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Council for Agricultural Research and Economics

REPORT 2021

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MINISTERO POLITICHE AGRICOLE
ALIMENTARI E FORESTALI



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PRE-PRINT

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Presentation by the President of CREA, Prof. Carlo Gaudio



CREA – Council for Agricultural Research and Economics - is the leading Italian research organization dedicated to agro-zootechnical sector, agri-food supply chains, food-science and nutrition, and socio-economics issues. CREA nowadays organizational structure – introduced by Law 23 December, nr. 190/1994 ("Disposizioni per la formazione del bilancio annuale e pluriennale dello Stato"/ "Provisions for the establishment of the State's annual and multiannual budget") which disposes the fusion of the previous Council for Agricultural Research (CRA) and of the National Agro-Economics Institute (INEA) – is a historical public body engaged in many activities related to the promotion of in-depth environmental culture and surveys about the Italian agronomic scena. CREA also supports the interaction among institutions (national and international) and stakeholders throughout the Country. CREA's history covers the last 150 years. Its origins, indeed, can be attributed to Camillo Benso Conte di Cavour, first Minister of Agriculture of the Italian Kingdom. Cavour founded the Network of Agronomic Stations in the second half of XIX century. This network was the initial core of the present CREA research centers organization. The Agronomic Stations were involved in experimental and specialized activities and increased in number between 1860 and 1880. Research activity basically concerned plant physiology, agricultural land in its physical, chemical and biological aspects, the study of fertilizers and soil fertility. A century later, in 1967, to better implement and organize this experimental stations' network (Law D.P.R. 23/11/1967 n. 1318) the Agricultural Research and Experimentation Institutes (IRSA) were set up under the supervision of the Ministry of Agriculture and Forestry, having the same scientific consideration as the Universities, ISRA counted 29 Research Institutes and 125 specialized operational sections, throughout the national territory

In 2004 the IRSA were re-organized into CRA, the Council for Agricultural Research, a country-wide institution with general scientific competence within the field of agriculture, agroindustry, food, fishery, and forestry (D. Lgs. n. 454/99). The most recent reorganization dates to 2015 when CREA reaches the present structure: a main headquarter and 12 specialized Research Centers. CREA disposes of prestigious infrastructures, with over 5,000 ha of experimental fields, specialized laboratories, advanced experimental equipments, greenhouses, fruit germplasm and zootechnical collections. Each CREA center looks back to a long and interesting history reflecting the development of the agricultural sector and agro-food chain in Italy over the time. CREA staff gave important contributions to knowledge and progress, readily available to farmers thanks to its important network across the national territory. The Experimental Agronomic Stations of the Kingdom of Italy introduced by Cavour, and later the IRSA, the CRA and now CREA activities have been and are still today the hinge between research and productive world, thanks to the extraordinary intuition pursued by Cavour to guarantee Italian agriculture with a research service, experimentation, dissemination and information.

It is therefore a real pleasure and a great honor to present this volume, which collects the most important and essential information on CREA's scientific activity. The aim of this volume is to provide the public with an overview of the precious results of CREA's immaterial capital. It is made up of over 2,000 researchers, technical and administrative staff whose intellectual and scientific work ranges from genomics to the environment, from food and nutrition to bioinformatics, from food engineering and processing to bioeconomy, from certification to protection of our agricultural products, from olive and citrus cultivation to floriculture, from the protection of forests and wood to animal husbandry, from viticulture to cereal culture, from aquaculture to horticulture and fruit cultivation, from genomics to the studies of the most advanced genetic techniques. CREA mission is clearly outlined by the management of its research activities, which include all experimental and methodological aspects in the field of agro-food and bio-economics, mainly, but also comprises the transfer of results to applied and productive contexts. Some data may help to understand the quality of the work done:

In 2021 the articles published in scientific journals, many of them international, doubled if compared to the year 2020, from 634 to 1,412; active research projects are about 900, up 12% if compared to the previous year. In addition, research doctorates, research grants and scholarships have increased significantly, from 200 in 2020 to 464 in 2021. These numbers place CREA firmly at the first place in the agri-food sector research in Italy. The 2021 report is also enriched with data on the scientific and historical libraries and technological infrastructures of CREA, providing a more complete picture of the Institute's research capacity. It is important to underline the translational aspect of the studies carried out in the CREA Research Centres, a common thread unites so many different activities, with the ultimate goal of creating the greatest possible integration between basic and applied research on specific and more advanced topics in the field of agrozootechnics, forestry, food and nutrition, agricultural policy and economics. An invaluable intangible capital, therefore, that must be supported, encouraged, strengthened, because it represents the true sap of an Institution that has given so much and so much more can give to the progress of the agri-food sector in Italy and in the World.

1. SUMMARY OF RESULTS



Stefano Vaccari,
CREA Director-General

The year **2021** heavily suffered from the COVID-19 pandemic, but thanks to science and innovation the reaction was rapid and successful.

Research activity plays, at a global level, a key role for the destiny of the Planet and for human well-being: research in the agri-food sector has contributed to these objectives and CREA, the largest Italian agency/public body in the field, has worked to provide new solutions to food operators and citizens

The Italian agri-food system demonstrated an extraordinary force of reaction, guaranteeing quality food to the nation and reaching record export volumes. Italian agriculture, indeed, remains the first in Europe in terms of added value.

CREA accompanied this extraordinary effort: research activity in 2021 was significantly increased compared to the previous year and the 12 centers, 80 locations and more than 2,200 people working there have continued to obtain results in all the agri-food and environmental sectors.

Some numbers of 2021 activity: 893 active research projects, with 1,412 publications, most of in specialized journals. CREA has enabled 464 young graduates (doctorates, research grants and scholarships) - more than double of 2020 - to develop research and technology. Research activities covered all fields of agri-food system, from genomics to mechanical and electronic technology, traditional varietal improvement, and predictive models for increasing agriculture sustainability, to reduce pesticides and increase the ability of plants to withstand water stress and adversities. Intense has been the fight against plant pests, both those, unfortunately increasingly, newly introduced in Italy, both traditional.

A new national quarantine laboratory for insects, bacteria and agricultural viruses is the largest project that CREA launched at the end of 2021. It will allow Italy to be at the forefront in managing risks from harmful species in agriculture. Animal welfare, development of specific solutions for the different Italian agriculture scenarios, enhancement of production and natural resources, water and soil in particular, and minor supply chains had an important scientific development in 2021 at CREA centres, as well as research into wood and forests sector. Furthermore, CREA significantly supported Italian Regions, the Ministry of Agriculture, Food and Forests and the Government in the long and complex phase of confrontation with the European Commission for National Strategic Plan implementation, the pivotal document of the new CAP. Among the 2021 results, 79 new patents, almost twice than in 2020, 693 plants rights and new varieties registered in the national registers. With tables and working groups, mostly internal and international, institutional partnerships, certifications, events and other services, in 2021, CREA staff activated and/or ensured continuity in scientific and technical cooperation for over 2,000 initiatives.

On the Food and Nutritional front, CREA, in quality of INRAN heir, in 2021 has also developed relevant research allowed Italy to better assert worldwide the validity of its nutritional model. For over 70 years, we have been developing the Food Composition Tables, a basis database of every nutritional analysis. In the Nutriscore-NutrInform Battery comparison, CREA provided the Italian Government with scientific support to demonstrate how the Nutriscore system is flawed and distortive for consumers: a support that proved decisive in comparison with the European Commission.

Also in 2021, CREA ensured the maintenance and increase of the extraordinary heritage of plant and animal collections, which is unique at global level. We proudly remember CREA holds germplasm collections of world importance for vine, olive trees and most of the cereals. Overall, 132 are the existing collections, some of which established in 2021.

The 2021 Report also considers the large artistic heritage, library and scientific CREA endowment, legacy of dozens of research institutes that marked the scientific history of this country. It's a heritage that CREA is committed to protect and enhance. In the following pages world' scholars and citizens will be able to examine in detail research field activities and find the references to Centers and People that have carried out them.

CREA hopes to have made a significant contribution in 2021 to the advancement of global research in the agri-food and food sectors: it moves us the awareness only with commitment, openness and enthusiasm we can still improve. And that is what we are committed to doing every day.

Summary table of CREA Activities 2021

PRODUCTS / CROSS-CUTTING ISSUES	RESEARCH ACTIVITIES (^)	PUBBLICATIONS	PhD SCHOLARSHIPS, RESEARCH GRANTS AND OTHER SCHOLARSHIPS	PATENTS	PLANT VARIETY RIGHTS AND VARIETIES REGISTERED	COLLECTIONS AND DATA BANKS	HISTORICAL SCIENTIFIC LIBRARY	OTHER SCIENTIFIC AND TECHNOLOGICAL INFRASTRUTTURES	VARIOUS SERVICES (*)	TOTAL RESEARCH AND SERVICE ACTIVITIES 2021
2.1 Cereals and Industrial Crops	75	95	24	3	150	25	1	8	204	585
2.2 Animal and Dairy Productions	74	120	37	8	54	4	2	3	163	465
2.3 Grapes and Wine	92	25	38	4	284	3	3	5	113	567
2.4 Fruit and citrus	73	96	36	1	60	10	4	5	86	371
2.5 Vegetable and Ornamental crops. Nursery	57	113	28	2	33	9	1	4	156	403
2.6 Olive and Oil	31	68	49	1		2	2	5	60	218
2.7 Fishery and Aquaculture	15	7	15	1				3	25	66
2.8 Minor supply chains and medicinal plants	35	57	16	2	49	10	2	12	46	229
2.9 Forest and Wood Production	46	67	11	1	63	1	2	19	68	278
3.1 Genomics, Biotechnologies and Bioinformatics	43	39	11			8		2	35	138
3.2 Plant protection, Resilience and Certification	76	105	29			35	3	39	334	621
3.3 Sustainability (ecosystems, climate, water, land..)	123	121	71	5		10	7	50	225	612
3.4 Technological innovations, digital transition and advanced sensoristics	67	158	48	17		1	1	16	79	387
4 Food, Nutrition and Food Waste	33	193	9	1		14		8	264	522
5.Agricultural Policies and Bioeconomy	55	148	42	33					191	469

(*) Working tables / working groups, institutional partnerships, certifications, disseminations, other services

The item includes research projects and programmes, both institutional and scientific, with autonomy from a scientific and financial point of view.

2. CREA RESEARCH LINES BY PRODUCTS

2.1. CEREALS and INDUSTRIAL CROPS

Cereals are the basis of human nutrition and an essential component of the Mediterranean diet, they occupy the largest cultivated areas of the planet and constitute the largest world trade exchanges for agri-food commodities. According to ISTAT (2020), in Italy, grain cereals constitute a total of about 43.9% of the cultivated areas.

Durum wheat is the main crop in terms of cultivated area, with about 1.22 Mhas, and a production of about 4 Mt. In Italy, the supply chain of durum wheat for pasta production is one of the pillars of agri-food exports and one of the main “Made in Italy” brand.

A great challenge for cereal production in national and European crop systems is the application of the EU Green Deal principles, which foresees agricultural sector helped by a progressive redesigning of the entire food and non-food production system, with a view to sustainability and the input reduction. Another issue addressed by cereal production, both in organic and conventional systems, is the need to replace monocropping by crop rotations, to preserve soil fertility and biodiversity and to contribute inputs reduction, while assuring economic sustainability in such diversified systems.

All the above research are supported by projects dedicated to the conservation, the phenotypical characterization (morpho-physiological, biochemical, metabolomic, genomic) and the exploitation of the large collections of cultivated germplasm present at CREA Centers. These collections, which range from cereals such as soft and hard wheat, rice, maize, sorghum and oats, to industrial species for food use, such as potatoes and beets, are the backbone of the activity aimed at achieving better adaptation to climate change, with a relative increase in productivity and quality, in balance with a reduced use of resources.

The biodiversity collections also constitute an important reservoir of variability for breeding programs, which are still in progress, and which have led to the release of varieties suitable for different agricultural systems (conventional, organic, etc.); parts of these collections also include ancient genotypes interesting to study for quality and adaptation to changed environmental conditions.



2.1.1 Research and research products - Cereals and Industrial Crops

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹
AdP4Durum Integrate approach to precision agriculture in the modern Apulian cereal farm	AdP4Durum aims to promote a set of enabling technologies, based on agronomic management techniques, proximal and remote radiometric measurements, evaluation of the interaction "genotype x environment", functional to obtain a smart and high automated management of durum wheat.	P. DE VITA CREA-CI CREA-IT	Apulia Region		
AGENT Activated GeneBank Network	The AGENT project aims to transform germplasm bank from simple "living" archives into bio-digitized center best organized to address the needs of a changing world	P. VACCINO CREA-CI	<ul style="list-style-type: none"> - Crop Research Institute VURV (VYZKUMN USTAV ROSTLINNE VYROBY VVI) - STICHTING WAGENINGEN RESEARCH - TEL AVIV UNIVERSITY, INSTITUTE FOR CEREAL CROPS IMPROVEMENT - National Agricultural Research and Development Institute - Royal Botanic Gardens, KEW - Plant Breeding and Acclimatization Institute (IHAR) - Hungarian Academy of Sciences - Centre for Agricultural Research - Eurice - European Research and Project Office GmbH - INTERNATIONAL CENTER FOR AGRICULTURAL RESEARCH IN THE DRY AREAS - ICARDA - INRAE - Institut National de Recherche pour l'Agriculture, l'Alimentation et l'Environnement - Eidgenössisches Departement für Wirtschaft, Bildung und Forschung (Agroscope) - Federal Research Center the N.I. Vavilov All-Russian Institute of Plant Genetic Resources - Institute of Plant Genetic Resources - INSTITUTO NACIONAL DE INVESTIGACION TECNOLOGIA AGRARIA Y ALIMENTARIA O.A.P. (INIA) - Università di Zurigo - IPGRI International Plant Genetic Resources Institute - National Agricultural and Food Centre 	<ul style="list-style-type: none"> - Research article Vaccino Patrizia (2021). Una rete europea di banche di semi. Molini D'Italia, 72, 6, 60-69. 	<ul style="list-style-type: none"> - CREABREAK – Genetic improvement of cereal new perspectives from AGENT project. 08/09/2021 - Research grant - n.1

¹ prototypes; dissemination activities (conferences, seminars, reports, sites and videos, etc.); training activities (scholarships, research grants and PhD scholarships)

			- European Commission		
AnFruBiAmbi Use of ancient varieties of durum wheat grown organically for the reduction of the environmental impact in the Avellino area	The general objective of AnFruBiAmbi project is to sensitize the agricultural operators of the Avellino area to the issues of soil preservation, In addition, ancient grains use ensures the preservation, dissemination, and enhancement of agro-biodiversity.	P. DE VITA CREA-CI	Campania Region		
AsFRUM Arsenic and mycotoxins in the durum wheat supply chain in Lazio: online optospectral control and use of innovative process technologies to contain the concentration in the processed	The main objective of the research is to develop innovative technologies of preventive selection effective in the control of unprocessed durum wheat raw material, and process, for the total arsenic and mycotoxins containment	P. MENESATTI CREA-IT	Lazio Region	<p>-Research article Cammerata, Alessandro, Marabottini, Rosita, Allevato, Enrica, Aureli, Gabriella, & Stazi, Silvia Rita, 2021. Content of minerals and deoxynivalenol in the air classified fractions of durum wheat. Cereal Chemistry 2021;00: 1–11. https://doi.org/10.1002/cche.10458</p> <p>-Research article Cammerata, Alessandro; Sestili, Francesco; Laddomada, Barbara; Aureli, Gabriella., 2021. Bran Enriched Milled Durum Wheat Fractions Obtained Using Innovative Micronization and Air-Classification Pilot Plants. Foods 2021, 10, 1790. https://doi.org/10.3390/foods10081796.</p> <p>-Research article Cammerata, Alessandro; Laddomada, Barbara; Milano, Francesco; Camerlengo, Francesco; Bonarrigo, Marco; Masci, Stefania; Sestili, Francesco., 2021. Qualitative Characterization of Unrefined Durum Wheat Air Classified Fractions. Foods 2021, 10, 2817. https://doi.org/10.3390/foods10112817.</p> <p>-Research article Cattaneo, Tiziana M.P.; Cutini, Maurizio; Cammerata, Alessandro; Stellari Annamaria; Marinoni, Laura; Bisaglia, Carlo and Brambilla Massimo, 2021. Near infrared spectroscopy and aquaphotomics evaluation of the efficiency of solar dehydration processes in pineapple slices. Journal of Near Infrared Spectroscopy 2021, Vol. 0(0) 1–11. https://doi.org/10.1177/09670335211054303.</p>	
BARISTA Advanced tools for breeding BARley for Intensive and Sustainable Agriculture under climate change scenarios	BARISTA integrates Crop Simulation Modelling, crop ideotyping, Genomic Prediction and genetic analysis of key characteristics for barley resilience, to make current methods of genetic improvement more efficient and develop genetic materials able to counteract climate change effects in different agro-ecological areas of Europe.	L CATTIVELLI CREA-GB	<p>- MUR - Ministero dell'Università e della Ricerca</p> <p>- Commissione europea</p>		- interview on the news TELECOLO 07/12/2021
C4FUTURE Sorghum Fortifying and Enhancing Resilience in C4 Crops for Current and Future Climate Change Adversities	C4FUTURE focuses on combining phenotyping, envirotyping, phenomics, and genomics, to fortify and enhance resilience of C4 crops (sorghum and maize) in current and future climate change scenarios,	E. HABYARIMANA CREA-CI	- Université Libre de Bruxelles		

CA.VA.SI.F.D. Characterization of native Sicilian varieties of durum wheat	Purpose of the CA. VA.SI.F.D. is the morphological and biochemical characterization of at least 10 varieties of durum wheat preserved on farm at the companies responsible for conservation or custodian farmers and allow registration in the National Registry of Biodiversity;	C. MICELI CREA-DC	Sicilian Region		
Breed4Bio Filiere sementiere Biologiche REGOLAMENTO Ente di tutela delle popolazioni evolutive di cereali frumentari: una importante risorsa PER il settore BIOlogico	PEI OPERATIONAL GROUPS FOR PRODUCTIVITY AND THE SUSTAINABILITY OF AGRICULTURE". FOCUS AREA 3A.	A. SOMMOVIGO CREA-DC	- Regione Emilia Romagna		
C4C CropsForChange Tackling the global warming effects in crops	Select lines of eggplant and cereals tolerant to dry and high temperatures	G. L. ROTINO CREA-GB	- MiPAAF - Ministero delle politiche agricole alimentari e forestali - Commissione europea - Bati Akdeniz Agricultural Research Institute - BATEM - Université Mohammed Premier (UMP) - UMKO, University of Kasdi Merbah - Stellenbosch University		
CEREALMED Enhancing diversity in cultivated biodiversity in Mediterranean environment cereal farming systems	Development of sustainable strategies to increase the cultivated biodiversity in Mediterranean environment in particular in cereal cultivation systems	E. MAZZUCOTELLI CREA-GB CREA-CI CREA-AA	- National Institute For Agricultural Research (INRA-Morocco) - University Hassan 1st, FST de Settat - University of Cukurova - Beni-Suef University - American University of Beirut (AUB) - Agencia Estatal Consejo Superior de Investigaciones Científicas - UNIVERSIDADE DE SANTIAGO DE COMPOSTELA USC - MUR - Ministero dell'Università e della Ricerca	- Research article Tuberosa Roberto; Cattivelli Luigi; Ceriotti Aldo; Gadaleta Agata; Beres Brian; Pozniak Curt (2021).Editorial: Proceedings of FSTP3 Congress – sustainable durum wheat chain for food security and healthy lives.Frontiers in Plant Science, 12,DOI:10.3389/fpls.2021.675510. - Research article Soresi Daniela; Bagnaresi Paolo; Crescente Juan Manuel; Díaz Marina; Cattivelli Luigi; Vanzetti Leonardo; Carrera Alicia (2021).Genetic characterization of a Fusarium head blight resistant QTL from Triticum turgidum ssp. dicoccoides. .Plant Molecular Biology Reporter, 39, 4, 710-726.DOI:10.1007/s11105-020-01277-0. - Research article Nigro Domenica; Fortunato Stefania; Giove Stefania; Mazzucotelli Elisabetta; Gadaleta Agata (2020).Functional Validation of Glutamine synthetase and Glutamate synthase Genes in Durum Wheat near Isogenic Lines with QTL for High GPC.International Journal of Molecular Sciences, 21, 23,DOI:10.3390/ijms21239253.	
CERESO	Process and product transfer and development of innovations to increase the economic and environmental sustainability of Lucanian cereal system	R. ROSSI CREA-ZA	- Regione Basilicata		

COBRA COprodotti da BioRAffinerie	Realization of a logistics platform for crops oil with the aim of obtaining the maximum valorization of the biomass components, to use in rotation with cereals and cultivated mainly in organic farms.. Residual raw materials are enhanced by creating innovative and more sustainable bioproducts	L. D'AVINO CREA-AA CREA-CI	- Regione Toscana		
	Collaboration on issues related to: Molecular traceability, Plant Growth Promoting Rhizobacteria, Use of plant species and varieties with high functional impact, to obtain high added value food	V. TERZI CREA-GB	- BARILLA G. E R. FRATELLI SPA		
CORE-SAVE Costituzione di una Rete Regionale per Salvaguardia del germoplasma Vegetale tradizionale lombardo	Exploration of biodiversity within some plant species phenotypic and molecular characterization of horticultural/cereal species	L. TOPPINO CREA-GB	- Regione Lombardia		
CoS.Mo Cooperazione per lo sviluppo in Sicilia della filiera Monococco	The project aims at the organization and development of the monococcus wheat supply chain in Sicily, to identify new products for the transformation..	L. GAZZA CREA-IT	- Regione Siciliana	- Research article Nocente Francesca; Natale Chiara; Galassi Elena; Tadda Federica; Gazza Laura (2021).Using einkorn and tritordeum brewers' spent grain to increase the nutritional potential of durum wheat pasta.Foods, 10(3), 1-9.DOI: 10.3390/foods10030502.	
DIBIO_BIOPRIME DIBIO Sottoprogetto BIOPRIME - Composizione naturali e microorganismi per la difesa ed il PRIming delle colture BIOlogiche MEditerranee	Identification and evaluation of microorganism molecules and natural botanical compounds useful for the defense of organic crops.	V. TERZI CREA_GB CREA-ZA CREA-VE CREA-AA	- MiPAAF - Ministero delle politiche agricole alimentari e forestali	- Volume/book Gacem Mohamed Amine; Terzi Valeria; Khelil Aminat Houli-El-Hadj(2021).Zinc nanostructures: Detection and elimination of toxigenic fungi and mycotoxins.Zinc Based Nanostructures for Environmental and Agricultural Applications Nanobiotechnology for Plant Protection, Part II, 403-430.DOI: 10.1016/B978-0-12-822836-4.00006-9.	
DIBIO_Coordinamento Riduzione di input di origine extra-aziendale per la Difesa delle coltivazioni BIOlogiche mediante approccio agroecologico	DIBIO has three macro-objectives, which are: 1. Development of phytopathological defense strategies in organic to reduce copper use. 2. Definition of means and protocols relating the use of natural biocidal substances, resistance inducers, biocontrol agents allowed in organic farming for seed tanning. 3. Selection of varieties resistant to the main seed-borne diseases based on skills and germplasm preserved and developed in breeding programmes.	V. TERZI CREA-GB	- MiPAAF - Ministero delle politiche agricole alimentari e forestali		
DROMAMED Capitalization of the Mediterranean maize germplasm for improving stress tolerance	a) Assemble collection of corn germplasm adapted to the Mediterranean area b) identification of physiological and morphological mechanisms related to the water and thermal stress response c) genotypic and phenotypic characterization of inbred lines adapted to arid areas (d) identification of sources of resistance to water stress and of models and selection criteria for breeding programmes	C. BALCONI CREA-CI	- Institut National Agronomique de Tunisie (INAT) - University of Vigo - Leibniz Institute of Plant Genetics and CROP Plant Research IPK - ENSA (École Nationale Supérieure Agronomique) - Hassan I University - INRAE - Institut National de Recherche pour l'Agriculture, l'Alimentation et l'Environnement - UNIVERSIDADE NOVA DE LISBOA		

	<p>e) crossing of the selected lines and evaluation of hybrids for agronomic characteristics, WUE (Water Use Efficiency), thermal stress resistance</p> <p>f) identification of innovative cultivation systems useful to mitigate stress</p>		<p>- Bati Akdeniz Agricultural Research Institut - BATEM</p> <p>- Institut National de la Recherche Agronomique</p> <p>- MUR - Ministero dell'Università e della Ricerca</p>		
DURDUStools Integration of molecular data into DUS testing in durum wheat: development of common online molecular database and a genetic distance calculation tool	Ensure the long-term use of the results achieved in the DURDUS project, i.e. the molecular information and the genetic distance defined by implementing the MODE. The tools resulting from the follow-up project are expected to substantially strengthen the decision making system supporting the choice of comparators for the benefit of all CPVO entrusted EOs for durum wheat	A.P.M. GIULINI CREA-DC	- COMMUNITY PLANT VARIETY OFFICE (CPVO)		
FERDI'2 Valutazione della fertilità biologica e della diversità microbica di suoli coltivati a mais ed analisi delle comunità microbiche metabolicamente attive nel suolo coltivato a riso	Evaluate the effect of different agronomic management on corn-grown soil biological fertility and microbial diversity. Evaluate the effect of different agronomic management on metabolically active microbial communities in rice-grown soil.	L. CANFORA CREA-AA	- Acqua Sole s.r.l		
GENDIBAR Utilization of local genetic diversity to understand and exploit barley adaptation to harsh environments and for pre-breeding	GENDIBAR intends to provide new knowledge to fill the research gaps for adapting barley farming to the future environments to secure the production of cereal food across Mediterranean countries. Specifically, GENDIBAR aims to achieve the following objectives: 1. Assembling a collection of local geo-referenced barley landraces along with crucial bioclimatic variables of collection sites in Mediterranean agro-ecological zones. 2. Identifying genetic signatures of barley adaptation at whole genome and adaptation syndromes at wellknown key genes, along with alleles for biotic stress resistance; 3. Characterizing the morphological, histological and genetic basis of heat response in the development of the reproductive structures of a selected panel of barley Mediterranean genotypes and of nearisogenic line. 4. Improving model-aided design for creating realistic and achievable barley ideotypes based on actual field data for the different Mediterranean agro-ecological zones and future climate conditions along with the implementation of pre-breeding programs to enable the creation of tolerant and resilient barley varieties. 5. Transferring of the established genetic material, knowledge and technologies to the stakeholders and providing hypotheses for new good agricultural practices aimed at minimizing the effects of climate change in current and future Mediterranean environments	A. FRICANO CREA-GB	- MUR - Ministero dell'Università e della Ricerca		
Grasciaririuiniti	The general objective of the project is the application of new virtuous management strategies of comparing organic waste, residues, as matrices to be reused in agriculture, energy, and other sectors.	L. D'AVINO CREA-AA	- Regione Marche		

iBarMed Innovative barley breeding approaches to tackle the impact of climatic change in the Mediterranean region	The objectives of the project are 1) to develop a genetic improvement programme based on genomic selection in barley in the Mediterranean region, 2) to identify drought-tolerant barley lines 3) to identify and map traits that confer drought tolerance in barley.	A. FRICANO CREA-GB	- MiPAAF - Ministero delle politiche agricole alimentari e forestali	- Boccardo Fricano Agostino; Battaglia Raffaella; Mica Erica; Tondelli Alessandro; Crosatt Cristina; Guerra Davide; Cattivelli Luigi (2021).Genetic Diversity for Barley Adaptation to Stressful Environments.Genomic Designing for Abiotic Stress Resistant Cereal Crops, 153-192.DOI: 10.1007/978-3-030-75875-2. - Research article Puglisi Damiano; Delbono Stefano; Visioni Andrea; Ozkan Hakan; Kara Ibrahim; Casas Ana M; Igartu Ernesto; Valè Giampiero; Lo Piero Angela Roberta; Cattivelli Luigi; Tondelli Alessandro; Fricano Agostino (2021).Genomic Prediction of Grain Yield in a Barley MAGIC Population Modeling Genotype by Environment Interaction.Frontiers in Plant Science, 12,DOI: 10.3389/fpls.2021.664148.	
ISEA	Evaluation of morphological, phenological and productive performances of different varieties of durum wheat grown in the Mediterranean environment.	P. GAROFALO CREA-AA	- I.S.E.A. SRL		
Lucan Cerea Gestione culturale sostenibile per standardizzazione delle tecniche di produzione dei cereali lucani	Development, implementation and dissemination of innovations related to Lucanian cereals	R. ROSSI CREA-ZA	- Regione Basilicata		
COMETA Native Mediterranean crops and their valorization with advanced green chemistry technologies	Analyze and validate low-input non-food farming systems in marginal areas of Southern Italy as catalysts for the activation of agro-industrial chains. Obtain fractions (seeds, hypogeal and epigeal biomass) suitable to be converted through advanced low-impact green chemistry technologies into bioproducts of interest for agriculture and industries.	L. MORRA CREA-CI CREA-IT CREA-ZA	MUR	- Research article Piragine E.; Flori L.; Di Cesare Mannelli L.; Ghelardini, C. Pagnotta E.; Matteo R.; Lazzeri L.; Martelli A. Miragliotta V.; Pirone A.; Testai L.; Calderone V.(2021).Eruca Sativa Mill. Seed Extract promotes anti-obesity and hypoglycemic effects in mice fed with high-fat diet.Phytotherapy Research, 35, 4, 1983-1990.DOI: 10.1002/ptr.6943 - Research article Martelli Alma; Eugenia Piragine; Era Gorica; Valentina Citi; Lara Testai; Eleonora Pagnotta; Luca Lazzeri; Nicolò Pecchioni; Valerio Ciccone; Rosangela Montanaro; Lorenzo Di Cesare Mannelli; Carla Ghelardini; Vincenzo Brancaleone; Lucia Morbidelli; Vincenzo Calderone.(2021).The H2S-Donor Eruca Exhibits Protective Effects against Vascular Inflammation in Human Endothelial and Smooth Muscle Cells.Antioxidants, 10, 6,DOI: 10.3390/antiox10060963 - Research article Giannini Vittoria; Melito Sara; Matteo Roberto; Lazzeri Luca; Pagnotta Eleonora; Chahine Sara; Roggero Pier Paolo. (2021).Testing Eruca sativa defatted seed meal as a potential bioherbicide on selected weeds and crops.Industrial Crops and Products, 171,DOI: 10.1016/j.indcrop.2021.113834. - Research article Pari Luigi, Alfano Vincenzo, Stefanoni Walter, Latterini Francesco, Liuzzi Federico, De Bari Isabella, Valerio Vito, Ciancolini Anna (2021). Inulin Content in Chipped and	3 Research Grant.

				Whole Roots of Cardoon after Six Months Storage under Natural Conditions. Sustainability, 13(7), 3902.	
SUSINCER SUSalNable use of bioactive compounds from <i>Brassicaceae</i> and <i>Solanaceae</i> wastes for CEReal crop protection (2020-2023).	Characterization and valorization of bioactive compounds extracted from wastes of <i>Brassicaceae</i> and <i>Solanaceae</i> and promote their reuse in sustainable agriculture to protect corn and wheat from attacks by fungal and insect pathogens.	C. BALCONI CREA-CI CREA-IT CREA-PB	Cariplo Foundation	<ul style="list-style-type: none"> - Article: Parisi B; Pacifico D; Lasorella V; Nicoletti F; Lo Scalzo F; Lanzanova C; Balconi C(2021).Dalle bucce di patata alla bioprotezione del futuro.L'Informatore Agrario, 40, 35-38. - Article: Pacifico Daniela; Lanzanova Chiara; Mastrangelo Annamaria; Locatelli, Sabrina Monica; Pagnotti Eleonora; Righetti Laura; Nicoletti Federica; Bassolino Laura; Balconi Carlotta (2021).Come proteggere frumento e mais dalle infezioni fungine. Secondo progetto del CREA, la difesa di questi cereali passa dal recupero dello scarto industriale di patata rucola.Molini d'Italia, LXXII, 11, 56-60. - Research article: Pacifico, Daniela; Lanzanova, Chiara; Pagnotti, Eleonora; Bassolino, Laura.; Mastrangelo, Annamaria; Marone, Daniela.; Matteo, Roberto; Lo Scalzo, Roberto; Balconi, Carlotta (2021).Sustainable Use of Bioactive Compounds from Solanum Tuberosum and Brassicaceae Wastes and by-Products for Crop Protection—A Review. .MOLECULES, 26, 8,DOI 10.1007/s11540-020-09474-w. 	<ul style="list-style-type: none"> - European Research Night 2021: The Potato Show 24/09/2021 - I fenoli in patate 24/09/2021 - Il recupero dello scarto agro-industriale: un modello di sostenibilità economica 27/05/2021 - Economia Circolare: come recuperare gli scarti dalla buccia di patate 26/09/2021 - La Patata: tesoro nascosto dai mille colori 24/09/2021 - Estraiamo il DNA dalla frutta 24/09/2021
BIODIVERSITY2FOOD Local and old cereal and legume varieties to increase the economic, environmental and social sustainability of the organic supply chain of Marche region	Strengthen the organic production chain of arable crops in Marche region, through the experimentation and promotion of technological and organizational solutions aimed at the recovery, characterization and valorization of old cereals and legumes varieties	P. DE VITA CREA-CI	Marche Region		
CLIMAQUALITEC Eol 96 SYSTEMIC-Agricultural biotechnology for nutritional quality of food crops in different agro-climatic scenarios. Challenges and perspectives in potato and cereal crops.	The overall objective of the SYSTEMIC project is to implement adaptive strategies for the production, consumption and health of sustainable foods, addressing the different impacts of climate change on food quality and composition and setting standards to achieve safety food and nutrition.	G. MANDOLINO CREA-CI CREA-AN CREA-IT	39 public research institutions of 8 different European countries /MIPAAF-- European Commission	<ul style="list-style-type: none"> - Abstract: Pacifico, Daniela; Ficco, Donatella Bianca Maria; De Vita, Pasquale (2021).Un Network dinamico per affrontare le nuove sfide del sistema alimentare.Tecnica Molitoria, 180, maggio, 2-3. - Research article: Lorenza Mistura; Francisco Javier Comendador Azcarraga; Laura D'Addezio; Deborah Martone; Aida Turrini (2021).An Italian Case Study for Assessing Nutrient Intake through Nutrition-Related Mobile Apps.Nutrients, 13, 9,DOI 10.3390/nu13093073. - Research article: Pacifico Daniela; Ficco Donatella; De Vita Pasquale (2021).Un Network dinamico per affrontare le nuove sfide del sistema alimentare.Pasta e Pastai, 26, 180, 23. 	<ul style="list-style-type: none"> - La Patata: tesoro nascosto dai mille colori 24/09/2021 - European Research Night 2021: The Potato Show 24/09/2021

NOBILI	CEREA	Improve the competitiveness of primary producers by better integrating them into the agri-food chain through quality schemes, the creation of added value for agricultural products, the promotion of products in local markets, short supply chains, producer associations and organizations and interbranch organizations'	D. B. M. FICCO CREA-CI	- GAL AISL		
AGROFILIERE	Integrate digital technologies for the sustainable strengthening of agri-food production and processing	Implement advanced digital and mechatronic applications for cereals and other grain crops. 2. Develop a Field Phenomics Platform equipped with experimental pheno-mobile for the digitized detection of multiple phenotypic parameters	P. MENESATTI N. PECCHIONI P. DE VITA CREA-IT CREA-CI	MIPAAF	Pecorella I., F. Fania, C.V.G. Azevedo, N. Santacroce, M. Pecchioni, P. de Vita. Exploitation of RGB indices from UAV imagery to estimate soil coverage ability in durum wheat and related traits (in preparation).	
CERESBIO	Cereals resistant to seed borne fungal diseases suitable for organic agriculture Subproject DIBIO	Durum and bread wheat - Monitoring of the presence of wheat carryover agent (Tilletia spp.) through the collection of samples of common and durum wheat in the main Italian cereal areas and subsequent identification and determination of virulence through greenhouse tests - Validation of a molecular diagnostic methodology for the early detection of infections by carryover agents (Tilletia spp.) - Identification on a morphological and molecular basis and determination of the virulence of Fusarium spp. through greenhouse tests Maize - Development of analytical technologies for the molecular identification of fungal strains of Fusarium Verticillium present in the corn cultivation area in Italy - Identification of resistant corn lines F. verticillium. Barley Collection of new isolates of P. graminea in the cultivation areas to evaluate the resistance of genetic materials of barley during selection - Pyramiding of pyrenophora graminea fungal resistance genes in barley to ensure durable resistance against different isolates Rice - Pyramiding of brusone resistance genes (Pyricularia oryzae) and Fusarium fujikuroi through the development of lines with wide spectrum of resistance for registration in the National Register of Varieties	P. DE VITA CREA-CI CREA-DC CREA-GB	MIPAAF	- Research article Faccini Nadia; Delbono Stefano; Çelik Oğuz Arzu; Cattivelli Luigi; Valè Giampiero; Tondelli Alessandro (2021).Resistance of European spring 2-row barley cultivars to Pyrenophora graminea and detection of associated loci.Agronomy, 11, 2,DOI: 10.3390/agronomy11020374. - Research article Aragona Maria; Campos-Soriano Lidia; Piombi Edoardo; Romano Elena; San Segundo Blanca; Spadaro Davide; Infantino Alessandro (2021).Imaging the invasion of rice roots by the bakanae agent Fusarium fujikuroi using a GFP-tagged isolate.European Journal of Plant Pathology, 161, 1, 25-36.DOI: 10.1007/s10658-021-02301-z.	3 Scholarships. 1 research grant
RGV	FAO VI Triennio - 2020-2022	The activity that CREA will develop in the three-year program 2020-2022 will be aimed at achieving the following primary objectives: a) maintain in safety the collections of genetic resources for agriculture and food currently held at CREA. b) collaborate with institutions, bodies, associations in the area to promote a correct "culture" of the conservation of plant genetic resources, in accordance with the Guidelines for the conservation of agricultural biodiversity; c) provide support to local communities through demonstration activities at the experimental field where the material is bred; d) maintain and contribute to the development of the computer database. e) support the MIPAAF for national and international actions related to the Treaty f) support the MIPAAF at national level,	I. VERDE CREA-OFA CREA-IT CREA-OF CREA-CI CREA-DC CREA-FL CREA-ZA CREA-GB CREA-VE CREA-AA	- MIPAAF - Ministero delle politiche agricole alimentari e forestali	- Research article Pasquale Tripodi; Gianluca Francese; Vincenzo Onofri; Sanaja; Carlo Di Cesare; Giovanna Festa; Antonietta D'Alessandro; Giuseppe Mennella (2021).A multi-methodological approach to study genomic footprint and environmental influence on agronomic and metabolic profiles in a panel of Italian traditional sweet pepper varieties.Journal of Food Composition and Analysis, 103,DOI: 10.1016/j.jfca.2021.104116. - Research article Marchetti Lucia; Saviane Alessio; Dalla Montanella; Paglia Graziella; Pellati Federica; Benvenuto Stefania; Bertelli Davide; Cappellozza Silvia (2021).Determination of 1-Deoxynojirimycin (1-DNJ) in Leaves of Italian or Italy-Adapted Cultivars of Mulberry (Morus sp.pl.) by HPLC-MS.Plants, 10, 8,DOI: 10.3390/pl10081251.	- Ecotipi tradizionali di patata. Una risorsa da tutelare 30/06/2021 Anzola dell'Emilia - European Research Night 2021: The Potato Show 24/09/2021 - La Patata: tesoro nascosto dai mille colori 24/09/2021

				<p>10.3390/plants10081553.</p> <p>- Research article Cappelozza Silvia; Demo Edoardo; Saviane Alessia (2021).I gelsi ai tempi dei Dogi: quando Venezia dominava il Mediterraneo..Vita in campagna, 7-8, 10-12.</p> <p>- Proceeding Sciacca Fabiola; Palumbo Massimo; Pagliaro Antonella; Di Stefano Vita; Scandurra Salvatore; Sollima Lucia; Viri Nino; Melilli Maria Grazia (2021).VALUTAZIONE DELLE CARATTERISTICHE QUALITATIVE E NUTRIZIONALI DI CEREALI FUNZIONALI, ARRICCHITI CON PORTULACA OLERACEA L. E OPUNTIA FICUS-INDICA. Atti del Convegno Nazionale "Cereali e Nutrizione", 283-288.</p> <p>- Proceeding Caputo Angelo Raffaele; Gasparro Marica; Bergamini Carlo; Alba Vittorio; Migliaro Daniele; Roccotelli Sabino; Cirigliano Pasquale; Del Lungo Stefano (2021).L'apporto di germoplasma viticolo dell'Enotria nel Mezzogiorno d'Italia.</p> <p>- Proceeding Gazza Laura; Galassi Elena; Cacciatori Pierina (2021).Agronomic, technological and nutritional characterisation of selected perennial wheat lines grown in Italy. 27-31.</p> <p>- Proceeding Pietrella Marco; Giovannini Daniela; Cappelozza Silvia (2021).Simple sequence repeat markers enable genetic characterization of mulberry germplasm preserved in the CREA's collection of Padua, Italy.Acta Horticulturae, 1307, 299-305.DOI: 10.17660/ActaHortic.2021.1307.46</p>	
<p>SYSTEMIC_1063</p> <p>ERA HDHL KH FNS A</p> <p>integrated approach to the challenge of sustainable food systems: adaptive and mitigatory strategies to address climate change and malnutrition. Eol N. 106</p> <p>From cereal diversity to plant breeding</p>	<p>SYSTEMIC_1063 intends to develop a proof of concept to demonstrate how genetic diversity can be used to increase sustainable cereal production in future climatic conditions. The existing germplasm of wheat and barley will allow to i) map the loci at the base of the characteristics related to the adaptation, ii) develop new cereal ideotypes and iii) develop new genomic prediction models</p>	<p>L. CATTIVELLI CREA-GB</p>	<p>- MiPAAF - Ministero delle politiche agricole alimentari e forestali</p>	<p>- Research article Puglisi Damiano; Delbono Stefano; Visioni Andrea; Ozkan Hakan; Kara Ibrahim; Casas Ana M; Igartua Ernesto; Valè Giampiero; Lo Piero Angela Roberta; Cattivelli Luigi; Tondelli Alessandro; Fricano Agostino (2021).Genomic Prediction of Grain Yield in a Barley MAGIC Population Modeling Genotype \times Environment Interaction.Frontiers in Plant Science, 12,DOI: 10.3389/fpls.2021.664148.</p>	
<p>BE^2R From Field to Glass.</p>	<p>Promote the development of the Apulian agriculture beer production with a strong territorial identity, using local and self-produced ingredients: cereals, hop yeasts.</p>	<p>M. SAVINO CREA-CI</p>	<p>Puglia Region</p>		
<p>FILIGRANO Innovations in the Campania cereal supply chain: from high quality sustainable production to differentiated storage</p>	<p>Strengthen the Campania cereal supply chain through the experimentation and promotion of technological and organizational solutions aimed at improving cultivation techniques, the use of digital technologies and the management of storage for homogeneous batches</p>	<p>P. DE VITA CREA-CI CREA-IT</p>	<p>Campania Region</p>		

POIGA Added value naturally enriched with bioactive molecules	Valorization of 4 ancient grains originating in Campania (Saragolla, Marzellina, Romanella e lanculedda) through a series of recovery, characterization and enhancement activities.	P. DE VITA CREA-CI	Campania Region		1 Research grant.
SAGRAL Saragolle and the ancient Lucanian grain preserved	The recovery and the morphological, molecular and biochemical characterization of ecotypes, local populations, obsolete varieties is a possibility to identify genotypes suitable for the conditions of water scarcity and sustainability of the agro-ecosystem.	P. DE VITA CREA-CI	Basilicata Region		
Wh-ITALY (New Breeding Techniques) for a sustainable breeding of durum wheat. BIOTECH subproject	1. Produce durum wheat lines improved for gluten tolerance through genome editing. 2. Obtain improved durum wheat lines for durable resistance to fungal pathogens via cisgenesis. 3. Acquire skills on genome editing, transformation, and in vitro culture techniques.	D. TRONO CREA-CI	MIPAAF		
				<ul style="list-style-type: none"> - Research article Mores Antonia; Borrelli Grazia Maria; Laidò Giovanni Petruzzino Giuseppe; Pecchioni Nicola; Amoroso Lucio Giuseppe Maria; Desiderio Francesca; Mazzucote Elisabetta; Mastrangelo Anna Maria; Marone Daniela (2021).Genomic approaches to identify molecular bases of crop resistance to diseases and to develop future breeding strategies. .International Journal of Molecular Science, 22, 11,DOI: 10.3390/ijms22115423. - Research article Marone Daniela; Russo Maria Anna; Mores Antonia; Ficco Donatella Bianca Maria; Laidò Giovanni Mastrangelo Anna Maria; Borrelli Grazia Maria (2021).Importance of landraces in cereal breeding for stress tolerance..Plants, 10, 7,DOI: 10.3390/plants10071267. - Research article Paris Roberta; Petruzzino Giuseppe; Savino Michele; Di Simone Vanessa; Ficco Donatella Bianca Maria; Trono Daniela (2021).Genome-Wide Identification, Characterization and Expression Pattern Analysis of the γ-Gliadin Gene Family in the Durum Wheat (Triticum durum Desf.) Cultivar Svevo.Genes, 12, 11,DOI: 10.3390/genes12111743. - Research article Anna Maria Mastrangelo; Luigi Cattivelli (2021).Wheat Makes Bread and Durum Wheat Different?.Trends in Plant Science, 26, 7, 677-684.DOI: 10.1016/j.tplants.2021.01.004. 	1. genome editing constructs 2. 20 cisgenic lines T0 containing the Lr67 gene conferring lasting resistance to powdery mildew and all leaf rusts. To be brought into homozygosity by self-fertilization . 2 Research grants.

DUROSTRESS Stratégie d'adaptation du blé dur au stress hydriques et thermiques.	Agronomically and genetically characterize wheat lines varieties tolerant to water and thermal stress	P. DE VITA CREA-CI	- Instituto Nacional de Investigação Agrária Veterinária (INIAV) - INRAE - Institut National de Recherche pour l'Agriculture, l'Alimentation et l'Environnement - GIE Blé dur - Groupement national interprofessionnel des semences et plants (GNIS) - SAMAE		
IN.TE.GRA Technological Innovation Durum Wheats.	Provide new products based on organic and functional cereals, with a high nutraceutical value and introduce, in the context of cultivation practices, precision agriculture in the current context of cereal sector in Sicily.	M.PALUMBO CREA-CI	Sicilian Region		
INNOGRANO Process and product innovations in the durum wheat supply chain.	Development of new materials by innovative genetic and agronomic methodologies	P. DE VITA CREA-CI	MISE/ European Commission - SANTACROCE GIOVANNI SRL		
PIGRANI Use of pigmented grains for the development of food products treatable and with high nutritional value.	Development and application of combined technologies to produce pigmented grains enriched with bioactive compounds on a large scale and for the formulation of flours and end-products	P. DE VITA CREA-CI	MISE	-Research article Romano Elio; Bergonzoli Simone; Pecorella Ivano; Bisaglia Carlo; De Vita, Pasquale (2021).Methodology for the Definition of Durum Wheat Yield Homogeneous Zones by Using Satellite Spectral Indices.Remote Sensing, 13, 11,DOI: 10.3390/rs13112036.	
RiBioFru Reduction of the environmental impact in traditional cereal area (BMC) through the organic cultivation of ancient varieties of durum wheat.	Interventions of animations and training	P. DE VITA CREA-CI	Campania Region	-Research article Beleggia, R.; Ficco, D.B.M.; Nigro, F.M.; Giovanniello, V. Colecchia, S.A.; Pecorella, I.; De Vita, P.(2021).Effect of Sowing Date on Bioactive Compounds and Grain Morphology of Three Pigmented Cerealspecies.Agronomy, 11, 3,DOI: 10.3390/agronomy11030591.	
SOFT Smart Organic Farming Techniques -Innovations to improve the sustainability and productivity of organic farming engaged in the Apulia herbaceous and industrial crops sector - Smart Organic Farming Techniques.	Implementation of an environmentally and technically economically efficient organic supply chain model for the organic production of high-quality durum wheat, legumes and industrial tomatoes.	P. DE VITA CREA-CI	Puglia Region		
SoIACE Solutions for improving Agroecosystem and Crop Efficiency for water and nutrient use.	SoIACE's overarching goal is to help European agriculture facing the challenge to deal with more frequent combined limitations of water and nutrients in the coming decades, through the design of novel crop genotypes and agroecosystem management innovations to improve water and nutrient (i.e. N and P) use efficiency.	N. PECCHIONI P. DE VITA CREA-CI	INRAE, IT, AIT, CREA, FIBL, JHI, KU, SU, SLU, UCL, UNEW, UPM, AGROSCOPE, ARVALIS, CON.CER, DCM, ECAF, IT, LEAF, ÖMKI, SOLYNTA, SP, SYNGENTA, AGROBIOTA		

STAZIONIDIMISURA	This agreement regulates the collaboration between CNR-ISSIA and CREA-CI for the realization and management of a station network for continuous measurement of environmental parameters at the CREA-CI companies based in Foggia and for the management of the already existing network at the CREA-CI company "Ovile Nazionale" based in Segezi (FG).	M. RINALDI CREA-CI	- CNR - Istituto di Studi sui Sistemi Intelligenti per l'Automazione - ISSIA - Sede Bari		
Plant-RED Exploiting the "PlantArray" physiological phenotyping platform for improving wheat and barley RESilience to Drought	The proposal falls under area 2. Development of climate resilient crop varieties in the overall scenario of ongoing changes in the Mediterranean basin	A. TONDELLI CREA-GB	- MAECI Ministero degli affari esteri e cooperazione internazionale - Hebrew University of Jerusalem (HUJI)		
RETIZ2020 Consolidamento e supporto tecnico alle filiere cerealicole e al monitoraggio delle materie prime.	The general objective is the consolidation of the results achieved by the "Cereal Quality Network" through the restructuring with a view to continuity of the network and the proposal of innovative technological solutions that aim to improve the sustainability and competitiveness of the cereal supply chains.	N. PECCHIONI CREA-CI CREA-IT CREA-GB CREA-PB	- MiPAAF - Ministero delle politiche agricole alimentari e forestali		
SUSCAP Developing resilience and tolerance of crop resource use efficiency to climate change and air pollution	Stakeholder engagement Crop and pedo-climatic data (point scale) Climate data and atmospheric composition (European Scale) Development and application of crop models	G.A. CAPPELLI CREA-AA	- MUR - Ministero dell'Università e della Ricerca - Commissione europea	- Research article Vaccino Patrizia; Mazzinelli Gianfranco; Di Sieno Simone; Masserano Greta (2021).Le varietà di grano tenero per le semine 2021.L'Informatore Agrario, 2021, 35-41. - Articolo in rivista Palumbo Massimo; Virzi Nino; Sciacca Fabiola; Licciardello Stefania; Anastasi Umberto; Scepelescu Concetta; Frenda Alfonso Salvatore; Amato Gaetano; Giambalvo Dario; Salafia Lucio; Randazzo Biagio; Mortaro Roberto; Pecchioni Nicola (2021).Speciale grano duro - Dettaglio regionale dei risultati 2021. Sicilia.L'Informatore Agrario, 29, 53-54. - Research article Cattivelli L.; Faccini N.; Gianinetti A.; Alberici R.; Alusi G.; Anastasi U.; Attene G.; Baronchelli M.; Belocchi A.; Cacciatori P.; Calvi A.; Caprara F.; Delbono S.; Fornara M.; Fuselli D.; Ghizzoni R.; Giordano M.; Governatori C.; Gualtieri P.; Invernizzi C.; Licciardello S.; Mameli L.; Mazzon V.; Pagani D.; Palumbo M.; Petrini A.; Pilati A.; Piredda A.; Pons R.; Preiti G.; Quaranta F.; Ravaglia S.; Reggiani F.; Rodriguez M.; Rossini F.; Ruggeri R.; Seveso D.; Signor M.; Tagliaferri L.; Troccoli A.; Viola P.; Virzi A.; Virzi N.(2021).Un buon 2021 per l'orzo da birra. Risultati produttivi delle prove varietali 2020-2021.L'Informatore Agrario, 77, 26, 43-44. - Research article Virzi Nino; Troccoli Antonio; Anastasi Umberto; Randazzo Biagio; Paone Silvana; de Gregorio Vito; Olivieri Angelo; Aniello Cosimo; Virgillito Santo; Li Puma Ezio; Licciardello Stefania; Sciacca Fabiola; Palumbo Massimo; Pecchioni Nicola (2021).Speciale grano tenero - Dettaglio regionale dei risultati 2021 - Puglia. Sicilia.L'Informatore Agrario, 28, 54-55. - Proceeding Gazza Laura; Taddei Federica; Nocente Francesco; Galassi Elena; Natale Chiara; Ciccoritti Roberto	

(2021). Micronization and air fractionation to improve technological, sensory and nutritional quality of whole grain pasta. *L'Informatore Agrario*, N. fascicolo 28, pp. 35-45.

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Vaccino Patrizia; Mazzinelli Gianfranco; Di Sieno Simone; Masserano Greta (2021). Le varietà di grano tenero per le semine 2021. *L'Informatore Agrario*, N. fascicolo 28, pp. 35-45.

- Articolo
Palumbo Massimo; Virzì Nino; Sciacca Fabiola; Licciardello Stefania; Anastasi Umberto; Scebano Concetta; Frenda Alfonso Salvatore; Amato Gaetano; Giambalvo Dario; Salafia Lucio; Randazzo Biagio; Mortaro Roberto; Pecchioni Nicola (2021). Speciale grano duro - Dettaglio regionale dei risultati 2021 - Sicilia. *L'Informatore Agrario*, N. fascicolo 29, pp. 53-55.

- Articolo
Cattivelli L.; Faccini N.; Gianinetti A.; Alberici R.; Alus G.; Anastasi U.; Attene G.; Baronchelli M.; Belocchi A.; Cacciatori P.; Calvi A.; Caprara F.; Delbono S.; Fornara M.; Fuselli D.; Ghizzoni R.; Giordano M.; Governatori C.; Gualtieri P.; Invernizzi C.; Licciardello S.; Mameli L.; Mazzon V.; Pagani D.; Palumbo M.; Petrini A.; Pilati A.; Piredda A.; Pons R.; Preiti G.; Quaranta F.; Ravaglia S.; Reggiani F.; Rodriguez M.; Rossini F.; Ruggeri R.; Sevedin D.; Signor M.; Tagliaferri L.; Troccoli A.; Viola P.; Virzì A.; Virzì N. (2021). Un buon 2021 per l'orzo da birra. Risultati produttivi delle prove varietali 2020-2021. *L'Informatore Agrario*, N. volume 77, N. fascicolo 26, pp. 43-45.

- Articolo
Virzì Nino; Troccoli Antonio; Anastasi Umberto; Randazzo Biagio; Paone Silvana; de Gregorio Vito; Olivieri Angelo; Aniello Cosimo; Virgillito Santo; Li Puma Ezio; Licciardello Stefania; Sciacca Fabiola; Palumbo Massimo; Pecchioni Nicola (2021). Speciale grano tenero - Dettaglio regionale dei risultati 2021 - Puglia. *L'Informatore Agrario*, N. fascicolo 28, pp. 54-55.

- Proceeding
Gazza Laura; Taddei Federica; Nocente Francesco; Galassi Elena; Natale Chiara; Ciccoritti Roberto (2021). Micronization and air fractionation to improve technological, sensory and nutritional quality of whole grain pasta. *L'Informatore Agrario*, N. fascicolo 28, pp. 87-88.

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Belocchi A., Sereni F., Gianinetti A., Reggiani F., Alus G., Demontis A., Rosta R., Massi A., Mantovani P., Zefelippo M., Converso R., Severi D., Quaranta F. (2021). Speciale grano duro: dettaglio regionale dei risultati 2021. Areale Nord. *L'Informatore Agrario*, LXXVII (29): 39-45.

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De Vita P., Paone S.; Pecorella I.; Rinaldi M.; Fornara M.; Gosparini E., Quaranta F., Colonna M.; Rosati D.D.; Mola M.; Di Mola I.; Ottaiano L.; Tedone L.; De Mastro G.; Schiavone D.; Preiti G.; Badagliacca G.; Pecchioni N. (2021). - Speciale grano duro. Dettaglio regionale dei risultati 2021. Areale Sud peninsulare. *L'Informatore Agrario*, LXXVII (29): 47-49.

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				Locatelli S. e Pecchioni N. 2021. Progetto RETI2020: da preliminari della campagna maidicola 2021. Mangimi Alimenti. Anno XIII, 6: 17-18. - Proceedings Lanzaova C., Mascheretti I., Mascheroni S., Pecchioni N., Locatelli S. 2021 Monitoring of micotoxin levels in Italian maize samples during seasons 2011 – 2020 Session S6 – poster 6. MycoTWIN-MycoKey International Conference Bari, 9 to 12 November 2021. ISBN digital version: 978-88-8080-221-1, ISBN printed version: 978-88-8080-224-3 https://doi.org/10.48257/ACBAQ	
DIBIO-CONCIABIO Maize seed-borne pathogens <i>Triticum</i> spp. and <i>Oryza sativa</i> : dressing and other defense strategies for organic agriculture.	Identify recent biological control methods effective against the main seed borne phytopathogens present in Italy for two of the most important cereal production crops: rice and wheat, common and durum	L.TAMBORINI CREA-DC P.VACCINO CREA-CI CREA-AA	MIPAAF		
PERMA Study of the races of <i>Peronospora</i> of Sunflower in the Marche Region to contain the fungal pathogen.	The project aims to identify the <i>P. halstedii</i> race currently present in the main cultivation areas of the Marche region, for agricultural and seed production, and a prototype for a more complete knowledge of the spread of the pathogen also in the other Italian areas cultivated with this crop	A. DEL GATTO CREA-CI	Marche Region	- Del Gatto A., Pieri S., Mangoni L., Fontenla A., Narbonne S., Baldin C., Alberti I.(2021).Peronospora del girasole via alla rilevazione delle razze.L'Informatore Agrario 16, 60-.	1 Research grant.
GEMMA Maize genotypes of Lombardy and microbiome: new perspectives for the control of toxigenic fungi and adaptation to climate change "- (2020-2023).	Provide effective responses to manage fungal diseases and abiotic stresses by enhancing the biodiversity consisting of the varieties of Lombard maize and the endophytic microorganisms within the varieties themselves	C. BALCONI CREA-CI	Lombardia Region		
MIRALO Analysis of MAIZ lines for the development of hybrids with efficient root system, to be used in Lombardy.	Identification of maize lines to produce hybrids with more efficient root system to increase yield and quality and in relation to their compatibility and use in the specific conditions of the Lombardy area	G. MAZZINELLI CREA-CI	Lombardia Region		1 research grant
P.S.G.O.-Km 0 BOLIVIA Small seeds, great opportunities: family agro-ecology and 0 Km supply chains in Bolivia.	Cooperation between Italy and Bolivia to collect and conserve indigenous maize biodiversity; enrichment of the CREA-CI maize germplasm bank with Bolivian "criollo" germplasm to create new pigmented varieties of corn, "morado" and violet type, rich in bioactive compounds with antioxidant properties	C. BALCONI CREA-CI	European Commission ² - AICS Agenzia Italiana per la Cooperazione allo Sviluppo		
VALOMAYS Varietà locali di mais: caratterizzazione per reintroduzione nel territorio lombardo	Operation 10.2.01 is aimed at supporting in situ and / or ex situ conservation activities of native plant varieties and animal breeds with limited diffusion to protect animal and plant biodiversity in the agricultural sector, guarantee the conservation of the genetic heritage of Lombard interest bringing advantages in terms of quality of plant and animal production, of greater longevity and well-being.	R. REDAELLI CREA-CI	- Regione Lombardia	- Research article Suriano S.; Carlotta B.; Valoti P.; Redaelli R.(2021).Comparison of total polyphenols, profile anthocyanins, color analysis carotenoids and tocopherols in pigmented maize.LWT - Food Science and Technology, 144, 1-9.DOI:10.1016/j.lwt.2021.111257.	

² Associazioni in Bolivia: FDUO, CGM, RENACC, AGRECOL - Università in Bolivia: Universidad Autónoma Tarija; Universidad Mayor de San Simón (UMSS); Universidad Mayor de Chuquisaca (UMRPSFXCH)/AICS - Agenzia Italiana per la Cooperazione allo sviluppo

INNORT 3.0- Innovations in industrial horticulture.	Identification of a technical strategy with low environmental impact for the containment of hypogaeic pests and fungi of the potato peel in the fucense potato sector, and consequent reduction of production waste	L. LaZZERI CREA-CI	Abruzzo Region		
RESILIENT Good Practices for the protection and cultivation of local varieties of potatoes and maize in inland areas.	Provide farmers with information and knowledge on Good Practices for the cultivation of traditional local varieties of potatoes and recover traditional ecotype through remediation and reintegration into the supply chain.	D. PACIFICO CREA-CI	Lombardia Region		
INNOVALEGUMI Nuovi sistemi colturali basati sulle leguminose per le aziende cerealicole pugliesi	The project has the general objective of improving the profitability, competitiveness, and sustainability of Apulian cereal farms by favoring the crop rotation of legumes from grain to cereals, to reduce the degradation of soil quality, promote carbon sequestration and increase the fertility of the soils in terms of nitrogen and organic matter.	P. DE VITA CREA-CI	- Regione Puglia		- Traditional potato ecotypes. A resource to protect 30/06/2021 Anzola dell'Emilia - La Patata: tesoro nascosto dai mille colori 24/09/2021 - European Research Night 2021: The Potato Show 24/09/2021
INNOVAR Next generation varieties testing for improved cropping on European farmland	Identify crop characteristics and sustainability criteria which indicate the capacity of varieties to maintain yield under more variable conditions and more sustainable crop management practices. Develop precise, rapid and automated methods for DUS testing in compliance with European/international requirements and the granting of PVR for new varieties. Revise and develop VCU trialing processes to provide data on characters that contribute to the capacity of new varieties to maintain yield under more variable conditions and sustainable crop management practices. Exploit synergies between DUS and VCU testing using genomics, phenomics, weather and soil data, and machine learning to set up databases and reference collections. Apply the methods and techniques developed for wheat to other cereals and other crop types, including oilseed grasses, legumes, sugar beet, maize, etc. Develop new tools for the evaluation and detection of variety characteristics, using genomic, phenomic and digital technologies. Analyse and review existing systems for providing and delivering information about varieties and facilitate variety specialists in adopting and developing new effective methods and tools for dissemination.	A.P.M. Giuliani CREA-DC	- Commissione Europea - Consejo Superior de Investigaciones Científicas - Instituto de la Grasa (IG-CSIC) - INTERNATIONAL CENTER FOR AGRICULTURAL RESEARCH IN THE DRY AREAS - ICARDA - Agri-Food and Biosciences Institute - University College Dublin, National University of Ireland, Dublin - Department of Agriculture, Food and the Marine - Forest Service - LESPROJEKT SLUZBY SRO (LESPRO) - DEBRECENI EGYETEM - UNIVERSITY OF DEBRECEN DE		
Panacea A thematic network to design the penetration PATH of Non-food Agricultural Crops into European Agriculture	Create a network of relationships and exchange between research, industry and the agricultural world aimed at disseminating knowledge and experience in the field of cultivation and use of non-food crops (NFC)	L. PARI CREA-IT	- Commissione Europea - Arkema France - Center Renewable Energy Source and Energy Saving - Iniciativas Innovadoras SAL - Stichting Wageningen Research (WR) - Institute Alterra and Institute Food Biobased Research - AgroTransilvania Cluster ATC - Association de Coordination Technique Agricole (ACTA) - 3B BioWarmia Bioenergy Bioresources		

			<ul style="list-style-type: none"> - Agricultural University Of Athens - Dept. of Natural Resources Agricultural Engineering - Instituto Navarro de Tecnologías e Infraestructuras Agroalimentarias SA - Upyte' Experim.Station Lithuanian Research Centre Agric.Forestry - Cooperativas Agro-Alimentarias de España - BIOS AGROSYSTEMS S.A. - Imperial College London (ICL)/ Centre for Environmental Policy - Universidade Nova de Lisboa - Faculdade de Ciências e Tecnologia - FCT- UNL Grupo de Disciplinas de Ecologia da Hidrosfera GDEH 		
QG2021	Productivity assessment and adaptation of sunflower commercial hybrids	A. DEL GATTO CREA-CI	- ASSOSEMENTI		
R.E.M.O. ISA Rete per un Modello Operativo di Integrazione Sociale in Area Rurale	Building from below a lasting and integrated operating model, networked, in one of the most disadvantaged rural areas of the Campania Region	S. ESPOSITO CREA-CI CREA-OFA	- Regione Campania		
RIUSIAMO Re-use of wastewater in agriculture.	Creation of an operative group to carry out a research and transfer project for a rational use of wastewater in agriculture, such as irrigation of industrial tomato crops	M. RINALDI CREA-CI	Puglia Region		n.1 fellowship
SUSRICE Creation of a new rice plant ideotype with improved resilience and sustainability through the insertion of traits that influence the adaptability of the crop.	1. Increase water and nitrogen use efficiency. 2. Modify the architecture of the rice plant by introducing, through genome editing and cisgenesis, the genes responsible for the characters in the traditional Italian variety of Vialone Nano rice.	P. VACCINO CREA-CI CREA-GB	MIPAAF		
				<ul style="list-style-type: none"> - Research article Volante, A., Tondelli, A., Desiderio, F., Abbruscato, P., Menin, B., Biselli, C., Casella, L., Singh, N., McCouch, S.R., Tharreau, D., Zampieri, E., Cattivelli, L., Valè, G. Genome wide association studies for japonica rice resistance to blast in field and controlled conditions (2020) Rice, 13 (1), art. no. 71. DOI: 10.1186/s12284-020-00431-2. 	

Risobiosystems Research and experimentation of national organic rice production systems	Project aimed at carrying out technical-scientific studies and insights to support and protect the national organic rice production systems and carried out by Universities and Research bodies with excellent skills on the subject with the involvement and participation of stakeholders and operators in the sector	N. PECCHIONI S. MONACO CREA-CI CREA-DC CREA-PB	MIPAAF		
CAMA Research-based participatory approaches for adopting Conservation Agriculture in the Mediterranean Area.	Identifying the major social, economic and agronomic barriers to CA implementation by smallholders in Mediterranean countries; Establishing a network of CA experiments and farmer associations adopting CA to apply a participatory research approach Improving legume-based rotations in rainfed cropping systems, with genomic and farmer participatory research aimed to enhance legume crop yield and resilience and research on crop/residue management; Quantifying the effects of CA application and developing agronomic innovation, to increase soil fertility, soil physical status, nitrogen and water use efficiencies, and to decrease soil erosion Disseminating the CA concept and techniques in Mediterranean countries, tailoring them to the specific pedo-climatic and socio-economic conditions Increasing technicians', advisors' and farmers' knowledge for a better adoption of CA, by the organisation of two training courses and their participation in the research activities	M. RINALDI CREA-CI CREA-ZA CREA-PB CREA-AA	PRIMA Foundation ³ - IAMZ-CIHEAM – Mediterranean Agronomical Institute of Zaragoza - National Institute for Agricultural Research INRA - APOSOLO - Agencia Estatal Consejo Superior de Investigaciones Científicas (CSIC) - CEBAS - HELLINIKOS GEORGIKOS ORGANISMOS - DIMITRA / HELLENIC AGRICULTURAL ORGANIZATION (HAO) - DEMETER - ARVALIS, International Centre for Arvalis Institut du Végétal - UNIVERSITAT DE LLEIDA - Association for Sustainable Agriculture - APAD - ENSA (École Nationale Supérieure Agronomique) - Instituto Nacional de Investigación Agrária Veterinária (INIAV) - Institut National de la Recherche Agronomique de Tunisie - INRAT ⁴	- Article Monaco Stefano; Pecchioni Nicola; Borsotto Patrizia; Borri Ilaria; Bocchi Stefano; Orlando Francesca; Vagstad Valentina; Bertora Chiara; Moretti Barbara; Del Vecchio Aurelio (2021).Redditività del riso bio: ruolo di agrotecniche varietà.L'Informatore Agrario, 18, 40-42. - Article Andreozzi Anna; Prieto Pilar; Mercado-Blanco Jesús; Monaco Stefano; Zampieri Elisa; Romano Silvia; Val Gianpiero; Defez Roberto; Bianco Carme (2019).Efficient colonization of the endophyte Herbaspirillum huttiense RCA24 and Enterobacter cloacae RCA25 influences the physiological parameters of Oryza sativa L. cv. Baldo rice.Environmental microbiology, 21, 9, 3489-3504.DOI: 10.1111/1462-2920.14688. - Research article Gabriele Mongiano; Elisa Zampieri; Caterina Morcia Patrizia Titone; Andrea Volante; Valeria Terzi; Luigi Tamborini; Giampiero Valé; Stefano Monaco (2021).Application of plant-derived bioactive compounds as seed treatments to manage the rice pathogen Fusarium fujikuroi.Crop Protection, 148,DOI: 10.1016/j.cropro.2021.105739. - Research article GIOVANNI DARA GUCCIONE; Pagliarino Elena; BORRI ILARIA; Vaccaro Alessandra; Borsotto Patrizia (2021).Participatory Analysis of the Control and Certification System in the Italian Organic Rice Value Chain.Sustainability, 13, 4,DOI: 10.3390/su1304200. - Article Borsotto Patrizia; Borri Ilaria; Dara Guccione Giovanni; Vaccaro Alessandra; Monaco Stefano (2021).Linea guida per l'armonizzazione delle procedure di certificazione.	https://www.risoitaliano.eu/crea-ecco-le-rese-di-risobiosystem/ ; http://sinab.it/bionovita/risobiosystems-video-da-una-giornata - La Certificazione delle sementi di riso e attività sperimentale - Campagna 2020-2021 09/02/2021
Ta.Ke.To Tuscan Kentucky tobacco: quality production and sustainable agronomic practices respecting the environment.	Preserve and improve the quality of soils through the addition of organic matter from compost and green manure. Introduce formulations with toxicological and residue profiles of lower environmental impact for the control of P. syringae bacteriosis.3. Reduce the number of interventions with synthetic insecticides for the defense of tobacco from the flea (Epitrix hirtipennis)	L. DEL PIANO CREA-CI	Toscana Region	- Research article Annicchiarico Paolo; Nazzicari Nelson; Notari Tommaso; Monterrubio Martin Cristina; Romagnolo Massimo; Ferrari Barbara; Pecetti Luciano (2021).Pea breeding for intercropping with cereals: variation for competitive ability and associated traits, and assessment of phenotypic and genomic selection strategies.Frontiers in Plant Science, 12,DOI: 10.3389/fpls.2021.731949. - Research article Lacolla Giovanni; Rinaldi Michele; Savino Michele; Russo Mario; Caranfa Davide; Cucci Giovanni	Website: http://www.camamed.eu/en/index Two research grants

³ APOSOLO (Portugal), INIAV (Portugal), ARVALIS (France), Univ. di Lleida (Spain), IAMZ-CIHEAM (Spain), CSIC (Spain) HAO-Demeter (Greece), INRAT (Tunisie), APAD (Tunisie), INRA (Morocco), ENSA (Algerie)/PRIMA Foundation - Call 2019 Section I – H2020

				(2021).Effects of mineral and organic fertilization with the use of wet olive pomace on emmer wheat (Triticum dicoccum Shrank) grain yield and composition.Journal of Cereal Science, 102, 103369,DOI:10.1016/j.jcs.2021.103369.	
AdP4Durum Integrated approach to precision agriculture in the modern Apulian cereal farm	AdP4Durum aims to promote a set of enabling technologies, based on agronomic management techniques, proximal and remote radiometric measurements, evaluation of the interaction "genotype x environment", functional to obtain a smart and high automated management of durum wheat.	P. DE VITA CREA-CI CREA-IT	Apulia Region		
AGENT Activated Germplasm Network	The AGENT project aims to transform germplasm bank from simple "living" archives into bio-digitized center best organized to address the needs of a changing world	P. VACCINO CREA-CI	<ul style="list-style-type: none"> - Crop Research Institute VURV (VYZKUMN USTAV ROSTLINNE VYROBY VVI) - STICHTING WAGENINGEN RESEARCH - TEL AVIV UNIVERSITY, INSTITUTE FOR CEREAL CROPS IMPROVEMENT - National Agricultural Research and Development Institute - Royal Botanic Gardens, KEW - Plant Breeding and Acclimatization Institute (IHAR) - Hungarian Academy of Sciences - Centre for Agricultural Research - Eurice - European Research and Project Office GmbH - INTERNATIONAL CENTER FOR AGRICULTURAL RESEARCH IN THE DRY AREAS - ICARDA - INRAE - Institut National de Recherche pour l'Agriculture, l'Alimentation et l'Environnement - EIDGENOESSISCHES DEPARTEMENT FUER WIRTSCHAFT, BILDUNG UND FORSCHUNG (Agroscope) - Federal Research Center the N.I. Vavilov All-Russian Institute of Plant Genetic Resources - Institute of Plant Genetic Resources - INSTITUTO NACIONAL DE INVESTIGACION TECNOLOGIA AGRARIA Y ALIMENTARIA O.A.P. (INIA) - Università di Zurigo - IPGRI International Plant Genetic Resources Institute - National Agricultural and Food Centre - European Commission 	<ul style="list-style-type: none"> - Research article Vaccino Patrizia (2021). Una rete europea di banche dati semi.Molini D'Italia, 72, 6, 60-69. 	<ul style="list-style-type: none"> - CREABREAK – Genetic improvement of cereal new perspectives from AGENT project. 08/09/2021 - Research grant - n.1
AnFruBiAmbi Use of ancient varieties of durum wheat grown organically for the reduction of the environmental impact in the Avellino area	The general objective of AnFruBiAmbi project is to sensitize the agricultural operators of the Avellino area to the issues of soil preservation, In addition, ancient grains use ensures the preservation, dissemination, and enhancement of agro-biodiversity.	P. DE VITA CREA-CI	Campania Region		

AsFRUM Arsenic and mycotoxins in the durum wheat supply chain in Lazio: online optospectral control and use of innovative process technologies to contain the concentration in the processed	The main objective of the research is to develop innovative technologies of preventive selection effective in the control of unprocessed durum wheat raw material, and process, for the total arsenic and mycotoxins containment	P. MENESATTI CREA-IT	- Lazio Region	-Research article Cammerata, Alessandro, Marabottini, Rosita, Allevato, Enrica, Aureli, Gabriella, & Stazi, Silvia Rita, 2021. Content of minerals and deoxynivalenol in the air-classified fractions of durum wheat. Cereal Chemistry 2021;00: 1–11. https://doi.org/10.1002/cche.10458 -Research article Cammerata, Alessandro; Sestili, Francesco; Laddomada, Barbara; Aureli, Gabriella., 2021. Bran Enriched Milled Durum Wheat Fractions Obtained Using Innovative Micronization and Air-Classification Pilot Plants. Foods 2021, 10, 1790. https://doi.org/10.3390/foods10081796 . -Research article Cammerata, Alessandro; Laddomada, Barbara; Milanesi, Francesco; Camerlengo, Francesco; Bonarrigo, Marco; Masci, Stefania; Sestili, Francesco., 2021. Qualitative Characterization of Unrefined Durum Wheat Air-Classified Fractions. Foods 2021, 10, 2817. https://doi.org/10.3390/foods10112817 . -Research article Cattaneo, Tiziana M.P.; Cutini, Maurizio; Cammerata, Alessandro; Stellari Annamaria; Marinoni, Laura; Bisaglia, Carlo and Brambilla Massimo, 2021. Near infrared spectroscopy and aquaphotomics evaluation of the efficiency of solar dehydration processes in pineapple slices. Journal of Near Infrared Spectroscopy 2021, Vol. 0(0) 1–11. https://doi.org/10.1177/09670335211054303 .	
BARISTA Advanced tools for breeding BARley for Intensive and SusTainable Agriculture under climate change scenarios	BARISTA integrates Crop Simulation Modelling, crop ideotyping, Genomic Prediction and genetic analysis of key characteristics for barley resilience, to make current methods of genetic improvement more efficient and develop genetic materials able to counteract climate change effects in different agro-ecological areas of Europe.	L. CATTIVELLI CREA-GB	- MUR - Ministero dell'Università e della Ricerca - Commissione europea		- interview on the news TELECOLORE 07/12/2021
C4FUTURE Sorghum Fortifying and Enhancing Resilience in C4 Crops for Current and Future Climate Change Adversities	C4FUTURE focuses on combining phenotyping, envirotyping, phenomics, and genomics, to fortify and enhance resilience of C4 crops (sorghum and maize) in current and future climate change scenarios,	E. HABYARIMANA CREA-CI	- Université Libre de Bruxelles		
CA.VA.SI.F.D. Characterization of native Sicilian varieties of durum wheat	Purpose of the CA. VA.SI.F.D. is the morphological, genetic and biochemical characterization of at least 10 varieties of durum wheat preserved on farm at the companies responsible for conservation or custodial management of farmers and allow registration in the National Registry of Biodiversity;	C. MICELI CREA-DC	Sicilian Region		
Breed4Bio Filiere sementiere Biologica REGolamEntate: popolazioni evolutive di frumenti: una importante risorsa PER il settore BIOlogico	PEI OPERATIONAL GROUPS FOR PRODUCTIVITY AND THE SUSTAINABILITY OF AGRICULTURE". FOCUS AREA 3A.	A. SOMMOVIGO CREA-DC	- Regione Emilia Romagna		

C4C CropsForChange Tackling the global warming effects in crops	Select lines of eggplant and cereals tolerant to dry and high temperatures	G.L. ROTINO CREA-GB	<ul style="list-style-type: none"> - MiPAAF - Ministero delle politiche agricole alimentari e forestali - Commissione europea - Bati Akdeniz Agricultural Research Institute - BATEM - Université Mohammed Premier (UMP) - UMKO, University of Kasdi Merbah - Stellenbosch University 		
CEREALMED Enhancing diversity in cultivated biodiversity in Mediterranean environment in particular in cereal cultivation systems	Development of sustainable strategies to increase the cultivated biodiversity in Mediterranean environment in particular in cereal cultivation systems	E. MAZZUCOTELLI CREA-GB CREA-CI CREA-AA	<ul style="list-style-type: none"> - National Institute For Agricultural Research (INRA-Morocco) - University Hassan 1st, FST de Settat - University of Cukurova - Beni-Suef University - American University of Beirut (AUB) - Agencia Estatal Consejo Superior de Investigaciones Científicas - UNIVERSIDADE DE SANTIAGO DE COMPOSTELA USC - MUR - Ministero dell'Università e della Ricerca 	<ul style="list-style-type: none"> - Research article: Tuberose Roberto; Cattivelli Luigi; Ceriotti Aldo; Gadaleta Agata; Beres Brian; Pozniak Curt (2021). Editorial: Proceedings of FSTP3 Congress – sustainable durum wheat chain for food security and healthy lives. <i>Frontiers in Plant Science</i>, 12, DOI: 10.3389/fpls.2021.675510. - Research article: Soresi Daniela; Bagnaresi Paolo; Crescente Juan Manuel; Díaz Marina; Cattivelli Luigi; Vanzetti Leonardo; Carrera Alicia (2021). Genetic characterization of a Fusarium head blight resistant QTL from <i>Triticum turgidum</i> ssp. <i>dicoccoides</i>. <i>Plant Molecular Biology Reporter</i>, 39, 4, 710-726. DOI: 10.1007/s11105-020-01277-0. - Research article: Nigro Domenica; Fortunato Stefania; Giove Stefania Lucia; Mazzucotelli Elisabetta; Gadaleta Agata (2020). Functional Validation of Glutamine synthetase and Glutamate synthase Genes in Durum Wheat near Isogenic Lines with QTL for High GPC. <i>International Journal of Molecular Sciences</i>, 21, 23, DOI: 10.3390/ijms21239253. 	
CERESO	Process and product transfer and development of innovations to increase the economic and environmental sustainability of Lucanian cereal system	R. ROSSI CREA-ZA	- Regione Basilicata		
COBRAFCO Prodotti da BioRAFFinerie	Realization of a logistics platform for crops oil with the aim of obtaining the maximum valorization of the biomass components, to use in rotation with cereals and cultivated mainly in organic farms. Residual raw materials are enhanced by creating innovative and more sustainable bioproducts	L. D'AVINO CREA-AA CREA-CI	- Regione Toscana		
Coll. Barilla	Collaboration on issues related to: Molecular traceability, Plant Growth Promoting Rhizobacteria, Use of plant species and varieties with high functional impact, to obtain high added value food	V. TERZI CREA-GB	- BARILLA G. E R. FRATELLI SPA		

CORE-SAVE COstituzione di una Rete Regionale per la Salvaguardia del germoplasma VEgetale tradizionale lombardo	Exploration of biodiversity within some plant species phenotypic and molecular characterization of horticultural/cereal species	L. TOPPINO CREA-GB	- Regione Lombardia		
CoS.Mo Cooperazione per lo sviluppo in Sicilia della filiera Monococco	The project aims at the organization and development of the monococcus wheat supply chain in Sicily, to identify new products for the transformation..	L. GAZZA CREA-IT	- Regione Siciliana	- Research article Nocente Francesca; Natale Chiara; Galassi Elena; Tadda Federica; Gazza Laura (2021).Using einkorn and tritordeum brewers' spent grain to increase the nutritional potential of durum wheat pasta.Foods, 10(3), 1-9.DOI: 10.3390/foods10030502.	
DIBIO_BIOPRIME	Identification and evaluation of microorganism molecules and natural botanical compounds useful for the defense of organic crops.	V. TERZI CREA-GB CREA-ZA CREA-VE CREA-AA	- MiPAAF - Ministero delle politiche agricole alimentari e forestali	- Volume/book Gacem Mohamed Amine; Terzi Valeria; Khelil Aminat Houl-El-Hadj(2021).Zinc nanostructures: Detection and elimination of toxigenic fungi and mycotoxins.Zinc Based Nanostructures for Environmental and Agricultural Applications Nanobiotechnology for Plant Protection, Part II, 403-430.DOI: 10.1016/B978-0-12-822836-4.00006-9.	
DIBIO_Coordinamento	Development of phytopathological defense strategies in organic to reduce copper use. Definition of means and protocols relating the use of natural biocidal substances, resistance inducers, biocontrol agents allowed in organic farming for seed tanning. Selection of varieties resistant to the main seed-borne diseases based on skills and germplasm preserved and developed in breeding programmes.	V. TERZI CREA-GB	- MiPAAF - Ministero delle politiche agricole alimentari e forestali		
DROMAMED Capitalization of the Mediterranean maize germplasm for improving stress tolerance	a) Assemble collection of corn germplasm adapted to the Mediterranean area b) identification of physiological and morphological mechanisms related to the water and thermal stress response c) genotypic and phenotypic characterization of inbred lines adapted to arid areas (d) identification of sources of resistance to water stress and of models and selection criteria for breeding programmes e) crossing of the selected lines and evaluation of hybrids for agronomic characteristics, WUE (Water Use Efficiency), thermal stress resistance f) identification of innovative cultivation systems useful to mitigate stress	C. BALCONI CREA-CI	- Institut National Agronomique de Tunisie (INAT) - University of Vigo - Leibniz Institute of Plant Genetics and CROP Plant Research IPK - ENSA (École Nationale Supérieure Agronomique) - Hassan I University - INRAE - Institut National de Recherche pour l'Agriculture, l'Alimentation et l'Environnement - UNIVERSIDADE NOVA DE LISBOA - Bati Akdeniz Agricultural Research Institut - BATEM - Institut National de la Recherche Agronomique - MUR - Ministero dell'Università e della Ricerca		
DURDUSTools Integration of molecular data into DUS testing in durum wheat: development of common online molecular database and a genetic distance calculation tool	The aim of the project is to ensure the long-term use of the results achieved in the DURDUS project, i.e. the molecular information and the genetic distance defined by implementing the MODEL. The tools resulting from the follow-up project are expected to substantially strengthen the decision-making system supporting the choice of comparators for the benefit of all CPV entrusted EOs for durum wheat	A.P.M. GIULINI CREA-DC	- COMMUNITY PLANT VARIETY OFFICE (CPVO)		

FERDI'2	Evaluate the effect of different agronomic management on corn-grown soil biological fertility and microbial diversity. Evaluate the effect of different agronomic management on metabolically active microbial communities in rice-grown soil.	L. CANFORA CREA-AA	- Acqua Sole s.r.l		
GENDIBAR Utilization of local genetic diversity to understand and exploit barley adaptation to harsh environments and for pre-breeding	GENDIBAR intends to provide new knowledge to fill the research gaps for adapting barley farming to the future environments to secure the production of cereal food across Mediterranean countries. Specifically, GENDIBAR aims to achieve the following objectives: 1. Assembling a collection of local geo-referenced barley landraces along with crucial bioclimatic variables of collection sites in Mediterranean agro-ecological zones (WP1; scientific objective). 2. Identifying genetic signatures of barley adaptation at whole genome and adaptation syndrome at wellknown key genes, along with alleles for biotic stress resistance (WP2; scientific objective). 3. Characterizing the morphological, histological and genetic basis of heat response in the development of the reproductive structures of a selected panel of barley Mediterranean genotypes and of nearisogenic lines (WP3; scientific objective). 4. Improving model-aided design for creating realistic and achievable barley ideotypes based on actual field data for the different Mediterranean agro-ecological zones and future climate conditions along with the implementation of pre-breeding programs to enable the creation of tolerant and resilient barley varieties (WP4; technological and industrial objective). 5. Transferring of the established genetic materials, knowledge and technologies to the stakeholders and providing hypotheses for new good agricultural practices aimed at minimizing the effects of climate change in current and future Mediterranean environments (WP5; technological and industrial objective)	A. FRICANO CREA-GB	- MUR - Ministero dell'Università e della Ricerca		
Grasciariruniti	The general objective of the project is the application of new virtuous management strategies of comparing organic waste, residues, as matrices to be reused in agriculture, energy, and other sectors.	L. D'AVINO CREA-AA	- Regione Marche		
iBarMed Innovative barley breeding approaches to tackle the impact of climatic change in the Mediterranean region	The objectives of the project are 1) to develop a genetic improvement programme based on genomic selection in barley in the Mediterranean region, 2) to identify drought-tolerant barley lines 3) to identify and map traits that confer drought tolerance in barley.	A. FRICANO CREA-GB	- MiPAAF - Ministero delle politiche agricole alimentari e forestali	- Boccardo Fricano Agostino; Battaglia Raffaella; Mica Erica; Tondelli Alessandro; Crosatt Cristina; Guerra Davide; Cattivelli Luigi (2021).Genetic Diversity for Barley Adaptation to Stressful Environments.Genomic Designing for Abiotic Stress Resistant Cereal Crops, 153-192.DOI:10.1007/978-3-030-75875-2. - Puglisi Damiano; Delbono Stefano; Visioni Andrea; Ozkan Hakan; Kara Ibrahim; Casas Ana M; Igartu Ernesto; Valè Giampiero; Lo Piero Angela Robert; Cattivelli Luigi; Tondelli Alessandro; Fricano Agostino (2021).Genomic Prediction of Grain Yield in a Barley MAGIC Population Modeling Genotype per Environment Interaction.Frontiers in Plant Science, 12,DOI: 10.3389/fpls.2021.664148.	

ISEA SPERIMENTAZIONE VARIETALE DI FRUMENTO DURO E TRITICALE IN CAMP	Evaluation of morphological, phenological and productive performances of different varieties of durum wheat grown in the Mediterranean environment.	P. GAROFALO CREA-AA	- I.S.E.A. SRL		
Lucan Cereals Gestione culturale sostenibile per standardizzazione delle tecniche di produzione di cereali lucani	Development, implementation and dissemination of innovations related to Lucanian cereals	R. ROSSI CREA-ZA	- Regione Basilicata		
COMETA Native Mediterranean crops and their valorization with advanced green chemistry technologies	1. Analyze and validate low-input non-food farming systems in marginal areas of Southern Italy as catalysts for the activation of agro-industrial chains. 2. Obtain fractions (seeds, hypogeal and epigeal biomass) suitable to be converted through advanced low-impact green chemistry technologies into bioproducts of interest for agriculture and industries.	L. MORRA CREA-CI CREA-IT CREA-ZA	MUR	- Research article Piragine E.; Flori L.; Di Cesare Mannelli L.; Ghelardini, C. Pagnotta E.; Matteo R.; Lazzeri L.; Martelli A. Miragliotta V.; Pirone A.; Testai L.; Calderone V.(2021).Eruca Sativa Mill. Seed Extract promotes anti- obesity and hypoglycemic effects in mice fed with high-fat diet.Phytotherapy Research, 35, 4, 1983- 1990.DOI: 10.1002/ptr.6943 - Research article Martelli Alma; Eugenia Piragine; Era Gorica; Valentin Citi; Lara Testai; Eleonora Pagnotta; Luca Lazzeri; Nicol Pecchioni; Valerio Ciccone; Rosangela Montanaro Lorenzo Di Cesare Mannelli; Carla Ghelardini; Vincenzo Brancaleone; Lucia Morbidelli; Vincenzo Calderone.(2021).The H2S-Donor Erucin Exhibits Protective Effects against Vascular Inflammation in Human Endothelial and Smooth Muscle Cells.Antioxidants, 10, 6,DOI: 10.3390/antiox10060963 - Research article Giannini Vittoria; Melito Sara; Matteo Roberto; Lazzeri Luca; Pagnotta Eleonora; Chahine Sara; Roggero Pie Paolo. (2021).Testing Eruca sativa defatted seed meal as a potential bioherbicide on selected weeds and crops.Industrial Crops and Products, 171,DOI 10.1016/j.indcrop.2021.113834. - Research article Pari Luigi, Alfano Vincenzo, Stefanoni Walter, Latterini Francesco, Liuzzi Federico, De Bari Isabella, Valerio Vito Ciancolini Anna (2021). Inulin Content in Chipped and Whole Roots of Cardoon after Six Months Storage under Natural Conditions. Sustainability, 13(7), 3902.	3 Research Grant.
SUSINCER Sustainable use of bioactive compounds from wastes of <i>Brassicaceae</i> and <i>Solanaceae</i> for Cereal crop protection (2020-2023).	Characterization and valorization of bioactive compounds extracted from wastes of <i>Brassicaceae</i> and <i>Solanaceae</i> and promote their reuse in sustainable agriculture to protect corn and wheat from attacks by fungal and insect pathogens.	C. BALCONI CREA-CI CREA-IT CREA-PB	Cariplo Foundation	- Article Parisi B; Pacifico D; Lasorella V; Nicoletti F; Lo Scalzo F Lanzanova C; Balconi C(2021).Dalle bucce di patata alla bioprotezione del futuro.L'Informatore Agrario, 40, 35 38. - Article Pacifico Daniela; Lanzanova Chiara; Mastrangelo Annamaria; Locatelli, Sabrina Monica; Pagnotta	- European Research Night 2021: The Potato Show 24/09/2021 - I fenoli in patate 24/09/2021 - Il recupero dello scarto agro-industriale: un modello di sostenibilità economica 27/05/2021 - Economia Circolare: come recuperare gli scarti dalle

				Eleonora; Righetti Laura; Nicoletti Federica; Bassolin Laura; Balconi Carlotta (2021).Come proteggere frumento e mais dalle infezioni fungine. Secondo progetto del CREA, la difesa di questi cereali passa dal recupero dello scarto industriale di patata rucola.Molini d'Italia, LXXII, 11, 56-69. - Research article Pacifico, Daniela; Lanzanova, Chiara; Pagnotta Eleonora; Bassolino, Laura.; Mastrangelo, Annamaria; Marone, Daniela.; Matteo, Roberto; Lo Scalzo, Roberto; Balconi, Carlotta (2021).Sustainable Use of Bioactive Compounds from Solanum Tuberosum and Brassicaceae Wastes and by-Products for Crop Protection—A Review. MOLECULES, 26, 8, DOI: 10.1007/s11540-020-09474-w.	buccia di patata 26/09/2021 - La Patata: tesoro nascosto dai mille colori 24/09/2021 - Estraiamo il DNA dalla frutta 24/09/2021
BIODIVERSITY2FOOD Local and old cereal and legume varieties to increase the economic, environmental and social sustainability of the organic supply chain of Marche region	Strengthen the organic production chain of arable crops in Marche region, through the experimentation and promotion of technological and organizational solutions aimed at the recovery, characterization and valorization of old cereals and legumes varieties	P. De VITA CREA-CI	Marche Region		
CLIMAQUALITEC EoI 96 SYSTEMIC -Agricultural biotechnology for nutritional quality of food crops in different agro-climatic scenarios. Challenges and perspectives in potato and cereal crops.	The overall objective of the SYSTEMIC project is to implement adaptive strategies for the production, consumption and health of sustainable foods, addressing the different impacts of climate change on food quality and composition and setting standards to achieve safety food and nutrition.	G. MANDOLINO CREA-CI CREA-AN CREA-IT	39 public research institutions of 8 different European countries /MIPAAF-- European Commission	- Abstract Pacifico, Daniela; Ficco, Donatella Bianca Maria; De Vita, Pasquale (2021).Un Network dinamico per affrontare le nuove sfide del sistema alimentare.Tecnica Molitoria, 180, maggio, 2-3. - Research article Lorenza Mistura; Francisco Javier Comendador Azcarraga; Laura D'Addezio; Deborah Martone; Aida Turrini (2021).An Italian Case Study for Assessing Nutrient Intake through Nutrition-Related Mobile Apps.Nutrients, 13, 9, DOI: 10.3390/nu13093073. - Research article Pacifico Daniela; Ficco Donatella; De Vita Pasquale (2021).Un Network dinamico per affrontare le nuove sfide del sistema alimentare.Pasta e Pastai, 26, 180, 2-3.	- La Patata: tesoro nascosto dai mille colori 24/09/2021 - European Research Night 2021: The Potato Show 24/09/2021
NOBILI CEREALI	Improve the competitiveness of primary producers by better integrating them into the agri-food chain through quality schemes, the creation of added value for agricultural products, the promotion of products in local markets, short supply chains, producer associations and organizations and interbranch organizations'	D.B.M. FICCO CRA-CI	- GAL AISL		
AGROFILIERE Integrate digital technologies for the sustainable strengthening of agri-food production and processing	1. Implement advanced digital and mechatronic applications for cereals and other grain crops. 2. Develop a Field Phenomics Platform equipped with experimental pheno-mobile for the digitized detection of multiple phenotypic parameters	P. MENISATTI N. PECCHIONI P. DE VITA CREA-IT CREA-CI	MIPAAF	Pecorella I., F. fania, C.V.G. Azevedo, N. Santacroce, N. Pecchioni, P. de Vita. Exploitation of RGB indices from UAV imagery to estimate soil coverage ability in durum wheat and related traits (in preparation).	
CERESBIO Cereals resistant to seed borne fungal diseases suitable for organic agriculture Subproject DIBIO	Durum and bread wheat - Monitoring of the presence of wheat carry agent (Tilletia spp.) through the collection of samples of common and durum wheat in the main Italian cereal areas and subsequent identification and determination of virulence through greenhouse tests	P. DE VITA CREA-CI CREA-DC CREA-GB	MIPAAF	- Research article Faccini Nadia; Delbono Stefano; Çelik Oğuz Arzu; Cattivelli Luigi; Valè Giampiero; Tondelli Alessandro (2021).Resistance of European spring 2-row barley cultivars to Pyrenophora graminea and detection of associated loci.Agronomy, 11, 2, DOI: 10.3390/agronomy11020374.	3 Scholarships. 1 research grant

	<ul style="list-style-type: none"> - Validation of a molecular diagnostic methodology for the early detection of infections by caries agents (Tilletia spp.) - Identification on a morphological and molecular basis and determination of the virulence of Fusarium spp. through greenhouse tests Maize - Development of analytical technologies for the molecular identification of fungal strains of Fusarium Verticillioides present in the corn cultivation area in Italy - Identification of resistant corn lines F. verticillioides. Barley -Collection of new isolates of P. graminea in the cultivation areas to evaluate the resistance of genetic materials of barley during selection - Pyramiding of pyrenophora graminea fungal resistance genes in barley to ensure durable resistance against different isolates Rice - Pyramiding of brusone resistance genes (Pyricularia oryzae) and Fusarium fujikuroi through an development of lines with wide spectrum of resistance for registration in the National Register of Varieties 			<ul style="list-style-type: none"> - Research article Aragona Maria; Campos-Soriano Lidia; Piombi Edoardo; Romano Elena; San Segundo Blanca; Spadaro Davide; Infantino Alessandro (2021).Imaging the invasion of rice roots by the bakanae agent Fusarium fujikuroi using a GFP-tagged isolate.European Journal of Plant Pathology, 161, 1, 25-36.DOI: 10.1007/s10658-021-02301-z. 	
RGV FAO VI Triennio - 2020-2022 anno	<p>The activity that CREA will develop in the three-year program 2020-2022 will be aimed at achieving the following primary objectives:</p> <p>a) maintain in safety the collections of genetic resources for agriculture and food currently held at CREA.</p> <p>b) collaborate with institutions, bodies, associations in the area to promote a correct "culture" of the conservation of plant genetic resources, in accordance with the Guidelines for the conservation of agricultural biodiversity;</p> <p>c) provide support to local communities through demonstration activities at the experimental field where the material is bred;</p> <p>d) maintain and contribute to the development of the computer database.</p> <p>e) support the MiPAAF for national and international actions related to the Treaty</p> <p>f) support the MiPAAF at national level,</p>	<p>I. VERDE</p> <p>CREA-OFA</p> <p>CREA-IT</p> <p>CREA-OF</p> <p>CREA-CI</p> <p>CREA-DC</p> <p>CREA-FL</p> <p>CREA-ZA</p> <p>CREA-GB</p> <p>CREA-VE</p> <p>CREA-AA</p>	<p>- MiPAAF - Ministero delle politiche agricole alimentari e forestali</p>	<ul style="list-style-type: none"> - Research article Pasquale Tripodi; Gianluca Francese; Vincenzo Onofari Sanaja; Carlo Di Cesare; Giovanna Festa; Antonietti D'Alessandro; Giuseppe Mennella (2021).A multi-methodological approach to study genomic footprint and environmental influence on agronomic and metabolic profiles in a panel of Italian traditional sweet pepper varieties.Journal of Food Composition and Analysis, 103,DOI: 10.1016/j.jfca.2021.104116. - Research article Marchetti Lucia; Saviane Alessio; Dalla Montanella; Paglia Graziella; Pellati Federica; Benvenuto Stefania; Bertelli Davide; Cappellozza Silvia (2021).Determination of 1-Deoxynojirimycin (1-DNJ) in Leaves of Italian or Italy-Adapted Cultivars of Mulberry (Morus sp.pl.) by HPLC-MS..Plants, 10, 8,DOI: 10.3390/plants10081553. - Research article Cappellozza Silvia; Demo Edoardo; Saviane Alessio (2021).I gelsi ai tempi dei Dogi: quando Venezia dominava il Mediterraneo..Vita in campagna, 7-8, 10, 12. - Proceeding Sciaccia Fabiola; Palumbo Massimo; Pagliaro Antonella; Di Stefano Vita; Scandurra Salvatore; Sollima Lucia; Viri Nino; Melilli Maria Grazia (2021).VALUTAZIONE DELLE CARATTERISTICHE QUALITATIVE E NUTRIZIONALI DI PANI FUNZIONALI, ARRICCHITI CON PORTULACACEE E OLERACEE L. E OPUNTIA FICUS-INDICA. - Proceeding Caputo Angelo Raffaele; Gasparro Marica; Bergamini Carlo; Alba Vittorio; Migliaro Daniele; Roccotelli Sabine Cirigliano Pasquale; Del Lungo Stefano (2021).Il germoplasma viticolo dell'Enotria nel Mezzogiorno d'Italia. - Proceeding 	<ul style="list-style-type: none"> - Ecotipi tradizionali di patata. Una risorsa da tutelare 30/06/2021 Anzola dell'Emilia - European Research Night 2021: The Potato Show 24/09/2021 - La Patata: tesoro nascosto dai mille colori 24/09/2021

				Gazza Laura; Galassi Elena; Cacciatori Pierin (2021).Agronomic, technological and nutrition: characterisation of selected perennial wheat line grown in Italy. 27-31 - Proceeding Pietrella Marco; Giovannini Daniela; Cappellozza Silvi (2021).Simple sequence repeat markers enable genetic characterization of mulberry germplasm preserved in the CREA's collection of Padua, Italy.Acta Horticulturae, 1307, 299-305.DOI: 10.17660/ActaHortic.2021.1307.46	
SYSTEMIC_1063 ERA HDHL KH FNS A integrated approach to the challenge of sustainable food systems: adaptive and mitigatory strategies to address climate change and malnutrition. Eol N. 106 From cereal diversity to plant breeding	SYSTEMIC_1063 intends to develop a proof of concept to demonstrate how genetic diversity can be used to increase sustainable cereal production in future climatic conditions. The existing germplasm of wheat and barley will allow to i) map the loci at the base of the characteristics related to the adaptation, ii) develop new cereal ideotypes and iii) develop new genomic prediction models	L. CATTIVELLI CREA-GB	- MiPAAF - Ministero delle politiche agricole alimentari e forestali	- Research article Puglisi Damiano; Delbono Stefano; Visioni Andrea; Ozkan Hakan; Kara Ibrahim; Casas Ana M; Igartu Ernesto; Valè Giampiero; Lo Piero Angela Robert; Cattivelli Luigi; Tondelli Alessandro; Fricano Agostino (2021).Genomic Prediction of Grain Yield in a Barley MAGIC Population Modeling Genotype by Environment Interaction.Frontiers in Plant Science, 12,DOI: 10.3389/fpls.2021.664148.	
BE^2R From Field to Glass.	Promote the development of the Apulian agricultural beer production with a strong territorial identity, using local and self-produced ingredients: cereals, hop yeasts.	M. SAVINO CREA-CI	Puglia Region		
FILIGRANO Innovations in the Campania cereal supply chain: from high quality sustainable production to differentiated storage	Strengthen the Campania cereal supply chain through the experimentation and promotion of technological and organizational solutions aimed at improving cultivation techniques, the use of digital technologies and the management of storage for homogeneous batches	P. DE VITA CREA-CI CREA-IT	Campania Region		
POIGA Added value naturally enriched with bioactive molecules	Valorization of 4 ancient grains originating in Campania (Saragolla, Marzellina, Romanella e lanculedda) through a series of recovery, characterization and enhancement activities.	P. DE VITA CREA-CI	Campania Region		1 Research grant.
SAGRAL Saragolle and the ancient Lucanian grain preserved	The recovery and the morphological, molecular and biochemical characterization of ecotypes, local populations, obsolete varieties is a possibility to identify genotypes suitable for the conditions of water scarcity and sustainability of the agro-ecosystem.	P. DE VITA CREA-CI	Basilicata Region		
Wh-ITALY (New Breeding Techniques) for a sustainable breeding of durum wheat. BIOTECH subproject	1. Produce durum wheat lines improved for gluten tolerance through genome editing. 2. Obtain improved durum wheat lines for durable resistance to fungal pathogens via cisgenesis. 3. Acquire skills on genome editing, transformation, and in vitro culture techniques	D. TRONO CREA-CI	MIPAAF		
				- Research article Mores Antonia; Borrelli Grazia Maria; Laidò Giovanni; Petruzzino Giuseppe; Pecchioni Nicola; Amoroso Lucia; Giuseppe Maria; Desiderio Francesca; Mazzucote Elisabetta; Mastrangelo Anna Maria; Marone Daniela (2021).Genomic approaches to identify molecular bases of crop resistance to diseases and to develop future breeding strategies. .International Journal of Molecular Science, 22, 11,DOI: 10.3390/ijms22115423. - Research article Marone Daniela; Russo Maria Anna; Mores Antonia; Ficco Donatella Bianca Maria; Laidò Giovanni; Mastrangelo Anna Maria; Borrelli Grazia Maria	1. genome editing constructs 2. 20 cisgenic lines T0 containing the Lr67 gene conferring lasting resistance to powdery mildew and all leaf rusts. To be brought into homozygosity by self-fertilization . 2 Research grants.

				(2021).Importance of landraces in cereal breeding for stress tolerance..Plants, 10, 7,DOI: 10.3390/plants10071267. - Research article Paris Roberta; Petruzzino Giuseppe; Savino Michele; D Simone Vanessa; Ficco Donatella Bianca Maria; Tron Daniela (2021).Genome-Wide Identification, Characterization and Expression Pattern Analysis of the γ-Gliadin Gene Family in the Durum Wheat (Triticum durum Desf.) Cultivar Svevo.Genes, 12, 11,DOI: 10.3390/genes12111743 - Research article Anna Maria Mastrangelo; Luigi Cattivelli (2021).Wheat Makes Bread and Durum Wheat Different?.Trends in Plant Science, 26, 7, 677-684.DOI: 10.1016/j.tplants.2021.01.004.	
DUROSTRESS Stratégie d'adaptation du blé dur au stress hydriques et thermiques.	Agronomically and genetically characterize wheat lines varieties tolerant to water and thermal stress	P. DE VITA CREA-CI	- Instituto Nacional de Investigação Agrária Veterinária (INIAV) - INRAE - Institut National de Recherche pour l'Agriculture, l'Alimentation et l'Environnement - GIE Blé dur - Groupement national interprofessionnel des semences et plants (GNIS) - SAMAE		
IN.TE.GRA Technological Innovation Durum Wheats.	Provide new products based on organic and functional cereals, with a high nutraceutical value and introduce, in the context of cultivation practices, precision agriculture in the current context of cereal sector in Sicily.	M.PALUMBO CREA-CI	Sicilian Region		
INNOGRANO Process and product innovations in the durum wheat supply chain.	Development of new materials by innovative genetic and agronomic methodologies	P. DE VITA CREA-CI	MISE/ European Commission - SANTACROCE GIOVANNI SRL		
PIGRANI Use of pigmented grains for the development of food products treacable and with high nutritional value.	Development and application of combined technologies to produce pigmented grains enriched with bioactive compounds on a large scale and for the formulation of flours and end-products	P. DE VITA CRE-CI	MISE	- Research article Romano Elio; Bergonzoli Simone; Pecorella Ivano; Bisaglia Carlo; De Vita, Pasquale (2021).Methodology for the Definition of Durum Wheat Yield Homogeneous Zones by Using Satellite Spectral Indices.Remote Sensing, 13, 11,DOI: 10.3390/rs13112036.	
RiBioFru Reduction of the environmental impact in traditional cereal area (BMC) through the organic cultivation of ancient varieties of durum wheat.	Interventions of animations and training	P. DE VITA CREA-CI	Campania Region	- Research article Beleggia, R.; Ficco, D.B.M.; Nigro, F.M.; Giovanniello, V. Colecchia, S.A.; Pecorella, I.; De Vita, P.(2021).Effect of Sowing Date on Bioactive Compounds and Grain Morphology of Three Pigmented Cereal Species.Agronomy, 11, 3,DOI: 10.3390/agronomy11030591.	
SOFT Smart Organic Farming Techniques -Innovations to improve the sustainability and productivity of organic farming engaged in the Apulia herbaceous and industrial crops sector - Smart Organic Farming Techniques.	Implementation of an environmentally and technically economically efficient organic supply chain model for the organic production of high-quality durum wheat, legumes and industrial tomatoes.	P. DE VITA CREA-CI	Puglia Region		

SolACE Solutions for improving Agroecosystems and Crop Efficiency for water and nutrient use.	SolACE's overarching goal is to help European agriculture facing the challenge to deal with more frequent combined limitations of water and nutrients in the coming decades, through the design of novel crop genotypes and agroecosystem management innovations to improve water and nutrient (i.e. N and P) use efficiency.	N. PECCHIONI P. DE VITA CREA-CI	INRAE, IT, AIT, CREA, FIBL, JHI, KU, SU, SLU, UCL, UNEW, UPM, AGROSCOPE, ARVALIS, CON.CER, DCM, ECAF, IT, LEAF, ÖMKI, SOLYNTA, SP, SYNGENTA, AGROBIOTA		
STAZIONIDIMISURA	This agreement regulates the collaboration between CNR-ISSIA and CREA-CI for the realization and management of a station network for continuous measurement of environmental parameters at the CREA-CI companies based in Foggia and for the management of the already existing network at the CREA-CI company "Ovile Nazionale" based in Sezze (FG).	M. RINALDI CREA-CI	- CNR - Istituto di Studi sui Sistemi Intelligenti per l'Automazione - ISSIA - Sede Bari		
Plant-RED Exploiting the "PlantArray" physiological phenotyping platform for improving wheat and barley RESilience to Drought	The proposal falls under area 2. Development of climate resilient crop varieties in the overall scenario of ongoing changes in the Mediterranean basin	A. TONDELLI CREA-GB	- MAECI Ministero degli affari esteri e cooperazione internazionale - Hebrew University of Jerusalem (HUJI)		
RETI2020	The general objective is the consolidation of the results achieved by the "Cereal Quality Network" through the restructuring with a view to continuity of the network and the proposal of innovative technological solutions that aim to improve the sustainability and competitiveness of the cereal supply chains.	N. PECCHIONI CREA-CI CREA-IT CREA-GB CREA-PB	- MiPAAF - Ministero delle politiche agricole alimentari e forestali		
SUSCAP Developing resilience and tolerance of crop resources: use efficiency to climate change and air pollution	OR1: Stakeholder engagement OR2: Crop and pedo-climatic data (point scale) OR3: Climate data and atmospheric composition (European Scale) OR4 - Development and application of crop models	G.A. CAPPELLI CREA-AA	- MUR - Ministero dell'Università e della Ricerca - Commissione europea	- Research article Vaccino Patrizia; Mazzinelli Gianfranco; Di Sieno Simone; Masserano Greta (2021).Le varietà di grano tenero per le semine 2021.L'Informatore Agrario, 28, 35-41. - Articolo in rivista Palumbo Massimo; Virzi Nino; Sciacca Fabiola; Licciardello Stefania; Anastasi Umberto; Scepele Concetta; Frenda Alfonso Salvatore; Amato Gaetano; Giambalvo Dario; Salafia Lucio; Randazzo Biagio; Mortaro Roberto; Pecchioni Nicola (2021).Speciale grano duro - Dettaglio regionale dei risultati 2021 - Sicilia.L'Informatore Agrario, 29, 53-54. - Research article Cattivelli L.; Faccini N.; Gianinetti A.; Alberici R.; Alusi G.; Anastasi U.; Attene G.; Baronchelli M.; Belocchi A.; Cacciatori P.; Calvi A.; Caprara F.; Delbono S.; Fornara M.; Fuselli D.; Ghizzoni R.; Giordano M.; Governatori C.; Gualtieri P.; Invernizzi C.; Licciardello S.; Mameli L.; Mazzon V.; Pagani D.; Palumbo M.; Petrini A.; Pilati A.; Piredda A.; Pons R.; Preiti G.; Quaranta F.; Ravaglia S.; Reggiani F.; Rodriguez M.; Rossini F.; Ruggeri R.; Sevedo D.; Signor M.; Tagliaferri I.; Troccoli A.; Viola P.; Virzi A.; Virzi N.(2021).Un buon 2021 per l'orzo da birra. Risultati produttivi delle prove varietali 2020-2021.L'Informatore Agrario, 77, 26, 43-49. - Research article Virzi Nino; Troccoli Antonio; Anastasi Umberto; Randazzo Biagio; Paone Silvana; de Gregorio Vito; Olivieri Angelo; Aniello Cosimo; Virgillito Santo; Li Puma Ezio; Licciardello Stefania; Sciacca Fabiola; Palumbo Massimo; Pecchioni Nicola (2021).Speciale grano tenero - Dettaglio regionale dei risultati 2021 - Puglia Sicilia.L'Informatore Agrario, 28, 54-55.	

				<p>- Proceeding Gazza Laura; Taddei Federica; Nocente Francesco; Galassi Elena; Natale Chiara; Ciccoritti Roberto (2021). Micronization and air fractionation to improve technological, sensory and nutritional quality of whole grain pasta . 87-88.</p> <p>- Articolo Vaccino Patrizia; Mazzinelli Gianfranco; Di Simone Simone; Masserano Greta (2021). Le varietà di grano tenero per le semine 2021. L'Informatore Agrario, N. fascicolo 28, pp. 35-41.</p> <p>- Articolo Palumbo Massimo; Virzi Nino; Sciacca Fabiola; Licciardello Stefania; Anastasi Umberto; Scepelescu Concetta; Frenda Alfonso Salvatore; Amato Gaetano; Giambalvo Dario; Salafia Lucio; Randazzo Biagio; Mortaro Roberto; Pecchioni Nicola (2021). Speciale grano duro - Dettaglio regionale dei risultati 2021 - Sicilia. L'Informatore Agrario, N. fascicolo 29, pp. 53-54.</p> <p>- Articolo Cattivelli L.; Faccini N.; Gianinetti A.; Alberici R.; Alusi G.; Anastasi U.; Attene G.; Baronchelli M.; Belocchi A.; Cacciatori P.; Calvi A.; Caprara F.; Delbono S.; Fornara M.; Fuselli D.; Ghizzoni R.; Giordano M.; Governatori C.; Gualtieri P.; Invernizzi C.; Licciardello S.; Mameli L.; Mazzon V.; Pagani D.; Palumbo M.; Petrini A.; Pilati A.; Piredda A.; Pons R.; Preiti G.; Quaranta F.; Ravaglia S.; Reggiani F.; Rodriguez M.; Rossini F.; Ruggeri R.; Severi D.; Signor M.; Tagliaferri I.; Troccoli A.; Viola P.; Virzi A.; Virzi N. (2021). Un buon 2021 per l'orzo da birra. Risultati produttivi delle prove varietali 2020-2021. L'Informatore Agrario, N. volume 77, N. fascicolo 26, pp. 43-45.</p> <p>- Articolo Virzi Nino; Troccoli Antonio; Anastasi Umberto; Randazzo Biagio, Paone Silvana; de Gregorio Vito; Olivieri Angelo; Aniello Cosimo; Virgillito Santo; Li Puma Ezio; Licciardello Stefania; Sciacca Fabiola; Palumbo Massimo; Pecchioni Nicola (2021). Speciale grano tenero - Dettaglio regionale dei risultati 2021 - Puglia. L'Informatore Agrario, N. fascicolo 28, pp. 54-55.</p> <p>- Proceeding Gazza Laura; Taddei Federica; Nocente Francesco; Galassi Elena; Natale Chiara; Ciccoritti Roberto (2021). Micronization and air fractionation to improve technological, sensory and nutritional quality of whole grain pasta . pp. 87-88.</p> <p>- Articolo Belocchi A., Sereni F., Gianinetti A., Reggiani F., Alusi G., Demontis A., Rosta R., Massi A., Mantovani P., Zefelippo M., Converso R., Severi D., Quaranta F. (2021). Speciale grano duro: dettaglio regionale dei risultati 2021. Areale Nord. L'Informatore Agrario, LXXVII (29): 39-41.</p> <p>- Articolo De Vita P., Paone S.; Pecorella I.; Rinaldi M.; Fornara M.; Gosparini E.; Quaranta F.; Colonna M.; Rosati D.D.; Mola M.; Di Mola I.; Ottaiano L.; Tedone L.; De Mastro G.; Schiavone D.; Preiti G.; Badagliacca G.; Pecchioni N. (2021). - Speciale grano duro. Dettaglio regionale dei risultati 2021. Areale Sud peninsulare. L'Informatore</p>
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				<p>Agrario, LXXVII (29): 47-49</p> <p>- Articolo</p> <p>Iori A., Pecchioni M., Palumbo M., Quaranta F., Trocena A., Vaccino P., Virzi N., Mascheroni S., De Franceschi P., Mameli L., Petrini A., Randazzo B., Viola P., Belocchi A., Cacciatori P., Fornara M., Groli E., Licciardello S., Malagesi F., Paone S. (2021). Malattie fungine su frumenti: la risposta delle varietà. L'Informatore Agrario, LXXVII (34): 56-61</p> <p>- Articolo</p> <p>Palumbo M., Virzi N., Sciacca F., Licciardello S., Anastasi U., Scepi G., Frenda A.S., Amato G., Giambalvo D., Salafia L., Randazzo B., Mortaro R., Pecchioni N. (2021). Speciale grano duro. Dettaglio regionale dei risultati 2021. Sicilia. L'Informatore Agrario, LXXVII (29): 52-54</p> <p>- Articolo</p> <p>Petrini A., Governatori C., Santilocchi R., Del Frate V., Bianchelli M., Fuselli D., Gironelli E., Porcarelli L. (2021). Speciale grano duro. Dettaglio regionale dei risultati 2021. Marche. L'Informatore Agrario, LXXVII (29): 42-43.</p> <p>- Articolo</p> <p>Pruneddu G., Motzo R., Giunta F., Carboni G., Detto M., Mameli L., Balmas V., Benedetti L. (2021). Speciale grano duro. Dettaglio regionale dei risultati 2021. Sardegna. L'Informatore Agrario, LXXVII (29): 50-51</p> <p>- Articolo</p> <p>Quaranta F., Arcangeli A., Basili O., Belocchi A., Bottazzi P., Mariotti A., Fabbrini L., Malagesi F., Mariotti R., Cacciatori P., Caprara F., Rossini F., Ruggeri R., Vecchiarelli V., Viola P., Iori A., Fornara M. (2021). Speciale grano duro. Dettaglio regionale dei risultati 2021. Centro Italia versante tirrenico. L'Informatore Agrario, LXXVII (29): 44-46</p> <p>- Articolo</p> <p>Quaranta F., Belocchi A., Cecchini C., Mazzon V., Fornara M. (2021). Speciale grano duro. Risultati della 48^ sperimentazione nazionale coordinata dal CREA-IT di Roma. Le varietà di grano duro per le semine 2021. L'Informatore Agrario, LXXVII (29): 32-34</p> <p>- Articolo in rivista</p> <p>Quaranta F., Fornara M., Belocchi A. (2021). Speciale grano duro. Primi risultati della sperimentazione nazionale coordinata dal CREA-IT di Roma. Le varietà più performanti. Terra è Vita, LXII (26): 30-31</p> <p>- Articolo</p> <p>Quaranta F., Arcangeli A., Mortaro R., Zefelippo M., Severi D., Converso R., Gianinetti A., Reggiani F., Alusi G., Demontis A., Rosta R., Massi A., Mantovani P., Bottazzi P., Mariotti A., Fabbrini L., Viola P., Ruggeri R., Rossini F., Mariotti R., Basili O., Mazzon V., Belocchi A., Cacciatori P., Caprara F., Sestili A., Fornara M., Vecchiarelli V., Governatori C., Petrini A., Fuselli D., Santilocchi R., Bianchelli M., Mori M., Di Mola L., Ottaiano L., De Vita P., Rinaldi M., Pecorella I., Paone S., Pecchioni N., Colonna M., Rosati D.D., Tedone L., Di Mastro G., Schiavone D., Preiti G., Badagliacca G., Pruneddu G., Motzo R., Giunta F., Balmas V., Carboni G., Dettori M., Mameli L., Frenda A.S., Amato G., Giambalvo D., Randazzo B., Anastasi U., Virgillito S., Scepi C., Salafia L., Palumbo M., Sciacca F., Leonardi F. (2021). Speciale frumento in campo. Risultati della 48</p>
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				rete nazionale coordinata dal CREA-IT di Roma. Duro, varietà consigliate. Terra è Vita, LXII (27):28-34 - Article Locatelli S. e Pecchioni N. 2021. Progetto RETI2020: dati preliminari della campagna maidicola 2021. Mangimi Alimenti. Anno XIII, 6: 17-18. - Proceedings Lanzanova C., Mascheretti I., Mascheroni S., Pecchioni N., Locatelli S. 2021 Monitoring of micotoxin levels in Italian maize samples during seasons 2011 – 2020 Session S6 – poster 6. MycoTWIN-MycoKey International Conference Bari, 9 to 12 November 2021. ISBN digital version: 978-88-8080-221-1, ISBN printed version: 978-88-8080-224-2 https://doi.org/10.48257/ACBAQ	
DIBIO-CONCIABIO Maize seed-borne pathogens against the main seed borne phytopathogens present in Italy for two of the most important cereal production crops: rice and wheat, common and durum	Identify recent biological control methods effective against the main seed borne phytopathogens present in Italy for two of the most important cereal production crops: rice and wheat, common and durum	L.TAMBORINI CREA-DC P.VACCINO, CREA-CI CREA-AA	MIPAAF		
PERMA Study of the races of <i>Peronospora</i> of Sunflower in the Marche Region to contain the fungal pathogen.	The project aims to identify the <i>P. halstedii</i> race currently present in the main cultivation areas of the Marche region, for agricultural and seed production, as a prototype for a more complete knowledge of the spread of the pathogen also in the other Italian areas cultivated with this crop	A. DEL GATTO CREA-CI	Marche Region		1 Research grant.
				- Del Gatto A., Pieri S., Mangoni L., Fontenla A., Narzi S., Baldin C., Alberti I. (2021). Peronospora del girasole via alla rilevazione delle razze. L'Informatore Agrario 16, 60-.	
GEMMA Maize genotypes of Lombardy and microbiome new perspectives for the control of toxigenic fungi and adaptation to climate change "- (2020-2023).	Provide effective responses to manage fungal disease and abiotic stresses by enhancing the biodiversity consisting of the varieties of Lombard maize and the endophytic microorganisms within the varieties themselves	C. BALCONI CREA-CI	Lombardia Region		
MIRALO Analysis of MAIZE lines for the development of hybrids with efficient root system, to be used in Lombardy.	Identification of maize lines to produce hybrids with more efficient root system to increase yield and quality and in relation to their compatibility and use in the specific conditions of the Lombardy area	G. MAZZINELLI CREA-CI	Lombardia Region		1 research grant
P.S.G.O.-Km 0 BOLIVIA Small seeds, great opportunities family agro-ecology and OK supply chains in Bolivia.	Cooperation between Italy and Bolivia to collect and conserve indigenous maize biodiversity; enrichment of the CREA-CI maize germplasm bank with Bolivia "criollo" germplasm to create new pigmented varieties of corn, "morado" and violet type, rich in bioactive compounds with antioxidant properties	C. BALCONI CREA-CI	European Commission ⁵ - AICS Agenzia Italiana per la Cooperazione allo Sviluppo		
VALOMAYS Varietà locali di mais caratterizzazione per reintroduzione nel territorio lombardo	Operation 10.2.01 is aimed at supporting in situ and / or ex situ conservation activities of native plant varieties and animal breeds with limited diffusion to protect animal and plant biodiversity in the agricultural sector guarantee the conservation of the genetic heritage of Lombard interest bringing advantages in terms of quality of plant and animal production, of greater longevity and well-being.	R. REDAELLI CREA-CI	- Regione Lombardia	- Research article Suriano S.; Carlotta B.; Valoti P.; Redaelli R. (2021). Comparison of total polyphenols, profile anthocyanins, color analysis carotenoids and tocopherols in pigmented maize. LWT - Food Science and Technology, 144, 1-9. DOI: 10.1016/j.lwt.2021.111257.	

⁵ Associazioni in Bolivia: FDUO, CGM, RENACC, AGRECOL - Università in Bolivia: Universidad Autónoma Tarija; Universidad Mayor de San Simón (UMSS); Universidad Mayor de Chuquisaca (UMRPSFXCH)/AICS - Agenzia Italiana per la Cooperazione allo sviluppo

INNORT 3.0- Innovations in industrial horticulture.	Identification of a technical strategy with low environmental impact for the containment of hypogaeic pests and fungi of the potato peel in the fucense potato sector, and consequent reduction of production waste	L. LAZZERI CREA-CI	Abruzzo Region		
RESILIENT Good Practices for the protection and cultivation of local varieties of potatoes and maize in inland areas.	Provide farmers with information and knowledge of Good Practices for the cultivation of traditional local varieties of potatoes and recover traditional ecotype through remediation and reintegration into the supply chain.	D. PACIFICO CREA-CI	Lombardia Region		
INNOVALEGUMI Nuovi sistemi colturali basati sulle leguminose per le aziende cerealicole pugliesi	The project has the general objective of improving the profitability, competitiveness, and sustainability of Apulian cereal farms by favoring the crop rotation of legumes from grain to cereals, to reduce the degradation of soil quality, promote carbon sequestration and increase the fertility of the soils in terms of nitrogen and organic matter.	P. DE VITA CREA-CI	- Regione Puglia		- Traditional potato ecotypes. A resource to protect 30/06/2021 Anzola dell'Emilia - La Patata: tesoro nascosto dai mille colori 24/09/2021 - European Research Night 2021: The Potato Show 24/09/2021
INNOVAR Next generation variety testing for improved cropping on European farmland	The objectives are to: 1. Identify crop characteristics and sustainability criteria which indicate the capacity of varieties to maintain yield under more variable conditions and more sustainable crop management practice 2. Develop precise, rapid and automated methods for DUS testing in compliance with European/international requirements and the granting of PVR for new varieties 3. Revise and develop VCU trialing processes to provide data on characters that contribute to the capacity of new varieties to maintain yield under more variable conditions and sustainable crop management practice 4. Exploit synergies between DUS and VCU testing using genomics, phenomics, weather and soil data, and machine learning to set up databases and reference collections. 5. Apply the methods and techniques developed for wheat to other cereals and other crop types, including oilseeds, grasses, legumes, sugar beet, maize, etc. 6. Develop new tools for the evaluation and detection of variety characteristics, using genomic, phenomic and digital technologies 7. Analyse and review existing systems for providing and delivering information about varieties and facilitate variety specialists in adopting and developing new effective methods and tools for dissemination.	A.P.M. GIULINI CREA-DC	- Commissione Europea - Consejo Superior de Investigaciones Científicas - Instituto de la Grasa (IG-CSIC) - INTERNATIONAL CENTER FOR AGRICULTURAL RESEARCH IN THE DRY AREAS - ICARDA - Agri-Food and Biosciences Institute - University College Dublin, National University of Ireland, Dublin - Department of Agriculture, Food and the Marine - Forest Service - LESPROJEKT SLUZBY SRO (LESPRO) - DEBRECENI EGYETEM - UNIVERSITY OF DEBRECEN DE		
Panacea A thematic network to design the penetration PATH of Non food Agricultural Crops into European Agriculture	The project aims to create a network of relationships and exchanges between research, industry and the agricultural world aimed at disseminating knowledge and experience in the field of cultivation and use of non food crops (NFC)	L. PARI CREA-IT	- Commissione Europea - Arkema France - Center Renewable Energy Source and Energy Saving - Iniciativas Innovadoras SAL - Stichting Wageningen Research (WR) - Institute Alterra and Institute Food Biobased Research - AgroTransilvania Cluster ATC - Association de Coordination Technique Agricole (ACTA) - 3B BioWarmia Bioenergy Bioresources - Agricultural University Of Athens - Dept. of Natural Resources Agricultural Engineering - Instituto Navarro de Tecnologías e Infraestructuras Agroalimentarias SA		

			- Upyte' Experim.Station Lithuanian Research Centre Agric.Forestry - Cooperativas Agro-Alimentarias de Espan - BIOS AGROSYSTEMS S.A. - Imperial College London (ICL)/ Centre for Environmental Policy - Universidade Nova de Lisboa - Faculdade de Ciencias e Tecnologia - FCT- UNL Grupo de Disciplinas de Ecologia da Hidrosfera GDEH		
QG2021	Productivity assessment and adaptation of sunflower commercial hybrids	A. DEL GATTO CREA-IT	- ASSOSEMENTI		
R.E.M.O.- ISA Rete per un Modello Operativo di Integrazione Sociale in Area Rurale	Building from below a lasting and integrated operating model, networked, in one of the most disadvantaged rural areas of the Campania Region	S. ESPOSITO CREA-IT CREA-OFA	- Regione Campania		
RIUSIAMO Re-use of wastewater in agriculture.	Creation of an operative group to carry out a research and transfer project for a rational use of wastewater in agriculture, such as irrigation of industrial tomato crops	M. RINALDI CREA-CI	Puglia Region		n.1 fellowship
SUSRICE Creation of a new rice plant ideotype with improved resilience and sustainability through the insertion of traits that influence the adaptability of the crop.	1. Increase water and nitrogen use efficiency. 2. Modify the architecture of the rice plant by introducing, through genome editing and cisgenesis, the genes responsible for the characters in the traditional Italian variety Cialone Nano rice.	P. VACCINO CREA-CI CREA-GB	MIPAAF		
				- Research article Volante, A., Tondelli, A., Desiderio, F., Abbruscato, P., Menin, B., Biselli, C., Casella, L., Singh, N., McCouch, S.R., Tharreau, D., Zampieri, E., Cattivelli, L., Valè, C. Genome wide association studies for japonica rice resistance to blast in field and controlled conditions (2020) Rice, 13 (1), art. no. 71. DOI: 10.1186/s12284-020-00431-2.	
Risobiosystems Research and experimentation of national organic rice production systems	Project aimed at carrying out technical-scientific studies and insights to support and protect the national organic rice production systems and carried out by Universities and Research bodies with excellent skills on the subject with the involvement and participation of stakeholders and operators in the sector	N. PECCHIONI S. MONACO CREA-CI CREA-DC CREA-PB	MIPAAF		
CAMA Research-based participatory approaches for adopting Conservation Agriculture in the Mediterranean Area.	1. Identifying the major social, economic and agronomic barriers to CA implementation by smallholders of Mediterranean countries 2. Establishing a network of CA experiments and farmer associations adopting CA to apply a participatory research approach 3. Improving legume-based rotations in rainfed cropping systems, with genomic and farmer participatory research aimed to enhance legume crop yield and resilience and research on crop/residue management; 4. Quantifying the effects of CA application and developing agronomic innovation, to increase soil	M. RINALDI CREA-CI CREA-ZA CREA-PB CREA-AA	PRIMA Foundation ⁶ - IAMZ-CIHEAM – Mediterranean Agronomical Institute of Zaragoza - National Institute for Agricultural Research INRA - APOSOLO - Agencia Estatal Consejo Superior de Investigaciones Científicas (CSIC) - CEBAS - HELLINIKOS GEORGIKOS ORGANISMOS - DIMITRA / HELLENIC AGRICULTURAL ORGANIZATION (HAO) - DEMETER - ARVALIS, International Centre for Arvalis	- Article Monaco Stefano; Pecchioni Nicola; Borsotto Patrizia; Borri Ilaria; Bocchi Stefano; Orlando Francesca; Vagstad Valentina; Bertora Chiara; Moretti Barbara; Del Vecchio Aurelio (2021).Redditività del riso bio: ruolo di agrotecniche varietà.L'Informatore Agrario, 18, 40-44. - Article Andreozzi Anna; Prieto Pilar; Mercado-Blanco Jesús; Monaco Stefano; Zampieri Elisa; Romano Silvia; Val Gianpiero; Defez Roberto; Bianco Carme (2019).Efficient colonization of the endophyte Herbaspirillum huttiense RCA24 and Enterobacte	https://www.risoitaliano.eu/crea-ecco-le-rese-di-risobiosystem/ ; http://sinab.it/bionovita/risobiosystems-video-da-una-giornata - La Certificazione delle sementi di riso e attività sperimentale - Campagna 2020-2021 09/02/2021

⁶ APOSOLO (Portugal), INIAV (Portugal), ARVALIS (France), Univ. di Lleida (Spain), IAMZ-CIHEAM (Spain), CSIC (Spain) HAO-Demeter (Greece), INRAT (Tunisie), APAD (Tunisie), INRA (Morocco), ENSA (Algerie)/PRIMA Foundation - Call 2019 Section I – H2020

	fertility, soil physical status, nitrogen and water use efficiencies, and to decrease soil erosion. 5. Disseminating the CA concept and techniques in Mediterranean countries, tailoring them to the specific pedo-climatic and socio-economic conditions. 6. Increasing technicians', advisors' and farmers' knowledge for a better adoption of CA, by the organisation of two training courses and their participation in the research activities		<p>Institut du Végétal - UNIVERSITAT DE LLEIDA</p> <p>- Association for Sustainable Agriculture - APAD</p> <p>- ENSA (École Nationale Supérieure Agronomique)</p> <p>- Instituto Nacional de Investigação Agrária Veterinária (INIAV)</p> <p>- Institut National de la Recherche Agronomique de Tunisie - INRAT</p>	<p>cloacae RCA25 influences the physiological parameters of <i>Oryza sativa</i> L. cv. Baldo rice. <i>Environmental Microbiology</i>, 21, 9, 3489-3504. DOI: 10.1111/1462-2920.14688.</p> <p>- Research article Gabriele Mongiano; Elisa Zampieri; Caterina Morcia; Patrizia Titone; Andrea Volante; Valeria Terzi; Luigi Tamborini; Giampiero Valé; Stefano Monaco (2021). Application of plant-derived bioactive compounds as seed treatments to manage the rice pathogen <i>Fusarium fujikuroi</i>. <i>Crop Protection</i>, 148, DOI: 10.1016/j.cropro.2021.105739.</p> <p>- Research article GIOVANNI DARA GUCCIONE; Pagliarino Elena; BORRI ILARIA; Vaccaro Alessandra; Borsotto Patrizia (2021). Participatory Analysis of the Control and Certification System in the Italian Organic Rice Value Chain. <i>Sustainability</i>, 13, 4, DOI: 10.3390/su1304200.</p> <p>- Altra Borsotto Patrizia; Borri Ilaria; Dara Guccione Giovanni; Vaccaro Alessandra; Monaco Stefano (2021). Linea guida per l'armonizzazione delle procedure di certificazione.</p>	
Ta.Ke.To Tuscan Kentucky tobacco: quality production and sustainable agronomic practices respecting the environment.	1. Preserve and improve the quality of soils through the addition of organic matter from compost and green manure. 2. Introduce formulations with toxicological and residual profiles of lower environmental impact for the control of <i>P. syringae</i> bacteriosis. 3. Reduce the number of interventions with synthetic insecticides for the defense of tobacco from the flea (<i>Epitrix hirtipennis</i>).	L. DEL PIANO CREA-CI	Toscana Region	<p>- Research article Annicchiarico Paolo; Nazzicari Nelson; Notari Tommaso; Monterrubio Martin Cristina; Romanello Massimo; Ferrari Barbara; Pecetti Luciano (2021). Phenotypic breeding for intercropping with cereals: variation for competitive ability and associated traits, an assessment of phenotypic and genomic selection strategies. <i>Frontiers in Plant Science</i>, 12, DOI: 10.3389/fpls.2021.731949.</p> <p>- Research article Lacolla Giovanni; Rinaldi Michele; Savino Michele; Russo Mario; Caranfa Davide; Cucci Giovanni (2021). Effects of mineral and organic fertilization with the use of wet olive pomace on emmer wheat (<i>Triticum dicoccum</i> Shrank) grain yield and composition. <i>Journal of Cereal Science</i>, 102, 103369, DOI: 10.1016/j.jcs.2021.103369.</p>	<p>Website: http://www.camamed.eu/en/index</p> <p>Two research grants</p>
					1 Research grant.

2.1.2 Patents and Services

Patents INDUSTRIAL PATENTS

PRODUCTS/MAIN TOPICS	DENOMINATION	INVENTORS	CREA RESEARCH CENTRES
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cereals	Peptides having a protective effect against the inflammatory activity of 31 43 of gliadin in celiac disease(IT + USA) Co-ownership: Istituto Superiore Sanità	L. Cattivelli P. De Vita D.B.M. Ficco	CREA-GB
cereals	Sowing machine for contrasting weeds (IT)	P. De Vita	CREA-CI
cereals	Process for the production of durum wheat pasta with high nutritional potential (IT)	A.Arcangeli A.Cammerata E. Gosparini R.Mortaro D.Sgrulletta S. Bellato R. Ciccoriti V. Del Frate G. Terracciano	CREA-IT

PLANT VARIETY RIGHTS

PRODUCTS	DENOMINATION	INVENTORS	CREA RESEARCH CENTRES	PRODUCTS	DENOMINATION	INVENTORS	CREA RESEARCH CENTRES
oat and red oat	GENZIANA	L. Cattivelli D. Pagani M. Baronchelli	CREA-GB	2-row barley	ALIMINI	D. Pagani M. Stanca R. Alberici V. Terzi N. Faccini	CREA-GB
oat and red oat	BIONDA	M. Motto	CREA-CI	2-row barley	AZZURRO	R. Alberici M. Baronchelli L. Cattivelli N. Faccini D. Pagani	CREA-GB
oat and red oat	PRIMULA	M. Motto	CREA-GB	2-row barley	DASIO	N. Pogna	CREA-CI
oat and red oat	TEOBD40	M. Motto	CREA-CI	2-row barley	DORIA	M. Baravelli N. Pecchioni A. Gianinetti M. Baronchelli F. Reggiani	CREA-GB
spelt wheat	ROSSELLA	P. Codianni	CREA-CI	2-row barley	ESOPO	G. Tacconi D. Pagani A. Gianinetti F. Reggiani M. Baronchelli	CREA-GB
emmer	PADREPIO	P. Codianni	CREA-CI	2-row barley	FUTURA	F. Rizza D. Pagani R. Alberici I. Tagliaferri	CREA-GB
einkorn	HAMMURABI	L. Gazza N. Pogna	CREA-IT	2-row barley	GIADA	N. Faccini	CREA-GB
einkorn	ANTENATO	A. Brandolini	CREA-ZA	2-row barley	LG ARAGONA	D. Pagani R. Alberici A. Tondelli	CREA-GB
einkorn	NORBERTO	L. Gazza P. Cacciatori	CREA-IT	2-row barley	NURE	N. Pogna	CREA-GB
durum wheat	BRADANO	N. Pogna	CREA-CI	2-row barley	PLACIDIA	D. Pagani A. Gianinetti I. Tagliaferri M. Baronchelli G. Tacconi	CREA-GB
durum wheat	CHIARA	N. Di Fonzo	CREA-CI	2-row barley	PONENTE	M. Motto	CREA-GB
durum wheat	CICLOPE	M. Palumbo M. Cambrea A. Spina S. Licciardello N. Virzi'	CREA-CI	2-row barley	SCHEGGIA	R. Alberici D. Pagani N. Faccini F. Rizza A. Gianinetti M. Baravelli	CREA-GB
durum wheat	GHIBLI	N. Di Fonzo	CREA-CI	2-row barley	SIRIO	M. Baronchelli A. Gianinetti N. Faccini D. Pagani	CREA-GB
durum wheat	LESINA	N. Pogna	CREA-CI	2-row barley	SPAZIO	R. Alberici A. Tondelli N. Faccini S. Delbono	CREA-GB
durum wheat	NADIF	G. Palumbo P. De Vita N. Pecchioni A. Gallo	CREA-CI	2-row barley	VEGA	M. Motto	CREA-GB
durum wheat	SANT'AGATA	M. Palumbo M. Cambrea A. Spina N. Di Fonzo N. Virzi'	CREA-CI	2-row barley	ZACINTO	M. Motto	CREA-GB
durum wheat	SFINGE	N. Di Fonzo	CREA-CI	6-row barley	ALDEBARAN	M. Motto	CREA-GB
durum wheat	SORRISO	N. Di Fonzo	CREA-CI	6-row barley	ALISEO	N. Pogna	CREA-GB
durum wheat	TURCHESE	N. Di Fonzo	CREA-CI	6-row barley	SCIROCCO	M. Motto	CREA-GB
soft wheat	SALVIA	N. Pogna	CREA-CI	potato	DORIBEL	F. Govoni B. Parisi	CREA-CI
maize	LO1208	Cra-Mac	CREA-CI	potato	UNIDEA	B. Parisi	CREA-CI
maize	LO1240	A. Verderio G. Mazzinelli	CREA-CI	potato	DUCATO	E. Lupotto G. Vale'	CREA-CI
maize	LO1264	Cra-Mac	CREA-CI	rice	ONICE	E. Lupotto G. Vale'	CREA-CI
maize	LO1285B	Cra-Mac	CREA-CI	brown mustard	ISCI TOP	M. Montanari L. Lazzeri B. Parisi R. Matteo	CREA-CI
maize	LO1301	Cra-Mac	CREA-CI	triticale	SATIRO	N. Faccini D. Pagani F. Rizza M. Baronchelli	CREA-GB
2-row barley	AIACE	M. Motto	CREA-GB	triticale	SILENO	N. Faccini D. Pagani F. Rizza R. Alberici	CREA-GB
2-row barley	AIRONE	N. Pogna	CREA-GB	triticale	FLASH	N. Faccini F. Rizza R. Alberici D. Pagani G. Tacconi F. Reggiani	CREA-GB
2-row barley	ALASTRO	Crea-GB	CREA-GB	triticale	LG ERGON	N. Faccini I. Tagliaferri D. Pagani G. Tacconi	CREA-GB
2-row barley	ALCE	R. Alberici M. Baravelli D. Pagani N. Faccini	CREA-GB	triticale	OCEANIA	M. Motto	CREA-GB
2-row barley	ATLANTE	R. Alberici L. Cattivelli N. Faccini D. Pagani F. Reggiani	CREA-GB				

CREA VARIETIES INCLUDED IN THE ITALIAN NATIONAL VARIETY REGISTER

PRODUCTS	DENOMINATION	CREA RESEARCH CENTRES	PRODUCTS	DENOMINATION	CREA RESEARCH CENTRES
oat and red oat	Rogar 8	CREA- CI	soft wheat	Salmone	CREA-IT
oat and red oat	Genziana	CREA-GB	soft wheat	Salvia	CREA-CI
oat and red oat	Ava	CREA-IT	soft wheat	Salice	CREA-ZA
oat and red oat	Marisa	CREA-CI	sunflower	Elly	CREA-CI
oat and red oat	TEOBD40	CREA-CI	sunflower	Fabio	CREA-CI
tall oatgrass	Gala	CREA-ZA	maize	Nero spinoso	CREA-CI
small naked oat	Irina	CREA- CI	maize	Rostrato rosso di Rovetta	CREA-CI
small naked oat	Luna	CREA-CI	maize	Scagliolo di Carenno	CREA-CI
spelt wheat	Benedetto	CREA-CI	2-row barley	Dasio	CREA-CI
spelt wheat	Giuseppe	CREA-CI	2-row barley	Alce	CREA-GB
spelt wheat	Maddalena	CREA-CI	2-row barley	Arda	CREA-GB
spelt wheat	Pietro	CREA-CI	2-row barley	Astartis	CREA-GB
spelt wheat	Rita	CREA-CI	2-row barley	Cometa	CREA-GB
spelt wheat	Rossella	CREA-CI	2-row barley	Doria	CREA-GB
emmer	Davide	CREA-CI	2-row barley	Nure	CREA-GB
emmer	Giovanni Paolo	CREA-CI	2-row barley	Pariglia	CREA-GB
emmer	Padrepio	CREA-CI	2-row barley	Sfera	CREA-GB
einkorn	Antenato	CREA-IT	2-row barley	Sirio	CREA-GB
einkorn	Hammurabi	CREA-IT	2-row barley	Zacinto	CREA-GB
einkorn	Monlis	CREA-IT	6-row barley	Aldebaran	CREA-GB
einkorn	Norberto	CREA-IT	6-row barley	Aliseo	CREA-GB
einkorn	Monili	CREA-ZA	6-row barley	Explora	CREA-GB
durum wheat	Adamello	CREA-CI	6-row barley	Scirocco	CREA-GB
durum wheat	Bradano	CREA-CI	6-row barley	Diomede	CREA-CI
durum wheat	Bronte	CREA-CI	potato	Antea	CREA-CI
durum wheat	Cappelli	CREA-CI	potato	Golden Queen	CREA-CI
durum wheat	Chiara	CREA-CI	potato	Mehari	CREA-CI
durum wheat	Ciclope	CREA-CI	potato	Dirubel	CREA-CI
durum wheat	Faridur	CREA-CI	potato	Ninfa	CREA-CI
durum wheat	Fortore	CREA-CI	potato	Riccione di Napoli	CREA-CI
durum wheat	Gargano	CREA-CI	potato	Unidea	CREA-CI
durum wheat	Lesina	CREA-CI	rice	Agata	CREA-CI
durum wheat	Nadif	CREA-CI	rice	Ducato	CREA-CI
durum wheat	Natal	CREA-CI	rice	Lomello	CREA-CI
durum wheat	Ofanto	CREA-CI	rice	Onice	CREA-CI
durum wheat	Sant'Agata	CREA-CI	rice	Opale	CREA-CI
durum wheat	Saragolle Lucana	CREA-CI	rice	Ribe (Euribe)	CREA-CI
durum wheat	Sfinge	CREA-CI	rice	Roma	CREA-CI
durum wheat	Sorriso	CREA-CI	rice	Vialone nano	CREA-CI
durum wheat	Turchese	CREA-CI	brown mustard	ISC120	CREA-CI
durum wheat	Varano	CREA-CI	brown mustard	ISC199	CREA-CI
durum wheat	Valnova	CREA-IT	triticale	Altair	CREA-GB
soft wheat	Risciola	CREA-CI	triticale	Oceania	CREA-GB
soft wheat	S.Pastore	CREA-IT	triticale	Quark	CREA-GB
soft wheat	Salgemma	CREA-IT			

Services

Collections

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA RESEARCH CENTRE
oats (<i>Avena sativa</i>)	960 accessions of national and international origin, different ploidy levels (diploids, tetraploids and hexaploids), both cultivated and wild.	R. Redaelli	CREA-CI
sugar beet <i>Beta vulgaris</i>	approximately 300 accessions including wild genotypes.	I. Alberti	CREA-CI
<i>Brassicaceae</i>, <i>Resedaceae</i>	56 food and non-food species of <i>Brassicaceae</i> , belonging to 27 different genera. In some cases, more accessions are available Stored in the medium and long term available upon request.	M. Bagatta, L. Malaguti	CREA-CI
tetraploid wheats	900 genotypes, including diverse accessions of <i>Triticum turgidum</i> spp. The majority of which are <i>genotyped</i> with SNPs type molecular markers. Stored at 7°C and periodically renewed in open field.	P. De Vita	CREA-CI
durum wheat	<i>Triticum turgidum</i> ssp. <i>durum</i> : approximately 400 accessions, stored at controlled conditions (temperature and humidity), renewed on a three year base, available upon request.	F. Sciacca, M. Palumbo	CREA-CI
durum wheat	12 accessions of the ancient wheat Saragolla (11 from Abruzzo Region and 1 from Puglia), stored at controlled conditions (temperature and humidity); not available upon request.	A. Rascio	CREA-CI
durum wheat- experimental population	Two set of Introgression Lines (ILs) derived by the cross of the durum wheat elite variety PR22D89 with one accession of <i>T. dicoccoides</i> and one of <i>T. carthlicum</i> (consisted of 130 e 150 lines, respectively).	D. Marone	CREA-CI
durum wheat- experimental population	MAGIC population (F4-like) of 900 lines, obtained by crossing 16 parental lines of diverse geographical origin.	D. Marone	CREA-CI
durum wheat- experimental population	NAM population (Nested Association Mapping) composed by 3500 lines derived from the cross of cv Cappelli with 35 ancient and modern grain varieties.	N. Pecchioni, P. De Vita	CREA-CI
common wheat	43 accessions, stored at controlled conditions (temperature and humidity), renewed on a three year base, available upon request.	F. Sciacca, M. Palumbo	CREA-CI
common wheat	4800 genotypes, encompassing old and new varieties, both national and international, populations of ancient wheats. Stored at 4°C and periodically renewed in open field.	P. Vaccino	CREA-CI
sunflower	25 male sterile lines, stored via cryopreservation.12 lines diversified for the evaluation of <i>Peronospora</i> races.	A.Del Gatto	CREA-CI
maize (<i>Zea mays L</i>)	over 5000 accessions stored <i>ex-situ</i> in cold chamber at 7°C and periodically renewed: around 1.200 varieties (over 600 italian and inbred lines), accessions of international origin (Europa, Stati Uniti, Bolivia, Messico) consisted of 1800 inbred lines and 600 landraces.	C.Balconi, P. Valoti	CREA-CI
barley (<i>Hordeum vulgare</i>)	about 100 accessions, stored at controlled conditions (temperature and humidity), renewed on a three year base, available upon request.	F. Sciacca, M. Palumbo	CREA-CI
potato (<i>S. tuberosum L</i>)	90 accessions, maintained in <i>in vitro</i> culture with 8 replicates, available upon request.	D. Pacifico	CREA-CI
castor bean	15 monoic and gynocic lines.	A. Del Gatto	CREA-CI
rice	700 accessions of <i>Oryza sativa</i> ssp <i>japonica</i> , 4 lines of <i>O. sativa</i> ssp. <i>indica</i> and 5 of <i>O. glaberrima</i> and of wild relative <i>O. rufipogon</i> . Storage at 4°C and periodically renewed in the open field.	P. Vaccino	CREA-CI
tobacco and other species of the genus <i>Nicotiana</i>	more than 1000 accessions of <i>Nicotiana tabacum</i> (of international origin like Burley, Bright, Kentucky, Orientali, Subtropicali, Havana e diverse varietal constitutions) 130 of <i>Nicotiana rustica</i> as well as others 60 species of the genus <i>Nicotiana</i> .Storage in cold room. Availability of small seeds stocks upon request.	L.del Piano	CREA-CI

Dedicated Historical Libraries

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA RESEARCH CENTRES
Historical library Leonardo Angeloni	The "Leonardo Angeloni" Library is made up of a historical nucleus from the former headquarters CRA-Research Unit for Alternative Tobacco Crops in Scafati and was established in 1895 in the past Royal Experimental Institute for Tobacco Cultivation. When the Scafati Institute was transferred to Caserta, the "Angeloni" Library incorporated the core of the existing library at the Research Unit for Fruit Growing (CRA). The Library is associated with the National Library Service (SBN: code NAP33) and refers to the Polo Napoli coordinated by the Vittorio Emanuele III National Library and supervised by the Central Institute for the Single Catalog (ICCU: ISIL code, IT-SA0075). About 3,000 volumes (15 of which are ancient, over 1000 published after 1834 and modern 2000) are catalogued on the SBN open access database. Furthermore, the library is a member of the National Collective Archive of Periodicals (ACNP, code CE004) where over 400 national and international periodicals owned have been included. These are over 10,000 volumes of magazines dating back to the early 1900s. The library has digitized part of the of the historical collection volumes and all the ancient ones, for a total of about 10,000 pages. The library's patrimony also includes Herbaria from the <i>Nicotiana</i> collection and wild species dating back to the period 1908-1936, collected in 21 volumes (half restored) and 119 loose sheets.	L. Morra	CREA-CI

Other scientific and technological infrastructures

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA RESEARCH CENTRES
FieldPhen Phenotyping Platform	The FieldPhen platform of the seat of Foggia is part of CREA's Pheno5C phenotyping platform. It is part of the Phen-Italy national research infrastructure, and of the European EMPHASIS infrastructure. It studies and develops phenotyping in the high throughput field with a specialization on wheat and aims to innovate the genetic improvement of cereals through phenotyping tools and strategies. FieldPhen has at its disposal three UAVs (unmanned aerial vehicles), a DJI Phantom 4 PRO, equipped with a dual 4K 5-band Sentra multispectral sensor and a 24mp RGB camera, a DJI Matrice 100 equipped with an RGB sensor - Zenmuse X5 and, a Bluegrass equipped with the 4-band Parrot Sequoia multispectral sensor. In addition, lightweight instrumentation (lean phenotyping) is available, in which the platform researchers are developing methods to evaluate yield-related characters by RGB proximal sensing using a mobile phone camera and machine learning algorithms.	N. Pecchioni, P. De Vita (Foggia)	CREA-CI
Phytopathological Laboratory	The Phytopathological laboratory is a network laboratory of the Cereal and Industrial Crops Center, currently located in the Rovigo, Bergamo and Caserta seats of the Center and has the necessary instrumentation and expertise for plant pathology studies and on the characterization and traceability of mycotoxins. The laboratory implements diagnostic methods for the isolation and classification of pathogens of the main industrial and cereal crops, conducts analyzes for the assessment of resistance to various pathogens on industrial and cereal crops and analysis of the soil microflora. It has an area with a flow hood for the preparation of the different growth substrates and a separate area with a Biohazard hood, with thermostats equipped with environmental control and NUV light. A small molecular biology laboratory is entirely dedicated to phytopathological diagnostics, where it is possible to carry out simple analyzes to refute the morphological identifications of fungi and some bacteria. Finally, an area is set up where optical microscopes and stereoscopes with related cameras for image acquisition are installed. A walk-in growth chamber is also available where it is possible to structure pathogenicity and resistance to pathogens tests. Also available are: chemical hood, autoclave, incubators, stoves and all the equipment necessary for the development and implementation of diagnostic methods, analysis for the evaluation of resistance to various pathogens on industrial crops and cereals and soil microflora analysis. At the Bergamo seat, the mycotoxin laboratory carries out the analysis of the main mycotoxins in grains and chopped corn and other cereals. Analyzes of the content of fumonisins, aflatoxins, deoxynivalenol and zearalenone are carried out by ELISA test. The quality of the analyzes is guaranteed by the regular participation in ring tests with inter-laboratory comparison of the results. Chemwell automated system (Awareness technologies inc) for the analysis of 84 samples simultaneously using specific Elisa tests for each mycotoxin; Beckman System Gold HPLC with UV detection system, fluorometer and ELSD. In the seat of Caserta, together with the classic ones, instrumentation and skills in molecular biology applied to phytopathology studies are present. The laboratory is equipped with chemical hoods, horizontal and vertical laminar flow hoods, autoclaves, freezers, incubators, optical microscopes and stereomicroscopes with image acquisition, ovens, rotavapors, ultracentrifuge, PCR and RT-PCR equipment, cells for electrophoresis and other minor instrumentation. In addition, pathogenicity tests, resistance studies and plant / pathogen interaction studies are carried out in controlled conditions, in the latest generation climatic chamber with photoperiod and light intensity control (thanks to NUV and fluorescent lamps with light with a spectrum similar to the solar one), temperature and humidity simulating real situations, and in the greenhouse. The laboratory has a collection of pathogenic fungal isolates, antagonists and producers of active molecules.	I. Alberti (Rovigo) C. Lanzasova, S. Locatelli (Bergamo) E. Lahoz, V. Battaglia (Caserta)	CREA-CI
Cereal Quality Lab	The laboratory is in three offices of the Center, Foggia, Acireale and Vercelli and includes the necessary instrumentation for qualitative and rheological analyzes on straw, cereals and rice. Rheology laboratory at the Acireale, Foggia and Vercelli offices, equipped with the Glutomatic System, Chopin's Alveograph, Brabender's Farinograph, NIR, Hagberg Falling Number Perten, Soxtec for the extraction of fats. It studies the rheological properties of hard and soft wheat doughs (as they are or integrated with other vegetable matrices), through the determination of the content and quality of gluten, of alveographic and farinographic indices and of the ash content. Experimental pasta making laboratory, at the Foggia headquarters. Experimental bread-making laboratory, in the seat of Acireale. The activity of the laboratory is aimed at evaluating the pasta and bread-making aptitude of the hard and soft wheat genotypes under study, through the creation of experimental pastas and breads (as they are or integrated with other vegetable matrices).	A. Spina, N. Virzi, F. Sciacca (Acireale); C. Fares, V. Menga, S. Moscaritolo (Foggia); Patrizia Vaccino (Vercelli)	CREA-CI
Applied Genomics Laboratory	The laboratory is in the various locations of the Center, mainly in Foggia and Bologna, and has the necessary instrumentation and expertise for the study of the biodiversity of plant genomes, for basic genetic and epigenetic studies and applied to modern genetic improvement, up to technological transfer to genetic improvement (marker-assisted selection and genomic selection) of cereal and industrial species. Bologna office - the laboratory specializes in genetics and genomics applied to industrial species. It is a subject accredited to the High Technology Network of the Emilia Romagna Region (Executive Resolution no. 15375 of 08/08/2022). Equipped with the necessary equipment for the extraction and amplification of DNA and RNA from plant samples, for the separation of amplified fragments, for the analysis and processing of electrophoretic traces. It performs gene expression analysis by RT-qPCR amplification by end point PCR, horizontal and vertical electrophoresis of nucleic acids and proteins, gene cloning. There is also an in vitro culture laboratory for maintaining the biodiversity collections of potatoes in Bologna and hemp at the Rovigo company At the Foggia headquarters, the laboratory is equipped for the study of the genetic basis of characters of agronomic importance, to support genetic improvement activities and for the study of gene expression. To this end there are: two automated robotic stations to automate routine operations such as DNA extractions and PCR; a 16-capillary sequencer for sequencing of small DNA fragments and analysis of molecular markers; a REAL TIME PCR, for quantitative genetic analysis; an ILLUMINA Miseq NGS sequencer, for metagenomics, RNAseq, small genome sequencing, etc. An in vitro culture and genetic transformation laboratory using the biolistic method is also available. At Bergamo, the Laboratory specializes in epigenetic and molecular biology studies, and is equipped to carry out official analyses of the presence of GMOs in corn and soybean seeds. The equipment for molecular biology includes the basic instrumentation necessary to perform various molecular biology experiments (extraction and analysis of nucleic acids and proteins, DNA amplification and cloning, preparation of libraries for NGS, etc.): 4 PCR machines, 2 PCR real-time, centrifuges, chemical and microbiological hood, horizontal and vertical electrophoresis devices, darkroom with transilluminator, spectrophotometer and various PCs for data analysis.	Roberta Paris (Bologna) D. Marone e M.A. Russo (Foggia) P. Vaccino (Vercelli)	

	At the Vercelli site - the laboratory is equipped with the basic instrumentation necessary for the extraction and amplification of DNA and RNA from plant samples, for the separation of amplified fragments, for the analysis and processing of electrophoretic traces. Performs gene expression analysis by RT-qPCR, amplification by PCR horizontal and vertical electrophoresis of nuclei acids and proteins.		
Biochemistry and Biomasses Laboratory	The Biochemistry laboratory of the Bologna office is equipped with instruments for the preparation of products from plant biomass and for the chemical and biochemical characterization of plant tissues. Together with the applied genomics laboratory of the Bologna office, it is an accredited subject to the High Technology Network of the Emilia-Romagna Region (Executive resolution no. 15375 of 08/08/2022). In addition to the complete instrumentation necessary for the preparation, it is equipped with 1 NMR MQC Oxford Instruments for the determination of the oil content, 2 Agilent HP1100 series HPLC with UV detector, equipped with autosampler, 1 Thermo Fisher Scientific U-HPLC Ultimate 3000 with UltiMate 3000 detector Diode Array, 2 FPLCs with a wide range of columns for various types of low molecular weight bioactive molecules and proteins, 4 FID gas chromatographs, 1 GC-MS Bruker SCION single quadrupole with autosampler for liquid injection, headspace and SPME, 1 GC-MS Thermo Fisher Scientific mod. TRACE1300 with ISQ 7000 single quadrupole mass spectrometer, 1 Phast System electrophoretic system for SDS and native PAGE, GE Healthcare, 1 Cary 3000 UV-Vis spectrophotometer (Varian-Agilent), 1 Cary Eclipse fluorimeter (Varian-Agilent). Connected with the Biochemistry Laboratory at Bologna is a Biomass laboratory, equipped with 1 LECO Truspec CHN elemental analyzer, 1 Thermo Fisher Scientific TRACE 1300 gas-chromatograph with 155-place autosampler, 1 Agilent 1100 Series HPLC + Sedex 85 LT-ELSP, plus other instrumentation necessary for the chemical physical characterization of biomass of plant origin.	L. Righetti , A. Moschella (Bologna)	CREA-CI
Metabolomics Lab	The Metabolomics laboratory of the Foggia headquarters deals with the analysis of primary and secondary metabolites of cereal and industrial species and is equipped with standard instrumentation for the preparation of samples, as well as analytical chemistry instrumentation, as follows: 1 GC-MS (GC 6890N - Quadrupole 5973 Agilent Technologies, 1 GC-MS / MS (GC 7890A- Triple Quadrupole 7000B) Agilent Technologies, 1 GC-QTOF (GC 7890A - QTOF 7200) Agilent Technologies, 1 HPLC-DAD 1200 Series Agilent Technologies, 1 LC-QTOF (HPLC 1290 - QTOF 6550 iFUNNEL) Agilent Technologies, 1 ICP- MS (7700x) Agilent Technologies.	R. Beleggia (Foggia)	CREA-CI
Soil and Plant Chemistry Lab	Laboratory at the Caserta site that deals with studies on soils and bioactive compounds in plant matrices, in particular the dynamics of the organic substance in fertilized soils, in relation to the texture and structure of the soil. It carries out studies of the nitrogen balance in crop systems, the chemical analysis of the soil for the determination of the assimilable fractions of macro- and micronutrients. It carries out studies on bioactive compounds as quality indicators of plant productions. The main instruments supplied are: Atomic Absorption Spectrophotometer (AAAnalyst 400 + AS 90PLUS - PerkinElmer autosampler); Gas chromatograph coupled to Mass Spectrometry (Clarus 680 + Massa Clarus SQ 8 C - PerkinElmer); HPLC (Series 200 - PerkinElmer); Automatic titrator (DL 28 - Mettler); UVVIS spectrophotometer (DU 640 Beckman); Field cycle NMR relaxometer (Stelar); Continuous flow colorimeter (Autoanalyzer III - Bran + Luebbe).	S. Baiano, L. del Piano (Caserta)	CREA-CI

Plant varieties Seed Certification

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA RESEARCH CENTRES
Seeds: sugarbeet	Agronomic test and chemical analysis for registration in the National Variety Register (MiPAAF, CREA-DC).	I. Alberti	CREA-CI
Seeds: various industrial crops	Chemical analyzes on rapeseed, soy, flax, sunflower, sorghum, safflower and cotton such as acidic composition, oil yield, protein yield, glucosinolate content, tannin content, anti-nutritional factors for registration in the National Variety Register (MiPAAF, CREA-DC).	L. Lazzeri, L. Righetti, L. Malaguti	CREA-CI
Seeds: rapeseed, soybean, flax, sunflower sorghum, safflower and cotton	Chemical analyses: acidic composition, oil yield, protein yield, glucosinolate content, tannin content, anti-nutritional factors for registration in the National Variety Register (MiPAAF, CREA-DC.)	L. Lazzeri, L. Righetti, L. Malaguti	CREA-CI
Seeds: durum wheat	Agronomic trials for registration in the National Variety Register (MiPAAF, CREA-DC).	M. Palumbo	CREA-CI
Seeds: durum wheat, soft wheat, triticale, oat barley, einkorn, emmer, spelt, forage crops	Agronomic trials for registration in the National Variety Register (MiPAAF, CREA-DC).	A. Troccoli, A. Gallo	CREA-CI
Seeds: sunflower, rapeseed, safflower sugarbeet, sorghum	Agronomic trials for registration in the National Variety Register (MiPAAF, CREA-DC).	A. Del Gatto	CREA-CI
Seeds: maize (grain and silage)	Agronomic trials for registration in the National Variety Register (MiPAAF, CREA-DC), maize, grain and silage	G. Mazzinelli	CREA-CI
Seeds: sorghum	Agronomic tests and analysis of dry matter sorghum x Sudanese grass for registration in the National Register of Varieties (MiPAAF, CREA-DC)	G. Mandolino	CREA-CI
<u>GMOs Second Instance Analyses</u>			
Soybean and maize seeds	Verification of the presence of heterologous DNA and quantification of the GMO content by "Real Time" PCR analysis.	H. Hartings	CREA-CI

Others services

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA RESEARCH CENTRES
<u>Agrochemical Test Centre</u>			
bioformulate	Conduct of effectiveness tests for the evaluation of a new bioformulate as herbicide, desiccant in potato, spollonants in wine -Gep test at Caserta Test Centre.	V.Battaglia, E. Lahoz	CREA-CI
bioformulate on tobacco	Consultancy on anti-budding tests of a bioformulate on tobacco - GEP TEST at Caserta Test Centre.	E.Lahoz, F. Raimo	CREA-CI
biopesticide on drupaceae	Conduct of effectiveness tests for the evaluation of a new biopesticide for the control of moniliosis on Drupaceae - GEP TEST at Caserta Test Centre.	V. Battaglia, E. Lahoz	CREA-CI
tobacco	Conduct of effectiveness tests against downy mildew on tobacco - GEP TEST at Caserta Test Centre.	V. Battaglia, E. Lahoz	CREA-CI
<u>National Network - Recommended List Trials</u>			
durum and common wheat	Varietal evaluation tests.	A.Troccoli	CREA-CI
durum and common wheat, barley for zootechny and malt supply chains	Varietal evaluation tests in Puglia, Molise and Campania.	A. Troccoli	CREA-CI
durum and common wheat, barley for zootechny and malt supply chains	Varietal evaluation tests in Sicilia.	N.Virzi, M. Palumbo	CREA-CI
sunflower and rapeseed	National network of varietal evaluation trials.	A.Del Gatto	CREA-CI
maize hybrid varieties for grain and whole chopped supply chains	National network.	G.Mazzinelli	CREA-CI
maize mycotoxins	Monitoring Network.	S.M. Locatelli	CREA-CI
<u>Third party service and Open field experimentation for third parties</u>			
sugar beet	Chemical analysis of sugar beet samples.	I. Alberti	CREA-CI
onion	Open field evaluation trial of short and long cycle onion lines.	N. Pecchioni, A.Troccoli	CREA-CI
wheat	Contract for research on the spread of wheat rust present on the national territory.	D. Marone, A.M.Mastrangelo	CREA-CI
durum wheat	Provision of physical analysis services as part of the project "creation of varieties of durum wheat having quality parameters in compliance with international standards, of high productivity and ecological stability.	P.De Vita	CREA-CI
durum wheat	Evaluation tests of Israeli lines of durum wheats in hot-arid Mediterranean environments.	N. Virzi	CREA-CI
durum wheat	Evaluation tests of new formulations for the fertilization of durum wheat in the Mediterranean area.	N.Virzi	CREA-CI
durum wheat	Evaluation of durum wheats varieties.	P.De Vita	CREA-CI
durum wheat	Evaluation of different fertilising products on the qualitative-quantitative response of durum wheat.	N.Pecchioni, A.Troccoli, A. Gallo	CREA-CI
durum wheat	Evaluation of advanced breeding lines of durum wheats.	P.De Vita	CREA-CI
durum wheat	RAGT - Evaluation of durum wheats genotypes.	P.De Vita	CREA-CI
durum wheat	Evaluation of durum wheats genotypes.	P.De Vita	CREA-CI
sunflower	Varietal evaluation tests on sunflower.	A.Del Gatto	CREA-CI
maize	Contract for research on study and comparison of the effect of microbial consortia in the early stages of development of the maize plant.	C. Lanzaova	CREA-CI
maize	Technical-scientific consultancy for the Eastern Lario Valle San Martino Mountain Community, regarding the improvement of productivity, the quality of the cultivation, conservation and transformation phases of Scagliolo di Carenno Corn.	P. Valoti, C. Balconi	CREA-CI
technical means	Evaluation tests of the effectiveness of technical means.	A. Gallo	CREA-CI
new durum wheat genotypes	Agreement of Plant Breeding -Agronomic and qualitative evaluation of new genotypes of durum wheat derived by i) Co So synthetic population ii) selection of materials to start the registry tests, iii) plant material selected for varietal development, iv) activity of maintenance of seed purity.	P. De Vita	CREA-CI
new durum wheat genotypes	Agreement of Plant Breeding-Evaluation of new durum wheat genotypes.	P.De Vita	CREA-CI
Brassicaceae flour and pomace oil	Use of raw and refined pomace oil as a technical fluid to be used as power supply of agricultural machinery for the olive grove. Study of formulas derived from pomace oil and Brassicaceae flour.	L. Lazzari	CREA-CI
rice	Contract for the realization of an experimental trial of rice both in the field and phytotron for the multiplication and evaluation of lines in the selection phase.	M. Canella	CREA-CI
rice	Contract for the construction of a demonstration field of rice with Clearfield technology.	M. Canella	CREA-CI
rice	Service contract for the cultivation of experimental rice plots.	M. Canella	CREA-CI
various	Contract for technical-logistic collaboration service.	P. Vaccino	CREA-CI

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA RESEARCH CENTRES
<u>International boards</u>			
desertification	DesertNet International network - - Network for international research on desertification.	A. Rascio	CREA-CI
wheat	AWAS (Adaptation of Wheat to Abiotic Stress) Expert Working Group in Wheat Initiative work space Referenti A. Rascio, CREA-CI.	A. Rascio	CREA-CI
wheat	European Working Group (EWG) in Wheat Initiative work space: Global Wheat Germplasm Conservation and Use Community -Working group for the: "conservation and use of wheat germplasm".	A. Rascio, M. Palumbo	CREA-CI
durum wheat	Wheat Initiative - Expert Working Group (EWG) on Durum Wheat Genomics and Breeding.	M. Palumbo, D. Marone, M.A. Russo	CREA-CI
durum wheat, barley	EVA – Wheat and Barley - Network - Multiplication and exploitation of wheat and barley genetic accessions stored in European germplasm banks; distribution to the partners involved in the Network through "SMTA" for genotyping and evaluation in the field, sharing of the results in the EURISCO database.	P. Vaccino	CREA-CI
maize	EVA – Maize - Network - Multiplication and exploitation of maize genetic accessions stored in European germplasm banks; distribution to the partners involved in the Network through "SMTA" for genotyping and evaluation in the field, sharing of the results in the EURISCO database.	C. Balconi, R. Redaelli, P. Valoti, N. Pecchioni	CREA-CI
maize	MAIZE WORKING GROUP - European Cooperative Programme for Plant Genetic Resources (ECPGR) MAIZE working group.	C. Balconi	CREA-CI
plant genetic resources	European Cooperative Programme for Plant Genetic Resources (ECPGR) wheat working group.	P. Vaccino, A. Rascio	CREA-CI
food losses	Global research network on reduction of food losses & food waste (FLW).	A. Rascio	CREA-CI
pathology	EFSA - the European Food Safety Authority, pursuant to art. 36 of Regulation (EC) no. 178/2002 - 4.1 Plant Health - CREA experts designation.	I. Alberti	CREA-CI
pathology	ISTA (International Seed Testing Association) Seed Health Committee – Development of diagnostic protocols for seed-borne pathogens	I. Alberti	CREA-CI
<u>Centre journals</u>	Maydica - A journal devoted to maize and allied species - ISSN: 2279-8013 https://journals-crea.4science.it/index.php/maydica	C. Balconi	CREA-CI
<u>Editorial Board</u>			
Micotoxins	Guest Editor (2020) for the Special issue “Analytical Methods for Mycotoxin Analysis”, rivista Molecules.	S. M. Locatelli, C. Lanzanova	CREA-CI
Plant Breeding	Editorial board of Frontiers in plant sciences, as review editor, section Plant Breeding	D. Marone	CREA-CI
Various	Guest editor of Special Issues of “FRONTIERS”: Plant Metabolism and Chemodiversity	A. Rascio	CREA-CI
Various	Guest editor of Special Issues of “FRONTIERS”:Plant Abiotic Stress	A. Rascio	CREA-CI
Various	Editorial Board journal “International Journal of Molecular Sciences”	D. Trono	CREA-CI
Various	Editorial Board journal “Plants”	D. Trono	CREA-CI
Various	Review Editor for Frontiers in Plant Science and Frontiers in Microbiology	I. Terracciano	CREA-CI
Various	Associate Editor for Frontiers – Plant Breeding section	G. Mandolino	CREA-CI
Various	Guest Editor for the Special Issue “Role of Secondary Metabolites in Plant Response to Abiotic Stresses” della rivista IJMS	D. Trono	CREA-CI
Various	Guest Editor for the Special Issue “Responses of Durum Wheat to Abiotic Stress” della rivista Plants	D. Trono	CREA-CI
Various	Guest Editor for the Special Issue "Genetic Improvement of Cereal Crops for Resistance to Biotic and Abiotic Stresses" della rivista “Plants”	G.M. Borrelli, D. Marone	CREA-CI
Various	Guest Editor for the Special Issue “Quality Evaluation and Functional Food Development of Cereals, Pseudocereals and Pulse Product” della rivista Plants	A. Spina	CREA-CI
Various	Guest Editor for the Special Issue “Diagnosis of Plant Pathogenic Fungi and Oomycetes and Plant Breeding for Disease Resistance” della rivista Journal of Fungi	A. Spina	CREA-CI
Cereals	Guest Editor for the Special Issue “Nutritional Quality Improvement of Cereals and their derived products” della rivista Recent Progress in Nutrition	A. Spina	CREA-CI
Various	Topical Advisory Panel Member of “Agronomy”	A. Spina	CREA-CI
Various	Editorial Board journal "International Journal of Nutrition and Food Sciences" (IJNFS)	A. Spina	CREA-CI
Various	Editorial Board Journal Archives of Agriculture Research and Technology (AART).	A. Spina	CREA-CI
Various	Review Editor in Plant Biotechnology for Frontiers in Plant Science	L. Bassolino	CREA-CI
Various	Guest Editor of Special Issue "Transcription Factors Controlling Plant Secondary Metabolism" per la rivista Plants (MDPI)	L. Bassolino	CREA-CI
Various	Guest Editor of Special Issue "Bioactive Natural Compounds against Animal and Human Pathogens" per la rivista Biomolecules (MDPI)	E. Pagnotta, L. Ugolini	CREA-CI
Various	Topic Editor for journal Plants.	L. Bassolino	CREA-CI
Various	Associate Editor of journal Frontiers in plant science/Plant Breeding.	A.M. Mastrangelo, N. Pecchioni	CREA-CI
Various	Editorial board, journal Genes.	A.M. Mastrangelo	CREA-CI
Various	Associate Editor Italian Journal of Agronomy.	M. Rinaldi	CREA-CI
Various	Associate Editor Euphytica.	N. Pecchioni	CREA-CI
<u>Public Engagement</u>	Non-profit activities carried out by the CREA-CI Centre having educational, cultural and developmental value for the society including the organization of public events (e.g. European Researchers' Night 2020), the management of the Centre's website and dissemination initiatives dedicated to students.	D. Pacifico	CREA-CI
<u>Working table</u>			

bioeconomy	Working table "Apulian Cluster for the Bioeconomy" - Coordinated and promoted by the SPRING Cluster with Assobiotech – Federchimica- University of Bari, Puglia Region.	A. Rascio	CREA-CI
maize	Working table MiPAAF and working groups. Working table of the corn sector (Mipaaf DM n. 31929 of 06.05.2019) and working groups (Mipaaf DG PQAI 2 Prot. 5339 del 24.07.2019) established with the aim of preparing the Sector Plan.	N. Pecchioni C. Balconi, S.M. Locatelli, G. Mazzinelli	CREA-CI
rice and other cereals	Working table and working groups. Member of the technical commission of the Italian Standardization Body UNI/CT 003/GL 22 " Rice and other Cereals.	P. Vaccino	CREA-CI
Soil health	Member of the technical group for the Lighthouse farms network project of the Re Soil Foundation	L. Morra	CREA-CI
<i>Working group</i>			
organic farming	Participant to technical working group at MiPAAF on rotations allowed in organic farming.	M. Rinaldi	CREA-CI
cereal	The Italian association of Cereal Science and Technology (Associazione Italiana Scienza e Tecnologia dei Cereali - AISTEC). Board of Directors - Secretary.	R. Redaelli	CREA-CI
cereal supply chain	Cereal supply chain at MiPAAF, Dep. of European and International Policies and Rural Development, Directorate General for International Policies and the European Union, PIUE IV.	S. M. Locatelli	CREA-CI
biological contaminants	GLM Mycotoxins Working Group (MiPAAF): planning, design, starting and implementation of projects on biological contaminants (e.g. mycotoxins) of agricultural production and their derivatives.	S. M. Locatelli	CREA-CI
plant phenotyping	CREA representative in the JRU Phen-Italy Assembly - National Platform for Plant Phenotyping.	N. Pecchioni	CREA-CI
plant breeding	Working group. Scientific technical committee CERMIS - Centro ricerche e sperimentazione per il miglioramento vegetale.	P. De Vita	CREA-CI
autumn and spring cereals	Working group. Commission dedicated to the coordination of test trials for registration of autumn and spring cereals - participation as an expert in qualitative analyses of bread wheat.	P. Vaccino	
conservation varieties	Working group. Sicilia Region Regional Department of Agriculture, Rural Development and Mediterranean Fisheries. Commission for evaluating applications for registration in the national register of varieties conservation.	M. Palumbo	CREA-CI
various	The Georgofili Academy (Accademia dei Georgofili). Member of the expert group for the initiative "L'Accademia risponde".	R. Redaelli	CREA-CI
various	The National Academy of Agriculture (Accademia Nazionale di Agricoltura) Bologna. Correspondent Academic - Cultural and dissemination activities.	P. De Vita	CREA-CI
various	The Georgofili Academy (Accademia dei Georgofili), Firenze. Academic Aggregate - North-West Section - Cultural and dissemination activities.	N. Pecchioni	CREA-CI
various	Board of Professors of the PhD Course "Gestione della Innovazione nei sistemi agro-alimentari della Regione mediterranea" of University of Foggia.	P. De Vita	CREA-CI
various	Board of Professors of the PhD Course "Scienze Tecnologie e Biotecnologie Agroalimentari" of the University of Modena and Reggio Emilia.	N. Pecchioni	CREA-CI
various	The Association of Graduates in Agricultural and Forestry Sciences (Associazione Laureati in Scienze Agrarie e Forestali-ADAF) President - Cultural and dissemination activities.	P. De Vita	CREA-CI
various	Working group M.U.R. Commission of experts for the preparation of the "National Research Plan" (Piano Nazionale della Ricerca - PNR 2021-2027) Topic: Sustainable Technologies, Agri-food, Natural and Environmental Resources - Management of agricultural resources. DM 969 del 03.07.2020.	N. Pecchioni	CREA-CI

2. CREA RESEARCH LINES BY PRODUCTS

2.2 ANIMAL AND DAIRY PRODUCTIONS

CREA research focuses mainly on the sustainability of production, which includes economic and environmental aspects.

For economic sustainability, research activities are aimed at optimizing diets to reduce waste, improve the level of feed supply, and use innovative protein raw materials. Of great importance is the activity in the field of precision livestock farming, with the aim of improving the management strategies and animal performances, and in the study of the genetic improvement of forage crops and grain protein crops. The latter is aimed at increasing the quantity and quality of production, more efficient use of resources, and adaptation to climate change, in particular resistance to drought, both in conventional and organic management.

In the context of environmental sustainability, complex biological systems are analyzed by means of Life Cycle Assessment (LCA) analysis, that can determine the quantity of climate-altering gases produced by each system and by studying innovative techniques aimed at reducing negative environmental criticalities; the recycling of by-products and livestock wastes is studied, the latter through the production of biogas with innovative and more efficient methods, also through anaerobic microbiology studies.

The sustainability of the various farming systems includes the state of animal welfare, the reduction of the use of antibiotics, and the study of ecosystem services. Research is aimed at improving the adaptability of animals in the various conditions of both intensive and extensive conventional farming and organic farming. A contribution is given by the identification of new genetic lines; and, of relevance are the studies on innate immunity to identify new flow cytometric markers, and their genetic basis, which can be used to detect inflammation early or as selection criteria to improve resistance to disease. Italy has a long tradition in the production of high-quality animal products. Much of the research activity is dedicated to the production and processing of milk (bovine, buffalo, and sheep-goat) and meat: the effects of fertilization of fodder, heat stress, the farming system, the different treatments of milk in the production of cheese, techniques for the preparation and use of vegetable rennet, the innovations and process controls during the cheese making, the study of the dairy microbial populations. The genetic improvement of the nutritional quality of milk is also studied due to its contents in molecules with prebiotic and protective action. Oxidation processes are studied on meat and new tenderizing and packaging technologies are tested to improve shelf-life and reduce waste. Other studies are aimed at enhancing the nutraceuticals contained in meat.





2.2.1 Research and research products - Animal and Dairy Productions

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CRE/ RESEARCH CENTRES	INTERNATIONAL PARTNERSHIP /FINANCING BODY	PUBLICATIONS	OTHERS RESEARCH PRODUCTS ¹
ABOCA Agreement with Aboca farm	- Scientific-technical advice to the working group dedicated to the adoption of an on-farm slaughter method that respects animal welfare as much as possible; - Support for the development of organic cattle and pig farms. The activity will focus on advice on feed and parasite management, as well as bibliographic research on the phylogenetic affinity between the Nero dei Nebrodi breeds and the Iberian swine	D. BOCHICCHIO CREA-ZA	- Aboca Spa Agricultural Society		
ACCASATA Adaptation and conservation of native genetic resources in the goat species in Basilicata Region	Conservation strategies and valorization of animal biodiversity	S. CLAPS CREA-ZA	- Basilicata Region	Articolo su rivista Landi Vincenzo; Maggiolino Aristide; Salzano Angela; Claps Salvatore De Palo Pasquale; Rufrano Domenico; Pedota Giuseppina; Negli Gianluca. 2021. Evaluation of different test-day milk recording protocols by wood's model application for the estimation of dairy goat milk and milk constituent yield. Animals, 11, 4 (Open Access) DOI: 10.3390/ani11041058	
AGRI HUB Development and technological integration of a high-throughput platform for the sustainable improvement of agrofood productive chains	Develop and integrate a high-throughput platform for the sustainable improvement of agrofood productive chains.	C.L.E. BISCOTTI CREA-ZA	- Lombardia Region	- Abstract in rivista Marino Rosanna; Richichi Mariantonietta; Borriello Giuliano; Petrera Francesca; Fabio Abeni (2021). Bibliometric analysis in precision livestock farming. Italian Journal of Animal Science, 20, 1, 168-169. DOI: 10.1080/1828051X.2021.1968170. - Articolo in rivista Marino Rosanna; Petrera Francesca; Speroni Marisanna; Rutiglian Teresa; Galli Andrea; Abeni Fabio (2021). Unraveling the Relationship between Milk Yield and Quality at the Test Day with Rumination Time Recorded by PLF Technology. Animals, 11, 6, DOI: 10.3390/ani11061583. Confalonieri, M.; Carelli, M.; Gianoglio, S.; Moglia, A.; Biazzi, E.; Tava A. CRISPR/Cas9-mediated target mutagenesis of CYP93E2 modulates the triterpene saponin biosynthesis in Medicago truncatula. Frontiers in Plant Science, 2021, 12, 690231; doi:10.3389/fpls.2021.690231	

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CRE/ RESEARCH CENTRES	INTERNATIONAL PARTNERSHIP /FINANCING BODY	PUBLICATIONS	OTHERS RESEARCH PRODUCTS ¹
Agridigit_PLF4Milk AGRIDIGIT Digital technologies in the bovine and buffalo milk supply chain	Overall, the project proposal aims to respond to the need for greater efficiency of livestock farms included in the bovine and buffalo milk supply chain, while at the same time enhancing animal welfare and environmental sustainability of production	F.P. ABENI CREA-ZA	- MIPAAF	<p>- Abstract in rivista Marino Rosanna; Richichi Mariantonietta Borriello Giuliano; Petrera Francesca; Fabio Abeni (2021). bibliometric analysis in precision livestock farming. Italian Journal of Animal Science, 20, s1, 168-169. DOI: 10.1080/1828051X.2021.1968170.</p> <p>- Abstract in rivista Abeni Fabio; Marino Rosanna; Petrera Francesca; Segati Giulia; Galli Andrea; Carminati Domenico (2021). Farm silage facilities and the management for spore former prevention. Italian Journal of Animal Science, 20, s1, 138-139. DOI: 10.1080/1828051X.2021.1968170.</p> <p>- Articolo in rivista Marino Rosanna; Petrera Francesca; Speroni Marisanna; Rutiglian Teresa; Galli Andrea; Abeni Fabio (2021). Unraveling the Relationship between Milk Yield and Quality at the Test Day with Rumination Time Recorded by PLF Technology. Animals, 11, 6, DOI: 10.3390/ani11061583.</p> <p>- Articolo in rivista Abeni Fabio; Canevaro Greta; Richichi Mariantonietta (2021). consumo di energia elettrica si può contenere, se monitorato. Stall da Latte, 1, 6, 44-45.</p> <p>- Abstract in atti di convegno Francesca Petrera; Francesca Capasso; Fabio Luzi; Alfonso Zeccon Rosanna Marino; Fabio Abeni; Veronica Redaelli (2021). Relationship between udder termography and milking features in dairy cows. 2017-171. DOI: 10.1080/1828051X.2021.1968170.</p> <p>- Abstract in atti di convegno Meo Zilio D., Steri R., Iacurto M., Catillo G., Barile V., Chiariotti A. Cenci F., La Mantia M. C., Buttazzoni L. (2021). Precision Livestock Farming For Milk (PLF4MILK): A Look Inside The Buffalo Sub-Project VI International Conference on Safety, Health and Welfare in Agriculture and Agro-food Systems, RAGUSA SHWA, Book of Abstracts 20. ISSN: 2532-103X, ISBN: 9788894120714.</p> <p>- Abstract in atti di convegno Steri R., Meo Zilio D., Gaspa G., Pauciullo A. (2021). Use Of The Daily Milk Yield Deviations As An Index Of Resilience In Water Buffalo. VI International Conference on Safety, Health and Welfare in Agriculture and Agro-food Systems, RAGUSA SHWA, Book of Abstract, 65. ISSN: 2532-103X, ISBN: 9788894120714</p> <p>- Abstract in rivista Meo Zilio D., Iacurto M., Cenci F., Steri R. (2021) Precision Buffalo Farming: preliminary results from the AGRIDIGIT project. ASPA 24th Congress Book of Abstract, Italian Journal of Animal Science, 20:suppl. 74. DOI: 10.1080/1828051X.2021.1968170.</p> <p>- Abstract in atti di congresso. Steri R., Barile V.L., Iacurto M., La Mantia C., Monti F., Cenci F., Meo Zilio D. 2021. Smart farming: which opportunities for buffalo farmers? 10th Asian Buffalo Congress, Rampur, (Nepal), October 25-29, 2021. Book of Abstracts, (Eds. Shal M.K.; Devkota, D.; Singh, U.M.; Kaphle, K.; Paudel, L.N.) Agriculture and Forestry University, Rampur, Chitwan, Nepal, 84</p> <p>- Articolo in rivista</p>	- Research grants - n.3

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CRE RESEARCH CENTRES	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHERS RESEARCH PRODUCTS ¹
				<p>Meo Zilio D., Steri R., Iacurto M., Catillo G., Barile V., Chiariotti A. Cenci F., La Mantia M. C., Buttazzoni L. (2021). Precision Livestock Farming for Mediterranean Water Buffalo: Some Applications and Opportunities from the Agridigit Project. M. Biocca et al. (Eds.): SHW 2020, LNCE 252, pp. 41–50. https://doi.org/10.1007/978-3-03098092-4_5</p> <p>Marino R., Abeni F. (2021). Benessere animale e produzione di latte. Informatore zootecnico n.20 22 novembre 2021 pag. 45-48</p> <p>Abeni F. (2021). La zootecnica di precisione per la vacca da latte. Bianco Nero, Anno LX, 1, 62-65</p>	
AGROENER Energy from agriculture: sustainable innovations for the bioeconomy	<p>The general objective of the project refers to the ever increasing need to reduce dependence on fossil sources, to contribute to the mitigation of the effect of climate-changing gases, to encourage the use of renewable raw materials and to transfer the most important skills to the agricultural world.</p> <p>The research priorities must therefore concern the type of raw material, the improvement of technologies and the optimization of transformation processes (biogas, thermal</p>	<p>P. MENESATTI CREA-IT CREA-OF CREA-CI CREA-OFA CREA-FL CREA-ZA CREA-AA</p>	- MiPAAF	<p>- Vasmara Ciro; Marchetti Rosa; Cianchetta Stefano; Galletti Stefania; Ceotto Enrico (2021). THERMO-KOH PRE-TREATMENT AND CO-DIGESTION WITH PLSLURRY IMPROVE METHANE YIELD AND DIGESTATE QUALITY FROM GIANT REED (Arundo Donax L. - Articolo in rivista)</p> <p>Sperandio Giulio; Suardi Alessandro; Acampora Andrea; Civitares Vincenzo (2021). Carbon Footprint of Thermal Energy Production from Poplar Short-Rotation Coppice Plantations. Environmental Science Proceedings, 3, DOI: 10.3390/IECF2020-0790</p>	<p>- Research grants - n.6 - Scholarships - n.1</p>

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CRE/ RESEARCH CENTRES	INTERNATIONAL PARTNERSHIP /FINANCING BODY	PUBLICATIONS	OTHERS RESEARCH PRODUCTS ¹
	energy, electricity), the efficiency in the use of energy both by machines (also through the use of self-produced alternative fuels from renewable sources and / or precision technologies) and structures (especially energy-intensive ones, eg protected crops			<p>- Articolo in rivist Fanigliulo Roberto; Pochi, Daniele; Servadio Pierann (2021).Conventional and Conservation Seedbed Preparation System for Wheat Planting in Silty-Clay Soil.Sustainability, 13, 11,DOI: 10.3390/su13116506.</p> <p>- Articolo in rivist Acampora Andrea; Civitarese Vincenzo; Sperandio Giulio; Reaz Negar(2021).Qualitative Characterization of the Pellet Obtained from Hazelnut and Olive Tree Pruning. .Energies, 14, 14, 1-16.DOI: 10.3390/en14144083.</p> <p>- Articolo in rivist Enrico Ceotto; Ciro Vasmara; Rosa Marchetti; Stefano Cianchetti; Stefania Galletti (2021).Biomass and methane yield of giant ree (Arundo donax L.) as affected by single and double annual harvest.Global Change Biology Bioenergy, 3, 3, 393-407.DOI: 10.1111/gcbb.12790.</p> <p>- Articolo in rivist Parenti Andrea; Cappelli Giovanni; Zegada-Lizarazu Walter; Sastr Carlos Martín; Christou Myrsini; Monti Andrea; Ginaldi Fabrizio (2021).SunnGro: A new crop model for the simulation of sunn hem (Crotalaria juncea L.) grown under alternative management practices.Biomass and Bioenergy, 146, 1-16.DOI: https://doi.org/10.1016/j.biombioe.2021.105975.</p> <p>- Articolo in rivist Manici L.M.; Caputo F.; Cappelli G.A.; Ceotto E. (2021).Can repeated soil amendment with biogas digestates increase soil suppressiveness toward non-specific soilborne pathogens in agricultural lands .Renewable Agriculture and Food Systems , 36, 4, 353-364.DOI: 10.1017/S1742170520000393.</p> <p>- Articolo in rivist Manici Luisa Maria; Caputo Francesco; Ceotto Enrico (2021).Digestati un contributo alla sanità del suolo.ECOSCIENZA, 12, 5, 46-47.</p> <p>- Articolo in rivist Sperandio Giulio; Acampora Andrea; Civitarese Vincenzo; Bajocchi Sofia; Bascietto Marco (2021).Transport Cost Estimation Model of the Agroforestry Biomass in a Small-Scale Energy Chain.Forests, 12, 2,DOI: 10.3390/f12020158.</p> <p>- Articolo in rivist Soppelsa Sebastian; Manici Luisa, Maria; Caputo Francesco; Zaghi Massimo; Kelderer Markus(2021).Locally available organic waste for counteracting strawberry decline in a mountain specialized cropping area.Sustainability (Switzerland), 13, 7,DOI: 10.3390/su13073964.</p> <p>- Articolo in rivist Giulio Sperandio; Andrea Acampora; Angelo Del Giudice; Vincenzo Civitarese (2021).Models for the Evaluation of Productivity and Cost of Mechanized Felling on Poplar Short rotation Coppice in Italy.Forests, 12, 7,DOI: 10.3390/f12070954.</p> <p>- Articolo in rivist Assirelli Alberto; Caracciolo Giuseppina; Stagno Fiorella; Rocuzzo Giancarlo (2021).Diradamento meccanico frutti: buoni risultati sull'albicocco.L'Informatore Agrario, 76, 11, 48-50.</p> <p>- Articolo in rivist Biocca Marcello; Gallo Pietro; Sperandio Giulio (2021).Technical and economic analysis of Stone pine (Pinus pinea L.) maintenance in urban areas.Trees, Forests and People, 6,DOI: 10.1016/j.tfp.2021.100162.</p>	

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CRE/ RESEARCH CENTRES	INTERNATIONAL PARTNERSHIP /FINANCING BODY	PUBLICATIONS	OTHERS RESEARCH PRODUCTS ¹
				<p>- Articolo in rivista Civitaresse Vincenzo; Acampora Andrea; Sperandio Giulio; Gall Pietro; Biocca Marcello; Gallucci Francesco; Vincenti Beatrice (2021).prodotti della gestione del verde urbano. Cantieristica e potenzia impieghi delle biomasse.Sherwood foreste ed alberi oggi, 254, 19-23.</p> <p>- Articolo in rivista Raffaele Spinelli; Natascia Magagnotti; Alberto Assirelli; Joao Pedro Martins; Matheuz Mihelic (2021).A Long-Term Follow-Up Study of Slash Bundling in Fast-Growing Eucalypt Plantations.Forests, 12, 11,DOI: 10.3390/f12111548.</p> <p>- Articolo in rivista Vasmara Ciro; Cianchetta Stefano; Marchetti Rosa; Ceotto Enrico; Galletti Stefania (2021).Potassium Hydroxyde Pre-Treatment Enhances Methane Yield from Giant Reed (Arundo donax L.).Energie 14, 3,DOI: 10.3390/en14030630.</p> <p>- Articolo in rivista Cappelli, Giovanni Alessandro; Ginaldi Fabrizio; Fanchini Davide; Corinzia Sebastiano Andrea; Cosentino Salvatore Luciano; Ceotto Enrico (2021).Model-Based Assessment of Giant Reed (Arundo donax L.) Energy Yield in the Form of Diverse Biofuels in Marginal Areas of Italy.Land, 10, 6, 1-24.DOI: 10.3390/land10060544.</p> <p>- Articolo in rivista Andrea Acampora; Vincenzo Civitaresse; Giulio Sperandio (2021).Produzione di pellet da residui di potatura di nocciolo, olivo.Sherwood, 250, 23-27.</p> <p>- Articolo in rivista Torrise Biagio; Allegra Maria; Amenta Margherita; Gentil Fausto; Rapisarda Paolo; Fabroni Simona; Ferlito Filippo (2021).Physical chemical and multielemental traits of anaerobic digestate from Mediterranean agro-industrial wastes and assessment as fertiliser for citrus nurseries.Waste Management, 131, 201-213.DOI: 10.1016/j.wasman.2021.06.007.</p> <p>- Articolo in rivista Sperandio Giulio; Acampora Andrea; Del Giudice Angelo; Civitaresse Vincenzo (2021).Abbattimento meccanizzato pioppeti invecchiati conviene?.L'Informatore Agrario, 33, 31-34.</p> <p>- Articolo in rivista Giulio Sperandio; Alessandro Suardi; Andrea Acampora; Vincenzo Civitaresse (2021).Environmental Sustainability of Heat Produced by Poplar Short Rotation Coppice (SRC) Woody Biomass.Forests, 12,DOI: 10.3390/f12070878.</p> <p>- Articolo in rivista Assirelli Alberto; Caracciolo Giuseppina; Rocuzzo Giancarlo; Stagnoli Fiorella (2021).New Tools for Mechanical Thinning of Apricot Fruitlets.Agriculture, 11, 1-11.DOI: 10.3390/agriculture11111131.</p> <p>- Abstract in atti di convegno Orlandini Alessandro; Cacini Sonia; Brambilla Massimo; Burci Gianluca; Cutini Maurizio; Fedrizzi Marco; Massa Daniele; Ceccarelli Angela Valentina; Cardarelli Maria Teresa (2021).Assessment of a Trichoderma-based biostimulant on two bedding plant growth in different growing media and within a basic heating system .Acta Italus Hortus 26, 26, 213.</p> <p>- Abstract in atti di convegno Cacini Sonia; Orlandini Alessandro; Brambilla Massimo; Burci</p>	

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CRE/ RESEARCH CENTRES	INTERNATIONAL PARTNERSHIP/ FINANCING BODY	PUBLICATIONS	OTHERS RESEARCH PRODUCTS ¹
				<p>Gianluca; Cutini Maurizio; Fedrizzi Marco; Massa Daniele; Ceccare Valentina; Cardarelli Mariateresa (2021).A Trichoderma-base biostimulant enhances Impatiens walleriana growth and flowering in different growing media .2nd International Symposium on Growing Media, Soilless Cultivation, and Compost Utilization in Horticulture 82-.</p> <p>- Abstract in atti di convegno Cianchetta Stefano; Polidori Nakia; Vasmara Ciro; Marchetti Rosa; Ceotto Enrico; Galletti Stefania (2021).GIANT REED HYDROLYSATES FOR SINGLE CELL OIL PRODUCTION BY OLEAGINOUS YEASTS LIPOMYCES STARKEYI AND RHODOSPORIDIUM AZORICUM</p> <p>- Abstract in atti di convegno Pignatti Giuseppe; Verani Stefano; Sperandio Giulio (2018).Produzione di legna da ardere da cedui di eucalipto a turno breve: produttività e costi.IV Congresso Nazionale di Selvicoltura (IV National Congress of Silviculture). Abstract Book, 270-272.</p> <p>- Contributo in atti di convegno Brambilla Massimo; Romano Elio; Cutini Maurizio; Fedrizzi Marco; Pagano Mauro; Burchi Gianluca; Cacini Sonia; Massa Daniele; Terro Chiara; Bisaglia Carlo (2018).Effect of Bench Heating on Growing Medium Temperature and Heat Loss From a Greenhouse in Wintertime.Proceedings of the European Conference on Agricultural Engineering AgEng2018, 877-882.</p> <p>- Contributo in atti di convegno Civitarese Vincenzo; Acampora Andrea; Sperandio Giulio; Assire Alberto; Scarfone Antonio (2021).Potential use of biomasses from urban green management for the pellet production. 673-675.</p> <p>- Contributo in atti di convegno Cappelli, Giovanni Alessandro; Ginaldi Fabrizio; Corinzia Sebastian Andrea; Cosentino Salvatore Luciano; Fanchini Davide; Ceotto Enrico (2020).Assessment of giant reed biomass potential (Arundo donax L.) in marginal areas of Italy via the application of Arungro simulation model.Proceedings of the 28th European Biomass Conference and Exhibition EUBCE, 15-21.</p> <p>- Contributo in atti di convegno Cutini Maurizio; Brambilla Massimo; Bisaglia Carlo; Pochi Daniele; Fanigliulo Roberto (2021).A Simplified Algorithm for the Optimization of the Factors Affecting Agricultural Tractor Fuel Consumption During Heavy Drawbar Tasks.Proceedings of the European Conference on Agricultural Engineering AgEng2021, 239-244.</p> <p>- Contributo in atti di convegno Giulio Sperandio; Andrea Acampora; Vincenzo Civitarese; Bajocchi Sofia; Marco Bascietto (2021).Transport Cost Estimation Model of the Agroforestry Biomass in a Small-Scale Energy Chain.Environmental Sciences Proceedings, 3,D0I: 10.3390/IECF2020-0789.</p> <p>- Contributo in atti di convegno Tomasone Roberto; Cedrola Carla; Mingozzi Marco (2021).Innovative mechanization schemes for leafy greens integrating flame treatments, minimum tillage and residue removal to improve sustainability.Proceedings Acta Horticulturae 1319, 1319, 1319-1320.D0I: 10.17660/ActaHortic.2021.1319.1319.</p> <p>- Contributo in atti di convegno Alberto Assirelli; Giancarlo Rocuzzo; Massimo Brambilla; Fiorelli Stagno; Vincenzo Civitarese; Andrea Paoletti; Carlo Bisaglia.(2021).Potential use of briquetting techniques for cereals</p>	

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				<p>chaff.European Biomass Conference and Exhibition Proceedings 2021: 178-181.</p> <p>- Contributo in atti di convegno Caracciolo Giuseppina; Cacchi Mattia; Sirri Sandro; Quacquarone Irene; Assirelli Alberto; Giovannini Daniela (2021).A new mechanic thinner to reduce hand labor in peach. 1304, 243-247.DOI: DOI: 10.17660/ActaHortic.2021.1304.34.</p> <p>- Contributo in atti di convegno Alberto Assirelli; Salvatore Faugno; Fiorella Stagno; Maura Sannino Enrico Santangelo; Andrea Paoletti; Stefano Amaducci.(2021).HEM CULTIVATION TECHNIQUES EVALUATION FOR SOWING SEE PRODUCTION.European Biomass Conference and Exhibition Proceedings 2021, 279-283.</p> <p>- Contributo in atti di convegno Cutini Maurizio; Brambilla Massimo; Assirelli Alberto; Romano Elio Bisaglia Carlo (2021).Encouraging the Adoption of Precision Fertilization Technologies: steps from Theory to Practice.Proceedings of the European Conference on Agricultural Engineering AgEng2021: 450-457.</p> <p>Contributo in atti ci convegno: Chiariotti, E. Rossi, R. Scalella, M. C. La Mantia, F. Monti, I. Santangelo. Anaerobic codigestion of tomato pomace (peels plus seeds) with buffalo sludge improves methane production EuropeanBiomass Conference and ExhibitionProceedings, 2021, pp. 581–584 (ISSN 22825819)</p> <p>-Contributo in atti ci convegno: R. Scalella, M. Cali, E. Rossi, E. Santangelo, M. C. La Mantia and F. Chiariotti. 2021. Modelling the methane production in anaerobic digestion of Buffalo Slurry and Tomato Pomace. Oralpresentation at 10th Asian Buffalo Congress, Nepal 25-29 Ottobre.</p> <p>-Contributo in atti ci convegno: Chiariotti A. and M. Cali. 2021. Scarti: una risorsa e una sfida per CREA-FUTURO. 28 settembre. https://www.creafuturo.eu/it/3628/</p>	
ANAPRI Pezzata Rossa Cytofluorimetric and molecular analyses on Italian Pezzata Rossa breed cows with low and high incidence of mastitis	Identifying genetic resistance traits to mastitis	G. DE MATTEIS CREA-ZA	- ANAPRI		
ANTIMONAS Evaluation of the effectiveness of HANSEN protective cultures in the containment of Pseudomonas in raw milk and mozzarella cheese	The trial will aim to verify under real conditions, by challenge testing, the effectiveness of protective cultures studied and developed at the Hørsholm (DK) laboratories and owned by Chr. Hansen, in containing bacteria of the genus Pseudomonas and other psychrotrophic microorganisms.	G. GIRAFFA CREA-ZA	- CHR HANSEN ITALIA S.P.A.		

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AUTOFEED Feeding automation for cattle farms in Lombardy	Aims at improving the dairy and beef cattle's welfare that result in an improved quality and sustainability of their production thanks to the adoption of mechanized and automatic device for feeding administering.	C. BISAGLIA CREA-ZA	- Lombardia Region	- Articolo in rivista Brambilla Massimo; Rossi Paolo; Cutini Maurizio; Bisaglia Carlo. 2021. Alimentazione dei Bovini; i livelli di automazione. Informatore Zootecnico 7/2021: pagg. 29-3 - Articolo in rivista Bisaglia Carlo; Lazzari Andrea; Giovinnazzo Simone; Brambilla Massimo. 2021. Automazione unifed a livelli sempre più alti. Informatore Zootecnico 20/2021: pagg. 56-6 - Articolo in rivista Rossi Paolo; Brambilla Massimo; Giovinnazzo Simone; Lazzari Andrea; Bisaglia Carlo. 2021. Inserire in stalla i sistemi automatici di alimentazione. Informatore Zootecnico 13/2021: pagg. 39-45	- Feed automation for dairy cattle: Why yes ... Why not? 26/11/2021 Cremona
BASC Animal welfare for consumers' health Dairy products from animals treated with natural medical device.	Use of natural extracts for the treatment of parasitosis in sheep and goats. Animal dairy products in farming systems obtained without the use of conventional drugs	S. CLAPS CREA-ZA	- Campania Region		1° WORKSHOP 8-6-2021 – Extractive procedures and technologies for obtaining bioactive phytocomplexes 2° WORKSHOP 15-6-2021 – Plant extracts for the control of parasitosis in sheep and goats: new perspectives 3° WORKSHOP 22-6-2021 – The role of bioactive phytocomplexes on product quality WORKSHOP 24-7-2021 – Cheese and welfare SEMINARIO 31-8-2021 – Animal welfare and consumer health
BIOMASS BIOMetAno per una Società Sostenibile sviluppo di un laboratorio italiano di circular economy dal biometano	1) Distribution of renewable fertilizers obtained from effluents and agronomic evaluation. 2) Development of variable rate distribution equipment for liquid and palatable organic wastewater. 3) Integration of renewable fertilizer management into a web platform for farm fertilization management.	G. CABASSI CREA-ZA CREA-IT	- Lombardia Region		- BIOMethane for a Sustainable Society: development of an Italian Circular Economy Laboratory from biomethane: BIOMASS HUB 09/06/2021 - Research grants - n.4

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BRUGEN Study of cell-mediated response during brucellosis and analysis of possible correlations with different brucella genotypes in Mediterranean Buffalo (Bubalus bubalis).	Development of a diagnostic test based on cell-mediated immunity to support brucellosis diagnosis. Study of mechanisms underlying resistance to brucella infection. WGS sequencing of the genome of brucellae isolated in outbreaks with the aim of fine characterizing the different strains that may be present. Study of changes in lymphocytic and monocytic subsets during Brucella infection.	L. ORRU' CREA-GB	- Ministry of health		
CALAFRE Effects of cheese-making with fresh milk	As part of the common objective of enhancing the production of Italian milk and dairy products, the project aims to i) evaluate the effects of milk storage time and the number and extent of milk heat treatments on the characteristics of fresh cheeses; ii) discriminate the Mozzarella di Bufala Campana PDO produced with fresh milk from that produced with frozen curd.	L. BUTTAZZONI CREA-ZA	- MiPAAF	- Articolo in rivista Rinaldi Simona; Palocci Giuliano; Di Giovanni Sabrina; Iacurto Miriam Tripaldi Carmela.(2021).Chemical Characteristics and Oxidative Stability of BuffaloMozzarella Cheese Produced with Fresh and Frozen Curd.Molecules, 26, 1-18.DOI: 10.3390/molecules26051405 - Articolo in rivista Tripaldi Carmela; Rinaldi Simona; Palocci Giuliano; Di Giovanni Sabrina; Claps Salvatore; Buttazzoni Luca.(2021).Effect of Storage and Heat Treatment of Milk Destined for Cheese Production on Its Oxidative Characteristics.Dairy, 2, 4, 585-601.DOI 10.3390/dairy2040046.	
CAMA Research-based participatory approaches for adopting conservation agriculture in the Mediterranean area	Pea and alfalfa breeding for Mediterranean environments.	M. RINALDI CREA-CI CREA-ZA CREA-AA	- European Commission Partners: France, Greece, Morocco, Portugal, Spain, Algeria, Tunisia	- Articolo in rivista Annicchiarico P., Nazzicari N., Notario T., Monterrubio Martin C. Romani M., Ferrari B., Pecetti L. (2021) Pea breeding for intercropping with cereals: variation for competitive ability and associated traits and assessment of phenotypic and genomic selection strategies. Frontiers in Plant Science 12: 731949	
CANAPRO Enhancement of the hemp supply chain through product and process innovation	Identify the hemp varieties most suitable for the Lombard environment and for transformation purposes; develop growth models both for open field and greenhouse cultivation; evaluate the yield and quality of extra-seasonal production of greenhouse-grown hemp; identify varieties with the highest oil yield; to enhance hemp products in animal nutrition.	M. POVOLO CREA-ZA	- Lombardia Region	- Post Bonazza Francesca; Povoletto Milena; Pelizzola Valeria; Monti Lucia; Lo Scalzo Roberto; Marinoni Laura; Fucella Roberto; Picca Nicola Cabassi Giovanni (2021).Fatty acid, phenolic compound, carotenoid and tocopherol composition of hemp (Cannabis sativa L.) seeds and of their processed products. 290-296 - Articolo in rivista Povoletto Milena; Pelizzola Valeria; Bonazza Francesca; Monti Lucia; Marinoni Laura; Lo Scalzo Roberto; Gasparini Andrea; Picca Nicola Fucella Roberto; Degano Luigi; Cabassi Giovanni (2021).Con il panello di semi di canapa.Informatore zootecnico, 20, 50-54.	- Research grant - n.1

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Canestrum Development of a synergy model to qualify and enhance the Natural Historic Cheeses of the Sicilian, Sardinian, Calabria, Basilicata and Campania Regions of Italy	The project aims to focus the attention on those products at risk of extinction or those having objective difficulties in terms of qualification and exploitation in the market. Sixteen traditional cheeses were selected (Age selection), among the cheese production in the Southern Italy: i) Characterization and integration of missing information by specific research activities; ii) Research and development of marketing and communication strategies; iii) Stakeholders' training.	S. CLAPS CREA-ZA	- Fondazione Cariplo		- Scholarship - n.1
CAPRINI Innovative goat cheeses and cosmetics based on medicinal and spontaneous Mediterranean herbs	ERBOSI Research, experimentation and validation in the dairy sector based on goat's milk, with rennet from wild herbs from Campania region and officinal plants, and cosmetics based on milk and goat whey, for innovative products with nutraceutical properties.	L. SEPE CREA-ZA	- Campania Region		- Presentation of the CAPRINI ERBOSI project - First day of transfer to dairy and tourism operators 08/06/2021 Montano Antilia
CERESO Optimization of the inputs for the sustainability of Lucanian Cereal cropping systems.	Contribute to the realization of a modular platform for precision agriculture.	R. ROSSI CREA-ZA	Basilicata Region		
COLAUTOC Seed bank collection of native sheep and goat breeds and strategies for the maintenance and increase in numbers.	1. Ex-situ maintenance of sheep and goat endangered breeds and new breeds identified at risk. 2. Application of reproductive biotechnologies. 3. Dissemination of genetic material of high genealogy in the Basilicata region	L. SEPE CREA-ZA M. D'ORONZIO CREA-PB	- Basilicata Region	Abstract in rivista Nadia Piscopo, Domenico Rufrano, Roberta Matera, Carmela Lovallone, Salvatore Claps, Lucia Sepe, Angela Salzano, 2021. Productive performance and meat characteristics of kids fed anthocyanins. Italia J. Animal Science, 20, 62 Articolo in rivista Aristide Maggiolino, Andrea Bragaglio, Angela Salzano, Domenico Rufrano, Salvatore Claps, Lucia Sepe, Sara Damiano, Roberto Ciarciello, Francesca Rita Dinardo, David Hopkins, Gianluca Neglia, Pasquale Di Palo, 2021. Dietary supplementation of suckling lambs with anthocyanins: effects on growth, carcass, oxidative and meat quality traits. Animal Feed Science and Technology, 276:1-14	
COMETA Autochthonous Mediterranean crops and their valorization with advanced green chemistry technologies	Testing the use of geophysical technologies for the estimation of root biomass	R. ROSSI CREA-ZA	MIUR		
CONNECTFARMS Connecting sustainable agroecosystems and farming with circular bioeconomy and new technologies	The general goal is to develop approaches to increase in a sustainable way integrate crop+livestock production while benefiting soil resilience to stress and climate change.	M. G. AMATO CREA-ZA	- MiPAAF		

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CONSENSI fase Fertilization optimization using sensor technology and precision agriculture methods	Submission of the project idea to be eligible for phase 2 of the call for proposals	G. CABASSI CREA-ZA	- Lombardia Region		- Optimization of organic fertilization assisted by soil sensors 10/03/2021
CORILUS2 Pilot project for development and innovation of Lucanian coriliculture	Obtain qualified Lucanian hazelnuts through the pilot first processing plant and two new pilot second processing processes obtaining new dairy product and a new bakery product both with high added value.	S. CLAPS CREA-ZA	Basilicata Region		
Ctrl_C_Mast Synergies between sensors and laboratory analysis for mastitis monitoring and rational drug use, informative and demonstrative actions	Enhance the knowledge of how to use all data gathered from precision livestock farming technologies in dairy farms with automated milking systems to improve on farm management of mastitis, by reducing infectious disease incidence and antibiotic use to treat control or prevent mastitis	F. PETRERA CREA-ZA	- Lombardia Region	- Articolo in rivista Francesca Petrera; Lucio Zanini (2021). A tu per tu con i titolari di una stalla robotizzata. Stalle da latte, 2, 55-58. Petrera F., Zanini L. (2021). Il passaggio da tradizionale a robotico ha cambiato oltre alla mungitura. Tecnica. La storia di due aziende agricole del Cremonese. Stalle da Latte 4/21: 57-60. Petrera F., Zanini L. (2021). Quando robot e sensori aiutano diventare "grandi". Stalle da Latte 3/21: 55- 58.	
DIBIO_BIOPRIME - DIBIO Sottoprogetto BIOPRIME - Natural compounds and microorganisms for the defense and PRIMing of MEditerranean BIOlogic crops	Identification and evaluation of natural botanical microorganisms, molecules and compounds useful for biological crop defense.	A. TAVA CREA-ZA	- MIPAAF	Tava, A.; Biazzi, E.; Ronga, D.; Mella, M.; Doria, F.; D'Addabbo, T. Candido, V.; Avato, P. Chemical identification of specialized metabolites from sulla (<i>Hedysarum coronarium</i> L.) collected in southern Italy. Molecules 2021, 26, 4606. https://doi.org/10.3390/molecules26154606	
DIVERSILIENCE Diversifying organic crop production to increase resilience	Improving the productivity and resilience of organic crop production by better utilization of crop diversity	P. ANNICCHIARICO CREA-ZA	- MIPAAF ⁸ - European Commission		
FI.LO. AGRI Fiera del Lodigiano – (FI.LO) Tradition, culture, education and excellent dairy production	The project addresses specific problems of the Lodigiano area. It is therefore intended to renew the fair offer and carry out an integrated promotion of the area through the presence of a multifunctional center in which to find a multi-level educational offer of excellence.	S. BARZAGHI CREA-ZA	- Fondazione Cariplo		
FOREST.COMP Valorisation of green forest waste in the on-farm compost production chain	Assessment of ecosystem services in foraging systems by soil quality index.	R. ROSSI CREA-ZA	- Basilicata Region		- Scholarship - n.1

⁸ • Agrologica • Agricultural Institute of Slovenia • LUKE Natural Resources Institute Finland • Norwegian Centre for Organic Agriculture • Graminor • Maritsa Vegetable Crops Research Institute (MVCRI) • University of Helsinki • National Agricultural Research and Development Institute • NORWEGIAN INSTITUTE OF BIOECONOMY RESEARCH (NIBIO), Division of food production and Society⁸

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FORMAGGI LUCANI PLU Diversification of the Lucanian cheeses and their nutraceutical characteristics.	1) Study and development a dairy pilot plant (prototype) for optimizing the infiltration of pates and / or other nutraceutical extracts in the cheese, ensuring high quality standards and at the same time a considerable saving of labor. 2) chemical-physical, nutritional and organoleptic characterization of the products.	S. CLAPS CREA-ZA	- Basilicata Region		
GENLEG Genomic selection for yield, drought stress tolerance and protein content in forage and grain legume crops	Genomic selection for yield and quality in alfalfa, pea and soybean.	P. ANNICCHIARICO CREA-ZA	- MiPAAF	Rubiales, D., P. Annicchiarico, M.C. Vaz Patto, B. Julier (2021) Legume breeding for the agroecological transition of global agri-food systems: an European perspective. <i>Frontiers in Plant Science</i> 12, 782574 (doi:10.3389/fpls.2021.782574).	- Research grant - n.1
"FORMAGGI GREEN BUF" Buffalo cheeses produced with vegetable rennet and enriched with natural antioxidants	Evaluate the effects of some factors affecting milk coagulation activity of vegetable rennet from thistle	C. TRIPALDI CREA-ZA	- Ministry of Health	- Articolo in rivista Tripaldi C., Palocci G., Di Giovanni S., Iacurto, M., Steri R., Campagna M. C., Di Russo C., Zottola T. (2021). Effects of the drying method of flowers of <i>Cynara cardunculus</i> var. <i>Altilis</i> on milk coagulation properties. <i>Italian Journal of Food Science</i> , 33, 57–66.	
Green De The use of pasture and grass to support sustainable development model for Parmigiano Reggiano mountain areas	The GOI aims to evaluate with a comparative approach the management of the hay yard use on primary production farms with 2 alternative related to the use of fresh grass in feed: grazing and fresh mowing with use in the feed lane. The comparative systems will serve to provide insights related to the quality of production quantity of forage produced, economic computation of management models as well as environmental footprints derived from the use of the different management types of cattle feeding.	D. BOCHICCHIO CREA-ZA	- Emilia Romagna Region		- Research grant - n.1
INNOBUF Innovative farming and processing technologies for the qualitative enhancement of buffalo meat from Lazio	The main objective of the project is to improve competitiveness of buffalo breeding in Lazio region by implementing a high-quality meat production line in the same farms, obtained thanks to the transfer of innovative production process as new ageing technologies, conservation and marketing through intelligent labeling	S. FAILLA CREA-ZA	- Lazio Region		
INNOFISHFARM Participatory research and technological transfer for the sustainable growth of Italian fish farming	Development of experimental and research activities in the fish farming sector, and technological transfer to farms	F. CAPOCCIONI CREA-ZA	- MiPAAF		

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INNOPROLATTE Application of process and product innovations for the development of the milk chain in Basilicata Region.	Providing process and product innovation immediately applicable, to the dairy sector of Basilicata Region, concerning different dairy species (bovine, donkey and goat). Specific objectives: 1. Innovative cheeses with vegetable rennet. 2. Innovative cheeses with donkey milk. 3. Vegetable fibers and innovative cheeses. 4. Innovative dairy products based on goat's milk	S. CLAPS CREA-ZA	- Basilicata Region	Articolo in rivista Salvatore Claps, Lucia Sepe, Salvatore Dimatteo, Daniele Stolfi, Antonio Imperatrice, 2021 – INNOPROLATTE, quattro linee di innovazione per il comparto lattiero-caseario. Agrifoglio, 101, 1-5 Rivista online AGRONOTIZIE - Febbraio 2021 – Innoprolatte: come fare innovazione e reddito con i formaggi	Webinar 24-5-2021 Cow's milk cheese with added donkey rennet 20-12-2021 Intermediate conference and demonstration of cheesemaking with vegetable rennet
INVITE Innovations in plant variety testing in Europe to foster the introduction of new varieties better adapted to varying biotic and abiotic conditions and to more sustainable crop management practices	Define more efficient procedures for evaluating varieties for inclusion in European Registries. Improvement of VCU and DUS in alfalfa; molecular prediction of drought tolerance in soybean	P. ANNICCHIARICO CREA-ZA CREA-DC	27 european partners - European Commission		
IZS ME 11/20 Differential Somatic Cell Count (DSCC) and animal welfare in the Italian Mediterranean Buffalo approach multidisciplinary	Validation of the DSCC parameter in the buffalo species • Definition of the physiological and pathological reference parameters of the DSCC in buffalo milk; • Assessment of the correlation between udder health and AMR. • Improvement of the decision-making phase in the context of breast health management regarding the implementation of antimicrobial treatment programs with related economic consequences and public health (AMR)	G. DE MATTEIS CREA-ZA	- Ministry of Health		
IZS ME 8/18/R Study of animal welfare and sustainability of the dairy buffalo production chain using multidisciplinary approach.	Develop an integrated information system of animal welfare and environmental performance of the supply chain. Define the main risks and benefits for dairy buffaloes welfare during the different production phases and the possible correlation with the metabolic profile and immunological efficiency; Formulate correlations between the hematochemical, immunological, cytofluorimetric and metabolomic parameters detected in the subjects, homogeneous for production Evaluate the sustainability of farms and generate a Quantitative Story Telling to relate with animal welfare Develop management protocols to implement animal welfare levels Evaluate the metabolic performance of companies using the analytical system of the "processor".	M.C. SCATA CREA-ZA	-Ministry of Health		

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA RESEARCH CENTRES	INTERNATIONAL PARTNERSHIP /FINANCING BODY	PUBLICATIONS	OTHERS RESEARCH PRODUCTS ¹
IZSME 09/19 Development of advanced molecular and flow cytometric methods for the diagnosis of tuberculosis in buffalo.	<p>The project has the following objectives:</p> <p>Evaluate in the buffalo species the use of cocktail of antigens (ESAT-6 and CFP-10) and early secretory antigens in comparison with PPD-B in the IDT test in order to increase the specificity and sensitivity of the g-IFN.</p> <p>Increase knowledge on the cell-mediated response in the course of tuberculosis in buffalo.</p> <p>Identify new molecules with co-stimulator action to be proposed for the in vivo diagnostic test.</p> <p>Evaluate, by flow cytometry, the cross reactivity of monoclonal antibodies.</p> <p>Set up flow cytometric panels for the determination of the markers</p> <p>Validate the digital PCR method in the early diagnosis of tuberculosis on non-invasive matrices such as milk.</p> <p>The expected results will be: an increase in knowledge related to the cell-mediated immune response, the identification of new molecules with stimulating action to be proposed for in vivo testing and the development of a flow cytometric protocol for the determination of specific lymphocyte subsets for to increase the power of diagnosis in life.</p>	G. DE MATTEIS CREA-ZA	- Ministry of Health- Washington State University, WA, US		
IZSME 12/2019 Use of biomolecular and flow cytometric techniques to study the safety and efficacy of the different IBR marker vaccines in the buffalo species	<p>Evaluate the safety and efficacy of various IBR marker vaccines on the market with single (gE) and double deletion (gE-, tk-) in the buffalo species.</p> <p>Deepen the study of the buffalo immune system during vaccinations by evaluating the main lymphocytic and monocytic subsets and cell viability levels.</p> <p>Identify microRNAs as potential biomarkers for the evaluation of vaccination efficacy for IBR in buffalo.</p>	G. DE MATTEIS CREA-ZA	- Ministry of Health		
Latte Digitale fase 1 Milk production in Lombardy towards digital and precision animal husbandry phase 1 (Latte Digitale fase 1)	The goal of the project is to develop an analytical tool capable of generating synthetic information so dairy farmers are able to improve the economic, environmental and social performance of dairy farming	F. P. ABENI CREA-ZA	- Lombardia Region		- Digital animal husbandry, animal welfare, environmental impact and economic efficiency: the case study of the Verdello farm 15/12/2021 Gonzaga

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CRE/ RESEARCH CENTRES	INTERNATIONAL PARTNERSHIP /FINANCING BODY	PUBLICATIONS	OTHERS RESEARCH PRODUCTS ¹
LATTE DIGITAL Milk production in Lombardy towards digital and precision zootechnics	Demonstrate how the introduction of digital technologies improve the performance and welfare of cows having effects on efficiency and environmental sustainability.	F. P. ABENI CREA-ZA	- Lombardia Region	<ul style="list-style-type: none"> - Articolo in rivista Abeni Fabio; Canevaro Greta; Richichi Mariantonietta (2021). consumo di energia elettrica si può contenere, se monitorato. Stall da Latte, 1, 6, 44-45 - Articolo in rivista Abeni Fabio (2021). La zootecnia di precisione per la vacca da latte. Bianco Nero, 60, 1, 62-65. Bergamin C., Carè S., Migliorati L., Pirlo G. (2021). Latte Digitale (digital milk) and environmental sustainability 	<ul style="list-style-type: none"> - Digital animal husbandry, animal welfare, environmental impact and economic efficiency: the case study of the Verdello farm 15/12/2021 Gonzaga - Research grants - n.3

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CRE/ RESEARCH CENTRES	INTERNATIONAL PARTNERSHIP/ FINANCING BODY	PUBLICATIONS	OTHERS RESEARCH PRODUCTS ¹
LIFE BEEF CARBO Demonstration actions to mitigate the carbon footprint of beef production in France, Ireland, Italy and Spain	Develop a BEEF CARBON ACTION PLAN, aimed at reducing beef carbon footprint by 15% over 10 years in 4 countries producing beef in Europe: France, Ireland, Italy and Spain.	L. MIGLIORATI CREA-ZA	- European Commission ⁹		- Azione E4 Beef farms - open 24/02/2021 - Guidelines for carbon neutrality in beef cattle farms 05/11/2021 Montichiari

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CRE/ RESEARCH CENTRES	INTERNATIONAL PARTNERSHIP/ FINANCING BODY	PUBLICATIONS	OTHERS RESEARCH PRODUCTS ¹
LIVESEED Improving the performance of organic agriculture by boosting organic seed and plant breeding efforts across Europe	White lupin breeding for organic farming	P. ANNICCHIARICO CREA-ZA CREA-OF	- European Commission		
Lucan Cerea Sustainable crop management for the standardization of the Lucanian cereal production technique	Introduction of proximal sensing techniques and technologies for crop-livestock systems	R. ROSSI CREA-ZA	- Basilicata Region		
MILK BIOACTINCAPS Use of microencapsulated bioactive compounds from food industry waste as feed supplements to improve the fermentation aptitude and nutraceutical value of milk	Extraction of phenolic compounds from food industry waste, such as the external tegument of legumes, and their characterization and microencapsulation, to be used in diets for dairy cows to improve the fermentative aptitude of milk, as well as to formulate milk and dairy products fortified with these bioactive ingredients	L. SEPE CREA-ZA	- MiPAAF	Contributo in atti di convegno Lucia Sepe, Attilio Matera, Rosanna Paolino, Giulia Francesca Cifuni, Maria Antonietta Di Napoli, Giuseppe Morone, Salvatore Claps, 2021. Il latte e formaggio biofortificati con tannini microincapsulati. Il profilo in acidi grassi e la qualità aromatica. Potenza, 15-10-2021	- Field-day - Project demonstration day MILKBIOACTINCAPS 22/10/2021 Bella - Use of microencapsulated bioactive compounds from food industry wastes as feed supplements for improving fermentative aptitude and nutraceutical value of milk 18/06/2021 - Final Conference Project MILKBIOACTINCAPS "Use of microencapsulated bioactive compounds from food industry wastes as feed supplements for improving fermentative aptitude and nutraceutical value of milk" 15/10/2021 Potenza
MIQUALAT Improvement of the nutritional quality and health image of milk for the content of functional molecules with prebiotic and protective action.	The goal of the project is to identify animals belonging to different cattle breeds that produce milk naturally enriched in bioactive prebiotic compounds and protective principles with beneficial effects on human health. The genetic component with effect on the nutraceutical characteristics of milk will be studied using omic methodologies	A. CRISA' CREA-ZA	- MiPAAF	Abstract su rivista Marco Milanesi, Cinzia Marchitelli, Michela Contò, Simona Rinaldi, Danilo Pignotti, Giovanni Chillemi, Alessandra Crisà (2021). Preliminary results of Genome Wide Association Study with milk functional molecules in different cow breeds., Ital J Anim Sci vol.20:s1, pag. 25, doi:10.1080/1828051X.2021.1968170 -Abstract su rivista Cinzia Marchitelli, Daniele Pietrucci, Marco Milanesi, Luca Casadei, Fernando Porcelli, Giovanni Chillemi, Alessandra Crisà (2021) Evaluation of milk quality in different cow breeds by biological markers. Ital J Anim Sci vol.20:s1, pag. 21, doi:10.1080/1828051X.2021.1968170 -Abstract su rivista Carmela Lovallo, Salvatore Claps, Francesco Napolitano, Alessandra Crisà (2021) Sialyloligosaccharides content in milk of different cow breeds. Italian Journal of Animal Science vol.20:s1, pag. 12, doi:10.1080/1828051X.2021.1968170 -Abstract su rivista: Michela Contò, Simona Rinaldi, Sebastiana Failla, Gianluca Renzi, Alessandra Crisà (2021) Effect of heat treatment on bovine milk in three genetic groups. Italian Journal of Animal Science vol.20:s1, pag. 132, doi:10.1080/1828051X.2021.1968170 - Abstract su rivista: Pasquale Marmo, Cinzia Marchitelli, Francesco Napolitano, Alessandra Crisà (2021) Study of candidate genes for the	- Research in animal husbandry for the enhancement of milk naturally enriched with substances beneficial to human health Notte dei ricercatori 25/09/2021 - Il progetto MIQUALAT - Improvement of the nutritional quality and health image of milk for the contents of functional molecules with prebiotic and protective action. Final conference of the project 13/10/2021 Monterotondo - Research grants - n. 3

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CRE/ RESEARCH CENTRES	INTERNATIONAL PARTNERSHIP /FINANCING BODY	PUBLICATIONS	OTHERS RESEARCH PRODUCTS ¹
				<p>biosynthesis of prebiotic molecules. Italian Journal of Animal Science vol.20:s1, pag. 153, doi:10.1080/1828051X.2021.1968170</p> <p>-Abstract su rivista: Alessandra Crisà, Pasquale Marmo, Cinzia Marchitelli (2021) Identification of new splicing variants in genes for cattle milk oligosaccharides biosynthesis. Journal of Integrative OMICS, 11,2, pag 24-14, ISSN 2182-0287</p> <p>-Abstract su rivista: Alessandra Crisà, Carmela Lovallo, Michel Conto, Salvatore Claps, Sebastiana Failla, Cinzia Marchitelli (2021) Glyconutrients with nutraceutical properties in milk of different bovine breeds.. J Clin Med Genomics, Volume 09, ISSN: 2472-128X</p> <p>-Abstract in atti di convegno Milanesi M, Marchitelli C, Contò M, Pietrucci D, Chillemi G, Crisà A (2021) Insight into the genetic background of sialic acid metabolism in bovine milk. 72th Annual Meeting of the European Federation of Animal Science (EAAP Congress – Davos, Switzerland – August 30 – September 3, pag. 302</p> <p>-Abstract in atti di convegno :Milanesi M., Marchitelli C., Contò M, Pietrucci D., Chillemi G., Crisà A. (2021) Preliminary evidence of genes associated with milk fatty acid profile in different cow breeds. 72th Annual Meeting of the European Federation of Animal Science (EAAP Congress – Davos, Switzerland – August 30 – September 3, pag 119</p> <p>-Abstract in atti di convegno Crisà A., Contò M., Lovallo C., Marmo P, Milanesi M., Napolitano F., Pietrucci D., Renzi G., Rinaldi S., Chillemi G., Claps S., Failla S., Marchitelli C. (2021) Il progetto MIQUALAT e lo studio sulle qualità funzionali del latte analizzate in alcune razze bovine ai fini del miglioramento genetico animale e della salute umana. XIII Convegno Nazionale sulla Biodiversità “Biodiversità 2021 – online – 7-9 settembre 2021, pag. 136</p> <p>-Abstract in atti di convegno Marco Milanesi, Carmela Lovallo, Cinzia Marchitelli, Salvatore Claps, Giovanni Chillemi, Alessandra Crisà (2021) Preliminary Genome Wide Association Study with Sialic Oligosaccharides content in four cattle breeds. 38th International Society for Animal Genetics (ISAG) - Virtual Conference – July 26-30 pag. 133.</p> <p>-Abstract in atti di convegno: Cinzia Marchitelli, Marco Milanesi, Giovanni Chillemi, Alessandra Crisà (2021) Genetic basis of immune response for mastitis in cattle revealed by a Genome Wide Association Study for Somatic Cell Count. VII European Veterinary Immunology Workshop (EVIW) – Livestreaming – 29-31 August 2021, pag. 118</p> <p>-Abstract in atti di convegno Cinzia Marchitelli, Daniele Pietrucci, Marco Milanesi, Luca Casadei, Fernando Porcelli, Giovanni Chillemi, Alessandra Crisà (2021) Using of NMR milk metabolomics to evaluate mammary gland health status in dairy cows. VI International Conference Safety, Health and Welfare in Agriculture and Agro-food Systems RAGUSA SHWA, virtual conference – 15 -16 september, ISSN 2532-103X, pag. 19</p>	

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA RESEARCH CENTRES	INTERNATIONAL PARTNERSHIP /FINANCING BODY	PUBLICATIONS	OTHERS RESEARCH PRODUCTS ¹
NControl Reduction of greenhouse gas and ammonia emissions in the livestock supply chain.	Demonstration of the effect of biochar in reducing GHG and ammonia emissions from soil and animal effluents	A. LAGOMARSINO CREA-AA C. SCOTTI CREA-ZA	- Lombardia Region		- Animal Husbandry and Environment - N-Control Project: The control of nitrogen losses in housing and diet 24/03/2021 - Animal husbandry and the environment. N-Control project agronomic and environmental results 2021 20/12/2021 - Biochar in the N-CONTROL project - Reducing greenhouse gas and ammonia emissions in the livestock supply chain 23/09/2021
NEWTECH New Technologies for Cheese production	Evaluate the usefulness of the plant DNA circulating in raw milk and bacterial DNA in cheese to distinguish the geographical origin of Grana Padano PDO on a molecular basis and, at the same time, differentiate the PDO product from similar Study the effects of using powdered milk in the production of fresh cheeses such as crescenza and mozzarella, evaluating the effects of processing technology, dairy yield and product quality Develop a low-cost portable spectrophotometric system for the analysis and monitoring in the boiler of the milk coagulation phase, in order to optimize the efficiency of process controls, with particular reference to Grana technology	G. GIRAFFA CREA-ZA	- MIPAAF	- Articolo in rivista Strani Lorenzo; Grassi Silvia; Alamprese Cristina; Casiraghi Ernestina; Ghiglietti Roberta; Locci Francesco; Picca Nicolò; De Juan Anna (2021).Effect of physicochemical factors and use of milk powder on milk rennet-coagulation: Process understanding by near infrared spectroscopy and chemometric .Food Control, 119,DOI: 10.1016/j.foodcont.2020.107494 - Articolo in rivista Tidona Flavio; Alinovi Marcello; Francolino Salvatore; Brusa Gianluca; Ghiglietti Roberta; Locci Francesco; Mucchetti Germano; Giraffa Giorgio (2021).Partial substitution of 40 g/100g fresh milk with reconstituted low heat skim milk powder in high-moisture mozzarella cheese production: Rheological and water-related properties.LWT Food Science and Technology, 137,DOI: 10.1016/j.lwt.2020.110391 - Abstract in atti di convegno Tidona Flavio; Alinovi Marcello; Locci Francesco; Ghiglietti Roberta; Francolino Salvatore; Brusa Gianluca; Monti Lucia; Giraffa Giorgio (2021).Employment of recombinant milk to produce Crescenza, an Italian soft cheese. ZAGO M., ROSSETTI L., BARDELLI T., CARMINATI D., NAZZICARI N., GIRAFFA G. Bacterial community of Grana Padano PDO cheese and generic hard cheeses: DNA Metabarcoding and DNA Metafingerprinting analysis to Assess similarities and differences. <i>Food</i> 10(8), 1826 (2021). GIRAFFA G. The microbiota of Grana Padano cheese. A review <i>Foods</i> 10, 2632 (2021). Zago M., Carminati D., Nazzicari N., Rossetti L., Bardelli T., Giraffa G. (2021) Recenti acquisizioni sulla diversità microbica del Grana Padano. Grana Padano Insieme, 1, 64-69 Zago M., Bardelli T., Rossetti L., Nazzicari N. Carminati D., Galli A. Giraffa G. (2021) Evaluation of bacterial communities of Grana Padano cheese by DNA metabarcoding and DNA fingerprinting analysis. Food Microbiol., 93: 103613	- NewTech Thursdays: Standardization of milk and processed cheese 25/03/2021 - Newtech Thursdays: DNA in the characterization of Grana Padano PDO 18/03/2021
NFP-ASCAL-2 Agreement National Focal Point and State Stud of Lipizzan Horses	- Management of the National Focal Point under the FAO Animal Genetic Resource program. - Conservation of breeding nucleus of classic Lipizzan horse lines at ASCAL	L. BUTTAZZONI CREA-ZA	- MIPAAF		

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA RESEARCH CENTRES	INTERNATIONAL PARTNERSHIP /FINANCING BODY	PUBLICATIONS	OTHERS RESEARCH PRODUCTS ¹
PAG Gene expression of pregnancy-associated glycoproteins (PAGs) and of the Interferon-stimulated gene (ISG) in the blood of buffaloes with different state of fattening: new diagnostic and prognostic markers of maternal-fetal cellular interaction	The main objective of the research is to investigate the expression of PAGs and ISG during the implantation period and in the first months of gestation in buffaloes, in order to monitor pregnancy and to show the presence of early embryonic mortality	V. BARILE CREA-ZA		<p>- Articolo in atti di convegno Casano A.B., Barile V.L., Menchetti L., Guelfi G., Canali C., Brecchia G., Scatà M.C., De Matteis G., Grandoni F., Turmalaj L., Postoli R., Sulc M., Barbato O. Interferon-stimulated genes during perimplantation period in pregnant buffalo cows. 3rd International Conference on Agriculture and Life Sciences (ICOALS III), Campobasso-Tirana, 2021. Ed. Agricultural University of Tirana, 444-446.</p> <p>- Abstract in atti di convegno Barbato O., Menchetti L., Guelfi G., Casano A.B., Bellucci M., Brecchia G., De Matteis G., Scatà M.C., Grandoni F., Canali C., Barile V.L. 2021. Regulation of interferon-stimulated genes (ISGs) in peripheral blood leukocytes during peri-implantation period in pregnant and non-pregnant buffalo cows. 10th Asian Buffalo Congress, Rampun (Nepal) October 25-29, 2021. Book of Abstracts, (Eds. Shah, M.K.; Devkota, D. Singh, U.M.; Kaphle, K.; Paudel, L.N.) Agriculture and Forestry University, Rampur, Chitwan, Nepal, 28</p> <p>- Articolo in rivista Barile, V.L.; Menchetti, L.; Casano, A.B.; Brecchia, G.; Melo de Sousa, N.; Zelli, R.; Canali, C.; Beckers, J.F.; Barbato, O. Approaches to Identify Pregnancy Failure in Buffalo Cows. Animals 2021, 11, 487. https://doi.org/10.3390/ani11020487</p>	
PASCOL-ANDO Sustainable management of pasture Information and demonstration activities in Alpe Andossi	Dissemination of knowledge, demonstration of good practices and innovations for the sustainable management of agricultural area of environmental importance and of pasture farms, even though the introduction of advantageous agronomic practices for operators and relevant to biodiversity	M. POVOLO CREA-ZA	- Lombardia Region	<p>- Articolo in rivista Povolo Milena; Cabassi Giovanni; Speroni Marisanna; Picca Nicola; Timini Massimo; Della Bella Donnino; Gusmeroli Fausto; Gentile Rodolfo; Comolli Roberto (2021). Anche i pascoli chiedono un gestione sostenibile. Informatore zootecnico, 6, 40-42.</p>	<p>- Video description of pasture activities of the project Grazing Summer 2021 30/11/2021</p> <p>- Pascolando project webinar: presentation of activities 24/06/2021</p> <p>- Scholarship - n.1</p>
PERILBIO Promotion AND strengthening of long-term devices in Organic Aquaculture	The project involves the drafting of the National Research Plan (PB); maintenance, strengthening and dissemination of innovation of the existing Long Term Experimental Device (DSLPS) (OFA- AA-OF); and implementation of three new DSLPS in poultry, mariculture and organic rabbit farming (ZA). The marine experimental device is aimed at testing innovative breeding systems with high sustainability.	D. CECCARELLI CREA-OFA CREA-OF CREA-ZA CREA-PB CREA-AA	- MiPAAF	<p>- Articolo in rivista Ciaccia Corrado; Mele Giuseppe; Testani Elena; Fiore Angelo; Persiani Alessandro; Montemurro Francesco; Diacono Mariangela (2021). Agroecologia, il caso-studio di Ricerca Partecipativa in Basilicata. Agrifoglio, 10, 07/10/2021</p> <p>- Articolo in rivista Ciaccia Corrado; Testani Elena; Fiore Angelo, Icola Ileana; Di Pierri Marta; Mele Giuseppe; Ferlito Filippo; Cutuli Marcello; Montemurro Francesco; Farina Roberta; Ceccarelli Danilo; Persiani Alessandro; Canali Stefano; Diacono Mariangela (2021). Organic Agroforestry Long-Term Field Experiment Designing Through Actors' Knowledge towards Food System Sustainability. Sustainability, 13, 10, DOI: 10.3390/su13105532.</p>	<p>- SEALOGY, the european blue economy show 18/11/2021</p> <p>- Science Project - STEM. Puntata 10 "CIEC" 07/10/2021</p> <p>- Monterotondo</p> <p>- Poultry Living Lab CREA inaugurates long-term experimental device for organic poultry farming 02/12/2021</p> <p>- Monterotondo</p> <p>- Research grant - n.3</p> <p>- Scholarships - n.3</p>
PIGBEN Pig slurry valorization with a view to biorefinery	Reduce environmental impact due to inappropriate disposal by solutions designed to protect farmer's income.	V. FAETI CREA-ZA	- Emilia Romagna Region		

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA RESEARCH CENTRES	INTERNATIONAL PARTNERSHIP /FINANCING BODY	PUBLICATIONS	OTHERS RESEARCH PRODUCTS ¹
PLFNoDrug Precision Livestock Farming for the reduction	Definition of a risk model of contracting mastitis following the omission of the use of an antibiotic for prophylactic purposes at the time of drying the cows, using all the information available in the farm, to enhance the preventive approach and ensure state of health and welfare of dairy cows.	F. P. ABENI CREA-ZA	- Lombardia Region	Petrera F., Marino R., Zoggia A., Abeni F. (2021). La PIF a supporto dell'asciutta selettiva. <i>Informatore Zootecnico</i> 68 (20), 40-43.	- Project PLFNoDrug: Precision animal husbandry to reduce the use of antibiotics 26/11/2022 Cremona - Research grant - n.1
POWER Proven welfare and resilience in organic pig production	Investigate the effects of different outdoor concrete paddock designs on the behavior of pigs in the finishing phase, on the health and hygiene of the paddocks themselves. This will improve animal welfare and reduce nutrient losses; Study the effects of the type of farrowing paddock, as well as better genetics on maternal behavior and piglet mortality; Investigate the effects of different management strategies (eg iron or probiotic administration)	DAVIDE BOCHICCHIO CREA-ZA	- MiPAAF		
REMIX Redesigning European cropping system based on species mixtures	Pea plant breeding for intercropping with cereals	P. ANNICCHIARICO CREA-ZA	- European Commission Partners: France, Belgium, China, Denmark, Germany, Greece, Holland, Poland, UK, Spain, Sweden, Switzerland, Hungary/ European Commission	- Articolo in rivista Annicchiarico P., Nazzicari N., Notario T., Monterrubio Martin C., Romani M., Ferrari B., Pecetti L. (2021) Pea breeding for intercropping with cereals: variation for competitive ability and associated traits and assessment of phenotypic and genomic selection strategies. <i>Frontiers in Plant Science</i> 12: 731949	- "Trasformazione dei prodotti bio. Le buone pratiche da conoscere. Contribution to Terra&Vita magazine. Published in April 2022. https://www.proorgproject.com/_files/ugd/88a346_51652348af1b441ea6b48f441ea80339.pdf (Flavio Paoletti)
RGV FAO VI Three-year program 2020-2022 for the conservation, characterization, use and valorization of agro-food plant genetic resources	Conservation and characterization of plant genetic resources of forage and grain legume crops	I. VERDE CREA-OFA CREA-IT CREA-OF CREA-CI CREA-DC CREA-FL CREA-ZA CREA-GB CREA-VE CREA-AA	- MiPAAF	- Articolo in rivista Annicchiarico P., Pecetti L. (2021) Comparison among nine alfalfa breeding schemes based on actual biomass yield gains. <i>Crop Science</i> 61: 2355-2370 Annicchiarico P. (2021). Breeding gain from exploitation of regional adaptation: an alfalfa case study. <i>Crop Science</i> 61, 2254-2270 (doi: 10.1002/csc.2.20423). Palombi M.A.; Antonetti M.; Balconi C.; Brandolini A.; Caboni E.; Cappelozza S.; Caputo A.; Carboni A.; Cervelli C.; de Dato G.; De Vito P.; Fascella G.; Ferretti L.; Ficcadenti N.; Fusani P.; Gaeta L.; Gardina M.; Giovannini D.; Palumbo M.; Pecetti L.; Perri E.; Petriccione M.; Quaranta F.; Russo G.; Schiavi M.; Stocchi P.; Terzi V.; Tripodi P.; Vaccino P.; Fideghelli C.; Verde I. Seventeen years of the RGV-FAO program, characterization and sustainable use of agrobiodiversity in Italy. II Agrobiodiversity International Congress.	

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CRE/ RESEARCH CENTRES	INTERNATIONAL PARTNERSHIP /FINANCING BODY	PUBLICATIONS	OTHERS RESEARCH PRODUCTS ¹
ROAM-FREE Robust Animals in sustainable Mixed FREE - range systems - ROAM FREE	Develop a common protocol and perform welfare assessment of pigs and other animals in MIXED FREE RANGE PRODUCTION Systems	D. BOCHICCHIO CREA-ZA	- MIPAAF		

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA RESEARCH CENTRES	INTERNATIONAL PARTNERSHIPS /FINANCING BODY	PUBLICATIONS	OTHERS RESEARCH PRODUCTS ¹
SANSINUTRIFEED Production of feed with nutraceutical value through the use oil industry by-products with study of the effects on animal welfare and milk and cheese quality	Production of new and competitive feeds with "nutraceutical value" (use of by-products rich in polyphenols from virgin destoned olive cake dried at low temperature and "powder" extracted from vegetation water), capable of improving the nutraceutical characteristics of milk and cheeses and animal welfare.	S. CLAPS CREA-ZA CREA-OFA CREA-PB	- MISE	<p>Articolo in rivista Benincasa Cinzia; Pellegrino Massimiliano; Veltri Lucia; Claps Salvatore; Fallara Carmelo; Perri Enzo; 2021. Dried destoned virgin olive pomace: a promising new by-product from pomace extraction process. Molecules, 26 (14) 4337 https://doi.org/10.3390/molecules26144337</p> <p>Articolo in rivista Benincasa Cinzia; Pellegrino Massimiliano; Romano Elvira, Claps Salvatore; Fallara Carmelo; Perri Enzo; 2021. Qualitative and quantitative analysis of phenolic compounds in spray-dried olive. Front Nutr. 8:782693 10.3389/fnut.2021.782693</p> <p>Articolo in rivista Ciliberti Maria Giovanna; Albenzio Marzia; Claps Salvatore; Santilli Antonella; Marino Rosaria; Caroprese Mariangela; 2021. NETosis of Peripheral Neutrophils Isolated From Dairy Cows Fed Olive Pomace. Frontiers in Veterinary Science 8:1-10 10.3389/fvets.2021.626314</p>	

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CRE/ RESEARCH CENTRES	INTERNATIONAL PARTNERSHIP /FINANCING BODY	PUBLICATIONS	OTHERS RESEARCH PRODUCTS ¹
SI Agrarian extension Consultin assignment for project implementation	Equip the agricultural institutes involved in th project with sensors and instrumentation related to agriculture and animal husbandr 4.0. Provide support and specific training o agriculture 4.0 to technical subject teachers	G. CABASSI CREA-ZA	- Fondazione Cariplo		

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CRE/ RESEARCH CENTRES	INTERNATIONAL PARTNERSHIP /FINANCING BODY	PUBLICATIONS	OTHERS RESEARCH PRODUCTS ¹
STAVALESCO Standardization, stabilization and valorization of ancient native genetic types (TGA) in pigs, sheep, goats and horses	Standardization, stabilization and enhancement of native genetic types by evaluating the growth performance, production and qualitative characteristics of the products	S. CLAPS CREA-ZA	- Basilicata Region		

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA RESEARCH CENTRES	INTERNATIONAL PARTNERSHIP /FINANCING BODY	PUBLICATIONS	OTHERS RESEARCH PRODUCTS ¹
TEMPRO Effects of raw milk storage temperature on the safety and quality characteristics of Provolone Valpadana PDO cheese	The objective is to evaluate the possibility of increasing the storage temperature of raw milk to produce Provolone Valpadana PDO cheese spicy type, to increase the pro-technological microflora and optimize the management of the production chain. Effects on the quality of the cheese evaluated by surveys on changes in microbiological, safety, chemical, physical and nutritional characteristics of the cheese.	D. CARMINATI CREA-ZA CREA-AN	- MiPAAF		

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CRE/ RESEARCH CENTRES	INTERNATIONAL PARTNERSHIP /FINANCING BODY	PUBLICATIONS	OTHERS RESEARCH PRODUCTS ¹
VALIP Enhancement of the Lipizzana horse breed in multifunctional agriculture through orientation to federal disciplines	Enhancement of the Lipizzana horse breed as prerequisite for its lasting preservation	L. BUTTAZZONI CREA-ZA	- ARSIAL		

2.2.2. Patents and Services

Patents INDUSTRIAL PATENTS

PRODUCTS/MAIN TOPICS	DENOMINATION/DESCRIPTION	CREA INVENTORS	CREA RESEARCH CENTRES
mastitis inflammation in dairy animals	Method and kit for determining the presence of mastitis inflammation in dairy animals (EN)	G. De Matteis	CREA-ZA
dairy products	Dairy product and method for the production of that dairy product (IT + FR + ES)	V. Fedele, S. Claps L. Sepe, F. Paladino	CREA-ZA

PLANT VARIETY RIGHTS – Forage species

PRODUCTS/MAIN TOPICS	DENOMINATION/DESCRIPTION	CREA INVENTORS	CREA RESEARCH CENTRES
Lucerne	COSTANZA	P. Annicchiarico	CREA-ZA
pisello da foraggio	FRASER	B. Parisi M. Di Candilo P. Ranalli	CREA-CI
white clover	GIGA	P. Annicchiarico	CREA-ZA

CREA VARIETIES INCLUDED IN THE ITALIAN OFFICIAL LISTS -Forage species

PRODUCTS	DENOMINATION	CREA RESEARCH CENTRES	PRODUCTS	DENOMINATION	CREA RESEARCH CENTRES
Dactylis	Dora	CREA-ZA	perennial ryegrass or English ryegrass.	Pamir	CREA-ZA
Dactylis	Jana	CREA-ZA	Sainfoin	Tetim	CREA-ZA
Dactylis	Padania	CREA-ZA	fodder peas	Coraline	CREA-CI
Lucerne	Alfitalia	CREA-ZA	fodder peas	Fraser	CREA-CI
Lucerne	Buttero	CREA-ZA	fodder peas	Pantera rosa	CREA-ZA
Lucerne	Camporegio	CREA-ZA	sulla	Centauro	CREA-ZA
Lucerne	Centauro	CREA-ZA	berseem clover	Nilodi	CREA-ZA
Lucerne	Colosseo	CREA-ZA	berseem clover	Sacromonte	CREA-ZA
Lucerne	Costanza	CREA-ZA	berseem clover	Saniros	CREA-ZA
Lucerne	Equipe	CREA-ZA	white clover	Giga	CREA-ZA
Lucerne	Gamma	CREA-ZA	white clover	L. 107/66 Espanso	CREA-ZA
Lucerne	Iside	CREA-ZA	white clover	Trefor	CREA-ZA
Lucerne	L. 202 Bresola	CREA-ZA	persian clover	Accadia	CREA-ZA
Lucerne	Lodi	CREA-ZA	persian clover	Rusty	CREA-ZA
Lucerne	Pegaso	CREA-ZA	purple meadow clover	Isella	CREA-ZA
Lucerne	Robot	CREA-ZA	purple meadow clover	L. 148/30 Longevo	CREA-ZA
Lucerne	Verbena	CREA-ZA	purple meadow clover	L. 69 Valente	CREA-ZA
harding grass	Partenope	CREA-ZA	purple meadow clover	Milo	CREA-ZA
harding grass	Fovea	CREA-ZA	subterranean clover	Antas	CREA-ZA
harding grass	Magno	CREA-ZA	subterranean clover	Campeda	CREA-ZA
harding grass	Tanit	CREA-ZA	subterranean clover	Limbara	CREA-ZA
Timothy	Toro	CREA-ZA	subterranean clover	Losa	CREA-ZA
birdsfoot trefoil	Franco	CREA-ZA	subterranean clover	Tanca	CREA-ZA

PRODUCTS	DENOMINATION	CREA RESEARCH CENTRES	PRODUCTS	DENOMINATION	CREA RESEARCH CENTRES
italian ryegrass and Westervoldico ryegrass	Crema	CREA-ZA	common vetch	Mirabella (118/7)	CREA-ZA
italian ryegrass and Westervoldico ryegrass	L. 17 Asso	CREA-ZA	velvety vetch	Orsara	CREA-ZA
italian ryegrass and Westervoldico ryegrass	Menichetti	CREA-ZA			

Services

Collections

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA RESEARCH CENTRES
Maremma cattle breed	CREA-ZA manages a herd of Maremma cattle of over 100 head in its farm in Monterotondo near Rome. The Maremma is a native Italian breed of long horned cattle, extremely resilient to poor, hot environments, where it is used to produce crossbred calves. The breed is at risk of genetic erosion. Interest in this breed is growing due to climate change.	S. Concetti	CREA-ZA
Lipizzan horses	CREA-ZA manages the State Stud Farm of Lipizzan Horses (ASCAL) in Montelibretti, near Rome. The horses fully descend from stallions and mares bred in Lipica (now in Slovenia) before the First World War. The herd has been kept in complete genetic isolation for over 120 years. It consists of 12 stallions from 6 paternal lines, 33 broodmares from 11 female families and foals.	L. Buttazzoni	CREA-ZA
Microorganisms of dairy interest	CREA-ZA in Lodi host a collection of about 5,000 strains and isolates of lactic acid bacteria of dairy origin, including a database with the main taxonomic, physiological and molecular characterization information of industrial interest. The collection also contains bacteriophages of thermophilic lactic acid bacteria and bacterial strains of harmful or pathogenic species, of dairy origin, useful for challenge tests or for studying their behavior in industrial practice.	G. Giraffa	CREA-ZA
sheep of the Altamura breed	CREA manages a flock of about 120 Altamura sheep at its Bella site. This is an endangered native breed, of which very few purebred animals remain. It is also known as the "moscia," because of the loosely rippled (mattress wool) and drooping woolly filaments of its fleece. It is extremely resilient in poor, arid environments (Bari Murgia), where it was used to produce lambs in crossbreeding and some milk. Interest in this breed is growing because of climate change and because of its marked resistance to tick bites.	S. Claps	CREA-ZA

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA RESEARCH CENTRES
Technical and scientific assistance			
genetic improvement	Support the Ministry of Agriculture for the revision of European and national legislation on genetic improvement. Participation in the development of the national certification scheme for the welfare of farmed animals. Formulation of opinions on a variety of subjects of zootechnical interest. Evaluation of poultry genotypes for inclusion in private production specifications.	L. Buttazzoni, G. Catillo, G. Pirlo, R. Steri, M. Guarino Amato	CREA-ZA
organic animal production	Scientific and technical support to the Ministry of Agriculture for the implementation and revision of organic farming regulations.	M. Guarino Amato	CREA-ZA
Scientific technical consultancy service			
pig feeding	Review, update and extension of the "Feeding guidelines for sows and pigs" published online by ANAS.	V. Faeti	CREA-ZA
lactid acid bacteria of industrial interest.	Scientific cooperation for the industrial valorization and exploitation of microorganisms of dairy interest coming from the CREA-ZA collection.	G. Giraffa	CREA-ZA
L. delbrueckii strains subsp. lactis.	Scientific collaboration for the identification and characterization of L. delbrueckii strains for the formulation of new starter cultures.	G. Giraffa	CREA-ZA
new coagulants for the dairy industry.	Scientific cooperation to evaluate the industrial performance of new coagulants for mozzarella cheese.	G. Giraffa	CREA-ZA
pig- genetic program of the Italian Large White breed.	Targeted production of breeding males selected within the genetic program of the Italian Large White breed.	V. Faeti	CREA-ZA
organic livestock	Scientific technical support to companies and industries for the development of organic productions.	D. Bochicchio	CREA-ZA
Analyses for third parties			
milk and butter	Determination of fatty acid composition of milk and butter (ISO methods 15884:2002, 15885:2002; Contarini et al., 2013).	M. Povo	CREA-ZA
butter	Determination of sugar content in lactose free butter (HPAEC-PAD method UNI/TS 11687:2017).	L. Monti	CREA-ZA
milk for infant	Determination of milk whey protein percentage in cow's milk infant formulas (SDS-CE method).	L. Monti	CREA-ZA
cow milk	Determination of milk fat purity (ISO method 17678).	M. Povo	CREA-ZA
Training for teachers of Agricultural Technical Institutes			

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA RESEARCH CENTRES
precision livestock farming	Training on precision livestock farming techniques and tools 12 training modules (GIS Technologies, ISOBUS, Sensing, Satellite Monitoring, Data Management)	G. Cabassi	CREA-ZA-IT
Certification			
poultry	Evaluation of poultry genetic types for outdoor production.	M.Guarino Amato	CREA-ZA
seed	Official testing for registration of new varieties to the national Register.	L. Borrelli	CREA-ZA

Historical libraries

PRODUCTS/MAIN TOPICS	DESCRIPTION	CONTACT PERSON	CREA RESEARCH CENTRES
Animal husbandry	<p>At the Bella Headquarters there are two libraries:</p> <ul style="list-style-type: none"> - in the first library there are collected some historical books (the oldest ones date back to 1890), as well as conference proceedings, Italian and foreign journals annals of research institutions, yearbooks. - in the second library there are more recent publications, on topics in animal husbandry, forage farming, veterinary medicine, as well as having transferred much of the bibliographic material present in Segezia (FG). <p>Following CREA's accession to the Italian Periodicals Catalogue (ACNP), the inclusion on the platform of the periodicals from Bella (PZ) has been completed, while those from Segezia (FG) are being catalogued for inclusion on the ACNP Catalogue.</p>	M. Alvino	CREA-ZA

Other science and technology infrastructures

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA RESEARCH CENTRES
Aviculture	Permanent experimental device for organic poultry farming. The experimental poultry house is equipped with automatic and precision feeding and watering facilities with a robot for tracking and mapping environmental and behavioral data. Maximum capacity 1200 broilers. Possibility to experiment with three types of feeding at the same time. Outdoor parcels via automatic ushers. The first breeding cycle to evaluate the production performance, welfare status, and meat quality of chicken fed insect meal started in September 2021.	M. Guarino Amato	CREA-ZA
Dairy	<p>CHEESE DAIRY BELLA (PZ)</p> <p>At the Bella "estate," there is a 250-square-meter experimental teaching dairy with an adjoining tasting room (14 stations). The plant is designed to process up to 5,000 liters of milk daily and is equipped with a pasteurizer with a processing capacity of 500 l/h. The dairy is equipped for all types of cheese: string cheese, soft cheese, cottage cheese, etc. A small area is set aside for small-scale trials (3 double-bottom boilers with a capacity of 50 l). Attached to the dairy, in addition to the tasting room, there are two rooms equipped with 6 cold rooms (for the storage and aging of different types of cheese) and a traditional cellar, made of tuff, for the aging of typical traditional cheeses. The location of the facility, within the Headquarters, allows to address, from a supply chain perspective, the main issues related to the production of typical southern Italian cheeses.</p>	S. Claps	CREA-ZA
Dairy	The experimental dairy in Lodi with a working capacity of up to 1,000 liters of milk per day is equipped with a pasteurizer with a process capacity of 800 l/h. The dairy is equipped for the following dairy technologies: Grana and other cooked cheeses, soft cheeses, pasta filata, and ricotta. A small area is set aside for small-scale trials or for the design and experimental testing of new ferments. The layout of the facility and the division of space allow new production lines to be implemented or other pilot equipment to be housed within collaborative projects with industry. The facility is divided into two physically separate areas: the "research area," which can house prototype plants for pilot or laboratory-scale production, and the "production area," where experiments conducted at the research area can be applied on a semi-industrial scale. Locating the facility at the Baroncina farm makes it possible to enclose the entire production cycle of the livestock supply chain in a single site and to address, from a "farm to fork" perspective, issues related to the dairy sector.	G. Giraffa	CREA-ZA

Other services

Working tables / working groups / institutional partnerships / Centre journals / Editorial Board of Journals

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA RESEARCH CENTRES
buffaloes	Collaboration with the Italian Embassy in Indonesia and with Indonesia Agency for Agriculture Research and Development (IAARD)- Directorate General of Livestock Service and Animal Health (DGLSAH) for the introduction of buffalo breeding.	V. L. Barile	CREA-ZA
buffaloes	International Buffalo Federation (IBF). Secretariat and Editorial Activities.	V. L. Barile A. Chiariotti	CREA-ZA
internal areas	National Rural Network-National Strategy for Internal Areas (SNAI). Working group set up within the NRN to support the development of internal areas.	D. Bochicchio	CREA-PBZA
poultry	EU Commission EIP Agri Focus Group. Antibiotic reduction in poultry farming.	M. Guarino Amato	
emissions	Global Research Alliance - Livestock Research Group https://globalresearchalliance.org/The Global Research Alliance on Agricultural Greenhouse Gases brings countries together to find ways to grow more food without growing greenhouse gas emissions. Livestock Research Group is focused on reducing the emissions intensity of livestock production systems and increasing the quantity of carbon stored in soils supporting these systems.	G. Pirlo	CREA-ZA
sustainability of livestock supply chain	Sustainability of livestock supply chain. FAO/LEAP Partnership. http://www.fao.org/partnerships/leap/en/The Livestock Environmental Assessment and Performance (LEAP) Partnership is a multi-stakeholder initiative committed to improving the environmental performance of livestock supply chains while ensuring their economic and social viability. It includes three stakeholder groups: the private sector, FAO Member Countries and NGOs	D. Meo Zilio	CREA-ZA
environmental footprint	Technical Advisory Board on Environmental Footprint (TAG on ENV). The Commission's Directorate General for Environment (DG Environment) decided to register an informal expert group with a view to provide advice and expertise to the Commission regarding the Environmental Footprint methods. The Product Environmental Footprint (PEF) and Organization Environmental Footprint (OEF) methods are annexed to the Commission Recommendation on the use of common methods for measuring and communicating the life cycle environmental performance of products and organizations (2013/179/EU).	G. Pirlo	CREA-ZA
milk and dairy products	Italian Standardization Body (UNI). Sub Committee UNI/CT 003/SC 09 "Milk and derivatives".	M. Povolo	CREA-DC ZA
nutrition and animal health	Technical Committee on Nutrition and Animal Health of the Department of Health. Technical and scientific support to the production of legislation in the field of animal nutrition and welfare.	L. Buttazzoni	
population genetics	Legislation in the field of animal nutrition and welfare. L. Buttazzoni population genetics IGGC (International Goat Genome Consortium) International Partnership Collaboration to the multi-year international research program VarGoat (http://www.goatgenome.org/vargoats.html). Activities within the working groups "Population genetics analyses and population history domestication reconstruction.	A. Crisà, R. Steri	CREA-ZA
dairy markets	International Dairy Federation (FIL-IDF). Participation in the Standing Committee on Analytical Methods for Composition (SCAMC).	M. Povolo, L. Monti	CREA-ZA
sustainable livestock production	Animal Task Force http://animaltaskforce.eu/The Animal Task Force is a European Public-Private Partnership of research organizations and farmers and industry organizations, working together on a sustainable and competitive European livestock production sector by fostering knowledge development and innovation in the whole animal production chain.	M. Guarino Amato	CREA-ZA
sustainable animal production	SCAR CWG SAP Standing Committee on Agricultural Research (SCAR) Collaborative Working Group on Sustainable Animal Production. Provides advice on coordinating research and innovation for the development of more sustainable animal production systems in Europe to member states, associated countries and the European Commission.	M. Guarino Amato	CREA-ZA
Animal Welfare	SCAR CWG AHW Standing Committee on Agricultural Research (SCAR) Collaborative Working Group on Animal Health and Welfare. Network between relevant authorities research funding bodies. Forum for better collaboration on setting research priorities and investments to meet animal health and welfare research needs. Cooperation with other relevant working groups and DG-RTD.	M. Guarino Amato	CREA-ZA
dairy, beef and dual-purpose cattle breeds, buffaloes, pigs, horses, sheep, goats, rabbits and poultry.	Central Technical Committees of Breeding Organization. Active participation in more than 20 Technical Commissions for the management of genetic programs in dairy, beef and dual-purpose cattle breeds, buffaloes, pigs, horses, sheep, goats, rabbits and poultry.	L. Buttazzoni, R. Steri	CREA-ZA

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA RESEARCH CENTRES
goat genomic characterization	ADAPTMAP international initiative. ADAPTMAP represents an international effort developed to improve coordination among otherwise independent projects for the genotyping, re-sequencing and phenotyping of goat breeds. CREA participates by providing some goat breeds and expertise for the analysis of genomic data.	A. Crisà, R. Steri	CREA-ZA
animal genetic resources	National Focal Point for FAO activities Italian National Focal Point in the "Global Strategy for the Management of Animal Genetic Resources"	L. Buttazzoni	CREA-ZA
forage species	Working group set up by the Ministry of Agricultural, Food and Forestry Policies for the revision of criteria and technical procedures for the variety registration of forage species included in the National Register, and for the definition of criteria and procedures for forage species newly admitted to the National Register of varieties	A. Giuliani, L. Pecetti	CREA-ZA
organic animal production	National technical roundtable.Organic farming (organic livestock section).	M. Guarino Amato	CREA-ZA

2.CREA RESEARCH LINES BY PRODUCTS

2.3 GRAPES AND WINE

Balanced sustainability is the keyword for a viticulture takes care not only of the environment but also of social and economic parameters. This concept implies that any aspect of technical and scientific improvement is driven by the equilibrium among all the considered factors. The Research Centre of Viticulture and Enology aims to obtain an optimal balance between three main factors (i) human input, (ii) respect of the environment and (iii) characteristics of the species of interest, grapevine and table grape, along the whole production chain. Our attention is focused on four major macro-areas i) precision-agriculture; ii)



Characterization, valorization, and improvement of biological resources; iii) sustainable orchard and vinery management; iv) innovation methods for traceability, valorization and characterization of grape and wine.

Grapevine (650.000 ha) and table grape (70.000 ha) represent, probably, the most advanced sector of the Italian agriculture, in terms of value and reputation of the “System Italy”. Viticulture is a highly relevant and driving sector, both in terms of consumption of processed products and environmental aspects. Technical advances and biological knowledge enable for many solutions to reduce human inputs, in particular some digital and other applications recently developed in the field of robotics, sensors, devices for decision support (DSS), and related software.

Mathematical modelling applied to climate records allows for the development of very efficient models to optimize insects and pathogens management and control. Also, irrigation and fertilization, based on distant imaging and proximal and distal sensing, allow for precise distribution of water and nutrition supply only in case they needed, thus avoiding dispersion and undesired pollution. In the vinery, our primary objective is to save energy, but we are also working on the reduction of the sulfur dioxide use, as well as on the development of novel technologies for the stabilization of red wines and sparkling wine refinery. Most of these activities are carried out with private companies and farmers are directly involved, leading the projects according to their needs, in promoting technical and research improvements. CREA Research Center for Viticulture and Enology is the reference point for the National Grapevine Varieties Collection of the Ministry of Agriculture, Food and Forestry Policies, where all registered varieties cultivated in Italy are hosted. The collection moreover comprises the Italy’s biggest collection of micro-organisms used in enology



Our natural vocation for the recovery, conservation and valorization of old and new grapevine and table grape varieties and their use in breeding is a crucial aspect of our activities. The recovery of old autochthonous varieties particularly aims at the valorization of their close link with their original *terroir*, while breeding research is direct to explore the still unknown genetic potential in both grapevine and table grape materials. Specifically, we follow several breeding programs in all the Italian Regions where our Center structures are located (Veneto and Friuli, Piedmont, Tuscany, Latium and Apulia), and we further cooperate with Universities and other research institutes in Campania, Basilicata, Calabria and Sicily, in order to collect old varieties and pollinate the best known with pollen of resistant local ones. Our collections currently comprise more than 20.000 seedlings which are resistant to the main fungal pathogens and are currently under evaluation.

Most of our breeding activities also involve private companies and producer consortia, to transfer as quickly as possible, the research products to the market and valorize them commercially. Now, 36 new seedless table grape varieties are in the process of registration. Our Center disposes of two biotechnological laboratories for the introduction and application of new breeding technologies like genome editing and cisgenetic approaches, both for grapevine and table grape. For table grape we aim to obtain seedless varieties deriving from the most famous Italian varieties like Italia and Regina, while for grapevine we aim to improve Italian varieties (Glera, Sangiovese, Primitivo) for biotic (fungi) and abiotic (water stress) resistance. Once they are obtained, new varieties are assessed for characteristics related to vinification, quality assessment and metabolomic assessment, by the most recent metabolomic protocols and platforms.

Sustainability in viticulture and enology is pursued by a considerable number of projects focusing on appropriate orchard management: grassing instead of weeding (especially chemical weeding), water usage control, organic and alternative fertilization, canopy growth control, photosynthetic efficiency, and disease control. In these last cases, emerging diseases and pests are studied in-depth to identify sustainable control management strategies as an alternative to standard chemical controls. Biotechnological approaches (double stranded RNA spreading) and natural biological control (competitive organisms and parasitoids) are examples of alternatives to synthetic chemical compounds. Finally, we focus our attention also on circular economy due to its potential in viticulture and enology; in fact, a relevant amount of waste material may become source of new economy, by recovering interesting metabolites for pharmaceutical, cosmesis and nutraceutical goals, as well as energy recovery or saving through composting field or seller residues.

2.3.1 Research and research products - Grapes and Wine

ACRONYMS RESEARCH TITLE	MAIN TOPICS	PERSON IN CHARGES AND CREA CENTRES	PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹
AdriUVA 2.0 Treatment efficacy on table grape bunch of biostimulants, effect on browning and cracking at ripening, storage and shelf-life.	Evaluate the effectiveness of the biostimulant PRODEXP6 and DRY-K30 on the containment of plant diseases respectively known as "browning" and "cracking" on susceptible varieties of table grapes, both at harvest during cold storage and in shelf-life.	A. D. MARSICO CREA-VE	K-Adriatica spa		(1) FT-NIR Analysis of Intact Table Grape Berries to Understand Consumer Preference Driving Factors. Basile M., Marsico A.D., Cardone M.F., Antonacci D., Perniola M. Foods. 2020 Jan; 9(1): 98. doi.: 10.3390/foods9010098 (2) NIR Analysis of Intact Grape Berries: Chemical and Physical Properties Prediction Using Multivariate Analysis.
SUVISA Digital viticulture	Implementation of decision support systems at different spatial scales, for the management of soils and plant valuation of monitoring systems of production and of the main adversities of the vine.	P. STORCHI CREA-VE CREA-AA	MIPAAF	Storchi P., Velasco R. (2020) Agricoltura digitale per il miglioramento della sostenibilità delle produzioni. RRN Magazine, 9(1): 7.	- Assegni di ricerca - n.3
ANTORES Evaluation of the anthocyanin composition in wines produced by resistant varieties.	Study the qualitative and quantitative composition of single anthocyanins monoglucosides and diglucosides present in wines produced by some varieties of vine resistant	R. FLAMINI CREA-VE	UNIUD		
ARSIALVE20-29 Agreement ARSIAL CREA VE (Velletri) 10 years collaboration 2020-2029	Build up a consortium as focus point for the entire viticulture and enology of Lazio Region, for research, technological transfer, training.	F. CECCHINI CREA-VE	- Agenzia Regionale per lo Sviluppo Agricolo del Lazio (ARSIAL)		

ASRAFS Advisory Services for Resilient Agri-Food System	Supporting the European Commission, Dternarelativational relationship for the agro-food system	E. MALUSA' CREA-VE	- European Commission GFA Consulting Group GmbH		
BIOFOSF-WINE Tools for solving fosfites residues problem in organic grapevine.	Identification of the causes of phosphonic acid (phosphite) and ethyl-phosphonic acid contamination in organic grapes and wines and study of soil-plant phosphite dynamics.	A. TRINCHERA CREA-AA CREA VE	MIPAAF	1)Trinchera A., Parisi N., Barattelli, Roccuzzo G., Soave I, Bazzocchi chera D., Finotti M. Riva F20, Norimberga 15 feb 2020. Webinar: "LMR fosfiti nel vino biologico: i passi avanti del nuovo decreto", Webinar (Unione 2020). Assessing the Origin aliana vini e Federbio), 3 ago 2020. Trinchera A. "Il progetto fosphonic Acid Residues in Organic OFOSF-WINE: attività e contributo al nuovo decreto sugli LMR egetable and Fruit Crops: The fosf Project Multi-Acto pproach", Agronomy 2020, 10(3 21. 2) Trinchera A., Bazzocchi chera D. (2020). Fosfito, il fantasma el biologico. Terra e Vita 3: 64-6 Trinchera A. "Il progetto BIOFOSF /INE: individuazione delle cause e ontaminazione da fosfiti nei vini ogici".	International Workshop: "Why phosphonic acid residues in organic wine? The Italian BIOFOSF-WINE project", BIOFACH 2020, Norimberga 15 feb 2020. Webinar: "LMR fosfiti nel vino biologico: i passi avanti del nuovo decreto", Webinar (Unione 2020). Assessing the Origin aliana vini e Federbio), 3 ago 2020. Trinchera A. "Il progetto fosphonic Acid Residues in Organic OFOSF-WINE: attività e contributo al nuovo decreto sugli LMR egetable and Fruit Crops: The fosf Project Multi-Acto pproach", Agronomy 2020, 10(3 21. 2) Trinchera A., Bazzocchi chera D. (2020). Fosfito, il fantasma el biologico. Terra e Vita 3: 64-6 Trinchera A. "Il progetto BIOFOSF /INE: individuazione delle cause e ontaminazione da fosfiti nei vini ogici".
BIONET 2017-2022	conservation of old italian varieties from Veneto in onegliano collection.	M. GARDIMAN CREA-VE	Veneto Region	- Abstract in atti di convegno ardiman Massimo; Carraro Roberto iero Marina; Soligo Stefan 2021).Recupero e caratterizzazione ella biodiversità viticola del Veneto caso dei vitigni "Benedina" Mattarella". 118-118.	
BIOPROTEC grapvine as product model for fruit conservation against microorganisms.	The project aims to identify and isolate natural antagonists and new technologies to contain the botritis during post harvest.	T. NARDI W. CHITARRA CREA-VE	- Cariverona Foundation		- Assegni di ricerca - n.1
BIOTECH-VITECH Novel biotechnologies for Italian agriculture - new breeding technologies for sustainability and competitiveness in viticulture.	Use the new biotechnologies for breeding of wine and table vines and rootstocks to increase sustainability and competitiveness of the supply chain. Improve both table and wine elite varieties, as well as rootstocks the characteristics of resistance to biotic and abiotic stress and quality characteristics such as apyrenia for table grapes.	R. VELASCO CREA-VE	MIPAAF	- Article Rosaria Forleo; Margherita Amico; Teodora Basile; Antonia omenico Marsico; Maria Francesco ardone; Flavia Angela Mariaaggiolini; Riccardo Velasco; Carlo ergamini (2021).Somat mbryogenesis in Vitis for Genom diting: ptimization of Protocols fo ecalcitrant enotypes.Horticulturæ, 7, 11,DOI:10.3390/horticulturæ7110511. Article versano Riccardo; Cardone Maria francesca; Morgante Michele; Mose audio; Perrone Irene; Velasco ccardo (2021).Le TEA porteranno ti più resistenti all /versità.L'Informatore Agrario, 23-25.	- Assegni di ricerca - n.2

				- Article Giudice G†, Moffa L†, Varotto S, Gardone MF, Bergamini C, De Lorenz, Velasco R, Nerva L*, Chitarra W 2021. Novel and emerging biotechnological crop protection approaches. Plant Biotechnology Journal (in press) doi.org/10.1111/pbi.13605. *Equally contributed as senior author. Equally contributed as first authors	
BIOTICES Cultivar Cesanese characterization.	Regional biotypes in viticulture of Olevano Romano and nearby landscape, particularly for the Cesanese variety	CREA-VE	- COMUNE DI OLEVANO ROMANO (RM)		
BODICA Study on the landscape and biodiversity of Cartizze	Deepen and disseminate knowledge of the landscape and biodiversity elements that distinguish the wine-growing area of DOCG Prosecco and Cartizze	F. GAIOTTI CREA-VE	- Consorzio per la Tutela del Prosecco di Conegliano Valdobbiadene		
CAMPI CONNESSI Precision agriculture and connectivity	Identify the interactivity needs of digital systems by putting the farmers in a position to know problems of interconnectivity and to choose and know how to direct the available technology towards a greater compatibility of the multiple technological components of the crop production system.	R. PERRIA CREA-VE	Toscana Region		- Borse di studio - n.2
CESANESE Research agreement focussing the correct management of Cesanese variety (regional variety)	Studies on the correct management of vinification (micro and meso vinifications) of the Lazio regional variety Cesanese	D. TIBERI CREA-VE	- University of Tuscia (DIBAF)		
CNR-ISP Study on the aromatic composition of wines, Malga products from Belluno province and Tirol	Study on the aromatic composition of products from Belluno province and Tirol aimed to define wine acceptability, organoleptic features and matching with food	R. FLAMINI CREA-VE	- CNR - CONSIGLIO NAZIONALE DELLE RICERCHE		
CPVO2021-VE Evaluation of varieties through the European office of patenting and plant novelties under parameters and quality tests for the CPVO sector table grapes	Characterization of new varieties, service for the CPVO European office of patenting and plant novelties under parameters and quality tests for the CPVO sector table grapes	L. AGGIO CREA-VE	- COMMUNITY PLANT VARIETY OFFICE (CPVO)		
CREAVEBDP Supporting research and development for sustainability in viticulture	Verify the potential use of UVA radiation to protect the new resistant grapevine varieties: against peronospora and mildew, Verify the real effect on pathogens of grapevine during the entire season Efficiency of natural product to induce resistances against the major pathogens in grapevine.	P. MARCUZZO CREA-VE	- Banca delle Prealpi SanBiagio		
DIBIO-BIOPRIME Natural compounds and microorganisms for plant protection in Mediterranean organic farming.	Reduce or substitute the use of pesticides in cereals culture, horticulture, viticulture and seed tanning. The innovation brought by project is the use of natural compounds, such as essential oils and natural molecules, already well characterized for their pharmacological activity and for which already exists a large-scale production at low costs. The selected molecules will be used to induce the priming state in the selected culture.	V. TERZI CREA-GB CREA-VE CREA-ZA CREA-AA	MIPAAF	Orsoni, N. et al. (2020). Double-stranded dsRNAs against grey mold in grapevines—Can Modified Natural Products Be Used as Alternatives to Chemical Fungicides? Frontiers in Plant Science, 11(22), 868. doi: 10.3389/fpls.2020.00868. *Equally contributed as senior author. Equally contributed as first authors	- Contributo in volume (Capitolo o Saggio) Zinc nanostructures: Detection and elimination of toxigenic fungi and mycotoxins. Zinc-Based Nanostructures for Environmental and Agricultural Applications Nanobiotechnology for Plant Protection, Molecular Sciences, 21(22), 868. doi: 10.3389/molecules.2020.00006-9.

				<p>rotection. Biomolecules, 12(12), 1911. Nerva, L., et al (2020). Isolation and molecular characterization and genome analysis of culturable wood-inhabiting endophytes in escaped grapevine plants. Environmental Microbiology, 22(12), 4511-4521.</p> <p>Maestrini, R. et al (2020). Photosynthetic Traits and Nitrogen Uptake in Crops: Which Is the Role of Arbuscular Mycorrhizal Fungi? Plants, 9(9), 1109.</p> <p>Bertazzon, N., Chitarra, W., Angelini, E., & Nerva, L. (2020). Two new putative plant viruses from wood-inhabiting endophytes: A metagenomics analysis of an escaped vineyard. Plants, 9(7), 835.</p>	
CUPROSUP Alternative strategies to reduce copper use in viticulture to cope with climate change	Identify canopy management techniques, alternative formulations or in association / alternation with copper, use of weather stations with predictive model of downy mildew infections of the vine, with the ultimate aim of reducing the use of copper in viticulture	V.TERZI CREA-GB CREA-VE CREA.CI	MIPAAF	Hunter et al., 2020 Grapevine physiological response to rotation-induced spatial radiation and microclimate changes. OENOLOGIA, 54, (2), 411-433.	
DIVINE Control of grapevine infectious diseases and nematodes.	Identify and try integrated strategies against infectious diseases, generation of grapevine and nematodes by means of natural compounds and biological control agents in highly productive grapegrowing areas, valuation of the economic balance of the adopted solutions and training of growers in Veneto region.	E. ANGELINI CREA-VE	Veneto Region	1) Vally Forte, Nadia Bertazzon, Michela Panzeri, Luisa Filippini, Manuel Gallo, Lorena Dalla Cia, Elisabetta Angelini, 2020. Diffusione della virosi della degenerazione infettiva in aree di alta vocazione viticola del Veneto. Atti Giornate Fitopatologiche, 2, 453-458; 2) G. D'errico, F. Vinale, M. Chitarra, S. L. Woo, E. Angelini, S. L. Woo, F. P. D'errico, M. Lorito, 2020. Nematofauna presente nei vigneti. Atti Giornate Fitopatologiche, 2, 303-310.	- Borse di studio - n.2 1 training course for winegrowers.
ECOFISIOVIT Ecophysiology in organic table grape.	Evaluation of the effects of irrigation management on vine growth, canopy microclimate, through physiological measurements in organic table grapes vines.	T. LUIGI CREA-VE	Istituto Agronomico Mediterraneo IAM		A method to predict the time of harvesting based on water consumption and changes in berry composition of table grapes (cv. Superior seedless) under plastic sheet covering. L. Tarricone1a, G. Dragonetti2 V. Verrastro: Acta Hort. (in press).
EJP SOIL Towards climate-smart sustainable management of agricultural soils	Research and integrated activities to improve the contribution of crop soil to the mitigation of the climate change, sustainable agriculture, and eco-systemic services prevention and recover of degraded soils.	G. BRAGATO CREA-VE CREA-AA CREA-PB	Commissione Europea I0		

ESCA ZEOFIX Esca disease management	Verify the effect of curative treatments on vines with asymptomatic of Esca disease.	P. STORCHI CREA-VE	I.S.L.A. srl		
ESCinterfere Vaccination in viticulture against Esca disease.	Introduce sustainable and environmental friendly approaches to mitigate the esca grapevine syndrome in order to valorize the Veneto region viticulture and its products. The project follows the objective to achieve a more sustainable agriculture helping the agriculturists, following the 2030 sustainable development agenda.	L. NERVA CREA-VE	- Veneto Region		
FD.NEW Searching for the causes of the new Flavescence dorée epidemics in Veneto region.	Searching for the causes of the Flavescence dorée epidemics in vineyard by means of: identification of potential new vectors and wild host reservoirs, molecular characterization of aggressive and mild pathogen strains.	E. ANGELINI CREA-VE	- Veneto Region	Sylvie Malembic-Maher, Delphine Desqué, Dima Khalil, Pascal Sala, Jean-Luc Danet, Marie-Pierre Dubrana-Ourabah, Sybille Dure, Zoltan Ember, Zoltan Acs, Michelella Bartolla, Alberto Matteredazi, Lisa Filippin, Slobodan Krnjajic, Ivica Boževski, Frederike Lang, Barbara Rausch, Maria Kölber, Jelena Jovic, Lisa Angelini, Nathalie Arricaud, Bouvery, Michael Maixner, Xavier Bissac 2020. New insights into the emergence of the grapevine flavescence dorée epidemics in Europe. PLoS Pathogen 16(3):1007967. doi.org/10.1371/journal.ppat.1007967	1) W. Chitarra, S. Bressan, M. Bottura, E. Angelini, F. Mutton, M. Unich, A. Zanzotto, 2020. Focus sulle fitopatie più dannose nel 2020 nei vigneti di Veneto, Friuli Venezia-Giulia, Trentino e Alto Adige. Atti incontro tecnico "Bilancio fitosanitario viticolo 2020" online, 27/11/2020.
GESOVIT2 Innovations for the sustainable management of the vineyard and for the definition of the environmental sustainability certification criteria of the wine farm.	Development of an innovative technology based on electronic sensors and an artificial vision system for "precision" irrigation in the vineyard	F. GAIOTTI CREA VE	Friuli Region	- Articolo in rivista Gaiotti Federica; Lucchetta Marco, Giacomo Rodegher; Daniele Brenzoni; Edoardo Longo; Emanuele Boselli; Stefano Cesco; Nicolò Elfiore; Lorenzo Lovat; José Manuel delgado-López; Francisco J. Carmona; Antonietta Guagliardi; Norbert Lasciocchi; Youry P. (2021). Urea-Doped Calcium Phosphate Nanoparticles as Sustainable Nitrogen Nanofertilizers for Viticulture: Implications on Yield and Quality of Pinot Grapes. Agronomy, 11, 6, DOI: 10.3390/agronomy11061026.	- Assegni di ricerca - n.1 1 Proceeding XIII International Terroir congress. Gaiotti et al. TERROIR VALORIZATION STRATEGIES IN REFORMED DENOMINATION AREA: THE PROSECCO CASE STUDY.

GLERES Breeding of Glera to main fungal diseases	Obtain new progeny of Glera variety for the production of Prosecco wine, new varieties resistant to the main pathogen of grapevine and promote new sustainable practice to decrease pesticides in viticulture	D. MIGLIARO CREA-VE	Confagricoltura Treviso	- Articolo in rivista "L'Informatore Agrario" di Riccardo; Migliaro Daniele; Possamai Tyrone; Niero Marina; Santellani Fiorenza; Panighi Annarita; Flamini Riccardo (2021). Immaginarsi il futuro della viticoltura, i figli di Glera. Corriere Agricolo, 17, 11-13. Articolo in rivista "L'Informatore Agrario" di Riccardo; Migliaro Daniele; Possamai Tyrone; Loffa Loredana; Pasetti Martin (2021). Strategie alternative di lotta ai patogeni: caso studio delle resistenze genetiche a Peronospora e Oidio nell'oliveto di Glera (Vitis rotundifolia). Dendronatura, 42, 2, 69-83. Articolo in rivista "L'Informatore Agrario" di Riccardo; Zombard Alessandra; Bergamini Carlo; Migliaro Daniele (2021). Il miglioramento genetico dei vitigni autoctoni. L'Informatore Agrario, 17, 11-13.	
IRRIVISION Rational management of irrigation based on artificial vision.	Development of an innovative technology based on electronic sensors and an artificial vision system for "precision" irrigation in the vineyard.	F. GAIOTTI CREA-VE		Veneto region Proceeding XI International Terroir congress. Gaiotti et al. Terroir valorization strategies in the reformed denomination area of Prosecco case study	IRRIVISION Rational management of irrigation based on artificial vision. Webinar presentation of results 1° year 2020/06/2020.
HABITAR-SI Strategies for truffle management in the typical truffle areas in central Italy	Innovative management of truffle habitat in the region of Tuscany (Siena) both in natural habitat and in cultivations, identification of new knowledges on the precious white truffle. The main object is to develop methods of management in semi-natural environment to implement the production of this species.	G. BRAGATO CREA-VE	- Toscana region		- Assegni di ricerca - n. 1
HPMEDMET Effects of climate change in the Mediterranean basin on health promoting metabolites production in blueberry and disease-resistant vines	Study the metabolic and physiological behavior of two fruit crops grown in the environmental conditions occurring more and more frequently in many regions of the Mediterranean basin, also due to global warming: elevated temperature and heatwaves and plant water stress. Study focused on vine and blueberry as they are fruit crops of substantial economic and social interest in Italy and growing interest in Israel.	R. FLAMINI CREA-VE	- MAECI		
IFG.MICRO activities of sanitary analyses, in vitro micropropagation and virus sanitation on grapevine	Recovery from viruses and micropropagation of grapevine and table grape	E. ANGELINI CREA-VE	- IFG - INTERNATIONAL FRUIT GENETICS		
INNOFRUIT Sustainability and innovation in table grape cultivation.	Promote the recovery of competitiveness and profitability of Apulian table grape producers compared to the main competitors, working organically on the product improvement and on the efficiency and sustainability of the entire production process.	A. R. Caputo CREA-VE CREA-AA	- Puglia Region		

INNOVITIS Innovazioni sostenibili di processo e prodotto per il miglioramento dell'uva da tavola siciliana	Innovitis ha l'obiettivo di trasferire alle aziende produttrici di uva da tavola del comprensorio di Mazzarrone innovazioni varietali, di tecniche gestionali e colturali e di trasformazioni dell'uva da tavola, allo scopo di aggiornare e arricchire la piattaforma ampelografica disponibile per i produttori, migliorare le produzioni, aumentare la sostenibilità economica ed ambientale degli impianti. Il trasferimento avverrà in un contesto di rinnovamento con un approccio agroecologico e tecnico e prevede protocolli di gestione del suolo, dell'acqua e del grappolo e di trasformazione.	F.S. FERLITO CREA-OFA	- Regione Siciliana		- Borse di studio - n.2
INVITENNET	GO (operative group) PSR Lazio for regional funds.	F. CECCHINI CREA-VE	- Lazio Region		
IPM-POPILLIA Integrated Pest Management of the invasive Japanese Beetle, <i>Popillia japonica</i>	The aim of IPM-Popillia is to address the challenge of the new risk to plant health in Europe, the invasion of the Japanese beetle, <i>Popillia japonica</i> . This pest was introduced accidentally to mainland Europe in 2014 and has spread easily in the course of trade and the movement of goods and people. <i>P. japonica</i> threatens the entire agricultural sector, as well as the biodiversity in the invaded area. Prevention of the species' invasion faces two constraints: The possibilities to restrict movement of goods and people are limited, and successful eradication of the population established south of the Italian-Suisse border is impossible. Recently, EFSA and the JCR of the European commission have nominated <i>P. japonica</i> as a candidate high priority pest in the new EU Plant health Law. Against this background, it is paramount to develop measures, which (1) help to confine the spread of the new pest, and (2) prevent the build-up of high population densities that cause economic loss to agricultural crops and increase migration pressure of the Japanese beetles. The project IPM-Popillia develops these measures. It involves teams working in the core of the recent outbreak area, conducting fit-for-purpose practical research in a European environment that can be applied immediately, as short-term containment measures. In the longer term, IPM-Popillia provides tools and advice on how to manage the pest on a larger, European continental scale, and on how to be better prepared for similar pest invasions in the future.	L. MARIANELLI CREA-DC	- Commissione Europea- INRA - UMR IGEPP - E-NEMA - Agroscope - SPOTTERON GMBH - PESSL INSTRUMENTS GMBH - JARDIN SUISSE SERVIZIO FITOSANITARIO TICINO - SFTi - TUM-Technische Universität München FUNDACAO GASPAR FRUTUOSO		- Assegni di ricerca - n.2
IRRIVISION Rational management of irrigation based on artificial vision.	Development of an innovative technology based on electronic sensors and an artificial vision system for "precision" irrigation in the vineyard.	F. GAIOTTI CREA-VE	- AVEPA Veneto Region	Proceeding XIII International Terroir congress. Gaiotti et al. Terroir valorization strategies in a reformulated denomination area the Prosecco case study.	Webinar presentation of results 1° year 23/06/2020. 1 student fellowship
Irrivit	Razionalizzazione dell'apporto irriguo in viticoltura da tavola, caratterizzazione fisiologica e carpometrica uva da tavola	G. MASI CREA-VE	- CHECKFRUIT S.R.L.		
IRRIVIT 6 Rational water supply in table grape cultivation.	Introduction on 9 table grape farms located on Apulia and Sicily regions an efficient water irrigation management, use of DSS to monitoring grape diseases and introduction of cover crops in vineyard to increase soil biodiversity and soil organic matter.	G. MASI CREA-VE	- CHECKFRUIT S.R.L.		Protocols of irrigation technology.

KATTIVO Treatments with innovative technology of variable rate, reduction of pesticides with low and proportionate to the canopy	Development of a technological kit that, applied to additional airblast sprayers used in viticulture, allows the distribution of phytosanitary products in a "variable" manner depending on the volume of the canopy to be treated, thus reducing the release of pollutants into the environment and waste of resources (eg water, fuel).	P. STORCHI CREA-VE	- Toscana Region	Presentation Accademia Georgofili, 12.11.2020.	- Assegni di ricerca - n.1
La Vialla Sustainable plant protection approach	Use of company waste products, with a biostimulating action, to reduce the use of copper against downy mildew	R. PERRIA CREA-VE	- La Vialla srl		
LIFE GREEN GRAPES New approaches for protection in modern sustainable viticulture: from nursery to harvesting	Improve the pest control response of grape varieties and increase of microbial biodiversity throughout the viticulture production chain, from the nursery to the production of wine and table grapes, by decision support systems and resistance-inducing natural products	P. STORCHI CREA-VE CREA-AA CREA-DC	- European Commission- Cyprus University of Technology		- Qualità delle uve nell'ottica della produzione sostenibile del prodotto fresco: il caso del Progetto LIFE GREEN GRAPES 12/05/2021 Una gestione sostenibile per migliorare la biodiversità nel suolo nel vigneto 11/04/2021 LIFE GREEN GRAPES - New approaches for protection in modern sustainable viticulture: from nursery to harvesting 12/03/2021 Progetto LIFE GREEN GRAPES: Nuovi approcci per la difesa in una viticoltura moderna e sostenibile: dal vivaio alla raccolta 13/12/2021 Assegni di ricerca - n.1
LIFE WINEgRover	Precision viticulture and its impact on the environment, human health and air quality to the standard management	P. CIRIGLIANO CREA-VE	- European Commission- Wellness Telecom S.L. techgroup - Smart city cluster Innova+ - Innovation Services, S.p.A.		- Assegni di ricerca - n.2
LI-NU effects of different yeast strain and nutrition on the aromatic composition of wines	Evaluate the effects of different nutrients on yeast strains in white wines Evaluate the effects of different nutrients on yeast strains in red wines Compare commercial <i>Saccharomyces cerevisiae</i> and experimental strains on aromatic profiles of several wines	A. COSTANTINI CREA-VE	- OENOBRANDS		
MED-GOLD Turning climate-related information into added value for traditional Mediterranean Grape, Olive and Durum wheat food systems	Setting the scene: appraising the MED-GOLD sector Assessing existing climate information and development of a common ICT platform Co-design of pilot service for olive/olive oil Co-design of pilot service for grape/wine Co-design of pilot service for durum wheat Engaging validating and exploiting the pilot services with MED-GOLD communities Communication and exploitation of MED-GOLD value chain Management and coordination of MED-GOLD	A. ROSATI CREA-OFA	- Commissione Europea		
MENOZOLFO New methods to contain the oidium development on grapevine	Excessive use of sulfur on grapevine creates troubles in grapevine orchards therefore the aim of this project is to evaluate alternative products and protocols to reduce dramatically the use of sulfur below the established thresholds	- RICCARDO VELASCO - Viticulture and Enology	- Regione Veneto		

METABARCODING Metabarcoding Study of the biodiversity and dynamics of the microbiome capable of producing biogenic amines by Metabarcoding; evaluation of their role as potential allergens.	Know the levels of AB contamination in Langhe, Roero and Monferrato wines; Determine the biodiversity of the wine microbiome through Metabarcoding; Identify if there are critical control points during the vinification; Develop know-how on the "biogenic amines theme" to be a point of reference in the area of wine control; Estimate the prevalence of wine intolerance symptoms in a sample of the adult population.	E. VAUDANO A. COSTANTINI CREA-VE	Ministry of Health	erutti, Crescio Costantini, Acuti audano, Peletto 2020. Wine tolerance: a pilot study. Italian Journal of Food Science Vol. 32 No.	
MI.DI.FEN.DO. Competitive microorganisms against flavescence dorée	Find a preventive defense method against Flavescence dorée, a disease-causing significant damage in viticulture, especially in organic wine-growing farms	V. FORTE CREA VE	Veneto Region	Bertazon N., Forte V., Filippin L., asarin S., Angelini E., 2020. L'uso sposte di difesa di due varietà versamente sensibili alla FlavEsceNza avescenza dorata della vite: studio centi e prospettive. Atti Giornate topatologiche.	Flavescenza dorata. Conegliano Valdobbiadene magazine, luglio 2019, pp70-71 / MI.DI.FEN.DO Uso di Microrganismi nella Difesa della vite contro Dorata cooperazione per migliorare la competitività e sostenibilità delle aziende biologiche. RRNN 2020 1 student fellowship - Assegni di ricerca - n.1
MICOVIT BIOTECH APPLICATE ALL'ALLEVAMENTO MICORRIZZAZIONE DELLA VITE IN VIVAI E SISTEMI DI RILEVAMENTO DELL'EFFICIENZA PERFORMANCE DI PIANTE MICORRIZZATE IN VIGNETO SU BASE GEOMATICA	rafforzare la capacità del sistema di ricerca e a favorire la competitività del sistema produttivo del Lazio	S. VANINO CREA-AA	- Regione Lazio		
MicroBIO	Protection and conservation of natural resources, biodiversity and natural ecosystems; reinforcement of the agriculture as mitigation strategies of climate change and environmental risks; adoption of novel cultivation protocols with lower environmental impact with higher respect of soil fertility; sustainable management and development of natural resources; valorization and care of natural and local resources also in view of tourism development; protection protocols and risk prevention to dramatic natural events	W. CHITARRA CREA-VE	- Fondazione Cariverona		
MO-NUT Study of the effect of different formulations and dosages of nutrients on alcoholic fermentation, on the aromatic composition and on the sensory profile of wine	Identification of the best nutrient formulation for yeast; evaluation of the impact of nutrients on the aromatic composition of wine; evaluation of the effect of nutrients on the sensory profile of wine	E. VAUDANO A. COSTANTINI CREA-VE	Oenobrand	Internal report on the results of the trial. Dissemination of results, meetings with tastings and discussion with farms.	
NUOVAVITE Toward a Veneto new model in viticulture.	Looking for a new strategic management of the Veneto vineyard based on soil sustainable approach and considering new natural products against grapevine disease	D. TOMASI CREA-VE	- Veneto Region		
NuVaUT Breeding of table grape in Puglia region	The aim of the project is to respond to the need for innovation in the Apulian viticulture sector by increasing the range of table grape cultivars that adapt to the pedoclimatic context of the Mediterranean areas.	R. PERNIOLA CREA-VE	Consorzio Nu.Va.UT		36 new table grape varieties adapted to the territory of southern Italy.
O.M. Organic nutrition of orchard soils in Tuscany region	Research activity aimed to develop new protocols for organic nutrition of grapevine orchards with different formulations in Tuscany	P. CIRIGLIANO CREA-VE	- SCAM S.P.A.		

OENOMED Mediterranean protected areas sustainable viticulture and development	Sustainable development in the wine production chains of the Mediterranean Protected Areas	P. CIRIGLIANO CREA-VE	- European Commission- AOCL Syndicat de l'Appellation d'Origine Contrôlée Languedoc HER - Conseil Départemental de Hérault - UVL - Union Vinicole du Liban ECOPARK - Société de Gestion de la Technopole de Borj-Cedria INRA - INSTITUT NATIONAL DE LA RECHERCHE AGRONOMIQUE CREAL - Centre de Recherches et d'Etudes Agricoles Libanais - ACS - Al Shouf Cedar Society		- Borse di studio - n.1
OLTRE.BIO Over BIO management innovation in organic cherries and table grape cultivation	Transfer of innovations in agronomic techniques in organic farming and optimization of organic table grape post-harvest	L. TARRICONE CREA-VE CREA-AA	Puglia Region - IAMZ-CIHEAM Mediterranean Agronomic Institute of Saragoza		- La compagnia del suolo. Contro la desertificazione dei suoli serve un'altra agricoltura 13/10/2021 Bari
OZOPLUS Management of water with ozone and yeast strains in grapevine orchards aimed to better management of sulfur during vinification	GRAP Verify in orchards if ozone rich water and additional yeast strains as eco-sustainable products may contribute substantially to the decrease of sulfur in containing oidium in grapevine	E. ANGELINI CREA-VE	- Regione Veneto	- Abstract in atti di convegno Gnorrotto Marzia; Bertazzon Nadia; Galla Rosa Giacomo; Angelini Elisa; Monte Gianni; Corich Viviana; Incenzi Simone (2021).Valutazione dell'applicazione integrata di acqua ozonizzata per una difesa sostenibile della vite. 31-31.	- Borse di studio - n.1
OZOPLUSWINE Ozonized water for an integrated control strategy in grapevine.	Assessment of the effectiveness of ozonized water and antifungal treatments in vineyards to control the main fungal diseases of grapevine: downy and powdery mildew and grey mold, by using a new experimental field spraying tool	E. ANGELINI CREA-VE	- Veneto Region	- Abstract in atti di convegno Gnorrotto Marzia; Bertazzon Nadia; Galla Rosa Giacomo; Angelini Elisa; Monte Gianni; Corich Viviana; Incenzi Simone (2021).Valutazione dell'applicazione integrata di acqua ozonizzata per una difesa sostenibile della vite. 31-31.	- Borse di studio - n.3
POFACS Storage capability, quality and security in horticulture	Make available new knowledge, new products and innovative processes aimed at improving shelf life, quality, safety and sustainability.	T. CARDI CREA-OF CREA-VE CREA-GB CREA-OFA	• MUR		
PRIM.VITI.VAAZ Monitoring and valorization of intravarietal variability within Primitivo clones in the farm TERRE DEI VAAZ	Characterization of "Primitivo Storico" accessions present within the Estate "Terre dei Vaaaz," located in a typical area of wine grape cultivation (Sammichele di Bari and area of the DOC Gioia del Colle), to identify a typical clone/variety of Primitivo "Storico". Study of a modified push training system and individuate the best rootstock grafting combination of Primitivo variety	G. MASI CREA-VE	TERRE DEI VAAZ Società Agricola Semplice	Masi, G., Ivone, W., Verrastro, V. (2020). "Il lungo viaggio del vitigno "Primitivo". Volume: Dalle Murge alle Terre dei Vaaaz - Territori e risorse di Puglia. DIELLE Comunicazione ISBN 978-88-9004903-3 pp.(240-242	
ProFito Multiple tests using novel products with low impact on environment	Evaluate the efficacy of bad smelling decrease of synthetic products in viticulture. Verify adhesive ability of new chemical product in viticulture Measure anti-transpiration effect of new synthetic products aimed to decrease water stress Test mixing tolerance of different products admitted in organic farming	M.E.M. D'ARCANGELO CREA-VE	- Paneco Ambiente s.r.l.		

PRO-Forma Supervision and diffusion of novel strategies to contain the use of sulfur and synthetic chemicals in viticulture	Training and diffusion of knowledges on novel protocols and methods regarding correct behavior and management of grapevine orchards, toward reduction of plant protection products, both in integrated and organic farming.	R. VELASCO CREA-VE	- Regione Veneto		- La sinergia tra la Regione Veneto e il CREA per la sostenibilità: viticoltura a basso impatto ambientale 3/07/2021 Jusegana Ricognizione e diffusione di strategie di difesa e prodotti innovativi finalizzati alla diminuzione dell'impiego di fitofarmaci in viticoltura 7/09/2021 onigo Ricognizione e diffusione di strategie di difesa e prodotti innovativi finalizzati alla diminuzione dell'impiego di fitofarmaci in viticoltura 0/09/2021 ave
Pros-Eco Development of pest and pathogen management	Development of pest and pathogen management with low environmental impact in the Prosecco superior DOCG	L. NERVA CREA-VE	- LA RIVETTA SOC. AGR. srl		
PROSIT Digital platform for soil management in the vineyard.	Development of an online digital platform for soil management in the vineyard	P. STORCHI CREA-VE CREA-AA	Toscana Region	D'Avino L., 2020. Perché l'agricoltura potrebbe salvarci dai cambiamenti climatici, Ecquologia sibile al sito https://ecquologia.com/category/efficienza/chimica-verde/ (accertato 10/11/2020).	- Assegni di ricerca - n.1 Borse di studio - n.1 Webinar 26 11 2020 "La mappatura digitale dei suoli toscani" L. D'Avino (https://www.goprosit.it/wp-content/uploads/2020/12/Lorenzo_DAvino.pdf)
Puglia_INNO.VIT Development of the ampelography platform in Puglia through evaluation of new varieties for their introduction in the Puglia region	Due to the increasing request of novelties in wine production this project aim to test the suitability in Puglia region of novel and ancient varieties to enlarge the offer and the adaptation to climate changes	A. R. CAPUTO CREA-VE	- Azienda Tormaresca soc. agr. r.l.		
PuVioT Puglia vitivinicola dell'Internet of Things	Introduction in different wine grape area of Apulia region of precision viticulture	G. MASI CREA-VE	- Regione Puglia		
QUALIFITO Recovery and distribution of sanitized germplasm in Lazio region	Lazio State of art survey of sanity of the germplasm in orchard and eventually obtain the full recovery through selection	L. FERRETTI CREA-DC CREA-VE	- ARSIAL		- Borse di studio - n.1
RESVIT Checking resistant varieties adaptation to different environments	Set up a new disease resistant grapevine varieties collection (60 genotypes) in order to examine resistance to diseases and to define the wines quality and plant productivity	D. TOMASI CREA-VE	Società Cattolica Agricola a r.l.		

REVINE Regenerative agricultural approaches to improve ecosystem services in Mediterranean vineyards	Apply regenerative agriculture techniques in viticulture in different Mediterranean areas with the introduction of new resistant genotypes in order to preserve the water resource and soil fertility, control soil erosion and create chemical-physical conditions suitable to favor the presence of beneficial soil microorganisms and favor a better adaptation of viticultural crops in response to climate change.	R.PERNIOLA CREA-VE	Public and private institutions - European Commission- Burgundy School of Business (BSB) - Agricultural Research Center - Associação de viticultores do concelho de Palmela (AVIPE) Vasiliko Oinopoieio Kyperounda Ltd (VOK) street Griva Digeni 102 Kyperounda, 4876 Limassol, Cyprus - Regional Centre of Agriculture Research of SidiBouazid (CARRA) Vlassides Winery Ltd (VW) street Panayias Eleousas 5, Koilani, 4771 Limassol FCiências.ID - Associação para a Investigação e Desenvolvimento de Ciências - Biosystems and Integrative Sciences Institute (BioISI) and Marine and Environmental Sciences Centre (MARE), street Campo Grande, edifício C1, 3.º piso, Campo Grande, 1749-016		
RGV-FAO	Conservation, characterization, use and evaluation of new genetic resources for feed and food. specifically, this unit is devoted to the conservation of the 5.000 accession of grapevine into the CREA collection	I. VERDE CREA- OFA CREA-VE CREA-AA CREA-CI CREA-DC CREA-FL CREA-GB CREA-IT CREA-OF CREA-OFA CREA-ZA	MIPAAF	- Articolo in rivista Pasquale Tripodi; Gianluca Francesco Onofaro Sanaja; Carlo Di Cesare; Giovanna Festa; Antonietta Alessandri; Giuseppe Mennella (2021).A multi-methodological approach to study genomic footprints and environmental influence on agronomic and metabolic profiles in panel of Italian traditional sweet pepper varieties.Journal of Food Composition and Analysis, 103,DOI: 10.1016/j.jfca.2021.104116. Articolo in rivista Marchetti Lucia; Saviane Alessio; Della Montà Antonella; Pagliaruzzi; Pellati Federica; Benvenuto; Bertelli Davide; Cappellozza Silvia (2021).Determination of 1-deoxynojirimycin (1-DNJ) in Leaves of Italian or Italy-Adapted Cultivars of mulberry (Morus sp.pl.) by HPLC-MS..Plants, 10, 8,DOI: 10.3390/plants10081553. Articolo in rivista Cappellozza Silvia; Demo Edoardo; Saviane Alessio (2021).I gelsi ai tempi dei Dogi: quando Venezia dominava l'Adriatico..Vita in campagna, 7-8,DOI: 10.1017/9781108888888.012. Abstract in atti di convegno Caccioppa Fabiola; Palumbo Massimo; Pagliaro Antonella; Di Stefano Vita; Candurra Salvatore; Sollima Lucia; Pirri Nino; Melilli Maria Grazia (2021).VALUTAZIONE DELLE	- Ecotipi tradizionali di patata. Una risorsa da tutelare 06/2021 Patata dell'Emilia European Research Night 2021: The Potato Show 09/2021 La Patata: tesoro nascosto dai mille colori 09/2021

				<p>ARATTERISTICHE QUALITATIVE E UTRIZIONALI DI PANI FUNZIONALI, RRICCHITI CON PORTULACA LERACEA L. E OPUNTIA FICUS-IDICA 283-283.</p> <p>Abstract in atti di convegno aputo Angelo Raffaele; Gasparro larica; Bergamini Carlo; Alba ttorio; Migliaro Daniele; Roccotelli abino; Cirigliano Pasquale; Del ungo Stefano (2021).Il germoplasm ticolo dell'Enotria nel Mezzogiorno Italia. .</p> <p>Contributo in atti di convegno azza Laura; Galassi Elena; Cacciato erino (2021).Agronomic, echnological and nutritional aracterisation of selected erennial wheat lines grown in Italy. 7-32.</p> <p>Contributo in atti di convegno etrella Marco; Giovannini Daniela; appellozza Silvia (2021).Simple equence repeat markers enabled enetic characterization of mulberry ermplasm preserved in the CREA's ollection of Padua, Italy.Acta orticulturae, 1307, 299-305.DOI: 0.17660/ActaHortic.2021.1307.46.</p>	
Ri.Vi.Parco 2 Discovery and valorization of germplasm in the Cilento National Parc	Protection and promotion of viticultural biodiversity in Campania to qualify the production and improve the competitiveness of wine sector, proceeding to the technical and legal recognition of the new plant variety	A. R. CAPUTO F. CECCHINI CREA-VE	Ente Parco Nazionale del Cilento, Vallo di Diano e Alburni		Technical and scientific files of new plant varieties (wine grape varieties).
Ri.Vi.Parco_2 Riscoperta e valorizzazione dei vitigni d'orso di caratterizzazione del Parco Nazionale del Cilento, Vallo di Diano e Alburni	Valorizzazione tecnologica della biodiversità viticola in Campania. Riscoperta e valorizzazione dei vitigni d'orso di caratterizzazione del Parco Nazionale del Cilento, Vallo di Diano e Alburni	- ANGELO RAFFAELE CAPUTO; MASSIMO MORASSUT - Viticulture and Enology	- Ente Parco Nazionale del Cilento, Vallo di Diano e Alburni		
Risanamento Risanamento da patogeni virali e germoplasma di vite autoctono della Regione Lazio	L'obiettivo generale di questo progetto è il risanamento da virus. Obiettivo del progetto è l'individuazione e l'ottenimento di accessioni di vite appartenenti a varietà autoctone del Lazio esenti dagli ORNQ previsti dal Reg. UE 1108/2019/2072.	- ANDREA GENTILI - Difesa e certificazione	- ARSIAL		
RIVA studio per la verifica della relazione tra composizione dell'uva e giacitura dei vigneti	Obiettivo della ricerca è quello di verificare l'esatta influenza delle condizioni dinamiche dei suoli (umidità, temperatura, attività di funghi e batteri) e dei mesoclimi proprio delle diverse giaciture (collina, pianura e fondovalle) sulla composizione chimica delle uve e sui valori organolettici dei vini	P. MARCUZZO CREA-VE	- Consorzio per la Tutela del Prosecco di Conegliano Valdobbiadene		
RUSTICA Demonstration of circular bio-based fertilisers and implementation	Production of new fertilizers starting from discarded material coming from agri-food industries. Validation of these products and demonstration of positive effect on	C. MONDINI CREA-VE	• European commission Katholieke Universiteit Leuven (Belgio))		- Assegni di ricerca - n. 2 - Contratto collaboratore di amministrazione a tempo determinato - n. 1

optimized fertiliser strategies and value chains in rural communities	ircular economy, waste decrease and management in four European rural region and one community in Latin America and Caribbeans CELAC		<ul style="list-style-type: none"> • Dranco NV (Belgio) • Chambre Regional d'Agriculture des Pays de la Loire (Francia) • Biosabor, S.A.T. (Spagna) • Tecnova (Spagna) • Avecom (Belgio) • EntomoAgroindustria (Spagna) • Particula Group (Croazia) • Wiedemann GmbH (Germania) • Idconsortium s.l. (Spagna) • Stichting Croyeye (Olanda) • ILVO (Belgio) • Universiteit Gent (Belgio) • CIAT (Colombia) 		
SCREENBIO-5TERRE20 Monitoraggio valutazione di biodiversità della mesofauna su aree viticole del Parco'	In 5 aree dell'Ente Parco, a distanza di un decennio, si studierà la comunità dell'artropodofauna edafica nel rispetto in relazione alle condizioni del suolo e sulla base delle pratiche colturali. La composizione della comunità della mesofauna e la biodiversità saranno valutate anche in base all'età dell'impianto. Il livello della copertura vegetale saranno approfondite la presenza e la composizione della comunità acarologica quale dotazione informativa da acquisire nella caratterizzazione del sistema.	SAURO SIMONI CREA-DC	- Parco Nazionale delle Cinque Terre		
SEL.ARGIANO clonal selection in grapevine	Clonal selection of cv Sangiovese to produce Brunello di Montalcino wine.	P.STORCHI CREA-VE	Argiano spa		
SEL-ECO selection of novel yeast genotypes and starters in enology (private and social wine cellars)	Development of new selection of yeast strains for private and social wine cellars	E.T. VAUDANO CREA-VE	- Sinergo Soc. Coop. Centro Studi, ricerche e servizi		
SESAMO Study of the oenological, historical, environmental and viticultural peculiarities of the "Aleramico" Monferrato for the enhancement of barrel aged Grignolino wine	Research on traditional Grignolino wine aged in wood, through the study of its aromatic and polyphenolic composition, key information to improve their shelf-life and promotion	M. PETROZIELLO CREA- VE	Cassa di Risparmio di Torino Fondazione		
SNIPS Natural byproducts from plant matrices for highly functional food preparation	Adoption of eco-sustainable vineyard management protocols aimed at the grapes' healthiness and the increase of secondary metabolites. Adoption of biotechnological protocols to produce preparations rich in bioactive components from winemaking waste.	R. A. MILELLA CREA-VE	- Puglia Region		

SOILANDPRO monitoring of organic carbon in relation to different soil management - PSR Marche	Organic fraction monitoring and carbon cycle in different locations in the Marche region with different history and human inputs	G. BRAGATO CREA-VE	REGIONE MARCHE – PSR 2014 2020		
SPUMAPULIA Sparkling process for the relaunch of the viticulture in North-Central areas of Puglia region.	Enhance the typical oenological productions of Central-Northern Puglia by effectively implementing sparkling techniques to obtain new sparkling wines and low alcoholic beverages (based on wine / must) representing the typicity of the Apulian territory and seize the opportunities offered by the markets	M.F. CARDONE CREA-VE	- Puglia Region	Velenosi, M.; Crupi, P.; Perniola, A.; Marsico, A.D.; Salerno, A.; Alexandre, H.; Archidiacono, N.; Ventura, M.; Cardone, M.F. Color stabilization of Apulian Red Wines through the Sequential Inoculation of <i>Archerella bacillaris</i> and <i>Saccharomyces cerevisiae</i> . Molecules 2021, 26, 907. https://doi.org/10.3390/molecules26040907	1° .12. 2020_Presentation Conference
TRANSFARM Transnational collaborative system to bring precision farming innovative applications closer to the market, address regional specializations in Central Europe	4. Improve sustainable linkages among Actors of the innovation systems for strengthening regional innovation capacity in Central Europe	R. VELASCO CREA-VE	- Commissione Europea		- Assegni di ricerca - n.2
TROPICSAFE Insect-borne prokaryote-associated diseases in tropical and subtropical perennial crops	Identify sustainable management strategies for the control of serious diseases of grapevine, citrus and palm crops in the tropical and subtropical areas, by means of disease and vector survey, field control trials and genetic resistance	E. ANGELINI CREA- VE CREA-PB	19 partners esteri/ European Commission	1)N Bertazzon, et al 2020. Le spore di difesa di due varietà diversamente sensibili alla avescenza dorata della vite: studi recenti e prospettive. Atti Giornate fitopatologiche, 2, 437-446; 2) Gasarin S., et al 2020. A grapevine genetic linkage map to find out quantitative trait loci responsible for lower susceptibility to flavescence dorée. Proceedings of the SIGA-SEI-BV-SIPAV Web Workshop "Young Scientists for Plant Health", 5/12/2020, ISBN 978-88-944843-1-1. Poster Communication Abstract – H.21	
URCOFI Unità di coordinamento per il potenziamento delle attività di sorveglianza, ricerca, sperimentazione, monitoraggio e formazione in campo fitosanitario	Individuazione ed identificazione di organismi alieni in entrata di piante con stadi vivi di organismi alieni; scheda sintetica e segnalazione EPPO di eventuali nuove specie rilevate, con foto e breve descrizione delle specie trovate. Supporto al personale regionale nell'identificazione di organismi dannosi alieni; valorizzazione e risanamento del germoplasma vegetale autoctono	F. FAGGIOLI CREA-DC CREA-OFA	- Regione Campania		
UVAMAT for a better quality of wine production	Evaluate the biostimulants efficacy of yeast lisate of aromatic fraction and technological impact on wine quality of Sangiovese-Vermicino/Toscana; Merlot (Cuvignon/Veneto)	M.E.M. D'ARCANGELO CREA-VE	- Enologica Vason.		

VALNUVAUT Valorization of New Breed varieties of Puglia	Respond the need for innovation in the Apulian viticulture sector by increasing the range of table grape cultivars adapted to the pedoclimatic context of the Mediterranean areas.	R. PERNIOLA CREA-VE	- Puglia Region	- Abstract in atti di convegno "L'isola Rosa Anna; Debiase; Giambattista; Marsico Antonio; Pomenico; Notarangelo Luciano; Giannandrea Maria Angela; Forleo Lucia Rosaria; Gasparro Marica; Delasco Riccardo; Perniola Rocco (2021). Caratterizzazione nutraceutica di trentasei nuovi genotipi di uve da tavola ottenuti con programmi di miglioramento genetico in Puglia (sud Italia)..Atti Biodiversità 2021 - II Convegno Nazionale sulla biodiversità , 286-286.	- Progetto VALNUVAUT: Visita in campo 03/07/2021 Castellana
Vi.Vo Innovation to recover traditional wine production in Calabria improvement of stress tolerance by biostimulants	Implement the sustainability of wine production in Calabria through better water use, including biostimulants increasing water stress and radiation tolerance.	R. CARRARO CREA-VE	- Calabria region	Carraro R., Sansone S., Gardiman M., Caputo A.R., Tarricone T., Masi G., Cecchini F., Lignolli G., Riggio E., 2022. Progetto VI.VO: miglioramento della tolleranza a stress idrici e termici mediante l'utilizzo di silicato di potassio per una maggiore sostenibilità delle produzioni viticole enologiche di vitigni autoctoni calabresi. Poster presentato al IX Convegno CO.NA.VI., 13-15 giugno, Cuneo (TV).	
VINIRES Innovative wines from vine varieties resistant to the main fungal diseases and agronomic techniques to increase the typicity and sustainability of wine production in the GAL-Prealpi Dolomiti territory	Development of the methods for agronomic management of vineyards of the resistant varieties Johanniter, Bronner, Pinot noir gris and Cabernet Cortis at medium altitudes in the Prealpine environment. Development of winemaking protocols and nutrient types, maceration conditions, relaying most suitable to produce innovative wines and sparkling wines of high quality using these grapes.	R. PLAMINI M. GARDIMAN CREA-VE	Veneto Region	Article " Valle di Seren, il progetto Vinires funziona promosse quattro varietà di vite resistente", Corriere delle Alpi 13 giugno 2020; Articolo " Il leno chimica nel vino con i vitigni resistenti vendemmia 2019 positiva", Corriere delle Alpi 27 giugno 2020.02/2020, 1 Tesi di Laurea.	- Webinar di presentazione dei risultati del secondo anno del progetto VINIRES 03/06/2021 Poster presentation "VINIRES-Vini innovativi da varietà resistenti alle principali ampelopatie della vite e tecniche agronomiche per incrementare tipicità e sostenibilità delle produzioni vinicole nel territorio del GAL Prealpi Dolomiti" al Webinar L'innovazione al servizio dell'agricoltura: le esperienze dei GO, 23/06/2020;
VINTES Grapewine from Sannio region applied and innovation technologies	Development of small and medium-sized wine companies in Sannio area, through suitable disease control and treatment reduction	P. STORCHI, CREA-VE	- Campania Region		Presentation Conference 05.03.2020 Gaurdia Sannitica (BN).
VIRE.BANFI evaluation of new breed varieties in Montalcino region	Study of phytosanitary management methods with a view to improving environmental sustainability	P.STORCHI CREA-VE	Azienda Banfi srl società agricola		Prove di degustazione dei vini e analisi sensoriale con panel addestrato.

VITE 4.0 plant protection innovation for sustainable viticulture.	The project will implement integrated pest management strategies by using combined approaches such as agronomical, metabolic, genetic and molecular analyses. Conventional and alternative pesticides, together beneficial microbes will be used against the main biotic stresses in grapevine. At the end, the influence on product quality and quantity of the selected strategies will be investigated	W. CHITARRA CREA-VE	Cassa di Risparmio di Cuneo Foundation	Bertazzon, N., Chitarra, W., Angelini, E., & Nerva, L. (2020). Two new putative plant viruses from food metagenomics analysis of an esca diseased vineyard. <i>Plants</i> , 9(7), 35.	
VITISBIO Development of sustainable and organic strategies in nurseries and vineyard	Control of grapevine pathogens during the different steps of multiplication, propagation and commercialization of grapevine in organic management: esca and other trunk diseases, grapevine yellows associated to phytoplasma virus diseases, with particular concern to massal selection	E. ANGELINI CREA- VE	- Friuli Region	- Articolo in rivista Battiston Enrico; Angelini Elisa; Divittini Angelo (2020). Viti centenarie per salvare la biodiversità viticola. <i>L'Informatore agrario</i> , 31, 42-45.	- Borse di studio - n.4 Nadia Bertazzon, Vally Forte, Elisa Angelini, 2020. Fast transmission of grapevine Pinot gris virus (GPGV) in vineyard. <i>Viti e Vigna</i> , 29-34. 2) Battiston E., Angelini E., Divittini A.V., 2020. Viti centenarie per salvare la biodiversità viticola. <i>L'Informatore agrario</i> , 31, 44-45.
VIT-VIVE Innovation models for development, testing and application of sustainable protocols in Veneto viticulture.	Novel strategies in plant protection, reduction of pesticides, soil and water management, weed and pest control within a sustainable farm economy	R. VELASCO CREA-VE	- Veneto Region		
VIVIUMBRIA Recovery and valorization of grapevine germplasm of Alto Orvietano - Città del Pieve	Characterization and enhancement of the autochthonous germplasm of Umbria and of the wines obtained	P.STORCHI CREA-VE	Umbria Region	- Articolo in rivista Alessandra Zombardo; Paolo Storchi; Paolo Valentini; Alice Ciofini; Daniele Ligliaro; Manna Crespan. (2021). Recovery, Molecular characterization, and Ampelographic assessment of Marginal Grapevine germplasm from Southern Umbria (Central Italy). <i>Plants</i> , 10, 8, 1-16. DOI: 10.3390/plants10081539.	

ZOSORE Characterization of specific area features, sustainability and resilience of the Prosecco DOC area	Characterization of soil, climate and morphology of the productive area of Prosecco DOC. Sub-areas will be defined based on homogeneity and interaction cultivar-environment. For each area will be developed a sustainable management protocol in view of climate changes. SQNPI parameters will be applied and verified their efficacy.	F. GAIOTTI CREA-VE	- Consorzio Tutela Prosecco DOC		
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2.3.2 Patents and Services

Patents INDUSTRIAL PATENTS

DENOMINATION/DESCRIPTION	AUTHORS/INVENTORS	CREA RESEARCH CENTRES
Non-invasive method to measure the water content of a leaf (IT + EPO [FR + DE]) <i>Co-titolarià: CNR + Università Pisa (IT) Co-titolarià: Università Pisa (EPO).</i>	P.Storchi, M.Pagano	CREA-VE
Ochratoxin A degradation to alpha ochratoxin (ES + USA + EPO [FR + DE + IT + RO]).	E. Garcia Moruno, F. Doria, A. Costantini	CREA-VE
Nucleotide and amino acid sequences of phytoplasmas responsible for golden flavescence (IT + EPO [FR + DE + CH]).	E. Angelini ,L. Filippin	CREA-VE
Procedure for malolactic fermentation with strains of Pediococcus d.(ES).	E. Garcia Moruno, A. Costantini, F. Bonello M C. Cravero	CREA-VE

PLANT VARIETY RIGHT

DENOMINATION/DESCRIPTION	AUTHORS	DENOMINATION/DESCRIPTION	AUTHORS	Denomination/Description	AUTHORS	DENOMINATION/DESCRIPTION	AUTHORS	DENOMINATION/DESCRIPTION	AUTHORS
Aika	D.Antonacci	Daunia	D.Antonacci	Joha	C.Bergamini	Medunio	D.Antonacci	Sturni	D.Antonacci
Apenestae	D.Antonacci	Dertum	D.Antonacci	Juventaum	D.Antonacci		C.Bergamini	Tarentum	D.Antonacci
Appia	D.Antonacci	Egnatia	D.Antonacci	Leuka	R.Perniola		M.F. Cardone	Triviani	A. D.Marsico
Azetium	D.Antonacci	Gallianum	D.Antonacci		M.F.Cardone		L. R. Forleo		L. R.Forleo
Barese	D.Antonacci		C.Bergamini		D.Antonacci		A. D. Marsico		C.Bergamini
Barium	D.Antonacci		M.F.Cardone		R.Velasco	Mesania	R.Perniola		D.Antonacci
Barolum	D.Antonacci		L.R.Forleo		L.R. Forleo		R. Velasco		R. Perniola
Brundisium	D.Antonacci		A. D.Marsico		A. D Marsico	Murex	D.Antonacci	Turese	M.F. Cardone
Butuntum	D.Antonacci		R.Perniola	Locreuse	C.Bergamini		A. D.Marsico		D.Antonacci
Canusium	D.Antonacci		R.Velasco		D.Antonacci		L. R.Forleo	Ursi	C.Bergamini
Celiae	D.Antonacci	Genusia	D.Antonacci		A. D.Marsico		C.Bergamini		D.Antonacci
Cerina	D.Antonacci C.Bergamini M.F.Cardone L.R. Forleo	Itria	R.Perniola		L. R.Forleo		D.Antonacci		R.Perniola
		Japigia	D.Antonacci M.F.Cardone		R.Perniola		R.Perniola		A.D.Marsico
					M. F.Cardone		M.F. Cardone		L.R. Forleo.
					C.Bergamini				

	A. D.Marsico R.Perniola R.Velasco		D.Antonacci L.R.Forleo A.D.Marsico C. Bergamini			Netium	D.Antonacci		
						Norba	D.Antonacci		
				Lupiae	D.Antonacci	Peucetia	D.Antonacci	Vaaz	C.Bergamini
				Maula	D.Antonacci	Pugliese	D.Antonacci	Vigilarum	D.Antonacci
						Siris	D.Antonacci		

CREA VARIETIES INCLUDED IN THE ITALIAN OFFICIAL LISTS

CLONE DENOMINATION /REFERENCE VARIETES	CLONE DENOMINATION /REFERENCE VARIETES	CLONE DENOMINATION /REFERENCE VARIETES	CLONE DENOMINATION /REFERENCE VARIETES	CLONE DENOMINATION /REFERENCE VARIETES	CLONE DENOMINATION /REFERENCE VARIETES	CLONE DENOMINATION /REFERENCE VARIETES	CLONE DENOMINATION /REFERENCE VARIETES
I - ISV CONEGLIANO 1 106-8	I - ISV SAVARDO 7 CABERNET FRANC N.	I - ARSIAL-CRA 228_CESANESE D AFFILE N.	I - ISV-CV 69 GARGANEGA B.	I - ISV-F-V6 MERLOT N.	I - ISV-F1 TOPPANI PINOT GRIGIO G.	I - ISV - VCR 6 S.O.4	I - ISV-F 6 TOCAI FRIULANO B.
I - ISV CONEGLIANO 1 110 RICHTER	I - ISV 101 CABERNET FRANC N.	I - ARSIAL-CRA 232_CESANESE D AFFILE N.	I - ISV-CV 84 GARGANEGA B.	I - ISV-F-V5 MERLOT N.	I - CRAVIT Ersa FVG 152 PINOT GRIGIO G.	I - 2 ISV - ICA PG SAGRANTINO N.	I - ISV-F 8 TOCAI FRIULANO B.
I - ISV CONEGLIANO 1 1103 PAULSEN	I - CRAVIT-ERSA FVG 300 CABERNET FRANC N.	I - ISV 4 CHARDONNAY B.	I - ISV - CV 11 GARGANEGA B.	I - ISV sn - V 11 MERLOT N.	I - ISV 15 PINOT NERO N.	I - 9 ISV SANGIOVESE N.	I - CRAVIT-ERSA FVG 202 TOCAI FRIULANO B.
I - ISV CONEGLIANO 1 140 RUGGERI	I - CRAVIT-ERSA FVG 301_CABERNET FRANC N.	I - ISV 5 CHARDONNAY B.	I - ISV - CV 18 GARGANEGA B.	I - ISV sn - V 12 MERLOT N.	I - 2007 ISV-C VI VA 2 "Canaja" PINOT NERO N.	I - ISV RC 1 SANGIOVESE N.	I - CRAVIT-ERSA FVG 203 TOCAI FRIULANO B.
I - ISV CONEGLIANO 1 1447 PAULSEN	I - CRAVIT-ERSA FVG 302 CABERNET FRANC N.	I - CRAVIT - Ersa FVG 100_CHARDONNAY B.	I - ISV sn 29 Angelini GARGANEGA B.	I - CRAVIT Ersa FVG 355 MERLOT N.	I - CRAVIT G 4 PRIMITIVO N.	I - CRA VIC BC SF6 SANGIOVESE N.	I - ISV - C VI 3 TOCAI ROSSO N.
I - ISV CONEGLIANO 161.49 C.	I - ISV-F-V5 CABERNET SAUVIGNON N.	I - CRAVIT - Ersa FVG 101_CHARDONNAY B.	I - ISV-ESAV 10 GLERA B.	I - CRAVIT Ersa FVG 356_MERLOT N.	I - CRAVIT 1 V PRIMITIVO N.	I - CRA-BR 1141 SANGIOVESE N.	I - ISV - C VI 17 TOCAI ROSSO N.
I - ISV CONEGLIANO 2 161.49 C.	I - ISV-F-V6 CABERNET SAUVIGNON N.	I - CRAVIT - Ersa FVG 102 CHARDONNAY B.	I - ISV-ESAV 14 GLERA B.	I - CRAVIT Ersa FVG 357 MERLOT N.	I - ISV-V2 RABOSO PIAVE N.	I - CRA-BR 1872 SANGIOVESE N.	I - CRAVIT - Ersa FVG 210 TRAMINER AROMATICO Rs.
I - ISV CONEGLIANO 1 17-37	I - ISV 2 CABERNET SAUVIGNON N.	I - CRAVIT - Ersa FVG 103 CHARDONNAY B.	I - ISV-ESAV 19 GLERA B.	I - ISV-CV 87 MOLINARA N.	I - ISV-V1 RABOSO VERONESE N.	I - ISV CONEGLIANO 1 SAUVIGNON B.	I - CRAVIT - Ersa FVG 212 TRAMINER AROMATICO Rs.
I - ISV CONEGLIANO 1 225 RUGGERI	I - ISV 105 CABERNET SAUVIGNON N.	I - CRAVIT - Ersa FVG 104 CHARDONNAY B.	I - 2007 ISV-VA 4 (Serprina) GLERA B.	I - ISV-CV 100 MOLINARA N.	I - ISV-V2 ABOSO VERONESE N.	I - ISV-F 2 SAUVIGNON B.	I - 1 ISV - ICA PG TREBBIANO SPOLETINO B.
I - ISV CONEGLIANO 1 3309 C.	I - ISV 117 CABERNET SAUVIGNON N.	I - CRAVIT - Ersa FVG 105 CHARDONNAY B.	I - 2007 ISV-VA 6 GLERA B.	I - ISV-CV 3 MOLINARA N.	I - ISV-F1 REFOSCO DAL PEDUNCOLO ROSSO N.	I - ISV-F 3 SAUVIGNON B.	I - ARSIAL-CRA 437 TREBBIANO TOSCANO B.
I - ISV CONEGLIANO 1 34 E.M.	I - CRAVIT-ERSA FVG 311 CABERNET SAUVIGNON N.	I - CRAVIT - Ersa FVG 106 CHARDONNAY B.	I - 2007 ISV-VA 7 GLERA B.	I - ISV 5 MOSCATO BIANCO B.	I - ISV-F4 TOPPANI REFOSCO DAL PEDUNCOLO ROSSO N.	I - ISV-F 5 SAUVIGNON B.	I - ARSIAL-CRA 546 TREBBIANO TOSCANO B.
I - ISV CONEGLIANO 1 41 B	I - CRAVIT-ERSA FVG 312 CABERNET SAUVIGNON N.	I - CRAVIT - Ersa FVG 107 CHARDONNAY B.	I - 2007 ISV-VA 8 GLERA B.	I - CRAVIT-ERSA FVG 135 MOSCATO BIANCO B.	I - ISV Ersa FVG 402 REFOSCO DAL PEDUNCOLO ROSSO N.	I - CRAVIT-ERSA FVG 190 SAUVIGNON B.	I - CRA VIC BC SF7 TREBBIANO TOSCANO B.
I - ISV CONEGLIANO 1 420 A	I - CRAVIT-ERSA FVG 313 CABERNET SAUVIGNON N.	I - CRAVIT - Ersa FVG 108 CHARDONNAY B.	I - ISV 2 GLERA LUNGA B.	I - ISV - V 5 MOSCATO GIALLO B.	I - ISV Ersa FVG 403 REFOSCO DAL PEDUNCOLO ROSSO N.	I - CRAVIT-ERSA FVG 191 SAUVIGNON B.	I - 10 ISV VERDICCHIO BIANCO B.
I - ISV CONEGLIANO 1 57 RICHTER	I - CRAVIT-ERSA FVG 314 CABERNET SAUVIGNON N.	I - ISV - R 4 CHENIN B.	I - ISV 3 GLERA LUNGA B.	I - ISV - V 13 MOSCATO GIALLO B.	I - CRAVIT - Ersa FVG 390 REFOSCO NOSTRANO N.	I - CRAVIT-ERSA FVG 192 SAUVIGNON B.	I - ARSIAL-CRA 549 VERDICCHIO BIANCO B.

CLONE DENOMINATION /REFERENCE VARIETES	CLONE DENOMINATION /REFERENCE VARIETES	CLONE DENOMINATION /REFERENCE VARIETES	CLONE DENOMINATION /REFERENCE VARIETES	CLONE DENOMINATION /REFERENCE VARIETES	CLONE DENOMINATION /REFERENCE VARIETES	CLONE DENOMINATION /REFERENCE VARIETES	CLONE DENOMINATION /REFERENCE VARIETES
I - ISV CONEGLIANO 1 775 PAULSEN	I - CRAVIT ERSa FVG 315 CABERNET SAUVIGNON N.	I - ARSIAL-CRA 223 CILIEGIOLO N.	I - ISV CONEGLIANO 1 GOLIA	I - CRAVIT-ERSA FVG 130 MOSCATO OTTONEL B.	I - ISV 6 REGINA B.	I - CRAVIT-ERSA FVG 193 SAUVIGNON B.	I - ARSIAL-CRA 553 VERDICCHIO BIANCO B.
I - ISV CONEGLIANO 1 779 PAULSEN	I - CRAVIT ERSa FVG 316 CABERNET SAUVIGNON N.	I - 8 ISV COCOCCIOLA B.	I - G 109 ISV - ICA PG GRECHETTO B.	I - ISV sn-Cle 56 NEGRO AMARO N.	I - ISV 9 REGINA B.	I - CRAVIT-ERSA FVG 194 SAUVIGNON B.	I - ISV - V2 VERDISO B.
I - ARSIAL-CRA 489 ALEATICO N.	I - ARSIAL-CRA 402 CANAILOLO BIANCO B.	I - ISV-CV 7 CORVINA N.	I - 2007 ISV-VA 1 INCROCIO MANZONI 2.15 N.	I - ISV sn-Cle 64 NEGRO AMARO N.	I - CRAVIT - ERSa FVG 180 RIBUELE B.	I - CRAVIT-ERSA FVG 195 SAUVIGNON B.	I - ISV - V 21 VERDISO B.
I - CRA VIC BC SF3 ALEATICO N.	I - CRA VIC BC SF4 CANAILOLO NERO N.	I - ISV-CV 48 CORVINA N.	I - ISV CONEGLIANO 1 KOBER 5 BB	I - ISV sn-Cle 71 NEGRO AMARO N.	I - ISV CONEGLIANO 1 RIESLING ITALICO B.	I - CRAVIT-ERSA FVG 196 SAUVIGNON B.	I - ISV - F2 VERDUZZO FRIULANO B.
I - Cravit - Assam PU 9B ALEATICO N.	I - ISV-VCR 24 CARDINAL N.	I - ISV-CV 78 CORVINA N.	I - SMA-ISV 317 LAMBRUSCO A FOGLIA FRASTAGLIATA N.	I - ISV sn-Cle 87 NEGRO AMARO N.	I - ISV-3 RIESLING RENANO B.	I - CRAVIT-ERSA FVG 197 SAUVIGNON B.	I - CRAVIT-ERSA FVG 223 VERDUZZO FRIULANO B.
I - Cravit - Assam PU 2L ALEATICO N.	I - ISV-F-V5 CARMENERE N.	I - ISV-CV-146 CORVINA N.	I - ISV-R6 MALBECH N.	I - TCG 2 ISV PASSERINA B.	I - ISV-F1 TOPPANI RIESLING RENANO B.	I - CRAVIT-ERSA FVG 198 SAUVIGNON B.	I - ISV-V5 VERDUZZO TREVIGIANO B.
I - Cravit - Assam PU 6M ALEATICO N.	I - CRAVIT ERSa FVG 324 CARMENERE N.	I - ISV-CV 13 CORVINA N.	I - ISV CONEGLIANO 1 MALVASIA ISTRIANA B.	I - 1 ISV PECORINO B.	I - CRAVIT-ERSA FVG 170 RIESLING RENANO B.	I - CRAVIT-ERSA FVG 199 SAUVIGNON B.	I - Sirena 1 VERMENTINO B.
I - Cravit Assam PU 10T	I - CRAVIT ERSa FVG 325 CARMENERE N.	I - ISV CV 2 CORVINONE N.	I - ISV-F6 MALVASIA ISTRIANA B.	I - ISV CONEGLIANO 1 PICOLIT B.	I - ISV CONEGLIANO 1 RIPARIA GLOIRE	I - CRAVIT - ERSa FVG 430 SCHIOPPETTINO N.	I - Marem 1 VERMENTINO B.
I - Cosa 1 ANSONICA B.	I - ARSIAL-CRA 838 CESANESE COMUNE N.	I - ISV CV 3 CORVINONE N.	I - 2007 ISV-VA 101 MALVASIA ISTRIANA B.	I - ISV-F4 PICOLIT B.	I - ISV - CV 73 RONDINELLA N.	I - ISV CONEGLIANO 1 SCHWARZMANN	I - Marem 3 VERMENTINO B.
I - Settefinestre 1 ANSONICA B.	I - A5 CESANESE D AFFILE N.	I - ISV CV 7 CORVINONE N.	I - SMA - ISV 222 MANZONI BIANCO B.	I - ISV-F6 PICOLIT B.	I - ISV - CV 76 RONDINELLA N.	I - ISV - R1 SYRAH N.	I - Sileno 1 VERMENTINO B.
I - Settefinestre 2 ANSONICA B.	I - A8 CESANESE D AFFILE N.	I - ISV CONEGLIANO 1 COSMO 10	I - SMA - ISV 237 MANZONI BIANCO B.	I - CRAVIT - ERSa FVG 160 PICOLIT B.	I - ISV - CV 23 RONDINELLA N.	I - CRAVIT - ERSa FVG 410 SYRAH N.	I - Sileno 3 VERMENTINO B.
I - Settefinestre 3 ANSONICA B.	I - A9 CESANESE D AFFILE N.	I - ISV CONEGLIANO 1 COSMO 2	I - ISV - V 1 MARZEMINO N.	I - CRAVIT - ERSa FVG 161 PICOLIT B.	I - ISV - CV 3 ROSSIGNOLA N.	I - CRAVIT ERSa FVG 435 TAZZELENHGE N.	I - CRA VIC LOR 5 VERMENTINO B.
I - ARSIAL-CRA 618 BELLONE B.	I - A10 CESANESE D AFFILE N.	I - ISV C VI 4 DURELLA B.	I - ISV - V 13 MARZEMINO N.	I - CRAVIT - ERSa FVG 370 PIGNOLO N.	I - ISV - CV 7 ROSSIGNOLA N.	I - ISV CONEGLIANO 1 TELEKI 5 C.	I - 1 ISV - CSV VERNACCIA NERA N.
I - ARSIAL-CRA 231 BOMBINO BIANCO B.	I - A19 CESANESE D AFFILE N.	I - ISV C VI 6 DURELLA B.	I - ISV - V 14 MARZEMINO N.	I - CRAVIT-ERSa FVG 140 PINOT BIANCO B.	I - ISV - CV 9 ROSSIGNOLA N.	I - ISV CONEGLIANO 1 TELEKI 8 B. FERRARI	I - ISV C VI 4 VESPAIOLA B.
I - ISV CONEGLIANO 1 CABERNET FRANC N.	I - A20 CESANESE D AFFILE N.	I - ISV C VI 13 DURELLA B.	I - ISV-F-V2 MERLOT N.	I - CRAVIT-ERSa FVG 141 PINOT BIANCO B.	I - ISV CONEGLIANO 1_RUPESTRIS DU LOT	I - ISV-F2 TERRANO N.	I - ISV C VI 9 VESPAIOLA B.
I - ISV-F-V4 CABERNET FRANC N.	I - A21 CESANESE D AFFILE N.	I - ISV-C VI 8 DURELLA B.	I - ISV-F-V4 MERLOT N.	I - CRAVIT-ERSa FVG 142 PINOT BIANCO B.	I - ISV - VCR 4 S.O.4	I - ISV-F 3 TOCAI FRIULANO B.	I - ISV C VI 16 VESPAIOLA B.

Services

Collections

PRODUCTS	DESCRIPTION	RESPONSIBLE	CREA CENTERS
Microorganisms of enological interest	Maintaining and enrichment of the collection at CREA-VE The cepage, moreover, are used for several projects and university degrees. In a climate change scenario, having germplasm collection is extremely important as source of biodiversity	G.M. Vaudano, Costantini Pulcini	CREA-VE
Grapevine germplasm collection of over 3.500 accessions in Susegana (TV) Arezzo and Turi (BA)	Care, management and valorization of genetic resources collected in the grapevine collection of CREA, Center of Research in Viticulture and Enology	D. Migliaro, M. Giust, R. Carraro, G. Masi, M. Ostan	CREA-VE
ViMed-Biomebank – Microbiological collection from vineyard environments	Maintaining and enrichment of the collection derived from the EU project REVINE. The stored isolates are exploited in some projects for biodiversity conservation and to develop novel microbiological-based products to improve sustainability and resilience in agriculture	W. Chitarra, L. Nerva	CREA-VE

Other Services

PRODUCTS/ MAIN TOPICS	DESCRIPTIONS	PERSON IN CHARGE	CREA CENTRES
Management of Certification services for the clonal grapevine material (nurseries)	This service aims to certificate “Mother stocks” and “Initial category vine cuttings” and “Base category vine cuttings” essential for first multiplication, by nurseries, where is produced the entire “Italian Vineyard”, both for table and grapevine.	C.G. Zavaglia	CREA-VE
National Register of grapevine varieties	Management and certification at molecular level for registered or under registration varieties into the ‘Registro Nazionale delle Varietà di Vite’. Publication and updating into the National genetic databank on MiPAAF website.	D. Migliaro, C. G. Zavaglia	CREA-VE
Characterization service of grapevine varieties	This service is offered to public and private entities under payment of a regular fees and allows to identify the grapevine varieties by molecular evaluation of genomic DNA and comparison with a wide database	C. Bergamini Turi (BA)	CREA-VE
Management of the National Register of grapevine varieties for MiPAAF	The software is hosted at MiPAAF at http://catalogoviti.politicheagricole.it and describes all the varieties and clones registered at the official National Register of Grapevine varieties (the only varieties allowed for cultivation in Italy). For each variety ampelographic description, pictures of nursery production cultivation areas and type of wines produced are registered. Site checking per day is over 500, and over 800.000 since it exists	C.G. Zavaglia	CREA-VE
External service for characterization service of grapevine varieties and technical support for forensic	This service is offered to public and private entities under payment of a regular fees and allows to identify the varieties of grapevine by molecular evaluation of genomic DNA and comparison with a wide database	D. Migliaro M. Crespan Susegana (TV)	CREA-VE
Analytical service of pests and pathogens of grapevine	In this service are executed specialistic analysis for diagnostic in plant pathology and pests, specifically viruses, bacteria and phytoplasmas then dangerous insects, leafhoppers, mealybugs, and moths. This service includes, depending on type and severity, field supervision symptoms severity definition, biological indexing, seriology analysis (ELISA), molecular analysis via PCR, in vitro culture recovery, entomological analysis, insects capturing. Clonal sanitation (DM 24/06/2008), certificate for plant propagation (DM 07/07/2006) and export. CREA/Viticulture and Enology is one of the accredited center by the MiPAAF for this type of certification (legge 21/06/1991, n. 192).	E. Angelini V. Forte, L. Filippin	CREA-VE
Phytosanitary certification for the viral status of grapevine plant material in the South of Italy	This service is dedicated to search of virus evidence in grapevine: Grapevine leafroll associated virus 1, 2 e 3, Grapevine fanleaf virus, Arabis mosaic virus, Grapevine virus A e B, Grapevine rupestris stem pitting associated virus, Grapevine fleck virus (phytosanitary certificate)	M. Gasparro	CREA-VE
Efficacy assessment of insecticides, bactericides or other syntetical or natural products	This service guarantees specific analysis to evaluate efficacy of registered products against pathogens, particularly bacteria and phytoplasmas and main dangerous insects, particularly moths and leafhoppers. Activities are performed in vitro or controlled conditions as well as in the fields. The service includes project description and execution, sometimes also with external support. Sampling, analytical studies and statistical analysis are performed. In case of not yet registered products, studies are performed under controlled conditions, or, if in the fields, with support of authorized test centers support.	E. Angelini, V. Forte, L. Filippin	CREA-VE
Evaluation of efficacy of novel pesticides (BPC linee EPP0)	Efficacy of alternative phytosanitary products	M.E.M D’Arcangelo	CREA-VE
Evaluation of competitive microbiological products (BPC linee EPP0)	Efficacy of competitive microbiological products (Trichoderma spp.)	M.E.M D’Arcangelo, W. Chittarra L. Nerva	CREA-VE
Efficacy of resistance inductor (BPL-BPC linee EPP0)	Efficacy of microbiological resistance inductor (Saccharomyces spp.)	M.E.M D’Arcangelo	CREA-VE
Characterization of microorganisms for enology	Identification and research microorganism in must sample/wine through in vitro isolation and molecular DNA analysis	E. Garcia-Moruno A. Costantini L. Pulcini	CREA-VE

Estimation level of <i>Brettanomyces bruxellensis</i> mediante qPCR/analysis 4-ethylphenols in wines via GCMS	Quantification of contaminants (<i>Brettanomyces bruxellensis</i>) directly from wine matrices via quantitative PCR, GCMS (ethylphenols) produced by contaminant microorganisms	A. Costantini M. Petrozziello	CREA-VE
Analysis of yeast dominance	Evaluation of yeast dominance in starters for the alcoholic fermentation through in vitro isolation and following molecular analysis	E. Vudano E. Garcia-Moruno, A. Costantini L Pulcini	CREA-VE
Analysis of yeast dominance	Panel of experts trained to sensorial analysis in wine but also other alcoholic products	M.C. Cravero F. Bonello, M. R Lottero	CREA-VE
Institute for management of clima revealed by climate stations for the PNS-ISTAT	Climate data for ISTAT analysis	M.E.M D'Arcangelo	CREA-VE
Efficacy evaluation of microbiological-based products	Efficacy trials using microbiological formulates in grape cultivation (mycorrhizal fungi and other microbial consortia)	W. Chitarra, L. Nerva	CREA-VE
Efficacy evaluation of nature-derived resistance inducers	Efficacy trials of nature-based products (elicitors of plant responses against biotic and abiotic stresses). Development of tailored protocols for specific pedoclimatic conditions	L. Nerva, W. Chitarra	CREA-VE
Phytosanitary certification for microbiological wood health conditions in grapevine	Analyses by culture-dependent and molecular techniques to evaluate the phytosanitary status of woody tissues both in cuttings and adult plants. Specific analyses have been developed for fungal pathogens related to esca syndrome.	L. Nerva, W. Chitarra	CREA-VE
Microbial identification from vineyard environments	Isolation and identification of microbes (including endophytes) from diverse grape tissues (roots, trunk and branch)	L. Nerva, W. Chitarra	CREA-VE
Premultiplication and management plant material	Management of the pre-multiplication and assignment of "base" category materials of clones selected by Plant breeders joining the Nucleo d Premoltiplicazione Viticola delle Venezie)	M. Giust	CREA-VE
Age assessments of vine samples	Service provided to private for the determination of xylem rings as a number of annual wood growth circles	A.R. Caputo; G. Gentileco, A.M Amendolagine	CREA-VE

Working tables / working groups / institutional partnerships, editorial board

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Working group for the preparation of the new PAC (Decreto 288 del 3 marzo 2018 DG CREA)	Definition of new indicators of sustainable agriculture for Mipaaf	M.E.M D'Arcangelo	CREA-VE
Working group for the plant protection (DM Mipaaf 30 giugno 2016 n. 0017713)	Supply specialistic experiences for the definition of the new PAN and for the new rules regarding the use of plant pesticides	M.E.M D'Arcangelo	CREA-VE
Working group to supply data to PNS-ISTAT	Definition of new indicators and analytical forms Circolo 13 for Agriculture, Forestry and Fisheries within PNS (Piano Nazionale di Statistica)	M.E.M D'Arcangelo	CREA-VE
Wine commission for DOP and IGP MiPAAF	Commission for Product Certification of Origin	A.Bosso	CREA-VE
Enology Commission OIV	Technology and Specification groups of the Enology commission OIV	A. Bosso	CREA-VE
Enology Commission OIV	Joint Group of Enology and Microbiology (group TECMIC)	A. Bosso	CREA-VE
Viticulture Commission OIV	Genetics Group	R. Velasco	CREA-VE
Viticulture Commission OIV	Genetics Group	R. Carraro	CREA-VE
Viticulture Commission OIV	Genetics Group	C Bergamini	CREA-VE

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Viticulture Commission OIV	Genetica Group	E Angelini	CREA-VE
Enology Commission OIV	Analytical methods Group	E.Garcia Moruno	CREA-VE
Hop Technical round Table	Working group	M.C.Craverio, F. Bonello	CREA-VE
Permanent group MIPAAF-sector reproduction grapevine material evaluation of registration of new varieties and clones	This service evaluates new applications for registration of dessert related to novel varieties and clones into the National Register of Varieties Today the number of varieties is 589 grapevines for 1445 clones, 182 table grapes, with 52 clones, 46 rootstocks with 46 clones	C. G. Zavaglia	CREA-VE
OIV - Organisation Internationale de la Vigne et du Vin	Cooperation activity for revision and updating descriptors (ampelography and agronomic) of grapevine varieties	D. Migliaro, R. Carraro, C. G. Zavaglia, M. Giust, M. Gardiman	CREA-VE
AEG-VIT-IS - Enhancing quality and quantity of Vitis genetic resources in AEGIS	Cooperation activity for description of guidelines for management of grapevine collections	D. Migliaro, R. Carraro, M. Gardiman	CREA-VE
International Committee on Taxonomy of Viruses	Expert member for the definition of viral taxonomy. Part of the Study Group on viruses belonging to the <i>Botourmiaviridae</i> family	L. Nerva	CREA-VE
European Food Security Agency	Participation as expert member for the Plant Health topic	W. Chitarra	CREA-VE
WG-OIV-CREA-VE CREA-VE working group on the revision of the OIV descriptors for grapevine	Cooperation activity for revision and updating of ampelographic and agronomic descriptors of grapevine varieties and Vitis species.	D. Migliaro, R. Carraro, C. G. Zavaglia, M. Giust, M. Gardiman, L. Sansone, T. Possamai	CREA-VE

2. CREA RESEARCH LINES BY PRODUCTS

2.4 FRUIT AND CITRUS

CREA's tradition in fruit tree research dates to more than a century. Nowadays, activities are focused on supply chain improvement through the application of new technologies for breeding, propagation, sustainable production, enhancement of fruit quality, and utilization of by-products. Furthermore, conservation, phenotyping, genotyping, and valorisation of fruit crop, olive and citrus genetic resources are essential elements of the work.

In order to enhance fruit and citrus crop supply chains, CREA is developing the following research fields:

- *Varietal innovations through traditional breeding and new biotechnology (NBT), aimed at obtaining new varieties and rootstocks with improved production, quality and strength characteristics.* Considering the climate change issue, which has a major impact on agriculture, and to support sustainable production, breeding can make a crucial contribution by systematically selecting those characteristics which increase the plants' ability to maintain high production levels and quality performance required by the fruit and citrus markets, also under the pressure of biotic and abiotic stresses.
- *Conservation, phenotyping, genotyping, and valorisation of fruit crop and citrus genetic resources (agrobiodiversity), also through breeding actions, to support sustainable and "Made in Italy" quality production.* Actions aimed at the maintenance, expansion and study of the germplasm collections and the deepening of knowledge on the traits of the conserved accessions, which are a valuable reservoir of genes for breeding programs. Main goals are the recovery and conservation of autochthonous varieties, but also the extension of the genetic base of a wider range of species by collection and acquisition of material in Italy and abroad, the sustainable use of the germplasm conserved in the collections, the reintroduction into cultivation of indigenous varieties for local and niche markets, through collaboration with small farmers communities.





- *Optimization of production methods to increase the adaptability of fruit and citrus crops to climate change.* Monitoring implementation of the physiological responses in the soil-plant-atmosphere continuum, particularly for the adaptation to climate change in the hot-dry environment and for an efficient use of inputs.
- *Implementation of digitalisation strategies for an agricultural system based on the use of precision farming tools.* Considering the rapid technological progress, studies are carried out on the use of *ad hoc* sensors for the monitoring of the trees' growing conditions, on the implementation and validation of digitalized platforms to support decisions on orchards management and the use of precision farming tools.
- *Development and optimization of resilient agro-technical production processes dealing with climate change, with a high degree of biodiversity in organic farming.* In consequence of the increase of organic farming, both in terms of cultivated areas and consumption patterns, the planned activities aim to define and optimize technically resilient routes facing climate change enabling to ensure a high degree of functional biodiversity. The OFA Center disposes of long-term experimental devices for carrying out research activities supporting surveys in the field of organic farming.
- *Application of integrated and organic systems for fruit and citrus crops protection, by developing diagnostic systems and the study of active compounds with low environmental impact and toxicological level.* This research activity comprises the study the biology and spread of economically and biologically harmful pests, the identification methods to contrast diseases and phytophagous agents. The development of diagnostic systems, geo-referenced and remote monitoring, sustainable use of plant protection products, detection of organisms harmful to crops by means of an integrated system for the proper protection of crops, which also includes the study of active substances with a low environmental impact and a low level of toxicology, in addition to the use of combinations of grafts incompatible with specific phytophagous and pathogens.
- *Development of new methods for monitoring, tracking and tracing fruit and citrus crops production, to guarantee quality, origin and provenance of the products.* Research activity aims to identify tools and methodologies to provide customers with the highest guarantee of quality, origin and provenance of products (geographical or organic or integrated farming).
- *Application of innovative technologies and biotechnologies for the extension of the shelf-life of both fresh and processed products, and for waste utilisation from agri-food industry.* In particular we focus on the reduction of product loss during processing and marketing, the maintenance of quality, nutraceutical and sensory characteristics of pre- and post-harvest products, the lengthening of shelf-life of fresh and processed products, organoleptic and nutraceutical characterization of the products, studies on allelopathic activity and the development of techniques for the exploitation of waste from the agro-food industry, in the field of nutraceuticals and cosmetics, and as a source of organic matter for recycling.

1.4.1. Research and research products – Fruit and Citrus

ACRONYMS AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRE	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹
AgriDigit_AgroFiliere AGRIDIGIT measure: Integrated digital technologies for the sustainable strengthening of agriculture food production and processing	WP2 involves experimentation and research on proximal and remote mapping of soils, the use and applications of multi-scale and multi-sensory systems mainly imaging-based (ground, proximal, on-site, on-the-go (robot terrestrial) and the development of simulation tools for precision agriculture applications. (WP Leader: Corrado Costa, CREA-IT) WP3 provides for the development of mechatronic systems and digital interface on machines for advanced management in the AdP. (WP Leader: Carlo Bisaglia, CREA-IT) WP4 provides for the application of precision and digital systems for the advanced management of the horticultural and horticultural supply chain as well as for the control and traceability of quality and safety throughout the cereal supply chain. (WP Leader: Teodoro Cardi, CREA-OF) WP5 provides for the implementation of advanced and innovative sensors with a high degree of digital and information integration for the development of advanced systems for global quality in the supply chain paths from production, transformation and consumption, as well as the potential use of a logistics platform for the built-in traceability of a blockchain for maintaining the quality of fresh-cut vegetable-based products. In addition, a traceability plan will be created through the application of blockchain technology to protect the quality of the citrus fruit supply chain. (WP Leader: Tiziana Cattaneo, CREA-IT)	P. MENESATTI CREA-IT CREA-OF CREA-OFA CREA-AA	- MiPAAF - Ministero delle politiche agricole alimentari e forestali	- Pallottino F; Figorilli S; Cecchini Cristina; Corrado (2021).Light drones for basic in-field phenotyping and precision farming applications: RGB tools based on image analysis.Crop breeding. Methods in Molecular Biology, 269-278.DOI: 10.1007/978-1-071201-9_18. - Traversari Silvia; Battista Piero; Masdaniele; Nesi Beatrice; Pane Catello; Bernardo; Romani Maurizio; Sabatini Francesco; Cacini Sonia (2021).Models Micrometeorological Parameters for Fungal Pathogen Spread Prediction - Bascietto Marco; Santangelo Enrico; Ben Claudio (2021).Spatial Variations of Vegetation Index from Remote Sensing Linked to Soil Colloidal Status.Land, 10, 1, DOI: 10.3390/land10010080. - Traversari Silvia; Cacini Sonia; Galimberti Angelica; Nesi Beatrice; Nicastro Nicola; Pane Catello (2021).Precision Agriculture Digital Technologies for Sustainable Fungal Disease Management of Ornamental Plants.Sustainability, 13, 7, 22-DOI: 10.3390/su13073707. - Figorilli Simone; Pallottino Federico; Corrado Giacomo; Spada Daniele; Beni Claudio; Tassinari Francesco; Vasta Simone; Antonucci Francesco; Pagano Mauro; Fedrizzi Marco; Costa Corrado (2021).An open source low-cost device coupled with an adaptive time-lag time series linear forecasting modelling for apple Trentino (Italy) precision irrigation.SENSORS, 21, 8, DOI: 10.3390/s21082656. - Romano Elio; Bergonzoli Simone; Pecorelli Ivano; Bisaglia Carlo; De Vita, Pasquale (2021).Methodology for the Definition of Durum Wheat Yield Homogeneous Zones Using Satellite Spectral Indices.Remote Sensing, 13, 11,DOI: 10.3390/rs13112033. - Manganiello Gelsomina; Nicastro Nicola; Caputo Michele; Zaccardelli Massimo; Cardi Teodoro; Pane Catello (2021).Functionality of Hyperspectral Imaging by High-Resolution Vegetation Indices to Track the Wide-Spectrum Trichoderma Biocontrol Activity Against Soil Borne Diseases of Baby-Leaf Vegetables.Frontiers in Plant Science, 12, 21.DOI: 10.3389/fpls.2021.630055. - Catello Pane; Gelsomina Manganiello; Nicastro; Luciano Ortenzi; Federico Pallottino; Teodoro Cardi; Corrado Costa (2021).Machine learning applied to canopy hyperspectral image data to support biological control of soil-borne fungal diseases in baby leaf vegetables.Biological Control, 164, 1-9.DOI: 10.1016/j.biocontrol.2021.104784. - Ortenzi Luciano; Violino Simona; Pallottino	- Agricoltura del futuro: entrano in campo i droni - Innovazione, ricerca sviluppo, sicurezza - fical servizio dell'agricoltura e delle foreste 14/12/2021 - L'innovazione tecnica dei mezzi pesanti per il trasporto per trattoristica e la logistica agroalimentare 10/03/2021 - L'innovazione digitale nella trasformazione agroalimentare 27/10/2021 - Tecnologie digitali applicate alle agrofilieri: qualità: il caso rucola e altre baby-leaf in Pianura del 18/06/2021 - La trasformazione digitale nelle produzioni agricole 26/10/2021 - SimAGRI: un simulatore per sperimentare virtualmente l'agricoltura di precisione 21/04/2021 - Filiera frumento duro-pasta: autenticità, tracciabilità e coltivazione sostenibile 20/05/2021 - Assegni di ricerca - n.7

ACRONYMS AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRE	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹
				<p>Federico; Figorilli Simone; Vasta Simone; To Francesco; Antonucci Francesca; Imp Giancarlo; Costa Corrado (2021).Estimation of olive production from light drone orthophoto, through canopy radius.DRONES, 4,DOI: 10.3390/drones504011</p> <p>- Pane Catello; Manganiello Gelsomir Nicastro Nicola; Cardi Teodoro; Carotenu Francesco (2021).Powdery Mildew Caused Erysiphe cruciferarum on Wild Rocket (Diplotaxis tenuifolia): Hyperspectral Imaging and Machine Learning Modeling for Non-destructive Disease Detection.Agriculture, 11, 4,DOI: 10.3390/agriculture1104033</p> <p>- Assirelli Alberto; Romano Elio; Bisaglia Carlo; Lodolini Enrico Maria; Neri Davide; Brambilla Massimo (2021).Canopy index evaluation for precision management in an intensive olive orchard.Sustainability, 13, 15,DOI: 10.3390/su13158266.</p> <p>- Assirelli Alberto; Caracciolo Giuseppe; Rocuzzo Giancarlo; Stagno Fiore (2021).New Tools for Mechanical Thinning of Apricot Fruitlets.Agriculture, 11, 1-11,DOI: 10.3390/agriculture11111138.</p> <p>- Pane Catello; Angelica Galieni; Carmelo Riefolo; Nicola Nicastro; Annamaria Castrignanò(2021).Hyperspectral Reflectance Response of Wild Rocket (Diplotaxis tenuifolia) Baby-Leaf to Bio-Based Disease Resistance Inducers Using a Linear Mixed Effects Model.Plants, 10, 12, 1-17,DOI: 10.3390/plants10122575.</p> <p>- Articolo in rivista Romano E.; Pirozzi M.; Ferri M.; Calcante M.; Oberti R.; Vitale E.; Rapisarda V.(2020).The use of pressure mapping to assess the comfort of agricultural machinery seats.International Journal of Industrial Ergonomics, 77,DOI: 10.1016/j.ergon.2019.102835.</p> <p>- Traversari Silvia; Battista Piero; Masella Daniele; Nesi Beatrice; Pane Catello; Rapisarda Bernardo; Romani Maurizio; Sabatini Francesco; Cacini Sonia (2021).Models for micrometeorological parameters for fungal pathogen spread prediction. 115</p> <p>- Traversari Silvia; Nicastro Nicola; Nesi Beatrice; Nin Stefania; Ortenzi Luciano; Pallottino Federico; Pane Catello; Cacini Sonia (2021).Digital tools for the early detection of grey mould symptoms on rose plants.Acta Italica Hortus 26, 26, 215</p> <p>- Traversari Silvia; Battista Piero; Masella Daniele; Nesi Beatrice; Pane Catello; Rapisarda Bernardo; Romani Maurizio; Sabatini Francesco; Cacini Sonia (2021).Setting up alert systems for the early detection of fungal diseases on Rosa spp..Acta Italica Hortus 26, 223-</p> <p>- Cutini Maurizio; Brambilla Massimo; Assirelli</p>	

ACRONYMS AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRE	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹
				<p>Alberto; Romano Elio; Bisaglia Carlo (2021).Encouraging the Adoption of Precision Fertilization Technologies: steps from Theory to Practice.Proceedings of the European Conference on Agricultural Engineering, AgEng2021, 450-451.</p> <p>- Romano Elio; Bergonzoli Simone; El Khafraoui Davide; Comolli Roberto; Ferré Chiara; Bisaglia Carlo (2021).Monitoring the uniformity of soil water permeability for orchard precision irrigation.Acta Horticulturae, 1314, 91-96. DOI: 10.17660/ActaHortic.2021.1314.1</p> <p>- Maura Sannino; Salvatore Faugno; Rossetto Pisco; Alessio Vincenzo Tallarita; Franceschini Serrapica; Alberto Assirelli; Gianluca Caruana (2021).EFFECT OF IRRIGATION, FERTILIZATION AND MECHANICAL HARVESTING ON YIELD AND PERFORMANCE OF PEANUT (ARACHIS HYPOGAEA L.) GROWN IN SOUTHERN ITALY.European Biomass Conference and Exhibition Proceedings 2021, 352-357.</p>	
AMi Almond Management Innovations	Transfer and validation of innovative protocols to rationalize the use of production inputs and increase productivity, quality and cost-effectiveness of Apulian organic almond growing. Making the first transformation phase more efficient by applying emerging technologies already applied in other sectors of the food processing. Enhance the regional almond production through the characterization and development of new products.	L. GAETA CREA-AA	-Regione Puglia		
Armonia – Year 2 Breeding of new Clementines and seedless mandarins	Citrus breeding	G. RUSSO CREA-OFA	-A.O.P. ARMONIA		- N.1 Post-doc
Armonia – Year 3 Breeding of new Clementines and seedless mandarins	Citrus breeding	G. RUSSO CREA-OFA	-A.O.P. ARMONIA		
Armonia – Year 4 Breeding of new Clementines and seedless mandarins	Generation of new seedless mandarins and sanitation of plant material through shoot-tip grafting	G. RUSSO CREA-OFA	-A.O.P. ARMONIA		
Armonia – Years 5,6,7 Breeding of new Clementines and seedless mandarins	Breeding of new Clementines and seedless mandarins	G. RUSSO CREA-OFA	-A.O.P. ARMONIA		

ACRONYMS AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRE	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹
BioFruPARCO Recovery, enhancement and characterization of the accessions of the fruit germplasm of the Cilento, Vallo di Diano and Alburni National Park	Recovery of fruit germplasm in the Cilento National Park, Vallo di Diano and Alburni Bio-agronomic characterization, genetic and dissemination of the results obtained.	A. NUNZIATA CREA-OFA	-Parco Nazionale del Cilento e Vallo di Diano		- Fellowship - 1
Pilot management system of the low entropy organic farm, through the interpretation of the environmental factor, the prevalent use of natural preparations and the use of precision farming techniques	Support for the establishment and management of EIP operational groups on agricultural productivity and sustainability	M. AMENTA CREA-OFA CREA-IT	-Regione Siciliana		
Innovation and sustainability in the management of organic orchards: Peach, Apricot and Cherry.	The general aim of BIOPAC is to define solutions to the main problems concerning the organic fruit sector and to strengthen the stone fruit production chains (peach, apricot, cherry).	D. CECCARELLI CREA OFA CREA CI CREA AA	-MiPAAF	- Ciccoritti Roberto; Ciorba Roberto; Mitra Francesco; Cutuli Marcello; Amoriello Tiziana; Ciaccia Corrado; Testani Elena; Ceccarelli Danilo (2021). Diversification and Management Effects on the Quality of Organic Apricots. <i>Agronomy</i> , 11, 9, DOI: 10.3390/agronomy11091791.	- Conference: The challenges for organic fruit growing: sustainability management and variety choice 09/12/2021 Roma
BIOTECH Action BIOSOSFRU: Next generation BIOTechnologies approaches for a better productivity and Sustainability of FRUIT crops	New Breeding Techniques applied to fruit crops for the development of varieties with superior agronomic traits and resistant to biotic stresses.	I. VERDE CREA OFA CREA DC CREA GB	- MiPAAF	-Malnoy M., Micali S., Minervini A.P., Pavan Ricciardi L., Vendramin E., Verde I. (2021). Grazie alle TEA la frutticoltura può essere 2.0. <i>Informatore Agrario Suppl</i> al 27/2021: Tecnologie di Evoluzione Assistita pagg. 26-27. ISSN 0020-0689 -Miccoli C., Gambacorta G., Urbinati C., Santiago Reyes M., Gentile A., Vona Monticelli S., Caboni E., Verde I., Vendramin E. & Micali S. Application of new breeding techniques to improve important agronomic traits in <i>Prunus</i> species. LXIV SIGA Annual Congress "Plant genetic innovation for food security in a climate change scenario" 16/09/2021 (virtual). ISBN: 978-88-944843-2	- 5 Research grant

ACRONYMS AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRE	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹
BIOTECH_CITRUS BIOTECH Subproject: Citrus improvement by sustainable biotechnologies	Define new transcriptional factors, hopefully one belonging to Myb-like family and one to WD40 family, considering that, together with R2H5 (Myb-like, already known and characterized), are involved in the control of the anthocyanin pigmentation in sweet orange fruits; Integrating cisgenesis at least one of these genes in citrus fruits already containing lycopene, in order to produce highly healthy fruits; Define the molecular mechanisms responsible for sterility in mandarin and mandarin-like fruit by genetic characterization of the main key genes involved and related phenotyping in model plants; Knock-out of candidate genes by genome editing in order to obtain seedless fruits	C. LICCIARDELLO CREA-OFA	- MiPAAF - Ministero delle politiche agricole alimentari e forestali		- N. 3 Post-doc
Pear and Apple joint breeding activity	Obtaining new apple and pear varieties, suitable for the lowland environments of northern Italy	G. BARUZZI CREA-OFA	-NEW PLANT Società Consortile Agricola a Responsabilità Limitata	- Articolo in rivista Caracciolo Giuseppina; Pallotti Giuseppe; Sirri Sandro; Baruzzi Gianluca (2021).Crea di Forlì New Plant lavorano su più fronti per il miglioramento genetico.Rivista di frutticoltura e di ortofloricoltura, 9, 22-23 - Articolo in rivista Caracciolo Giuseppina; Maltoni, Maria Luigia; Faedi Giulia; Sirri Sandro; Baruzzi Gianluca (2021).Qualitative and Nutritional Characteristics after Storage of New Pear Selections in Emilia-Romagna Region.Agronomy, 11, 12, DOI: 10.3390/agronomy11122515.	
Strawberry breeding APOSCALIGERA Strawberry joint breeding activity for obtaining and developing new strawberry genotypes for Vercelli area 2018-2022	Produce new strawberry plant varieties through specific genetic research actions using traditional breeding techniques. The scientific action will produce new genetic material initialled CRAPO, which will have to undergo selection/evaluation work by CREA and APO before proceeding to possible dissemination and commercial exploitation of the varieties.	G. BARUZZI CREA-OFA	-APO Scaligera	- Articolo in rivista Baruzzi Gianluca; Sbrighi Paolo; Turci Patrizia (2021).Innovazione varietale sempre più attiva a livello internazionale.Rivista di Frutticoltura e di ortofloricoltura, 85, 3, 12-17. Contributo in atti di convegno Baruzzi Gianluca; Ballini Lorenzo; Birilli Matteo; Capriolo Giuseppe; Carullo Alfredo; Faedi Giulia; Funaro Maurizio; Gimelli Nivea; Magnani Sabina; Maltoni Maria Luigia; Sbrighi Paolo; Turci Patrizia; (2021).Updates on Italian strawberry breeding programs coordinated by CREA. .Acta Horticulturae, 1309, 106-1073.DOI: 10.17660/ActaHortic.2021.1309.151.	
Strawberry breeding ARSAC Calabria Strawberry joint breeding activity for obtaining new genotypes for Calabria areas.	To continue the project action of genetic improvement related to the Calabrian territory, as well as the activity of full exploitation of the selections in advanced stage of study already obtained with previous project actions	G. BARUZZI CREA-OFA	-ARSAC - Azienda Regionale per lo Sviluppo dell'Agricoltura Calabrese	- Articolo in rivista Funaro Maurizio; Ambrosio Marco; Grotte Maria; Longo Luigi; Matozzo Giuseppe; Spagnolo Gian Franco; Sbrighi Paolo; Baruzzi Gianluca (2021).Nuove selezioni dotate di precocità e rusticità per la coltivazione in Calabria .Rivista di Frutticoltura e di ortofloricoltura, 3, 40-41 - Contributo in atti di convegno Baruzzi Gianluca; Ballini Lorenzo; Birilli Matteo; Capriolo Giuseppe; Carullo Alfredo; Faedi Giulia; Funaro Maurizio; Gimelli Nivea; Magnani Sabina; Maltoni Maria Luigia; Sbrighi Paolo; Turci Patrizia; (2021).Updates on Italian strawberry breeding programs coordinated by CREA. .Acta Horticulturae, 1309, 106-1073.DOI: 10.17660/ActaHortic.2021.1309.151.	

ACRONYMS AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRE	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹
Laimburg breeding 2021-2025 Strawberry joint breeding activity "the tasty strawberry of Alto Adige"	Implementation of a breeding activity to be carried out in collaboration between CREA and LAIMBURG, aimed at obtaining new strawberry genotypes with high winter chilling requirements (HWRC), through specific genetic research actions carried out with traditional breeding methodologies	G. BARUZZI CREA-OFA	-CENTRO DI SPERIMENTAZIONE AGRARIA E FORESTALE "LAIMBURG"		
CBS Italy - EFS Pilot application of small-scale surveillance tools for citrus black spot pathogen in Italy	Monitoring using captaspore traps, both from the air and from rainwater, for the presence of the quarantine fungus <i>Phyllosticta citricarpa</i> at the site in Trebisacce, Cosenza	L. RICCIONI CEA-DC	-EFSA – European Food Safety Authority		n.1 Fellowship
Certification Apo Scaligera Agreement for genetic-plant health certification on strawberry plant propagation material in Veneto	Apo Scaligera, adhering to the National Strawberry Certification Process, is interested in acquiring the certification service for strawberry plants CREA-OFA, as a Conservation Center for Premultiplication (CCP) (M.D. 30245, 07.09.2005 and M.D. 05.04.2018) and Premultiplication Center (M.D. 30245, 07.09.2005)	G. BARUZZI CREA-OFA	-A.P.O. SCALIGERA SOC.COOP.		
CORY Corilynnova characterization and conservation of the coriliccolo germplasm, health genetic certification in nurseries, improvement of the quality of the hazelnut produced	Application of solutions aimed at improving the quality and quantity of the production of hazelnuts infested by the bug through biological control using generic and specific indigenous parasitoids	R. RIZZO CREA-DC	-Regione Siciliana		
CPVO Examination Office for peach, plum, kiwi and eucalyptus species	DUS test characterization of novel varieties following the CPVO/UPC protocols	F. GERVASI CREA-OFA	- COMMUNITY PLANT VARIETY OFFICE (CPVO) CPVO Examination Office for peach, plum, kiwi and eucalyptus species		
DICOVALE Diversity, conservation and enhancement of native Campanian fruit tree species	Recovery, assessment and description of the autochthonous RGV of woody fruit tree species Conservation of autochthonous RGV of woody fruit species through the establishment of germplasm banks, creation of catalog fields. Morpho-physiological, agronomic and genetic characterization of some autochthonous RGV of woody fruit species. Exchange of information with other competent bodies and dissemination of the results obtained.	M. PETRICCIONE CREA-OFA	- Regione Campania		- Fellowships - n.4

ACRONYMS AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRE	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹
Eausiris	Reinforced dissemination of new, non-conventional water resource management practices in the program area	F. S. FERLITO CREA-OFA	<ul style="list-style-type: none"> - Commissione Europea - Mediterranean Renewable energy center - Institut des régions arides de Médénine (IRA) - Ministère de l'agriculture des Ressources Hydrauliques et de la Pêche (MARHP) - Direction Générale de l'Aménagement et de la Conservation des Terres Agricoles - Ecole Supérieure d'Ingénieurs de Medjez el Bab 		
ESPERA Circular economy and sustainability of the Mantuan PGI pear supply chain	<p>Determination of a non-destructive ripening index at harvest as a selection tool to improve fruit storage;</p> <p>Improvement of fruit management during storage with the identification of fruit intended for fresh consumption and fruit intended for processing into dried washers;</p> <p>Production of dried pear washers from fruits with physiopathologies originally not intended for fresh consumption;</p> <p>Recovery of waste from the production of washers for the extraction of nutritional compounds with valuable technological functionality and high added value;</p> <p>Creation of a prototype for non-destructive optical measurements of ripeness degree adaptable to fruit sorting lines;</p> <p>Reconfiguration of the Mantuan PGI pear supply chain based on the principles of sustainability and circularity, through the analysis and implementation of innovative technological, process and organizational solutions for waste prevention and circular management of food surplus</p>	M. VANOLI CREA-IT	- Regione Lombardia	<ul style="list-style-type: none"> - Posti Vanoli Maristella, Cortellino Giovanni, Buccheri Marina, Grassi Maurizio, Lovati Fabio, Caramanico Rosita, Levoni Pietro, Spina Lorenzo, Torricelli Alessandro (2021) Economia circolare e sostenibilità della filiera della pera IGP del Mantovano: recupero dei rifiuti con fisiopatie per la produzione di chi di pera. XIII Giornate Scientifiche SOI. Catania 22-23 giugno 2021, Acta Italus Hortus 26: 21. - Posti Buccheri Marina, Grassi Maurizio, Cortellino Giovanni, Caramanico Rosita, Lovati Fabio, Vanoli Maristella (2021). Ethylene, α-farnesene and conjugated trienols in 'Abate Fetel' pear in relation to storage, 1-MCP treatment and superficial scald development. XIII Giornate Scientifiche SOI. Catania, 22-23 giugno 2021, Acta Italus Hortus 26: 117. 	
FAVINNOVA Varietal innovation for better quality in the 'Favetta' strawberry from Terracina	<p>Establishment of a working group focused on the 'Favetta' strawberry grown in Terracina; promote the cultivation of novel 'Favetta' lines in the agropontino region (South of Lazio);</p> <p>Testing the agronomic and qualitative performance of 'Favetta' lines with higher flesh firmness grown in Terracina and quality certification of the production</p>	P. FERRANTE CREA-OFA	- Regione Lazio		
FERRERO Etiology of hazelnut spoilage	We intend to identify the fungal species present on the hazelnut since inception and trace the evolution of the fungal communities considering the pathogenic species associated with the symptoms of the "spoiled kernel. The most frequently isolated species will be further investigated for their deteriorating capacity of the fruit.	S. VITALE CREA-DC	-Ferrero Trading Lux S.p.A.		
FF_IPM In-silico boosted, pest prevention and off-season focused IPM against new and emerging fruit flies	Eco-sustainable strategies for <i>Ceratitis capitata</i> containment	M. R. TABILIO CREA-OFA	-Università degli Studi del Molise		

ACRONYMS AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRE	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹
FRAMONT Production and quality of strawberry cultivation in Lazio mountain.	Evaluation of the effect of the genotype on the productivity and on fruit quality parameters (colour, flesh firmness, soluble solids, phenolic compounds and vitamins) of strawberry varieties grown in mountain environment	P. FERRANTE CREA-OFA	-ARSIAL		
FREECLIMB FRUIT CROPS RESILIENCE CLIMATE CHANGE IN THE MEDITERRANEAN BASIN	Optimization of phenotyping protocols, generation of pre-breeding material resistant to biotic and abiotic stresses	M. CARUSO CREA-OFA	MIUR - Ministero dell'Università e della Ricerca- Hellenic Agriculture Organization - Hellenic Agriculture Organization - Institute of Plant Breeding and Genetic Resources - Hellenic Agriculture Organization - Institute of Olive Tree, Subtropical Crops Viticulture - Institut National de la Recherche Agronomique du Maroc - INRA - Génétique et Amélioration des Fruits et Légumes - INRA - Biologie du Fruit et Pathologie - ENSA (École Nationale Supérieure Agronomique) - Université Frères Mentouri Constantine 1 - Agricultural Research Center - CENTRE DE RECHERCHE EN AGRIGENOMICA CSIC-IRTA UAB-UB - CRAG (Centre for Research in Agricultural Genomics) - University of Cukurova - Institut de l'Olivier (IO)	- Articolo in rivista Di Guardo Mario; Moretto Marco; Moscatello Mirko; Catalano Chiara; Troglio Michela; Deng Ziniu; Cestaro Alessandro; Caruso Marco; Distefano Gaetano; La Malfa Stefano; Bianco Luca; Gentile Alessandra (2021). The haplotype-resolved reference genome of lemon (Citrus limon L. Burm f.). Theoretical and Applied Genetics, 125, 6, DOI: 10.1007/s11295-021-01528-5. - Articolo in rivista Russo Riccardo ; Caruso Marco ; Arlotti Carmen ; Lo Piero Angela Roberta; Nicolosi Elisabetta; Di Silvestro Silvia (2020). Identification of field tolerance and resistance to mal secco disease in a citrus germplasm collection in Sicily. Agronomy, 10, 11, DOI: 10.3390/agronomy1011180. - Articolo in rivista Caruso Marco; Strano Maria Concetta; Arlotti Carmen; Russo Riccardo; Ciacciulli Angelo; Pietro Paolo Donata; Scirè Michele; Licciardello Concetta; Caruso Paola; Russo Giuseppe; Di Silvestro Silvia (2021). Nuove tecnologie genetiche per la selezione di agrumi resistenti. Rivista di Frutticoltura e Ortofrutticoltura, 1, 40-44. - Articolo in rivista Catalano Chiara; Di Guardo Mario; Distefano Gaetano; Caruso Marco; Nicolosi Elisabetta; Deng Ziniu; Gentile Alessandra; La Malfa Stefano Giovanni (2021). Biotechnological Approaches for Genetic Improvement of Lemon (Citrus limon L.) Burm. f.) against Mal secco Disease. Plants, 10, 5, DOI: 10.3390/plants10051002. - Articolo in rivista Russo Riccardo; Sicilia Angelo; Caruso Marco; Arlotti Carmen; Di Silvestro Silvia; Gmitter Frederick G Jr; Nicolosi Elisabetta; Lo Piero Angela Roberta (2021). De Novo Transcriptome Sequencing of Rough Lemon Leaves (Citrus jambhiri Lush.) in Response to Plenodomus tracheiphilus Infection. International Journal of Molecular Sciences, 22, 2, DOI: 10.3390/ijms22020882.	- Fellowship - n.1

ACRONYMS AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRE	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹
Fruitimpresa Breeding of citrus through mutagenic agents and crossing activities	Generation of new citrus cultivars through conventional breeding	G. RUSSO CREA-OFA CREA-IT	<ul style="list-style-type: none"> - Azienda Agricola Campisi Antonino - SPEEDY 97 S.r.l. - A.P.A.L. O.P. Soc. Consortile a R.L. - PANNITTERI C. S.r.l. - ORANFRIZER S.R.L. - Gruppo Bonomo S.p.a. - CAVALLINO S.r.l. - COSENTINO SEBASTIANO FIGLIO s.n.c. - ORTOFRUTTICOLA TORO CATENA S.r.l. - COA s.r.l. 		
FRU.BRA Collaboration agreement for the evaluation and dissemination in Brazil of the genetic material of Italian fruit species obtained by CREA-OFA	Evaluation and dissemination activities of new CREA genetic material in Brazil.	G. BARUZZI D. GIOVANNINI CREA-OFA			
FRUTTIJOB On-the-job training for Cuneo fruit growers	Support the growth of human capital within the Cuneo fruit companies in order to increase their competitiveness. Equip the Cuneo fruit companies with adequate knowledge on innovative tools to obtain quality production in compliance with more sustainable and green techniques	P. BORSOTTO CREA-PB	- Fondazione Cassa di Risparmio di Cuneo		
GRANATUM Agronomic innovations to improve the quality of pomegranate fruits and the competitiveness of farms in short supply chains	The project is organized in the following operational objectives: <ul style="list-style-type: none"> - improvement of the agronomic performance of pomegranate cultivars; - evaluation of process innovation on the qualitative parameters and biological activities of the fruit; - definition of biochemical and molecular indices for fruit characterization; - assessment of economic and environmental sustainability and consumer preferences 	M. PETRICCIONE CREA-OFA	- Regione Campania		
GS PES-NET-2 Study and dissemination actions aimed at reducing and optimizing the use of pesticides in peach and nectarine crops, and at identifying good agronomic practices to preserve the environment and bees	Study and dissemination actions aimed at reducing and optimizing the use of pesticides in peach and nectarine crops, and at identifying good agronomic practices to preserve the environment and bees	S. LANDI CREA-DC	- GS S.p.A.		

ACRONYMS AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRE	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹
HO-FOOD Innovative High Pressure process to increase the preservation of ready-to-eat Organic Food	The overall goal of this project is to support the local fresh food supply chain by developing new mild, minimal and careful pasteurization technologies for fresh/raw fruits and vegetables as RTE. The implementation will focus on the development and production of small/medium plants used by SMEs, to reinforce or create new business opportunities fostering the production and consumption of local and seasonal organic products	S. FABRONI CREA-OFA	- MiPAAF - Ministero delle politiche agricole alimentari e forestali - Commissione europea - Ataturk Central Horticulture Research Institute - Institute of Agricultural and Food Biotechnology - Université Ahmed Benbella Oran 1		- Borse di studio - n.1
IN-NOCE – 2020-2021	Evaluation of the agronomic-productive performance of walnut 'Chandler' grafted or micro-propagated – 4 th and 5 th year	D. GIOVANNINI CREA-OFA	- VITROPLANT ITALIA S.R.L.	- Contributo in atti di convegno: Cozzolino, Eugenio; Giovannini, Daniela; Sirri Sandro; Neri, Davide (2021). Micropropagation vs. grafted 'Chandler' trees in young walnut orchards. Acta Horticulturae, 1318, 17-24. DOI: 10.17660/ActaHortic.2021.1318.3. - Contributo in atti di convegno: Neri Davide; Cozzolino Eugenio; Sirri Sandro; Massetani Francesca; Daniela Giovannini (2021). Shoot growth and bud topology of 'Chandler' walnut. Acta Horticulturae, 1318, 9-108. DOI: 10.17660.1318.16.	- Aggiornamento tecnico su Noce e Pecan focus su impianti, propagazione e potatura 31/03/2021
INNOCORE Nursery innovations for Piedmontese coriliculture	The initiative aims to help develop a modern and specialized nursery introducing process and product innovations, to make Piedmontese coriliculture more competitive. Therefore, the objectives of the project include the evaluation, from a physiological and molecular point of view, of the effect of non-polloniferous rootstocks on the 'Tonda Gentile Trilobata' (TGT) and 'Tonda di Giffoni' (TdG) cultivars, to introduce the use of grafted plants also in coriliculture	W. CHITARRA CREA-VE	- CNR - Istituto per la Protezione Sostenibile delle Piant		
INNOVABIO Application of innovative methods for the traceability of organic farm products	This project aims to improve the knowledge of the factors that influence the food quality of organic horticultural products, paying particular attention to their differentiation from conventional ones and traceability from field to table. The aim of the project is the implementation, for organic horticultural crops, of a chemical and chemometric investigation system that allows through the acquisition of isotopic data and other chemical and biochemical parameters, to distinguish between productions obtained with synthetic fertilizers, typical of conventional agriculture and not allowed in organic farming, and productions obtained with the organic farming method, which involves the use of only allowed organic fertilizers and the application of agronomic methods for the management of soil fertility such as rotations and the introduction of agroecological services crops and leguminous species	S. FABRONI CREA-OFA CREA-OF CREA-AA	- MiPAAF - Ministero delle politiche agricole alimentari e forestali		- Organic authenticity: a research on cauliflower through N Isotope and multivariate chemical approach - INNOVABIO project February, 18/ 2021
INNOVITIS Sustainable process and product innovations for the improvement of Sicilian table grapes	Innovitis project aims to transfer to the table grapes producers in the Mazzarrone area, innovations in varieties, management, cultivation and transformation techniques for table grapes, in order to update and enrich the ampelographic platform available for growers, to improve productivity and to increase the economic and environmental sustainability of the crop	F. S. FERLITO CREA-OFA	- Regione Siciliana		- N.2 Fellowships

ACRONYMS AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRE	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹
IPM-POPILLIA Integrated Pest Management of the invasive Japanese Beetle, Popillia japonica	<p>The aim of IPM-Popillia is to address the challenge of a new risk to plant health in Europe, the invasion of the Japanese beetle, Popillia japonica</p> <p>. This pest was introduced accidentally to mainland Europe in 2014 and can easily spread in the course of trade and the movement of goods and people. P. japonica threatens the entire agricultural sector, as well as the biodiversity in the invaded area. Prevention of the species' invasion faces two constraints: The possibilities to restrict movement of goods and people are limited, and successful eradication of the population established south of the Italian-Swiss border is impossible. Recently, EFSA and the JCR of the European commission have nominated P. japonica as a candidate high priority pest in the new EU Plant health Law. Against this background, it is paramount to develop measures, which will help to confine the spread of the new pest, and (2) prevent the build-up of high population densities that cause economic loss to agricultural crops and increase migration pressure of the Japanese beetles</p>	L. MARIANELLI CREA-DC	<ul style="list-style-type: none"> - Commissione Europea - INRA - UMR IGEPP - E-NEMA - Agroscope - SPOTTERON GMBH - PESSL INSTRUMENTS GMBH - JARDIN SUISSE - SERVIZIO FITOSANITARIO TICINO - SFTI - TUM-Technische Universität München - FUNDACAO GASPAR FRUTUOSO 		- n. 2 Post-Docs
ISS2021 IX International Strawberry Symposium (ISHS)	L'obiettivo è stato quello di organizzare il IX International Strawberry Symposium dell'ISHS in collaborazione tra il CREA e l'Università Politecnica delle Marche	G. BARUZZI CREA-OFA	- Università Politecnica delle Marche - Dipartimento di Scienze Ambientali e delle Produzioni Vegetali		
Jingold Preliminary protocol for the use of dormancy switch in kiwi (cv. Jintao) calibrated according to the time and dose of administration.	2 Develop an objective and repeatable protocol for the application of dormancy switch on actinidia cv Jintao.	L. GAETA CREA-AA	- JINGOLD S.P.A.		
KIRIS III year The death of the kiwi - In-depth study of the etiology and prevention and defense tools	Deepen the knowledge of the physiological aspects that are at the origin of the die-off as a response to environmental, agronomic and phytopathological factors, in order to prevent their onset in new plantations and to find possible solutions for existing plants.	L. BARDI CREA-IT	- Regione Piemonte		
Lav.Reg.La PREVENTION OF IRREGULAR LABOUR IN THE LAZIALE FRUIT AND VEGETABLE CHAIN: TOOLS FOR SUPPORT AND FINALIZING INTERVENTIONS	Create a methodology for detecting and identifying "areas of vulnerability"; Mapping the farm types and vulnerable areas classified by vulnerability gradient and by the nature of its determinants; Identify the Policy recommendations with reference to the regional intervention programs in agriculture; Identify the strategic options for structural and organizational reorganization of vulnerable business types.	A. TANTARI CREA-PB	- Regione Lazio		

ACRONYMS AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRE	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹
MADDOGEN <i>Malus domestica</i> genotyping	Molecular characterization of apple accessions in the frame of the action under the Lazio region law L.R. n.15/2000 for the Protection of autochthonous genetic resources of agricultural interest. PSR Lazio 2014-2020	S. MICALI CREA-OFA	- ARSIAL		
Mathilde Models for Hazelnut Diseases	Develop reliable simulation models aimed at predicting hazelnut pest and disease outbreaks and quantifying associated yield losses and quality defects. The expected benefits consist of decision support tools, which can help decision makers to limit the impacts of quality issues in a context of economic, social, technological and climatic changes	S. U. M. BREGAGLIO CREA-AA	- Fonds National de la Recherche Luxembourg		
MONI.TOSC Scientific collaboration agreement for the implementation of joint activities in the field of investigations, studies of common interest in the fields of entomology and nematology of ornamental and forest trees and shrubs	The activities are aimed at the development of emergency and predictive models to be activated in the event of the discovery of quarantine organisms according to the EU Reg. 2016/2031, refinement of biomolecular diagnostic techniques, development of models for emergency plans phytosanitary.	L. MARIANELLI CREA-DC	- Regione Toscana		
NOBILFRUTTA Implementation and study of the "Nobile" method in fruit growing: case study on apple and fig	Support for the establishment and operation of EIP Operational Groups on productivity and agriculture sustainability	M. PETRICCIONE CREA-OFA	- GAL Irpinia Consorzio		
NOCETO Assistance for the identification and solution of pathological problems in WALNUT	Monitoring, diagnosing and solving of the phytopathological problems that will arise during the 2021/2022 season in the specialized walnut cultivation in the Veneto region.	S. VITALE CREA-DC	- IL NOCETO - SCA		
OLTRE.BIO INNOVATIVE MANAGEMENT OF ORGANIC TABLE CHERRY AND GRAPE CULTIVATION	The project will implement the following innovative strategies: - Soil management: the aim is to improve soil health, biological fertility, organic matter content, water retention capacity, erosion reduction, increase the efficiency of irrigation water use. - Water resource management: the goal is to transfer an approach based on Water Use Efficiency and on the vegetative-productive balance monitored through the installation of weather stations, innovative sensors (stem psychrometer), "plant based" physiological indicators, able to characterize the water state of the soil, the microclimate of the canopy and to provide irrigation advice through the implementation of a DSS - Management of adversity: the goal is to transfer a rational and innovative management of phytosanitary interventions, reducing the onset of forms of resistance and the introduction of heavy metals to the ground (copper). - Post-harvest and packaging management: the goal is to enable Apulian entrepreneurs to reach increasingly distant and ambitious markets and manage the supply of the product on the market in a more strategic way, thanks to the application of technological and process innovations able to increase the shelf-life of organic grapes and cherries that can be presented on the market with an excellent quality.	L. TARRICONE CREA-VE CREA-AA	- Regione Puglia - IAMZ-CIHEAM – Mediterranean Agronomic Institute of Zaragoza		- La compagnia del suolo. Contro desertificazione dei suoli serve un'altra agricoltura 13/10/2021 Bari

ACRONYMS AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRE	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹
PIR strawberry project "Obtaining new low winter chilling requirement genotypes for southern areas, especially Metaponto area."	Obtaining new strawberry genotypes with low winter chilling requirement (LWCR (Low Winter Chilling Requirement) through specific gene research actions carried out with traditional breeding methodologies	G. BARUZZI CREA-OFA	- Azienda Piraccini Secondo	- Articolo in rivista Antonio Felipe Fagherazzi; Fernanda Grimaldi; Aike Anneliese Kretschmar; Leo Rufato; Marllon Fernando S dos Santos; Paolo Sbrighi; Pierluigi Lucchi; Gianluca Baruzzi; Waltha Faedi (2021).Pircinque: new strawberry cultivar for Brazilian producers.Horticultura Brasileira, 39, 4, 464-469.DOI: 10.1590/s01030536-20210416.	
PROMENADE Implementation of Ferrero's support system for provision of hazelnut yields	Develop the HADES system for yield provision through (i) implementation of the impact of pollen on interannual yield variability, (ii) extension of the system to Chilean areas and consolidation in Italy, and (iii) improvement prediction of "spoiled" and "bug" quality defects.	S. U. M. BREGAGLIO CREA-AA	- Ferrero Trading Lux S.p.A.		
QUALIFITO Phytosanitary qualification of the autochthonous fruit, vine and olive tree germplasm of Lazio	The general objective of the project is the phytosanitary qualification of the autochthonous fruit, olive and grape germplasm according to current European and national regulations through a health selection activity aimed at identifying plant material free from regulated pathogens and maintenance in a controlled environment.	L. FERRETTI CREA-DC	- ARSIAL		- n.1 Fellowship
QUALITYKIWI Innovations for the improvement of qualitative standards of Kiwi in Lazio	Implementation of a DSS to manage irrigation, fertilization, and diseases of kiwi	A. SUARDI CREA-IT CREA-OFA CREA-DC	- Regione Lazio		
RGV FAO VI Triennio - 2° year Program 2020-2022 Preservation of plant agrobiodiversity through the conservation, implementation, and assessment of the health status of collections of fruit tree species.	Conservation, characterization, and valorization of plant genetic resources for agriculture and food.	I. VERDE CREA-OFA CREA-IT CREA-OF CREA-DC CREA-FL CREA-ZA CREA-GB CREA-VE CREA-AA	- MiPAAF – Italian ministry of agriculture	- Pasquale Tripodi; Gianluca Francese; Vincenzo Onofaro Sanaja; Carlo Di Cesare; Giovanni Festa; Antonietta D'Alessandro; Giuseppe Mennella (2021). A multi-methodological approach to study genomic footprint and environmental influence on agronomic and metabolic profiles in a panel of Italian traditional sweet pepper varieties. Journal of Food Composition and Analysis 103,DOI: 10.1016/j.jfca.2021.104113. - Marchetti Lucia; Saviane Alessio; Dalla Morte Antonella; Paglia Graziella; Pellati Federico Benvenuti Stefania; Bertelli David Cappelozza Silvia (2021). Determination of Deoxynojirimycin (1-DNJ) in Leaves of Italian Italy-Adapted Cultivars of Mulberry (Morus sp.pl.) by HPLC-MS..Plants, 10, 8,DOI: 10.3390/plants10081553. - Cappelozza Silvia; Demo Edoardo; Saviane Alessio (2021). I gelsi ai tempi dei Dogi: quando Venezia dominava il Mediterraneo..Vita	RGV FAO VI Triennio - 2° year Program 2020-2022 Preservation of plant agrobiodiversity through the conservation, implementation, and assessment of the health status of collections of fruit tree species.

ACRONYMS AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRE	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹
				<p>campagna, 7-8, 10-11</p> <p>- Baronti S; Galassi E; Ugolini F; Miglietta G; Genesio L; Vaccari FP; Cacciatori P; Gazzera L(2022). Agronomic and ecophysiological evaluation of an early establishment perennial wheat lines in Central Italy. Gene Resources Crop Evolution, 69, 619-633. DOI: 10.1007/s10722-021-01248-8.</p> <p>-Congress Abstracts</p> <p>Sciacca Fabiola; Palumbo Massimo; Paglia Antonella; Di Stefano Vita; Scandurro Salvatore; Sollima Lucia; Virzi Nino; Meloni Maria Grazia (2021). VALUTAZIONE DELLE CARATTERISTICHE QUALITATIVE E NUTRIZIONALI DI PANI FUNZIONALI ENRICHITI CON PORTULACA OLERACEA L. OPUNTIA FICUS-INDICA. 283-288</p> <p>- Caputo Angelo Raffaele; Gasparro Maria; Bergamini Carlo; Alba Vittorio; Miglietta Daniele; Roccotelli Sabino; Cirigliano Pasquale Del Lungo Stefano (2021). Il germoplasma viticolo dell'Enotria nel Mezzogiorno d'Italia</p> <p>-Congress Proceedings</p> <p>Gazza Laura; Galassi Elena; Cacciatori Pieri (2021). Agronomic, technological and nutritional characterisation of selected perennial wheat lines grown in Italy. 27-31</p> <p>- Pietrella Marco; Giovannini Daniele; Cappellozza Silvia (2021). Simple sequence repeat markers enabled gene characterization of mulberry germplasm preserved in the CREA's collection of Padua Italy. Acta Horticulturae, 1307, 299-305. DOI: 10.17660/ActaHortic.2021.1307.46.</p>	
RiGeFru-Sicily Center for the conservation of the biodiversity of Sicilian fruit genetic resources	Creation of a public center for the conservation of native fruit germplasm of the Sicily Region for the biodiversity safeguarding	G. SORRENTINO CREA-OFA	- Regione Siciliana		
S.I.R.P.A. DEVELOPMENT OF RESISTANCE INDUCERS TO VASCULAR PATHOGENS OF CITRUS.	<p>SIRPA aims to the optimization, development, and validation of "products" directed to contain two pathogens that afflict the citrus fruit production of strategic importance for Sicily and the Mediterranean area. Particular attention is focused to the identification and use of natural biotechnological remedies to be used in defense of:</p> <ul style="list-style-type: none"> - "tristeza", caused by the phloem virus Citrus tristeza closterovirus (CTV) which causes a progressive deterioration of the plants, leading them to death. - "malsecco", disease caused by <i>Plenodomus tracheiphilus</i>, a xylem ascomycete fungus, widespread in all Mediterranean and Middle Eastern countries 	C. LICCIARDELLO CREA-OFA	- Regione Siciliana	<p>- Articolo in rivista</p> <p>Licciardello Grazia; Ferraro Rosario; Scuderi Giuseppe; Russo Marcella; Catara Antonino Felice.(2021).A simulation of the use of high throughput sequencing as pre-screening assay to enhance the surveillance of citrus virus and viroids in the EPPO region..Agriculture, 11(5),DOI: 10.3390/agriculture11050400.</p>	- Post-doc - n.1

ACRONYMS AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRE	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹
Simodrofila	Validation of an innovative control system of <i>Drosophila suzukii</i> and other relevant phytophagous.	M. BIOCCA CREA-IT CREA-OFA	- Regione Lazio		
SISTER Organizational support and supply chain services for new fruit crops	Fully verify the suitability of the new varietal genotypes (strawberry 12.25.01, actinidia Ac 459-11, interspecific pear PremP009) for cultivation with both integrated and organic production techniques, in the most suitable regional environments. Analyze the consumer acceptance and propensity to purchase, as well as the suitability for IV gamma processing of the new types of fruit. Create new organizational supports and services for New Plant's member producer organizations (Apofruit Italia, ApoConerpo and Orogel Fresco) conceived in a supply chain logic: from the acquisition of cultivation rights and commercial exploitation of the new varieties to the preparation and distribution of the plants to be grown, to the marketing of the products ("Club" varieties).	G. CARACCILO CREA-OFA	- Regione Emilia Romagna		
STONY HARD_ 2020-2021 Ricerca, Innovazione e Sviluppo di un nuovo carattere "SH" (Stony Hard) su pesche - annualità 2020-2021 Research, Innovation and Development of SH (Stony Hard) traits on peach – year 2020-2021	The objective of the project is related to the deepening of knowledge and verification of the commercial potential that the "SH" character can bring in peach tree varietal innovation	D. GIOVANNINI CREA-OFA	- AOP Italia Società Consortile a r. l.	- Contributo in atti di convegno: Giovannini Daniela; Bassi Daniele; Cutler Marcello; Drogoudi Pavlina; Foschi Stefano; Hilaire Christian; Liverani Alessandro; Ruesch Julien; Iglesias Ignasi (2021). Evaluation of new peach cultivars in the European Union: the EUFRIN Peach and Apricot Working Group initiative. Acta Horticulturae, 1304, 13-19. DOI: 10.17660/ActaHortic.2021.1304.13. - Contributo in atti di convegno: Caracciolo Giuseppina; Cacchi Mattia; Sirri Sandro; Quacquarelli Irene; Assirelli Alberto; Giovannini Daniela (2021). A new mechanism to reduce hand labor in peach. 1304-243-247. DOI: 10.17660/ActaHortic.2021.1304.34. - Contributo in atti di convegno: Giovannini Daniela; Quacquarelli Irene; Brancati Federica; Maltoni Maria Luigia; Sirri Sandro; Liverani Alessandro (2021). Promising blood-fleshed peaches and nectarines from the CREA Forlì breeding program. Acta Horticulturae, 1304, 77-80. DOI: 10.17660/ActaHortic.2021.1304.11.	
TESS Targeted engineering of stone fruit tree genomes for resistance to Sharka	H2020 Marie Curie RISE project, for personnel and know-how exchange among partner institutions aiming at the establishment of an interdisciplinary group working on the development of stone fruit trees resistant to Sharka (Plum Pox Virus), through the CRISPR/Cas9-mediated editing of host susceptibility genes	S. MICALI CREA-OFA	- Commissione Europea		
URCOFI IV Coordination and strengthening of surveillance, research, experimentation and monitoring activities in the phytosanitary field	Monitoring of pests of phytosanitary alert and strategic interest. Morpho-phenological, bioagronomic and qualitative characterization of chestnut ecotypes that are tolerant / resistant to the gall wasp found in the Campania region	M. SCORTICHINI CREA-OFA CREA-DC	- Regione Campania		

ACRONYMS AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRE	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹
ValRiGeF-Sicilia Improving the genetic resources of Sicilian fruits	Biodiversity preservation and enhancement of plant genetic resources	M. CUTULI CREA-OFA	- Regione Siciliana		
Agreement for entrusting the activity of scientific coordination and scientific and agronomic evaluation on apple cultivar	Identify apple cultivars suitable for lowland cultivation, with commercial and agronomic characteristics to replace the current ones, which are no longer valued by the market, possibly with genetic resistances to pathogens, using rootstocks suitable for replanting as well as resistant to soil-borne fungal diseases to improve production performance	G. CARACCIOLO CREA-OFA	- Organizzazione produttori Nord Est		

2.4.2. Patents and Services

PATENTS INDUSTRIAL PATENTS

PRODUCTS/MAIN TOPICS	DENOMINATION/DESCRIPTION	AUTHORS/INVENTORS	CREA RESEARCH CENTRES
Citrus	Method for the production of an extract from citrus by-products from citrus processing (IT)	G. Ballistreri, M. Amenta, S. Fabroni, P. Rapisarda	CREA-OFA

PLANT VARIETY RIGHT

CITRUS	DENOMINATION	AUTHORS	CREA RESEARCH CENTRES	CITRUS	DENOMINATION	AUTHORS	CREA RESEARCH CENTRES
mandarin orange	EARLY SICILY	G. Russo, S. Recupero	CREA-OFA	mandarin	SWEET SICILY	G. Russo, S. Recupero	CREA-OFA
mandarin	GALATEA	G. Russo, M. Caruso, C. Licciardello, P. Caruso	CREA-OFA	mandarin	TACLE	CREA-OFA	CREA-OFA
mandarin	IONIO	Russo G. Caruso M.	CREA-OFA	ornamentale (ibrid arancio dolce)	ARCOBAL	S. Recupero, G. Russo	CREA-OFA
mandarin	RED SUNSET	M. Caruso, G. Russo	CREA-OFA	grapefruit	BELLINI	G. Russo, C. Licciardello, Caruso. P. Caruso	CREA-OFA
mandarin	SUN RED	G. Russo, C. Licciardello, P. Caruso	CREA-OFA	rootstock (citrus ibrid e poncirus)	F16 P12	G. Russo, S. Recupero	CREA-OFA
OTHER FRUIT SPECIES	DENOMINATION	AUTHORS	CREA RESEARCH CENTRES	OTHER FRUIT SPECIES	DENOMINATION	AUTHORS	CREA RESEARCH CENTRES
apricot	ISCHIA	F. Pennone	CREA-OFA	pear	TURANDOT	L. Rivalta	CREA-OFA
apricot	PROCIDA	F. Pennone	CREA-OFA	peach	ADAMI-NATASHA	C. Fideghelli, G. Della Strada	CREA-OFA
strawberry	AGNESE	P. Sbrighi, G. Baruzzi, W. Faedi	CREA-OFA	peach	ALIBLANCA	A. Liverani	CREA-OFA
strawberry	ARGENTERA	W. Faedi, G. Baruzzi, P. Sbrighi	CREA-OFA	peach	ALICE COL	A. Liverani, D. Giovannini	CREA-OFA

strawberry	BRILLA	W.Faedi, G. Baruzzi, P. Sbrighi		peach	ALIPERSIE'	A. Liverani	CREA-OFA
strawberry	CALLAS	P.Sbrighi, W. Faedi, G. Baruzzi	CREA-OFA	peach	ALIROSADA	A. Liverani	CREA-OFA
strawberry	CRAPO 135	W. Faedi, G. Baruzzi, P. Sbrighi	CREA-OFA	peach	ALITOP	A. Liverani	CREA-OFA
strawberry	GARDA	W. Faedi, G. Baruzzi, P. Sbrighi	CREA-OFA	peach	AUTUNNO	C. Fideghelli, G. Della Strada	CREA-OFA
strawberry	IRMA	W.Faedi, G. Baruzzi	CREA-OFA	peach	CORNELIA	M. Cutuli, M. Terlizzi, A.Sartori	CREA-OFA
strawberry	JONICA (2)	W. Faedi, P. Sbrighi, G. Baruzzi	CREA-OFA	peach	GILDA ROSSA	A. Nicotra, L. Moser	CREA-OFA
strawberry	LIA	W. Faedi, G. Baruzzi	CREA-OFA	peach	GRETA	A. Nicotra, L. Moser	CREA-OFA
strawberry	PIRCINQUE (2)	W. Faedi, G. Baruzzi	CREA-OFA	peach	LIVIA	Cutuli M. Terlizzi M. Sartori A.	CREA-OFA
strawberry	TECLA	W. Faedi, G. Baruzzi	CREA-OFA	peach	LOLITA	Nicotra A. Moser L.	CREA-OFA
strawberry	MEDI'	W.Faedi, G. Baruzzi, P. Sbrighi, P. Lucchi	CREA-OFA	peach	LUCILLA	M. Cutuli, M.Terlizzi, A. Sartori	CREA-OFA
strawberry	LIGEA	W.Faedi, G. Baruzzi, P. Sbrighi, P. Lucchi	CREA-OFA	peach	MARILYN	A. Nicotra, L. Moser	CREA-OFA
raspberry	ALPENGOLD	F.R.De Salvador, A. Pititto, L. Gadler	CREA-OFA	peach	ORION	C. Fideghelli. G. Della Strada	CREA-OFA
raspberry	ERIKA (2)	De Salvador F. R. Pititto A. Gadler L.	CREA-OFA	peach	PIATTAFORONE	D. Giovannini, A. Liverani	CREA-OFA
raspberry	ROME BRIGHT	F.R. De Salvador, G. Proietti, P. Puleo, P. Engel	CREA-OFA	peach	PIATTAFORTWO	D. Giovannini, A. Liverani	CREA-OFA
raspberry	RUBYFALL	F.R. De Salvador, A. Pititto A., Gadler	CREA-OFA	peach	ROME STAR	C. Fideghelli, G. Della Strada	CREA-OFA
apple	CREA 105	G. Baruzzi, W. Faedi, M. Bergamaschi	CREA-OFA	peach	SAGITTARIA	O. Inero	CREA-OFA
apple	FORLADY	G. Baruzzi, W. Faedi, M. Bergamaschi	CREA-OFA	peach	FRF 813	A. Liverani, D. Giovannini, F. S. Brandi	CREA-OFA
apple	GOLDEN ORANGE	A. Bergamini	CREA-OFA	peach	FRF 1500	A. Liverani, D. Giovannini, F. S. Brandi	CREA-OFA
Pear	AIDA	L.Rivalta	CREA-OFA	peach	VENUS	Fideghelli C. Della Strada Liverani A	CREA-OFA
Pear	BOHEME	L. Rivalta	CREA-OFA	rootstocks (non-sucker pomegranate)	PJERED ONE	P. Preka, Cherubini S.	CREA-OFA
Pear	CARMEN	L. Rivalta	CREA-OFA				
Pear	CREA 194	G. Baruzzi, W. Faedi, L. Rivalta S. Sirri	CREA-OFA	rootstocks (plum tree - similar to peach tree)	PENTA	A. Nicotra. L. Moser	CREA-OFA
Pear	FALSTAFF	W. Faedi, S. Sirri, L. Rivalta	CREA-OFA	rootstocks (plum tree - similar to peach tree)	TETRA	A. Nicotra. L. Moser	CREA-OFA

Services

Collections

PRODUCTS/MAIN TOPICS	DENOMINATION/DESCRIPTION	PERSON IN CHARGE	CREA RESEARCH CENTRES
Citrus	Citrus germplasm collection. It contains around 700 accessions belonging to Citrus and relatives. Accessions are grown in open field and under screen houses	G. Russo, M. Caruso, P.Caruso , C. Licciardello	CREA-OFA
anona e avocado	Annona and avocado germplasm collection. It contains around 20 selections of which 8 are annona.	G. Russo, G.Cicciarello	CREA-OFA

PRODUCTS/MAIN TOPICS	DENOMINATION/DESCRIPTION	PERSON IN CHARGE	CREA RESEARCH CENTRES
ciliegio albicocco melo pero pesco mandorlo susino nocciolo castagno noce nashi, sorbo cotogno kal melograno nespolo fico d'india avocado ecc	Varietal collection of fruit trees at the experimental farm of Pignataro Maggiore, Caserta The Caserta varietal collection is stored in the open field, in the Area No farm in Pignataro Maggiore (CE), and consists of over 1200 accessions (cultivars and accessions of the germplasm local) of cherry, apricot, apple, pear, peach, almond, plum, hazel, chestnut and walnut, but also minor fruit species (nashi, rowan, quince, sour cherry, persimmon, pomegranate, Japanese medlar, common medlar, prickly pear and fig) and some tropical ones (avocado and feijoa).	M. Petriccione, A. De Luca, Antonio	CREA-OFA
Cherry, apple, pear, strawberry and peach	Varietal collection of fruit trees at the experimental farm in Magliano, Forlì. Forlì's varietal collection is maintained in the open field and consists of more than 100 accessions (cultivars and local germplasm accessions) of strawberry, cherry, apple, pear and peach.	G. Baruzzi, G. Caracciolo, D. Giovannini	
Strawberry, peach, plum, apple, pear, cherry and mulberry	In vitro collection of fruit trees under the RGV-FAO program. In vitro maintenance of more than 200 accessions of native and/or historical varieties of strawberry, peach, plum, apple, pear, cherry, and mulberry under slow-growing conditions.	D. Giovannini, G. Baruzzi	CREA-OFA
peach	Peach RefPop. Reference Peach germplasm collection, with a total of 400 accessions comprising varieties and progenies, collecting the whole diversity of the species conserved by different European institutions (INRA, IRTA, University of Milan, CREA-OFA Rome). The collection is a shared European tool, with 'copies' maintained in different locations: Greece, Spain (2 sites) and Italy (2 sites). At CREA-OFA in Rome one copy of the varietal collection is maintained.	S. Micali	CREA-OFA
peach, plum, apple, pear, apricot, cherry and others	In vitro collection of fruit species in the frame of the RGV-FAO Program. In vitro conservation in slow growth condition of more than 80 autochthonous varieties of peach, plum, apple, pear, apricot, cherry and other fruit species.	E. Caboni, S. Lucoli, S. Monticelli	CREA OFA
complex biological and ecological processes	Long term experiment (LTE) in organic management: Living Lab CORSA-LL (Co-design of ORganic fruit Systems through Agroecology Living Lab) aims at establishing Living Laboratories under organic management for fruit and olive growing in the Lazio region. From the interaction with stakeholders (from the productive and commercial sector), two LTEs have been designed and implemented in the experimental fields at CREA-OFA in Rome. <ul style="list-style-type: none"> • MAIOR (MAIntenance of Organic oRchards), established for apricot (<i>Prunus armeniaca</i>) in 2017 • AD HOC (Agroforestry as Diversification Horizon in Organic Cherry-grove), established for sweet cherry (<i>Prunus avium</i>) in 2021. The Living Lab CORSA-LL offers an environment for co-innovation and discussion over the themes of organic fruit farming in Lazio and can be considered a research tool for the long-term study of complex biological and ecological processes. A specialized olive orchard will also be included.	D. Ceccarelli	CREA OFA
raspberry	In vitro maintenance of raspberry varieties	S. Lucoli	CREA-OFA
Peach, apricot, plum, cherry, almond, apple, pear, kiwi, hazelnut, walnut, pistachio, asimina, pomegranate	National Fruit Germplasm Center (NFGC). The National Fruit Germplasm Center (NFGC) located in Rome covers an area of 30 ha. Established in 2001 with a grant from the Italian ministry of agriculture, it currently preserves more than 8,000 accessions of over 20 fruit species (pome and stone fruits, nuts, small fruits, subtropical species).	I. Verde, J. Giovinnazzi, D. Loletti, S. Micali, E. Vendramin	CREA- OFA

Historical libraries

PRODUCTS/MAIN TOPICS	DENOMINATION/DESCRIPTION	PERSON IN CHARGE	CREA RESEARCH CENTRES
Various fruit crops	In Rome over 3500 volumes, many of which of considerable value, and series specifically dedicated to fruit trees are conserved.	E. Perri	CREA-OFA
		E. Perri	CREA-OFA
Various fruit crops	In Acireale there is a collection of books on fruit and citrus trees of considerable value. The library is registered in the ACNP catalogue	E. Perri	CREA-OFA
Various fruit crops	Forlì unit maintains a collection including books and magazines of more than 4,000 copies, some of considerable value published between 1800 and throughout the 1900s	E. Perri	CREA-OFA
Various fruit crops	In Caserta at the CREA-OFA headquarters there is a prestigious library named "Leonardo Angeloni" the first director of the Royal Institute for the cultivation of tobacco Scafati.	E. Perri	CREA-OFA- CREA-CI

Other scientific and technological infrastructures

PRODUCTS/MAIN TOPICS	DENOMINATION/DESCRIPTION	PERSON IN CHARGE	CREA RESEARCH CENTRES
Technological platform	The CREA-OFA laboratory in Forlì is equipped with HPLC, for the analytical investigation of primary and secondary metabolites, instrumentation for pomological and qualitative characterization of fruit, and temperature- and humidity-controlled cold storage cells, where semi-commercial tests are carried out both inherent to fruit treatment and storage.	M. Luigia Maltoni	CREA-OFA

Micropropagation laboratory	The CREA-OFA laboratory in Forlì is equipped with fume hoods, growth and storage chambers for the preservation and maintenance of ancient and/or particularly affected fruit germplasm; support the production and/or multiplication of new strawberry genetic material to be included in the national Genetic-Health Certification process; for the rehabilitation of virus-infected material by the culture of primary meristems.	S. Magnani	CREA-OFA
Sequencing platform	ABI GA 3130 sequencer is present for obtaining and analyzing obtained data.	M. Pietrella	CREA-OFA
long term experimental device	A long-term experimental device (DLSP) in biological regime (apple, pear and peach) is present at the Magliano farm in Forlì. This DLSP represents an open-air laboratory (Living Lab) to implement participatory and trans-multidisciplinary forms of research	G. Roccuzzo, F. Brandi	CREA-OFA
Greenhouse	The farm in Magliano di Forlì is equipped with greenhouses where the first phase of seedling development from the genetic improvement programs of peach, strawberry, pear and apple tree is initiated from seed germination. Strawberry breeding crosses are also carried out in the greenhouses. There are also tunnels for the breeding of basic category strawberry plants as part of the certification pathway (Premultiplication Center (CP1) first stage	P. Sbrighi, G. Buda, A. Gazzoni	CREA-OFA

Working tables / working groups / institutional partnerships, editorial board

PRODUCTS/MAIN TOPICS	DENOMINATION/DESCRIPTION	PERSON IN CHARGE	CREA RESEARCH CENTRES
Certification			
Strawberry	Strawberry certification Activity related to the production of certified strawberry plants in Veneto	G.Baruzzi	CREA-OFA
Strawberry	Voluntary Certification System CREA-OFA Forlì Branch has been recognized by MIPAAFT "Conservation Center for Premultiplication (CCP) and Premultiplication Center (CP1) first stage for Strawberry Plant Propagation Material" (OJ no. 290 of 14/12/2005) under the Process of "Voluntary Certification of Plant Propagation Material of Fruit Plants," which is an official control system based on precise technical standards for plant production activated on a national scale in 1993 and recently also at the European level.	G.Baruzzi	CREA-OFA
fruiting, eucalyptus	Examining office for the granting of plant rights (fruit and eucalyptus) DUS-test and varietal certification on behalf of the CPVO (peach, Sino-Japanese plum, kiwi,, eucalyptus), GEVES (Sino-Japanese plum), MIPAAF (peach)	F. Gervasi, e G. Pignatti	CREA-OFA CREA-FL
biodiversity	FAO National Focal Point State of the World's Biodiversity for Food and Agriculture	I. Verde	CREA-OFA
Sweet and sour cherry	Sweet and sour cherry Working Group EUFRIN (European Fruit Research Institutes Network)	D. Giovannini	CREA- OFA
corroborants	Corroborants Commissione	G. Roccuzzo	CREA-OFA
Fruit crops multiplication material	MIPAAF - Permanent working group on plant protection – Section for perennial, annual and ornamental species propagation.	D. Ceccarelli, M. Cutuli, G.Baruzzi, M.Caruso	CREA- OFA
pesco, albicocco	Apricot and Peach Working Group EUFRIN (European Fruit Research Institutes Network)	D. Giovannini	CREA- OFA
Postharvest	SOI-Postharvest	M.C. Strano	CREA- OFA
Genetic resources	FAO National Focal Point – Inter-governmental Technical Group on Plant Genetic Resources for Food and Agriculture (ITWG-PGR).	I. Verde	CREA- OFA
Genetic resources	FAO- National Focal Point - Committee on Plant Genetic Resources for Food and Agriculture (CGRFA)	I. Verde	CREA- OFA
Genetic resources	FAO National Focal Point International Treaty on Phytogenetic Resources for Food and Agriculture (ITPGRFA).	I. Verde	CREA- OFA
risorse genetiche	Berry Working Group nell'ambito del Programma Europeo per le Risorse Genetiche	G.Baruzzi	CREA- OFA
risorse genetiche	Prunus Working Group nell'ambito del Programma Europeo European Community Programme for Genetic Resources	D. Giovannini	CREA- OFA
sistemi integrati	Accademia dei Georgofili-Gruppo di lavoro "Sistemi integrati "Livestock, crop, forestry"	A.Rosati	CREA- OFA
fruit species	CPVO Examination Offices Meeting- Technical board in charge of the European Examination Offices.	F. Gervasi	CREA- OFA
fruit species	CPVO Fruit Expert Meeting- technical board in Europe for fruit species	F. Gervasi	CREA- OFA
ornamental species	CPVO Ornamental Expert Meeting- Technical group responsible for DUS technical examination in Europe for ornamental species. Organized annually by the CPVO	F. Gervasi, G. Pignatti	CREA-OFA - FL
fruit species	Member of the Italian Fruit and Vegetable Society (SOI) - Fruitculture section - Board of Directors	E. Caboni	CREA-OFA
in vitro cultures	Member of the Italian Fruit and Vegetable Society (SOI) - Working group "in vitro cultures"	E. Caboni	CREA-OFA
Apple and pear	Apple and pear variety and rootstocks testing Working Group in the European Fruit Research Institutes Network (EUFRIN)	G. Caracciolo	CREA-OFA
Organic agriculture	MIPAAF - Technical Commission for BIOLOGICAL AGRICULTURE AND BIODYNAMIC AGRICULTURE	G. Roccuzzo, R.Ciccoritti	CREA-OFA
Food safety	EFSA- European Food Safety Authority, in accordance with art. 36 of the EU regulation (CE) n. 178/2002 -Board of experts in Genetically modified organisms (GMOs)	E. Vendramin, S. Zelasco	CREA-OFA
Food safety	EFSA- Autorità europea per la sicurezza alimentare, ai sensi dell'art. 36 del Regolamento (CE) n. 178/2002 Gruppo di esperti Chemical contaminants in the food chain	E. Perri, F. Romeo, C. Benincà	CREA-OFA

PRODUCTS/MAIN TOPICS	DENOMINATION/DESCRIPTION	PERSON IN CHARGE	CREA RESEARCH CENTRES
Food safety	EFSA- European Food Safety Authority, in accordance with art. 36 of the EU regulation (CE) n. 178/2002 -Board of experts in Human nutrition, dietetic products, allergens and/o novel foods	E. Perri , K. Carbone, S. Fabro	CREA-OFA
Food safety	EFSA - European Food Safety Authority, pursuant to art. 36 of Regulation (EC) no. 178/2002 Environmental risk assessment (ERA) expert group	M Petriccione, S. Bella	CREA-OFA
institutional partnerships			
Organic farming	Agreement (pursuant to Article 15 of Law 241/90) between the Caravaggio Higher Education Institute of San Gennaro vesuviano (NA) and the Research Center for Olive, Fruit and Citrus Growing	N. Angelina	CREA-OFA
Agricoltura biologica	Cooperation agreement (ex art. 15 L. 241/90) tra Mipaaf e CREA – BIOLOGICO	D. Ceccarelli	CREA-OFA
Genetic resources	Agreement on Scientific and Technological Cooperation between the Council for Agricultural Research and Economics (CREA) and the Shanghai Academy of Agricultural Science (SAAS)	I. Verde	CREA-OFA
Hazelnut	Nursery innovations for coriliculture of Piedmont	W. Chitarra	CREA-VE
Peach	Memorandum of Agreement (MOA) on Scientific & Technological Cooperation the Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria (CREA) and Agricultural Research Council (ARC) South Africa	R. Velasco	CREA-VE
Fruiting species	Memorandum of Understanding on agricultural research and cooperation between the Council for Agricultural Research and Economics (CREA), Italy, and the Miguel Hernandez University of Elche (UMH), Spain	E. Caboni S. Lucioli	CREA-OFA
Native fruit species	Recovery, enhancement and characterization of the accessions of the fruit germplasm of the Cilento, Vallo di Diano and Alburni National Park	A. Nunziata	CREA-OFA
	Testing and non - propagation agreement	P. Rapisarda	CREA-OFA
Pear and apple	Testing and non - propagation agreement	G.Caracciolo G. Baruzzi M. Berbamaschi	CREA-OFA
Pear and apple	Memorandum of Understanding concerning the Eufrin Testing Agreement for Fruit Plant Material	G. Caracciolo	CREA-OFA
Vocational training services			
Support activities for specialized training /strawberry	Catalogo verde Regione Emilia Romagna 4 Training cycles for a total of 12 lessons of 36 hours for entrepreneurs entitled "The cultivation of strawberry "DINAMICA soc. cons. r.l	G. Baruzzi	CREA-OFA
Support activities for specialized training /Strawberry	Cmatalogo verde Regione Emilia Romagna 4 Training cycles for a total of 12 lessons of 36 hours for entrepreneurs entitled "The cultivation of strawberry "DINAMICA soc. cons. r.l	P. Sbrighi	CREA-OFA
Editorial activities			
various	Guest editor in Recent Progress in Nutrition for the Special Issue: Improvement of Technological and Nutritional Quality of Grains, Fruits, and Their Transformed Products	R. Ciccoritti	CREA-OFA
various	Guest Editor for the Special Issue "Sustainability: Recovery and Reuse of Brewing-Derived By-Products" in "Sustainability"	R. Ciccoritti	CREA-OFA
various	Ecotoxicology-Springer (Associate Editor)	M. Petriccione	CREA-OFA
various	Novel Techniques in Nutrition & Food Science (Editorial Board)	M. Petriccione	CREA-OFA
various	Agronomy-MDPI (Associate Editor)	M. Petriccione	CREA-OFA
various	Technical Advances in Plant Science for Frontiers in Plant Science (Associate Editor)	M. Petriccione	CREA-OFA
various	Guest editor per lo Special issue "Improvement of Postharvest quality of fruits and vegetables- Foods (MDPI)"	M. Petriccione	CREA-OFA
various	Convener "IX International Strawberry Symposium", Rimini 2021	G. Baruzzi	CREA OFA
various	Guest Editor Special Issue ""Strawberry Production in a Protected Environment and under Field Conditions" _in Agronomy MDPI	G. Baruzzi G. Rocuzzo	CREA-OFA
various	Academic Editor per Hindawi – Journal of Food Quality (Editorial Board)	M. C. Strano	CREA-OFA
various	Guest Editor Special Issue "Postharvest Management of Citrus Fruit" in Horticulturae (MDPI)	M. C. Strano	CREA-OFA
various	Guest Editor special Issue "Advances in citrus breeding, genetics, physiology and horticultural management" in "Agronomy"	M. Caruso	CREA-OFA

various	Topic Editor per la rivista "Frontiers in Plant Science", Research Topic "Recent Advancements on the Development and Ripening of Mediterranean Fruits and Tree Crops"	M. Caruso	CREA-OFA
Various	Plants-MDPI (reviewer board)	M. Caruso	CREA-OFA
Various	Crop Breeding, Genetics and Genomics journal (Editorial board)	P. Caruso	CREA-OFA
Various	Guest Editor of special issue "Plant-Microbe Community and Its Mechanisms of Interaction with Mediterranean Crops: A Key Interaction for Plants' Benefit and Resilience" Agronomy MDPI.	P. Caruso G. Licciardello	CREA-OFA
Various	Guest Editor - Research Topic "Functional Genomics in Fruit Trees: from 'Omics' to Sustainable Biotechnologies, Volume II" in Frontiers in Plant Science	C. Licciardello	CREA-OFA
Various	Guest Editor - Special Issue "Advances in Studies on Citrus Antioxidant Compounds Using Traditional and New Biotechnological Approaches" ("Plants" section "Plant Genetics, Genomics and Biotechnology" MDPI)	C. Licciardello	CREA-OFA
Various	Editorial Board Member AS Agriculture journal (ISSN: 2581-365X), Acta Scientific Open International Library	S. Fabroni	CREA-OFA
Various	Guest Editor of molecules (ISSN 1420-3049), open access journal by MDPI. Special issue 'Discovery of bioactive ingredients from natural products';	S. Fabroni	CREA-OFA
Various	Editor of Chemistry (ISSN 2624-8549), open access journal by MDPI. Special issue 'Discovery of bioactive ingredients from natural products';	S. Fabroni	CREA-OFA
Various	Guest Editor of Molecules (ISSN 1420-3049), open access journal by MDPI. Special issue 'Discovery of bioactive ingredients from natural products – II edition';	S. Fabroni	CREA-OFA
Various	Topical Advisory Panel Member of Molecules (ISSN 1420-3049), open access journal by MDPI, section 'Food Chemistry'	S. Fabroni	CREA-OFA
Various	Guest editor in "Enhancing Surveillance and Detection of Invasive Harmful Plant Pathogens and Pests" (Agriculture)	G. Licciardello	CREA-OFA
Various	Review editor for technical advances in plant science (Frontiers in plant science)	E. Vendramin	CREA-OFA

Publications various

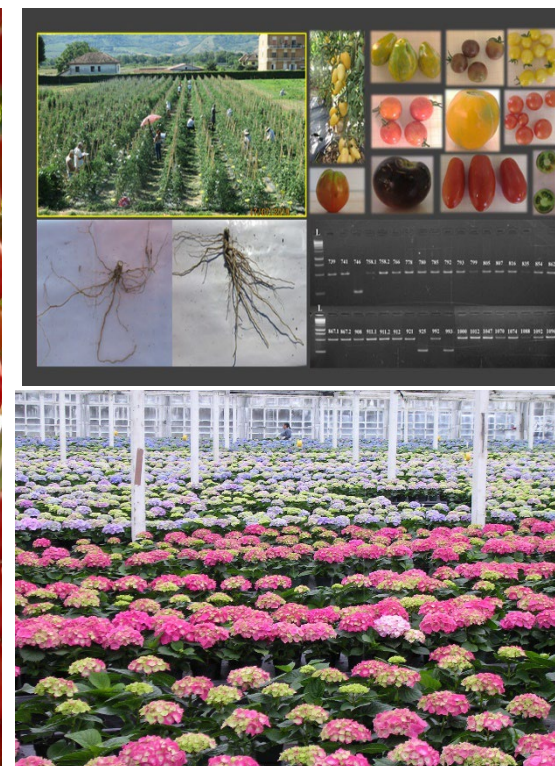
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2.CREA RESEARCH LINES BT PRODUCTS

2.5VEGETABLE AND ORNAMENTAL CROPS. NURSERY

The horticultural sector is characterized by highly intensive production processes: at the European level, they generate about one quarter of the agricultural production value, harvested on 3% of the whole interested surface. The sector covers a very high variability in terms of species, products and uses. Food crops play an important role for nutritional and health aspects linked to the consumption of fresh products presenting however particular problems of conservation and transport, while ornamental species, relevant for hedonistic aspects, are particularly affected by fluctuations the market. For both sectors, the intensification of crops both in protected cultivation and in the open air represents a challenge for environmental sustainability in agriculture, to be addressed at a multidisciplinary and integrated level. CREA conducts research aimed at improving production, both from a quantitative and qualitative point of view, with particular attention to approaches based on innovative technologies and methodologies, which promote also environmental and economic sustainability.

Breeding, both through classic/participatory and innovative approaches and based on genomics and genome editing, is the main tool to introduce resistance/tolerance to biotic and abiotic stresses and enhance the production quality. The 2021 projects mainly relate to tomatoes, peppers, eggplants, asparagus, basil and rocket salad. They also aim to select new genotypes suitable for organic cultivation. At the same time, emphasis is put on the recovery, conservation, characterization and enhancement of genetic resources of agricultural interest. CREA carries out studies focusing on the increase of sustainability of greenhouse and open field crops by the optimization of agrochemical inputs and through variety comparisons, from different areas. Aspects related to microbial fertility and soil pathogens are also evaluated.



These goals are pursued through advanced decision support systems such as the use of sensors, digital technologies and forecasting models. Sustainable use of water is promoted not only by the optimization of fertigation but also through studies related to the possibility of water reuse, even if of low quality (e.g. high salinity), through closed-cycle soilless systems in protected cultivation or, in the open field, through agricultural systems management models that envisage the recovery and reuse of rainwater, favoring its infiltration into the soil by living mulch. The result is a reduction of runoff occurring which protects the resource "soil", limiting erosion. Soil quality is promoted with different composts, such as those obtained from pomace or solid digestate derived from the transformation of buffalo manure into biogas for energy production. The valorization of these wastes not only improves soil fertility by increasing the organic matter content and enhancing soil microbial biodiversity, which has a suppressive effect with respect to specific pathogens, but also uses strategies in accordance with the implementation of agricultural systems based on circular economy. The improvement of environmental sustainability, both in the horticultural and nursery sectors, is pursued by studying innovative plant technologies to reduce energy costs for heating greenhouses and evaluating the possibility of using new materials as growing substrate.

In line with the development guidelines established in the "National fruit and vegetable strategy 2018-2022" of the MiPAAF, the improvement of the quality, shelf life, safety and sustainability of fruit and vegetables of the III, IV and V range is pursued through a series of research interventions addressed to all levels of the supply chain and aimed at a general upgrade of the production chain, from pre-cultivation to sale. Innovations in cultivation techniques, as well as processing and packaging lines, are tested to improve the quality and the shelf life of the product and give it greater competitiveness on the market, while optimizing the resources use.

As regards organic farming, a long-term experimental trial is active at the Monsampolo del Tronto branch of the Center for Vegetable and Ornamental Crops, where both research and dissemination activities are carried out for the sake of the scientific community, the public and policy makers. Organic agronomic systems are also being investigated at the Metaponto branch of the Center for Agriculture and the Environment, with conducts studies on agrotechnics, intercropping, fertilization, and weed management.

In the floricultural sector, in addition to the genetic improvement of cut flower species and the conservation of the biodiversity of ornamental species in general, studies aimed to the use of flowers in human nutrition are particularly interesting. These studies explore the organoleptic and nutritional characteristics, the microbiological and toxicological safety, as well as the use for transformed products. From a naturalistic point of view, the activity carried out for the protection of spontaneous populations of orchids at risk of extinction is worth to note, in order to counteract the current decline.

Research activities, some of which carried out in collaboration with private entities, have produced industrial and proprietary patents and allowed the registration of new varieties in the national registers and of local varieties in the regional ones. Finally, the researchers carry out support activities to international, national and regional institutions, taking part at technical tables, working groups and commissions. The training and dissemination activity is also intense, carried out through university and non-university lectures, through the organization of events for citizens, schools of all levels and operators of the sector, as well as through dissemination projects specifically addressed to entrepreneurs and farm staff.

2.5.1 Research and research products – Vegetable and Ornamental crops. Nursery

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHERS RESEARCH PRODUCTS
ABC Campania agroBiodiversity propagation, conservation and characterization of autochthonous herbaceous plant genetic resources	Multiply and store in situ and ex situ herbaceous local plant varieties of Campania Region; characterize them morphophysiological, agronomic biochemical/chemical/nutritional at molecular level; set-up a public database containing all the information about characterization results; expand knowledge about Italian and European legislation and databases available on vegetable biodiversity (Concertation action); disseminate all the results (accompanying action).	M. ZACCARDELLI CREA-OF CREA-DC	-Campania Region	Abstract in conference acts of XIII National Congress on Biodiversity, Agriculture, Environment and Health, 7-9 September 2021, Foggia (online): Enrica De Falco, Rosa Pepe, Francesco Lupo, Carlo Cardelli, Antonella Vitti, Francesco Vairo, Massimo Zaccardelli. Caratterizzazione agronomica di varietà genetiche locali fagiolo del Vallo di Diano. Rosa Pepe, Pasquale Tripodi, Riccardo Riccardi, Patrizia Spigariello, Massimo Zaccardelli. Il Progetto ABC: un'opportunità per mettere a sistema le RGV Campane con gli agricoltori, amministrazioni pubbliche e il mondo della ricerca, per salvaguardia dell'agrobiodiversità e lo sviluppo di nuovi modelli di sviluppo economici e sociali. Rosa Pepe, Pasquale Tripodi e Massimo Zaccardelli. Le banche degli agricoltori custodi: una valida risposta per conservare antiche varietà vegetali di interesse agrario al passo con i cambiamenti climatici. Massimo Zaccardelli. Agrobiodiversità Campana: un progetto per la moltiplicazione, conservazione e caratterizzazione delle risorse genetiche vegetali erbacee autoctone a rischio di estinzione.	- On-line courses for guardian farmers (2021) - 5° day – Insights into the main issues that emerged during the previous day (08/04/2021) - Laboratory of ABC project - Il Pomodorino del Pienno (19/09/2021) - Cultivation techniques and protection of ornamental plants (22/02/2021) - Presentation of intermediate results of ABC Project - Agrobiodiversity of Campania Region: multiplication, storage and characterization of indigenous herbaceous plant genetic resources (30/11/2021) - Laboratory of ABC project – Traditional Campania Region peppers in danger of extinction (18/09/2021) - Cultivation techniques and protection of tomato (18/03/2021) - On-line courses for guardian farmers (2021) - 1° day of gene presentation of ABC Project (18/02/2021) - Laboratory of ABC project – Traditional Campania Region pulses in danger of extinction (18/09/2021) - Principal pathogens transmitted by seeds (15/01/2021) - The Network Agreement for the promotion of Campania Region biodiversity. ABC Project - PSR 2014/20 Measure 10.2 (20/09/2021) - Meeting with adherents of Network Agreement on agrobiodiversity of Campania Region (10/12/2021) - Meeting with adherents of Network Agreement Operational meeting organized by CREA-Research Centre for vegetable and ornamental crops, Pontecagnano, (20/12/2021) On-line courses for guardian farmers (2021) - 2° Technical aspects of seed multiplication: allogamous species. (02/25/2021) N. 4 Research Fellowships in agronomy, phytopathology, genetics and food biochemistry field
ALPIMED INNOV INNOVATION IN MEDITERRANEAN ALPS	Territory development, optimization of energy efficiency, optimization of water resources for cross-border agricultural supply chains in alpine and pre-alpine areas	A. COPPETTA CREA-OF	- European Commission – Objective European Italy-France Cooperation (INTERREG - ALCOTRA) STC ALCOTRA		-Good practices for energy efficiency and valorization of agriculture by-products in the AlpiMed area (27/04/2021) -Alpimed INNOV Boot camp (23/11/2021) Imperia

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHERS RESEARCH PRODUCTS
ASPORT Improvement cultivation techniques of industrial tomato crops to increase environmental and economic sustainability Tuscany region	Improving environmental sustainability industrial tomato production of Tuscany Region; Verifying the relationships between environmental sustainability and economic aspects of cultivation.	M. PARISI CREA-OF	ASPORT		- Inspection of the experimental field (09/08/2021) Campiglia Marittima
AutoFitoViv Good practices for self-control and sustainable phytosanitary management in ornamental nursery	Development of phytopathological prevention and alert systems for decreasing the use of "chemical" plant protection products and for the management of the main phytoparasites borne by the nursery sector and management of phytosanitary emergencies related to extraordinary weather trends.	B. NESI CREA-OF	- Tuscany Region		SOI webinar 'Monitoring networks and alarm systems for defense in nursery gardening: the experience of the AUTOFITOVIV Project' (04/03/2021)
BanGeCar_3 Management of the regional germplasm bank a characterization of local varieties of herbaceous species of the Marche region, as part of the "biodiversity and genetic resources — L.R. 12/2003	Protection, investigation, conservation, and characterization of herbaceous plant accessions of agricultural interest in the Marche region	S. SESTILI CREA-OF	- A.S.S.A.M.		- 492 local accessions conserved - WEBINAR "Tutela e valorizzazione dell'agrobiodiversità vegetale delle Marche: la Banca del Germoplasma", 24 May 2021
BIODIVER Identification of genetic polymorphisms in local pepper varieties collected by ARSIAL in Lazio	Identify the genetic polymorphisms of local pepper varieties from the Lazio region; investigate genetic diversity and determine its uniqueness with respect to similar types grown on farms and farmers' premises in the Lazio region and surrounding areas. The analysis of the internal variability of the local populations is proposed both to identify appropriate strategies for in situ / on-farm conservation, both to verify the possibility of registration as "Conservation variety" in the	P. TRIPODI CREA-OF	- ARSIAL		
BIOFIORI Innovative products from organic edible flowers	Food processing from edible flowers	B. RUFFONI CREA-OF	- Liguria Region	- Abstract in congress: Copetta Andrea; Bazzicalupo Miriam; Marchionni Ilaria; Casse Arianna; Mascarello Carlo; Cornara Laura; Pistelli Laura; Ruffoni Barbara (2021). A method to improve acclimatization in oyster plant <i>Mertensia maritima</i> (L.) Gray. pp. 27-28. - Abstract in congress: Marchionni Ilaria; Mascarello Carlo; Pistelli Laura; Ariano Sergio; Lanteri Alberto; Copetta Andrea (2021). Selezione di filari commestibili per la realizzazione di nuovi prodotti commerciali. Acta Italus Hortus, N. volume 26, pp. 42-42.	- Leggere la biodiversità (18/11/2021) - N. 1 Research Fellowship

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BIOFORT Development of novel methodologies for organic horticulture from the nursery to the field	Setting up of innovative biological defense protocols applied to the cultivation of horticultural species in greenhouse, in Lazio Region	M. ZACCARDELLI CREA-OF	-Lazio Region	<ul style="list-style-type: none"> - Root Zone Management for Improving Seedling Quality of Organically Produced Horticultural Crops. Domenico Rongoni, Antonella Vitti, Massimo Zaccardelli, Catello Pane, Federica Caradonia, Mariateresa Cardarelli, Giuseppe Colla and Youssouf Rouphael. Agronomy 2021, 11, 63. https://doi.org/10.3390/agronomy11040630 - Essential oils and quality composts sourced by recycling vegetable residues from the aromatic plant supply chain. Massimo Zaccardelli, Graziana Roscigno, Catello Pane, Giuseppe Celano, Marisa Di Matteo, Marika Mainente, Alessandra Vuoto, Teresa Mencherini, Tiziana Esposito, Antonella Vitti, Enrica I Falco. Industrial Crops & Products 162 (2021) 113255. - The Role of Peat-Free Organic Substrates in the Sustainable Management of Soilless Cultivations. Giulia Atzori, Catello Pane, Massimo Zaccardelli, Sonia Cacini and Daniele Massa. Agronomy 2021, 11, 1236. https://doi.org/10.3390/agronomy11061236 	
BIOTECH_CISGET Cisgenesis and genome editing in tomato	Application of cisgenesis and genome editing in tomato breeding (abiotic and biotic stress; quality)	A. NICOLIA CREA-OF	- MIPAAF	<ul style="list-style-type: none"> -Tognacca Rocío Soledad; Carabelli Monica; Morelli Giorgio; Ruberti Ida; Botto Javier Francisco (2021). ATHB2 is a negative regulator of germination in Arabidopsis thaliana seeds. Scientific Reports, N.volume 11, DOI: 10.1038/s41598-021-88874-3 -Carabelli Monica; Turchi Luana; Morelli Giorgio; Østergaard Lars; Ruberti Ida; Moubayidin Laila (2021). Coordination of biradial-to-radial symmetry and tissue polarity by HD-ZIP proteins. Nature Communication, N.volume 12, N.fascicolo 10.1038/s41467-021-24550-1 -Nicolia Alessandro, Andersson Mariette, Hofvander Per, Feskovskaya Giovanna, Cardì Teodoro (2021) Tomato protoplasts as cell targets for genome editing 	<ul style="list-style-type: none"> - Parasitic Weeds: know the enemy to combat it (29/06/2021) -3 Research Fellowships (2 genome editing; 1 bioinformatics)
BIOTECH_GEO Genome editing for the improvement of the resistance of <i>Ocimum basilicum</i>	Application of genome editing in <i>Ocimum basilicum</i> to improve resistance to Peronospora	M. SAVONA CREA-OF	MIPAAF		RESEARCH CONTRACT- n.1

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHERS RESEARCH PRODUCTS
BREEDNET Biotechnological innovations strengthen a network breeders in western Liguria	The following objectives will be pursued: a) creation of a biotechnological platform for ornamental plants; b) creation of a public-private partnership to strengthen breeding work; c) strengthening of synergies to achieve a qualitatively superior product in a shorter time.	A. MERCURI CREA-OF	- Liguria Region	- Contribution in volume 1 of the book "Breeding - Genetic Improvement Methods, volume 2264, pp. 187-196. DOI: 10.1007/978-1-0716-1201-9_1"	1 Scholarship

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHERS RESEARCH PRODUCTS
BRESOV Breeding for Resilient, Efficient and Sustainable Organic Vegetable production	Breeding for sustainable food production tomato, bean, brassica	P. TRIPODI CREA-OF CREA-IT CREA-CI	EUROPEAN SEED ASSOCIATION (Belgium), UNIVERSIDAD DE ALMERIA (Spain), UNIVERSIDADE DE TRAS-OS-MONTES E ALTO DOURO (Portugal), RIK (Czechia), FIBL (Switzerland), VEGENOV BBV, France), THE UNIVERSITY OF LIVERPOOL (UK), UNIVERSITAT POLITECNICA DE VALENCIA (Spain), STATIUNEA DE CERCETARE DEZVOLTARE PENTRU LEGUMICULTURA BACAU (Romania), BEIJING ACADEMY OF AGRICULTURE AND FORESTRY SCIENCES (China), ZHEJIANG ACADEMY OF AGRICULTURAL SCIENCES (China), UNIVERSITE DE TUNIS EL MANAR (Tunisia), SERVICIO REGIONAL DE INVESTIGACION Y DESARROLLO AGROALIMENTARIO DEL PRINCIPADO DE ASTURIAS (Spain), PROSPECIERARA (Switzerland), INRA (France), TERRE D'ESSAIS (France), Eurice (Germany), UNIVERSITA POLITECNICA DELLE MARCHE (Italy), ITAKA SRL (Italy), UNIVERSITY OF CATANIA (Italy)/ European Commission	-Pasquale Tripodi; Salvador Soler; Gabriele Campanelli; María José Díez; Salvatore Esposito; Sara Sestili; Maria R. Figàs; Fabrizio Leteo; Cristina Casanova; Cristiano Platani; Elena Soler; Alberto Bertone; Leandro Pereira-Dias; Daniela Palma; Resurrección Burguet; Andrea Pepe; Elena Rosa-Martínez; Jaime Prohens; Teodoro Cardi (2021). Genome wide association mapping of agronomic, fruit quality, and root architectural traits in tomato under organic farming conditions. BMC Plant Biology, N.volumen 21, N.fascicolo 1, DOI: 10.1186/s12870-021-03271-1 -Salvatore Esposito; Cardi Teodoro; Campanelli Gabriele; Sestili Sara; Díez María José; Soler Salvador; Prohens Jaime; Tripodi Pasquale (2020). ddRAD sequencing-based genotyping of population structure analysis in cultivated tomato provides new insights into the genomic diversity of Mediterranean 'da serbo' type long shelf-life germplasm. Horticulture Research, N.volumen 7, N.fascicolo 1, DOI: 10.1038/s41438-020-00353-1	1 Research Fellowship (Breeding, phenotyping e genome wide association in tomato for the development of cultivar for organic breeding) In-depth analysis of the BRESOV project: validation of molecular markers and study of root architecture in tomatoes. CREA Monsampolo del Tronto 01/27/2021
CaFalMa Calibration and estimation of irrigation needs in the Marche agriculture.	The estimate of the irrigation needs will be sent to SIGRIAN based on the Mipaaf DM 31 July 2015 and the DGR Marche 590/2017. CREA will use the acquired data to optimize the irrigation volumes for horticultural species and to quantify the environmental benefits in terms of water savings related to organic farming	G. CAMPANELLI CREA-OF	- Marche Region		
CRIREC Chrysanthemum for cut flower breeding interventions.	To recover, remediate and make available for growers in Liguria Chrysanthemum varieties and to quantify the environmental benefits from the commercial point of view, currently unavailable in the catalogues of Dutch and Danish breeders.	A. COPPETTA CREA-OF	- Liguria Region	- Poster in congress - Restuccia Pasquale; Miozzi Laura; Marian Daniele; Copetta Andrea; Pamato Manuela; Vinci Gianluca; Vinotti Paolo; Copetta Marco; Vaira Anna Maria (2021). The virome of Chrysanthemum at the service of varietal recovery	- Crisantemo da fiore reciso: interventi di miglioramento varietale CRIR Tag (03/12/2021)

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EVA-Pepper Implementation of the ECP European Evaluation Network (EVA) on wheat/barley and vegetable crops (carr lettuce and pepper) - Support Agreement No: L21ROM1 "EVA Pepper lab tests a genotyping - CREA Pontecagnano Faiano"	Pre-screening di accessioni di peperoni carota e lattuga depositate in banche germoplasma europee per la valutazione laboratorio di resistenza a malattie. Moltiplicazione delle accessioni e successi prove di campo al fine di eseguire caratterizzazione morfofisiologica agronomica in base ai principali caratteri interesse per i breeder. Le prove sono eseguite in più siti e con procedure armonizzate tra i diversi partner. accessioni saranno inoltre saggiate laboratorio per la resistenza a patogeni fungini, batterici e virali. Infine, le accessioni verranno genotipizzate e la totalità dei dati ottenuti sarà depositata nel database EURISCO	L. SIGILLO CREA-OF	<ul style="list-style-type: none"> - Euroseeds - Institute of Plant Sciences and Genetics in Agriculture - Institute of Genetics Cytology NAS - Agricultural University of Tirana, Institute for Genetic resources - Centre for Genetic Resources (CGN) - Institute for vegetable crops, Serbia - INRAE - Institute of Plant Breeding and Genetic Resources- HAO DEMETER - Semillas Fito - Federal Ministry of Food and Agriculture (BMEL) 		
FertiSele Sustainable management fertility in the Piana Sele Valley regarding the conventional and IV gamma organic production processes under greenhouse, employing high quality soil organic improvers derived from the local zootechnical sector.	Promote the development of circular economy concept based on the set up high value digested manure to be employed into the biogas production. Moreover efforts will be placed in the vermicomposting manufacturing to be used in protected horticulture alone or in combination with traditional cultivation techniques (i.e. solarization and cover crops), with the final goal to reduce the soil stress and to support the horticultural productions.	M. ZACCARDELLI CREA-OF	- Campania Region	-Abstract in congress: G. Di Rauso Simeone, G.P. Coppola, F. Vairo, M. Caputo, Calabritto, G. Ciccone, C. Amalfitano, M. Zaccardelli, M.A. Ragnano, 2021 Sustainable agricultural management of soil fertility through vermicompost based organic amendment under organic and conventional farming. Second Joint Meeting on Soil and Plant System Science, 20-23 September 2021, Torino.	-Michele Caputo; Massimo Zaccardelli; Domenico Ronga (2021) Concimi a lenta cessione, i vantaggi sulle orticole. L'Informatico Agrario, N.volume 76, N.fascicolo 29, pp. 64-66
Harmorescoll Setting up an EU system of harmonized collections of reference isolates, controls and differentials to facilitate disease resistance testing	Setting up of a reference material collection including pests and vegetable control varieties to be used in DUS (Distinguishability, Uniformity, Stability) resistance tests developed in variety registration and breeding programs	L. SIGILLO CREA-OF	<p>GEVES-SNES (FR), Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria (INIA) (SP), Naktuinbouw (NL), European Seed Association (EU) Science and Advice for Scottish Agriculture (SASA) (UK), Bayer (NL), Enza Zaden (NL), HmClausen (FR), Rijk Zwaan (NL), Sakata (FR)</p> <p>Community Plant Variety Office (EU)</p>		

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHERS RESEARCH PRODUCTS
IGUESS-MED Innovative Greenhouse Support System in the Mediterranean Region: efficient fertigation and pest management through IoT based climate control	Developing, validating, and transferring pioneering Decision Support System (DSS) for the Mediterranean tomato greenhouse	A. NAVARRO GARCIA CREA-OF	- University of Almeria (Spain) Fundacion CAJAMAR (Spain), Grupo La Caña (Spain) Regional Center of Research in Horticulture and Organic Agriculture (Tunisia) Akdeniz University (Turkey), University di Pisa (Italy) - EVJA srl (Italy) - BIOPLANET (Italy)/	- Abstract in congresses: Massa Daniele; Traversari Silvia; Cacini Sonia; Venezia Accursi Navarro-Garcia Alejandra (2021). Testing Sap-Flow Sensors for the Estimation of Crop Transpiration in Soilless Tomato Irrigation with Saline Water. Acta Italus Hortus, pp. 27-28.	- Webinar: Sensori sap-flow in orticoltura intensiva: aspetti applicativi e sperimentali Società di Ortoflorofrutticoltura Italiana (SOI) (10/12/2020) - Online Publication in FRESH PLAZA: https://www.freshplaza.com/article/9358263/four-mediterranean-countries-support-the-transition-towards-innovative-sustainable-and-competitive-greenhouses/ (27/09/2021) - 4th meeting of the EUVRIN Working Group on Fertilization and Irrigation (17/06/2021). - 2 Research Fellowships (Physiology studies and data analysis from soil-plant-atmosphere sensors in greenhouse tomatoes)
INTRAVIVA Creation of added value for the regional ornamental plant sector, through the introduction of technological and process innovations in the production phase of packaging and transport of nursery products	Improvement of the transport conditions of ornamental plants at medium and long distances to preserve the quality of the ornamental product during transport	G. BURCHI CREA-OF	- Tuscany Region	- Fabio Mencarelli; Raffaele Cerreta; Andrea Bellinconti; Gianluca Burchi; Emanuele Begliomini (2020). Trasporti oltreoceano: innovare per ridurre lo stress delle piante. FLORICULTORE, N. volume 9, pp. 44-48.	
IOF-2 Pomodoro "National project for studying new processing tomato varieties: variety comparison for industrial management techniques and tomatoes and for increasing environmental sustainability of improved processing tomato hybrids cultivation by reduction of water consumption and the introduction of biodegradable mulching".	The aim of this project is to test, verify and measure and transfer the results of scientific research relating to agronomic crop management techniques and to identification of the bio-agronomic behavior of improved processing tomato hybrids	M. PARISI CREA-OF	- ITALIA ORTOFRUTTA	- Pentangelo A, Baldassari P., Caruso G., Iacullo, B. M., Falconi Parisi M. 2021. Confronto tra pomodori di tipo lungo e tondo squadrato, L'Informatore Agrario, 7: 3-5.	- Inspection of the experimental field (04/08/2021) Foggia Marigliano (N) 1 Research Fellowship
IOF BASSO LAZIO Incremento della sostenibilità agro ecologica delle coltivazioni ortive intensive nella zona di basso Lazio	Increase organic matter into the soil Reduce chemical inputs Reduce water consumption Introduce integrated solarization	M. ZACCARDELLI CREA-OF	- ITALIA ORTOFRUTTA consortium company	- Assunta Maria Palese, Catello Pane, Domenica Villecco Massimo Zaccardelli, Gessica Altieri and Giuseppe Celano. Effect of Organic Additives on Chemical, Microbiological and Plant Pathogen Suppressive Properties of Aerated Municipal Waste Compost Teas. Appl. Sci. 2021, 11, 7402. https://doi.org/10.3390/app11167402 .	

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LIFE - Orchids Improving the conservation status of critically endangered orchid communities in selected habitats in Northwestern Italy	Protect the spontaneous terrestrial orchids present in the Parks of the Po Vercellese, Alessandria and Portofino, typical of high biodiversity grasslands, which are considered of quality when rich in orchids.	A. GIOVANNINI CREA-OF	- Czech Union for Nature Conservation (ČSOP) European Commission - Directorate General Environment - Directorate E - Global Regional Challenges LIFE - ENV E.4 ENVIRONMENT		- 1 Research Fellowship
LIFE SUBSED Sustainable SUBstrates for agriculture from dredged remediated marine SEDiments from port to pots	Demonstrate the suitability of phytoremediated dredged sediment to be reused as a growth substrate for ornamental and food crop species	S. NIN CREA-OF	- Viveros Caliplant (Spain) - Miguel Hernández University (Spain) - European Commission - Directorate General Environment - Directorate E - Global Regional Challenges LIFE - ENV. E.4 ENVIRONMENT	- Abstract IN CONGRESS Tozzi F., Antonetti M., Prisa D., Burchi G., Castellani M., Boned D., Cacini S., Nin S. (2021). Sustainable substrates for agriculture from dredged remediated marine sediments: from ports to pots (LIFE 17ENV/IT/000347). ISHS International Symposium of Growing Media, Soilless Cultivation, and Compost Utilization in Horticulture, Ghent, Belgio, 22-27 agosto. Book of Abstracts, pp. 82-83. - Abstract IN CONGRESS F. Tozzi, A. Turchi, M. Antonetti, D. Prisa, S. Pecchioli, Masciandaro, S. Doni, M. Castellani, S. Nin (2021). Quality assessment in wild strawberry fruit and basil leaf from plants cultivated on dredged remediated sediment (LIFE SUBSED 17ENV/IT/000347). 12th International SedNet Conference, Giugno – 2 Luglio 2021 “Sediment Challenges and Opportunities due to Climate Change and Sustainable Development” - Abstract IN CONGRESS F. Tozzi, A. Turchi, M. Antonetti, G. Burchi, C. Macci, E. Peruzzi, S. Nin (2021) Developing pattern in <i>Prunus laurocerasus</i> grown on sediment enriched substrates (LIFE SUBSED 17 ENV/IT/000347). 12th International SedNet Conference, 28 Giugno – 2 Luglio 2021 “Sediment Challenges and Opportunities due to Climate Change and Sustainable Development” - Abstract IN CONGRESS A. Turchi, F. Tozzi, M. Antonetti, D. Prisa, G. Burchi, M. Castellani, S. Nin (2021). Sustainable substrates for agriculture from dredged remediated marine sediments: from ports to pots (LIFE 17ENV/IT/000347). ISHS International Symposium of Growing Media, Soilless Cultivation, and Compost Utilization in Horticulture, Ghent, Belgio, 22-27 agosto. Book of Abstracts, pp. 82-83.	- LIFE SUBSED: substrati sostenibili per l'agricoltura ottenuti da sedimenti marini dragati e bonificati: dai porti ai vasi (08/07/2021) - 2 Research Fellowship (Technical-scientific validation of the use of phytoremediated sediment for the cultivation of ornamental species through physiological and morphometric analyses)
MODELLI Implementation of management models for the agricultural systems aimed to preserve water resources	Encourage the self-handling and employment of different organic compounds (compost from olive waste, compost teas and microorganism accumulator) to be used for horticulture and olive growing	M. ZACCARDELLI CREA-OF	- Campania Region	- Ronga Domenico; De Falco Enrica; Mellone F.; Lanzara E.; Vito Antonella; Zaccardelli Massimo; Pane Catello; Caputo Michele (2021). Biostimolanti su lattuga positivi su produzioni e qualità. L'informatore Agrario, N.fascicolo 22, pp. 40-46. - Massimo Zaccardelli; Maurizio Agostino; Giuseppe Celant (2020). TÈ DI COMPOST, COME RIVALUTARE GLI SCARAFAGGI AGRICOLI. Colture Protette, N.fascicolo 3, pp. 42-46.	

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHERS RESEARCH PRODUCTS
MONVER GREEN WORLD	Training in the green supply chain ornamental crops - garden maintenance historic garden - landscaping	B. RUFFONI CREA-OF	INRA Villa Thuret Antibes - EPLEFPA Antibes - CFPPA Savoie - GIP Fipam Nic European Commission	- Abstract IN CONGRESS Cavallo Chiara; Copetta Andrea; Klobut Alice; Tinivella Federico; Martini Patrizia; Repetto Laura; Mariotti Mauro (2021). formation transfrontaliere dans les filieres du vert comme instrument synergique pour la prevention des invasions biologiques. Invasions biologiques vegetales et animales Mediterranee, pp. 28-2 - Abstract IN CONGRESS Copetta Andrea; Ruffoni Barbara; Mariotti Mauro (2021). progetto MONVER per la formazione transfrontaliera coordinata nelle filiere del verde. Acta Italus Hortus, N.volume 26, pp. 14-144.	- 1 Research fellowship
MULTIFLORA New Chain in Floriculture for sustainable and multipurpose flower production	The project tends to improve the innovation and the knowledge about the multipurpose plants useful for the Ligurian region. The new information will improve the possibility to develop a production chain floriculture connected with other sectors aromatic, medicinal and cosmetic sectors	B. RUFFONI CREA-OF	- Liguria Region		
Plant Care 4.0 Plant Local Area Network Tracking system and high quality green Care	According to Industry 4.0 Strategy, the aim of the project is to develop a modular Hw Sw system to support the digital management of ornamental plants throughout the entire life cycle, both public and private green areas. Through functional components, Plant Care 4.0 should bring various ICT solutions to operational level, with significant technological, organizational, and socio-economic advantages for the horticulture sector	S. CACINI CREA-OF	- Tuscany Region-		

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POFACS Shelf life, quality and safety of high-convenience fruit and vegetables	Development of advanced tools for gene innovation Characterization of gene resources and varietal innovation Pre-harvest innovations to improve product safety Pre-harvest innovations to improve product quality Agronomic innovations for crop cultivation Post-harvest process innovations to produce high-convenience fruit and vegetables Post-harvest innovations to implement product safety Post-harvest innovations to improve the sustainability of the process Consumption trends and market valorization strategies for high-convenience fruit and vegetables	T. CARDI CREA-OF CREA-NUT CREA-OFA CREA-GB CREA-PB CREA-VE	Ministero dell'Università e della Ricerca (MIUR)		
PSAMMbeach Water and energy savings in nursery practices using indigenous sand dune plants	Promote the efficient use of resources: profitability, productivity, competitiveness, emission reduction, working for ecological agro production systems and operating in harmony with essential natural resources. We are therefore in the presence of unique and endemic plants that allow us to enhance and protect biodiversity, by ex situ repopulation, favoring water and energy savings during cultivation. The chosen species have a high ornamental value and are resistant to climate change and can guarantee excellent and profitable prospects for cultivation in coastal areas	M. SAVONA CREA-OF	Liguria Region		- Research Fellowship - n.1
RIADAg Reduction of the agricultural environmental impact by disseminating agrobiodiversity	Transfer the knowledge and the eco-friendly cultivation techniques regarding the autochthonous vegetables ecotypes cultivated into the agroacerrara mariglianese district in Campania Region.	M. ZACCARDELLI CREA-OF	Campania Region		Arrangement of seminars about the employment of eco-friendly techniques into the horticulture and the use of local varieties.

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ROSTRI Rotations as a tool to reduce environmental impact and improve farms profitability	Create a dissemination program on good agricultural practices that use crop rotation to improve the soil physical-chemical and biological quality and its organic matter supply, reducing the need to resort to massive use of inorganic fertilizers and pesticides. The training of operators in the sector about the advantages of rotation and their awareness to use them as widely as possible, is aimed at promoting the conservation of the soil resource and the improvement of its quality, with a reduction in erosion and loss of organic matter, which represent the key principles to reduce the environmental impact of agriculture while increasing the profitability of farms	P. IOVENO CREA-OF	Campania Region		
SAL.VA.PRO.LI Conservation and enhancement of methods of typical crops in western Liguria	Maintenance of local agrobiodiversity supply to farmers of improved plant material	L. DE BENEDETTI CREA-OF	- Liguria Region – Local Action Group “Riviera dei Fiori”		
VA.PO.RE Varietal innovations resistant to mildew and alternaria to produce industrial tomato with a lower environmental impact	Promoting cooperation between stakeholders for the development and transfer of innovations through the action of the Operational Groups for innovation, with the implementation of pilot plans and development plans of new production practices, processes and technologies in the agricultural sector. The Operation, in particular, encourages the functioning and management of the Operational Groups (GO) of the European Partnership for Innovation (PEI) - art. 55 and 56 of Reg. (EU) no. 1305/2013 - to improve agricultural productivity and sustainability as well as the implementation of a innovation to identify a concrete solution for farms, aimed at solving a specific problem	L. SIGILLO CREA-OF	- Emilia Romagna Region		
ValMa Phenotypic evaluation and analysis of genotyping data of tomato lines derived from MAGIC population	Phenotypic selection of genotypes and R obtained from a MAGIC tomato population to develop new varieties adapted to organic farming	S. SESTILI CREA-OF	- I.S.I. SEMENTI SPA		

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHERS RESEARCH PRODUCTS
VerdeCittà The renewal of trees in the city - Green, Beauty and Health: The Made in Italy of Italian Nurseries	Improving the perception of the importance of urban greenery in cities by municipalities and citizens	G. BURCHI CREA-OF	- MIPAAF	- Gianluca Burchi (2021). L'uomo e le piante, il cittadino e il verde urbano. VerdeCittà - Il rinnovo delle alberate nelle città: verde, bellezza e salute. Il Made in Italy del florivivaismo italiano, N.volume 1, pp. 121-132 (25/06/2021) - Ruffoni Barbara; Copetta Andrea (2021). Fiori eduli in città. VerdeCittà - Il rinnovo delle alberate nelle città: verde, bellezza e salute. Il Made in Italy del florivivaismo italiano, pp. 235-242 (17/09/2021) - Cristina Giannetti (2021). La sfida di comunicare VerdeCittà. VerdeCittà - Il rinnovo delle alberate nelle città: verde, bellezza e salute. Il Made in Italy del florivivaismo italiano, N.volume 1, pp. 283-289. (08/06/2021) - Gianluca Burchi (2021). Prefazione a VerdeCittà. VerdeCittà - Il rinnovo delle alberate nelle città: verde, bellezza e salute. Il Made in Italy del florivivaismo italiano, N.volume 1, pp. 6-11 (25/06/2021) - Burchi G. (2021). VerdeCittà - Il rinnovo delle alberate nelle città: verde, bellezza e salute. Il Made in Italy del florivivaismo italiano. (17/09/2021) - Alberi in città: un patrimonio per tutti (16/07/2021) - Scopriamo i benefici del verde in città (03/09/2021) - VerdeCittà - Il rinnovo delle alberate nelle città: verde, bellezza e salute. Il Made in Italy del florivivaismo italiano. (16/07/2021) - VerdeCittà - Il rinnovo delle alberate nelle città: verde, bellezza e salute. Il Made in Italy del florivivaismo italiano. (11/06/2021) - VerdeCittà - Il rinnovo delle alberate nelle città: verde, bellezza e salute. Il Made in Italy del florivivaismo italiano. (03/09/2021) - Il Verde in città contro il cambiamento climatico (11/06/2021) - Comunicare VerdeCittà. Scientificamente il Verde (18/09/2021) Padova	VerdeCittà a Palerm VerdeCittà a Pado VerdeCittà si Pado Più verde in città con meno acqu Vivere il verde in città fa ber Alberi in città: un patrimonio per tu Scopriamo i benefici del verde in ci VerdeCittà a Ror VerdeCittà a Bolog VerdeCittà a Bolog VerdeCittà a Tori Il Verde in città contro il cambiamento climati Comunicare VerdeCittà. Scientificamente il Ver

2.5.2 Patens and Services

Patents INDUSTRIAL PATENTS

PRODUCTS/MAIN TOPICS	DENOMINATION /DESCRIPTION	AUTHORS
greenhouse	Naturally ventilated greenhouse (IT + MA + DZ + TN) Joint ownership: Opus et Vita firm	L. Santonicola
mulching method	Composition and method for mulching (IT) Joint ownership: Barzaghi firm	D. Massa, G. Burchi, A. Benedetti

PLANT VARIETY RIGHTS - Vegetables species

PRODUCTS	DENOMINATIONS	AUTHORS	CREA CENTRES
helichrysum	HYBCRAMAR4	C. Cervelli	CREA-OF

melon	NAD	N. Ficcadenti, S. Sestili, G. Campanelli, A. Natalini	CREA-OF
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CREA VARIETIES INCLUDED IN THE ITALIAN OFFICIAL LISTS- Vegetables species

PRODUCTION/MAIN TOPICS	DENOMINATION	CREA CENTRES	PRODUCTS	DENOMINATION	CREA CENTRES
Chard from ribs	Sibilla	CREA-OF	Peppers	Graffito	CREA-OF
Cauliflower	Noverde	CREA-OF	Peppers	Romital	CREA-OF
Cauliflower	Noviese	CREA-OF	Peppers	Vulcan	CREA-OF
Cauliflower	Tardux	CREA-OF	Tomato	Polluce 88-083	CREA-OF
Fennel	Chiarino	CREA-OF	Tomato	SAAB CRA	CREA-OF
Endive escarole	Ascolana	CREA-OF	Tomato	Trasformi'	CREA-DC
Aubergine	Partena	CREA-OF	Leek	S.Giovanni 90	CREA-OF
Aubergine	Partenone	CREA-OF			

Services

Collections

PRODUCTS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Solanaceae, Cucurbitaceae, Graminaceae and more	ABC (AgroBiodiversità Campana). Maintenance of a collection of about 300 accessions of local cultivars of herbaceous species belonging to different botanical families including Leguminosae, Solanaceae, Cucurbitaceae and Graminaceae	M. Zaccardelli/P. Tripodi	CREA-OF
local varieties herbaceous species	Maintenance of 492 accessions of herbaceous species belonging to different species of agricultural interest and at risk of genetic erosion found in the Marche region	S. Sestili	CREA-OF
pathogenic fungi and bacteria	Collection of pathogenic fungi and bacteria in long and short term storage	L. Sigillo	CREA-OF
Asian and American botanical species	Collection of 118 Hydrangea accessions among botanical, Asian and American species, as well as some hybrids and cultivars on the market	B. Nesi	CREA-OF

PRODUCTS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
various horticultural	Collection of 2500 accessions of vegetable crop species of agricultural interest	P. Tripodi	CREA-OF
Ornamental plants	Maintenance of 35 accessions and hybrids typical of Ibises with ornamental function	A. Mercuri	CREA-OF
Edible and ornamental flowers	Maintenance of 50 accessions of edible and ornamental Passiflora	A. Giovannini	CREA-OF

Historical libraries

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Agronomic issues in general; Floriculture	Book heritage of more than 2000 volumes, from the second half of the 19th century to the 1990s, interesting for some unique pieces; more than 150 magazines from the same period, notable for their antiquity, good conservation and wide coverage of agronomic topics; historical paper archive from 1924 (year of establishment of the institution) to 2013 (transition to the IT protocol), notable for its antiquity and presumably intact from its formation (although at risk of loss due to inadequate storage methods). Interesting for the purposes of a reconstruction of the history of science in the Public Administration. The library contains part of the collection of prof. Mario Calvino, father of the writer Italo and first director of the Experimental Station for Floriculture established on 25 January 1925 with Royal Decree, from which the CREA OF in Sanremo originated.	L. De Benedetti	CREA OF sede di Sanremo

Scientific infrastructures

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Nutritional quality of vegetables	Metabolomics facilities for the determination of the nutritional quality of vegetables equipped with the following instrumentation: 1) HPLC WATERS e2695 with UV-Vis photodiode detector and refractive index (IR) detector: analysis of carotenoids, phenolic compounds, ascorbic acid, organic acids and sugars 2) GC-MS Bruker SCION single quadrupole with PAL3 autosampler for liquid injection, static and dynamic headspace and solid phase microextraction fiber (SPME): analysis of volatile compounds and waxes of the cuticle of vegetable species 3) UPLC-MS, mass spectrometer (linear trap, LTQ XL): analysis of secondary polar targeted metabolites (flavonoids, polyamines, glucosinolate phenols, anthocyanins, etc.).	G. Francese	CREA-OF Pontecagnano
Plant biotechnologies	Plant biotechnology facilities: 1) Laboratory for in vitro culture, equipped for embryo rescue, haploid cultures, somatic embryogenesis, in vitro regeneration protocols, propagation in solid and liquid substrates; 2) Molecular biology laboratory, equipped for extraction, analysis, quantification of nucleic acids, gene expression studies, molecular markers 3) Biochemistry laboratory, equipped for isolation and quantification of plant compounds and microbiology laboratory of microorganisms associated with plants and soil	B. Ruffoni	CREA-OF Sanremo

Other services

PRODUCTS/MAIN TOPICS	AIMS/DESCRIPTIONS	PERSON IN CHARGE	CREA CENTRES
Lettuce varieties	ARCA2010: (Agreement): Realization of agronomic tests aimed to lettuce varieties comparison. The aim will be to identify the best lettuce varieties	M. Zaccardelli	CREA-OF Pontecagnan
Biostimulantes	Attivi.Bio (Biostimulant activity of plant-derived substances and endophytic fungi on plants). Evaluation of the biostimulatory activity of protein hydrolysates and endophytic fungi by in vivo and in vitro bioassays	M. Cardarelli	CREA-OF Pontecagnan
Local varieties of herbaceous species	BANGECAR - Management of the regional germoplasm bank and characterization of local varieties of herbaceous species from the Marche region, project "biodiversity and genetic resources - L.R. 12/2003"	S. Sestili	CREA-OF Monsampolo del Tronto
Local varieties of pepper	BIODIVER - Identification of genetic polymorphisms of pepper local varieties collected by ARSIAL Lazio. Identification polymorphic markers able to discriminate local varieties of sweet pepper retrieved from the area of Lazio region.	P. Tripodi	CREA-OF Pontecagnan
Biological agriculture	Biological certified agro-ecological system for scientific research on horticultural species open field cultivated (Laboratorio terza missione OF2 Monsampolo).	G. Campanelli	CREA OF-Monsampolo
CAuliflower named "ROmanesco"	CA.RO.B.: Joint research agreement on Breeding for the typology of CAuliflower named "ROmanesco". Cauliflower 'Romanesco' breeding collaboration with HM.Clause farm	A. Natalini	CREA OF-Monsampolo
Compost, production and analysis of tea compost and accumulator of microorganisms	CARPENATURAM 2 Technology transfer aimed to the production of compost tea and the microorganism's accumulator, with consequent microbiological analyses	M. Zaccardelli	CREA-OF Pontecagnan
Ornamental Plants	COMMICRO - Use of compost treated with microorganisms and earthworms for the cultivation of ornamental plants. To investigate the transformation process of manufacturing waste from tanneries, by means of microbial treatment and earthworm activity, to produce a substrate that can be used for the cultivation of ornamental plants.	D. Prisa	CREA-OF Pescia
Tomato	CON-Pom - Scientific support in research and experimentation aimed at the sustainable protection of processing tomatoes using naturally derived products	C. Pane	CREA-OF Pontecagnan
Lettuce	CORARES_21. Evaluation of resistance to <i>Fusarium oxysporum</i> f. sp. lactucae in <i>Lactuca sativa</i> genotypes	L. Sigillo	CREA-OF Pontecagnan
Cactus and ornamental succulents	COVES - Plant matrix corrective in alkaline organic substrates for growing cacti and ornamental succulents. Goal: To evaluate the effectiveness of a naturally occurring acidifier in modifying soil pH, plant growth and rhizosphere microbial activity	D. Prisa	CREA-OF Pescia
Compost tea	CT SIMBIOSOIL. Analysis and utilisation of compost tea obtained from virgin olive pomace called symbiosoil	M. Zaccardelli	CREA-OF Pontecagnan

PRODUCTS/MAIN TOPICS	AIMS/DESCRIPTIONS	PERSON IN CHARG	CREA CENTRES
Onion	CVC. Variety comparison in onions for legal evaluation in support of the Genua Court	B. Ruffoni, A. Natalini	CREA-OF Sanremo
Horticultural plants	DIFARMA Experimental trials under controlled conditions on the effect of osmotic stress on the content of secondary metabolites in vegetable productions	D. Massa	CREA-OF Pescia
Green and purple types of cauliflower	EARLY-CAV: Genetic improvement of green and purple cauliflower Objective: obtaining genetic material in selection to produce pure lines of green and purple types of cauliflower for the constitution of F1 hybrids with precocity characteristics suitable for short cycles and autumn harvests	N. Ficcidenti	CREA-OF Monsampolo del Tronto
Ornamental plants	FOOPVECREA – Planting techniques, production, cutting and harvesting products - Fertilisation and phytosanitary treatments, verification, and process control for green operators. To evaluate the effectiveness of new ornamental plants cultivation methods by sustainable products. Teaching and training of these methodologies on personnel interested in new job opportunities in urban greenery	D. Prisa	CREA-OF Pescia
Botanical gardens	Framework Convention for Hanbury Gardens GBH Collaboration agreement between GBH and CREA-OF to work on the joint development of initiatives, scientific activities and research programs, including the organization of training courses and other activities of common interest.	F. Monroy	CREA-OF Sanremo
Horticultural and ornamental species	GENCHI – Evaluation of a plant-based formulation suitable for the cultivation of vegetables and ornamental plants	G. R. De Nicola	CREA-OF Pescia
Watermelon and zucchini crops	GS ANG-ZUC 20 - Study and dissemination actions aimed at reducing and optimizing the use of pesticides in watermelon and zucchini crops, and identifying good agronomic practices to preserve the environment and bees	C. Pane	CREA-OF Pontecagnan
Reducing and optimising the use of pesticides	GS PES-NET-21 - Study and dissemination actions aimed at reducing and optimising the use of pesticides in peach and nectarine crops, and identifying good agronomic practices to preserve the environment and bees	C. Pane	CREA-OF Pontecagnan
Ornamental crops and fertilizers	ICFERT 3 - Controlled release fertilizers Studies on the effects of controlled release fertilizers on the performance of potted ornamental crops	D. Massa	CREA-OF Pescia
Ornamental crops and fertilizers	ICFERT4 - Controlled release fertilizers Studies on the effects of controlled release fertilizers on the performance of potted ornamental crops	D. Massa	CREA-OF Pescia
Rocket	IL-Rucola Bio - Scientific support in research and experimentation actions aimed at controlling downy mildew on organically grown rocket with alternative products to copper	C. Pane	CREA-OF Pontecagnan
In vitro propagation of Hydrangea	Plant production for a private company - Mansuino Srl	B. Ruffoni	CREA-OF Sanremo
Inula viscosa extracts in the growing and protection of vegetable plants	INORT - Evaluation of Inula Viscosa extracts in the growing and protection of vegetable plants Study and evaluate the possible use of Inula Viscosa extracts in the improvement of growth, production quality and protection of lettuce, tomato and spinach plants.	D. Prisa	CREA-OF Pescia
Tomato, cauliflower	ISIBRALYC_21 Evaluation of resistance to bacterial diseases in Solanum and Brassica genera	L. Sigillo	CREA-OF Pontecagnan
Professional education	ITSAS Mazzocchi Internship for training and professional orientation in plant biotechnologies for students from the "Higher Education Institute" Mazzocchi - Biotechnological, Environmental and Healthcare Courses	S. Sestili	CREA-OF Monsampolo del Tronto
Micropropagation	Laboratory of micropropagation and in vitro culture of ornamental species Third mission service (OF1 code of the CREA service charter) Micropropagation of elite cultivars.	B. Ruffoni	Crea-OF Sanremo
Organic farming	Agro-ecological system certified as organic for scientific and application research on open field horticulture (OF2 code of the CREA service charter)	G. Campanelli	CREA-OF Monsampolo del Tronto

PRODUCTS/MAIN TOPICS	AIMS/DESCRIPTIONS	PERSON IN CHARGE	CREA CENTRES
Pathogens	Laboratory of phytopathological, molecular and microbiological analyses Third mission service (OF3 code of the CREA service charter)	L. Sigillo	CREA-OF Pontecagnan
Hydrangea spp. for cut flower market	MiGeHydra 3 Establish new genetic material of Hydrangea spp. for cut flower market through intra- and interspecific crossings and in vitro techniques.	B. Nesi	CREA-OF Pescia
Nutraceuticals and health compounds in fruits	NUTRISALFRUTTI. Content of compounds with nutraceutical and health benefits in fruit trees Measurement of total anthocyanins, total phenols, resveratrol, simple sugars and organic acids in two table grape varieties grown under 4 different photomodulating protective cover sheets.	G. Mennella	CREA-OF Pontecagnan
Hornamental hemp	ORNABIS - Development of new hemp genotypes for ornamental purposes and study of propagation systems in vivo and in vitro	G. Burchi	CREA-OF Pescia
Exclusive rights of UE patented cultivars	PRIVA PLANTIPP - Phenotypic evaluation of registered varieties to evidenciate possible violations of exclusive rights of UE patented cultivars Evaluation of phenotypic morphological differences between 4 registered varieties of 4 ornamental species, of which the client company owns the exclusive rights, and 4 other varieties which are presumed to be the same registered varieties mentioned above, but sold by another company under another first name	G. Burchi	CREA-OF Pescia
Pear tomato	SAAB-CRA– Abruzzo consortium of pear tomato producers Variety reproduction and seed delivery to the consortium of Abruzzo producers	G. Campanelli	CREA-OF Monsampolo del Tronto
Soil conditioner	UNIMER Evaluation test of UNIMER soil enriched with microorganisms	M. Zaccardelli	CREA-OF Pontecagnan
Tomato	ValMa Phenotypic evaluation and genotyping analyses of tomato lines derived from MAGIC population. Tomato breeding to improve sustainability, performance and competitiveness by selection of new varieties adapted to low input system and different pedoclimatic area	S. Sestili	CREA-OF-Monsampolo

Working tables / working groups / institutional partnerships, editorial board

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Herbaceous species	Collaboration Agreement (ex art. 15 L. 241/90) between the Department of Pharmacy of the University of Salerno and (CREA-OF)	Z. Massimo	CREA-OF Pontecagnano
Ornamental Crops	Committee Member of the Horticultural and Agricultural District of Western Liguria	A. Copetta	CREA-OF Sanremo
Supply chains	Steering group in charge of managing the evaluation process of the National Strategy regarding operational programs in the fruit and vegetable sector	A. Venezia	CREA-OF Pontecagnano
Nursery production	Technical Table of the Nursery Sector, Working Group "Quality"	G. Burchi	CREA-OF Pescia
Nursery production	Technical Table floriculture and horticulture	B. Ruffoni	CREA-OF Sanremo
Propagation	MiPAAF Working group of plant protection - Propagation materials for fruit trees, vegetables and ornamental plants – Ortive (DM 17713/2016)	C. Teodoro	CREA-OF Pontecagnano
Genetic Resources/Allium	ECPGR (European Collaborative Programme for Plant Genetic Resources) - Working Group Allium	A. Natalini	CREA-OF Monsampolo del Tronto
Ornamental species	Accademia dei Georgofili "Accademia Risponde" working group "floricultural". Working group dealing with responding to specific problems relating to ornamental species	A. Giovannini	CREA-OF Sanremo
Horticulture	Meeting and discussion table of the problems of the horticultural sector created by MiPAAF in 2012, including producers, traders, designers and maintenance of greenery, associations, cooperatives and public and private research bodies	G. Burchi	CREA-OF Pescia

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Fertilization	Working Group GL 02 (Soil Improver and Growing Media), under Fertilizer Committee UNI CT/406 of UNICHIM The Working Group is involved in standardization projects related to analytical standard provided for in European Regulation about fertilizers (FPR UE 1009/19), soil improve (organic and inorganic), growing media, compost and digestated. The GL 02, under the Fertilizer Committee, interfaces with CEN Committees (Euroean Committee for Standardization) and ISO and, specifically, drawn up documents by CEN TC 223 - Soil improvers and growing media are properly analysed and voted.	S. Cacini	CREA-OF Pescia
Fertilization	EUVRIN Participation to the European Vegetable Research Institutes Network: EUVRIN – WG Fertilisation and Irrigation; WG Greenhouse Crops	D. Massa	CREA-OF Pescia
Fertilization	MOA BAAFS Memorandum of agreements between CREA Vegetable and Ornamental Crops and Beijing Academy of Agriculture and Forestry Sciences for the development of protocols for efficient fertilization in vegetable crops	D. Massa	CREA-OF Pescia
Genetic resources	EUVRIN Participation to the European Vegetable Research Institutes Network: EUVRIN – WG Genetic Resources, Breeding and Seed Production	T. Cardi	CREA OF Pontecagnano
Photovoltaic materials	CNR ICCOM Innovative photovoltaic materials for covered crops	D. Massa	CREA-OF Pescia
Soilless crops	SOI, Working group "Soilless crops" of the Italian Society of Horticultural Science, coordinator Daniele Massa, activities in the field of containerized crops grown in substrate or hydroponically	D. Massa, S. Cacini, D. Prisa	CREA-OF Pescia
Ornamentals	Working group with the aim to protection and enhancement of the heritage of local breeds and varieties of agricultural, zootechnical and forestry interest referred to in LR 64/2004 Technical and scientific board of ornamental and flower species of the Tuscany Authority Region	B. Nesi	CREA-OF Pescia
Biodiversity	Working Group of Italian Ministry of Agriculture, Food and Forestry group to discuss the PAC European strategy on biodiversity	P. Tripodi	CREA - OF Pontecagnano
Horticultural species	Accademia dei Georgofili "Accademia Risponde" working group "vegetables" Working group that deals with responding to specific problems relating to vegetables of agricultural interest	P. Tripodi, L. Sigillo	CREA - OF Pontecagnano
Micropropagation and in vitro culture	SOI, Società di Ortoflorofrutticoltura Italiana- Working Group "Micropropagation and In Vitro Technologies" Working group that mainly deals with organizing meetings (Conferences, Workshops, Demonstration Days, Seminars) on topics related to micropropagation and, broadly, on in vitro technologies.	M. Antonetti, B. Nesi, S. Nin, G. Burchi, M. Cardarelli, B. Ruffoni	CREA - OF Pescia, Pontecagnano, Sanremo
Ornamenta Specialized Collections	SOI, Società di Ortoflorofrutticoltura Italiana- Working Group "Specialized Vegetable Collections" Working group that mainly deals with raising awareness of the protection of greenery by enhancing cultural and recreational aspects of ornamental collecting and monitoring, and censoring, including in a database, the public and private Specialized Vegetable Collections, both public and private, present on the Italian territory.	M. Antonetti, D. Prisa, S. Nin, G. Burchi, M. Cardarelli, C. Cervelli, B. Nesi, P. Tripodi	CREA - OF Pescia, Pontecagnano, Sanremo
Registration criteria of horticultural crops	MiPAAF working group for updating registration criteria of horticultural crops Working group that deals with updating the registration criteria for vegetables	P. Tripodi	CREA - OF Pontecagnano
Organic farming and Agroecology	SOI, Società di Ortoflorofrutticoltura Italiana- Working Group Organic farming and Agro- ecology Working group on the importance and dissemination of organic agricultural production	D. Prisa	CREA - OF Pescia
Horticultural and fruits post-harvest	SOI, Società di Ortoflorofrutticoltura Italiana- Working Group Post-harvest Working group on the importance of the post-harvest sector of those processes that aim to maintain the organoleptic and marketable characteristics of the product	D. Prisa, G. Burchi	CREA - OF Pescia
Nursery	SOI, Società di Ortoflorofrutticoltura Italiana- Working Group Nursery Working group aimed at assessing the evolution of individual production sectors, varietal innovation to respond to changing climatic and environmental conditions while respecting the new requirements of breeding forms and systems	D. Prisa, S. Nin, Gianluca Burchi, S. Cacini, M. Cardarelli	CREA - OF Pescia, Pontecagnano

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Plant novelties	SOI, Società di Ortoflorofrutticoltura Italiana- Working Group Plant novelties Working group with the aim of sharing issues related to tools and methods for the establishment, characterisation and protection of new plants in horticulture.	D. Prisa, G. Burchi	CREA - OF Pescia
Learning and research in horto-floriculture	SOI, Società di Ortoflorofrutticoltura Italiana- Working Group Education and Research in Horticulture and Floriculture Working group that promotes the discussion of issues relating to the quality of teaching and research in the field of horticulture, floriculture and ornamental plants, with a view to proposing measures for their improvement.	D. Prisa, S. Nin, G. Burchi	CREA - OF Pescia
Sustainability of the fruit and vegetable sector	MiPAAF fruit and vegetable national technical table. Working Group on sustainability To identify problems and needs relating to the sustainability of the fruit and vegetable sector	A. Venezia	CREA - OF Pontecagnano
Operational programs on fruit and vegetable	MiPAAF National Strategy on sustainable operational programs for the fruit and vegetable sector. Steering group in charge of the evaluation process Evaluation of the National Strategy for the recognition and control of fruit and vegetable producer organizations and their associations, operational funds and operational programs	A. Venezia	CREA - OF Pontecagnano
Fruits, vegetables and aromatic herbs	Scientific Technical Committee between CREA Centers for accompanying measures to the Mipaaf-CREA cooperation project "Fruit and vegetables in schools" Preparation of a didactic notebook concerning in-depth studies on fruit, vegetables, aromatic herbs as well as on food waste	G. Francese	CREA - OF Pontecagnano
Corroborating products	Technical Commission MiPAAF for products used as invigorating, enhancers of the natural defenses of plants Evaluation of corroborating products in conventional agriculture	M. Cardarelli	CREA - OF Pontecagnano
Post-doc training and research	Scientific Council of the PhD School "Plant and animal production sciences" (Dep. DAFNE, University of Tuscia) Sector ERC (European Research Council) LS9 - Applied life sciences and biotechnology: agriculture. Commission for promoting formation and post-graduation research	M. Cardarelli, G. Burchi	CREA-OF Pontecagnano
Post-doc training and research	Scientific Council of the PhD School "Ciencias Agropecuarias", Universidad Veracruzana, Cordoba (VZ), Mexico Commission for promoting formation and post-graduation research	G. Burchi	CREA-OF Pescia
Precision agriculture	Regional observatory of precision agriculture, Campania Region Support to the Campania Region for the diffusion policies of precision agriculture	C. Pane	CREA-OF Pontecagnano
Pesticides	New PAC scientific technical table "Defense - sustainable use of pesticides" Support table for the new PAC (Common Agricultural Policy)	C. Pane	CREA-OF Pontecagnano
Variety registration	UPOV, International Union for the Protection of New Varieties of Plants. Technical Working Party for Vegetables TWV49 Fifty-Fourth Session Working group to discuss about the UPOV technical guidelines for vegetables that are used for variety description in the framework of Variety Registration and for Plant Breeder's Right	L. Sigillo	CREA - OF Pontecagnano
Fruit and Vegetable	Fruit and Vegetable National Technical Table - MiPAAF CREA Delegate	T. Cardi	CREA - OF Pontecagnano
Plant protection	Permanent Working Group on Plant Protection - MiPAAF CREA Delegate	T. Cardi	CREA - OF Pontecagnano
Micropropagation of flowers	GUEST EDITOR for special issue "Micropropagation and Flowers" of PLANTS-MDPI Guest editor	A. Giovannini, M. Savona	CREA-OF Sanremo
Organic farming	New PAC MiPAAF scientific technical table - Biological Agriculture Working Group (Decreto CREA n. 288 del 08/03/2018) Working group to discuss the issues of the new PAC with reference to organic farming	G. Campanelli	CREA OF Monsampolo del Tronto

2. CREA RESEARCH LINES BY PRODUCTS

2.6 OLIVE TREE and OIL

The olive sector is strategic in Italy with over one million hectares of surface, 60 million plants and the highest world olive biodiversity. CREA inherits over a hundred years of tradition of olive-growing and olive oil production research with the largest collection of world olive germplasm. The research lines developed in 2021 concern the following topics:

-Variety innovations through traditional genetic improvement and new biotechnologies

Germplasm collections and segregating populations by crossbreeding programs represent a source of genes and molecular markers useful for genetic improvement. The research activity concerns the identification of candidate genes and epigenetic mechanisms, the exploitation of genomic information, the study of host-parasite interactions, the use of the latest generation biotechnologies (NBT- New Breeding Techniques, such as cis-genesis and genome editing) by optimization of transformation and regeneration protocols, to promote varietal innovation by selection of new genotypes with improved production, quality and resistance characteristics.

-Enhancement of agrobiodiversity to support sustainable and quality in olive production chains

Activities of genetic improvement aimed at the development of new cultivars for different cultivation areas, more tolerant to biotic and pedoclimatic adversities. These cultivars meet the real needs of the three production chains and better combine innovation, sustainability and "Made in Italy".

- Search for sources of resistance to biotic and abiotic agents through olive germplasm screening

Identification of resistance / tolerance genes to the main biotic and abiotic adversities by sequencing and analysis of the transcriptome and application of NBT to obtain plants modified in the genes of interest.

- Innovations in production methods with reference to the digitization and optimization of cultivation operations

In this context, CREA develops and validates new production methods to increase the yield and quality of olive production and to improve the environmental sustainability and competitiveness of agricultural farms. It carries out studies on physiological responses in the soil-plant-atmosphere continuum for adapting fruit production to climate change by improving resource efficiency with positive economic and environmental impacts. The Centre promotes the use of sensory technology for monitoring the conditions of fruit and for implementing and validating digitalized platforms to optimize the management of olive grove by means of precision farming tools.

- Integrated systems for olive crop protection

Studies of the biology and of the diffusion of agents causing economic and biological damage are carried out, by identification of methods of contrast and identification of diseases and pests. The research activity concerns the development of geo-referenced and remote monitoring systems, the sustainable use of plant protection products, and the identification of antagonistic organisms of harmful agents for crops. Behind this activity there is the integrated approach for a correct crop protection including the study of compounds with low environmental impact and a reduced toxicological level.

- Quality of the products of the olive oil chain by processing and product industry. Identification of tools and methodologies to provide consumer with the maximum guarantee of quality in terms of qualitative, nutraceutical and sensorial characteristics of the products and organoleptic and nutraceutical characterization of EVOOs and table olives

As part of a project carried out by the Italian Space Agency, the Made in Italy oil is used as a "bonus food" for the astronauts on the international station orbiting the Earth. Some oil samples will also be used for an experiment on the effects of staying in the space

- Development of new methods for chemical, molecular and digital traceability of olive oil

- Use of innovative technologies and biotechnologies for the enhancement of secondary products of the oil industry

- Consolidation of relations with stakeholders

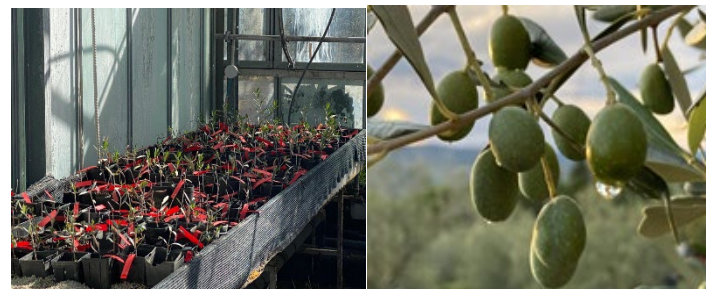
- Management and phenotyping of olive germplasm collections

- Development of tools and strategies to guarantee a complete accessibility on the information contained on the food label

In the field of labeling, specific research has been carried out to allow more information to people with visual problems, through a specific talking label.

CREA has interdisciplinary scientific skills, in Chemistry, Pharmaceutical Chemistry and Technologies, Food Science and Technology, Agricultura Sciences, Biological Sciences, and qualified technicians with considerable experience in the problems of the supply chain.

Finally, many CREA researchers and technicians are also professional virgin olive oil tasters, registered on the national register of tasters and pane leaders' experts in the sensory evaluation of oils.





2.6.1 Research and research products – Olive and Oil

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND RESEARCH CENTRES	INTERNATIONAL PARTNERSHIP FINANCING BODY	PUBLICATION	OTHER RESEARCH PRODUCTS ¹
ALIVE Characterization and enhancement of table and dual purpose olives	The project focuses on the enhancement of new olive varieties with dual purpose (table and oil) and on the characterization of the main varieties of Italian table olives by analysis of the characters: a) morphological, b) bio-agronomic, c) resistance to biotic and abiotic stress; d) molecular, and the identification of organoleptic characteristics, to achieve typical quality productions	I. MUZZALUPO CREA-OFA	- MiPAAF - Ministry of Agricultural, Food and Forestry Policies		- Conservation, packaging, traceability, marketing of table olives 06/10/2021 - Post-doc - n. - Fellowships - n.4

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND RESEARCH CENTRES	INTERNATIONAL PARTNERSHIP FINANCING BODY	PUBLICATION	OTHER RESEARCH PRODUCTS ¹
<p>BIOTECH_GENOLICS</p> <p>BIOTECH</p> <p>Sub-project: In vitro regeneration of olive cultivars and identification of allelic variants for use of modern biotechnologies</p>	<p>Create the conditions for the application of modern biotechnologies in olive trees. The project has two specific aims: developing of regeneration protocols in olive trees and identification of editable allelic variants for the application of the genome editing techniques</p>	<p>S. ZELASCO</p> <p>CREA-OFA</p> <p>CREA-OF</p>	<p>- MiPAAF - Ministry of Agricultural, Food and Forestry Policies</p>	<p>- Abstract in atti di convegno SIRANGELO TIZIANA MARIA; SALIMONTI AMELIA; FORGIONE IVANO ZELASCO SAMANTA; VENDRAMIN ELISA; ANGILÈ F.; FANIZZI F. P.; BENINCASA CINZIA; CARBONE FABRIZIO (2021). GENETIC AND DEVELOPMENT FACTORS AFFECT THE EXPRESSION OF GENES INVOLVED IN FATTY ACID AND PHENYLPROPANOID BIOSYNTHESIS AND IN LIGHT SIGNAL TRANSDUCTION IN OLIVE FRUIT.</p> <p>- Abstract in atti di convegno ANGILÈ FEDERICA; FOIANINI IVANO; FANIZZI FRANCESCO PAOLO; PELLEGRINO MASSIMILIANO; ROMANO ELVIRA; RIPOLI ANTONIO; GIUSEPPE; PELLICORI VICTORIA; LO FEUDO GABRIELLA; SANTILLI ELENA; BENINCASA CINZIA; MANCINI SONIA; CATTIVELLI LUIGI; DI GASPER GABRIELE; SCAGLIONE DAVIDE; SCALABRIN SIMONE; MORGANTI MICHELE; ZELASCO SAMANTA (2021). POPULATION GENETIC STRUCTURE AND PHENOTYPING OF ITALIAN VARIETIES AIMING TO A GENOME WIDE ASSOCIATION STUDY FOR OLIVE OIL CHEMICAL COMPOSITION.</p>	<p>- Post-doc - n.1</p>

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND RESEARCH CENTRES	INTERNATIONAL PARTNERSHIP FINANCING BODY	PUBLICATION	OTHER RESEARCH PRODUCTS ¹
DEAOLIVA Improvement of quality, sustainability and safety of use in the de-amarization of table olives by innovative processes on a pilot scale	Introduction of the results of the research on the de-amarization of the "table olives" product to more sustainable and healthier compatible processes	B. LANZA CREA-IT CREA-AN CREA-OFA	- MiPAAF - Ministry of Agricultural, Food and Forestry Policies	- Articolo in rivista Ortenzi Luciano; Figorilli Simone; Costa Corrado; Pallottino Federico; Violino Simona; Pagano Mauro; Imperi Giancarlo; Manganiello Rossella; Lanza Barbara; Antonucci Francesca (2021).A machine vision rapid method to determine the ripeness degree of olive lots.SENSORS, 21, 9,D0I: 10.3390/s21092940 - Articolo in rivista Lanza Barbara; Di Marco Sara; Baccei Martina; Di Serio Maria Gabriella; Di Loreto Giuseppina; Cellini Martina; Simone Nicolò (2021).Lactiplantibacillus plantarum Used as Single, Multiple, and Mixed Starter Combined with Candida boidinii for Table Olive Fermentation: Chemical, Textural, and Sensorial Characterization of Final Products.Fermentation, 7, 4, 1-16.D0I: 10.3390/fermentation7040235 - Articolo in rivista Manganiello Rossella; Pagano Mauro; Nucciarelli Davide; Ciccoritti Roberto; Tomasone Roberto; Di Serio Maria Gabriella; Giansante Lucia Del Re Paolo, Servili Maurizio; Veneziani Gianluca (2021).Effects of Ultrasound Technology on the Qualitative Properties of Italian Extra Virgin Olive Oil.FOODS, 10, 11, 1-20.D0I: 10.3390/foods10112884. - Articolo in rivista Ortenzi Luciano; Violino Simona; Pallottino Federico; Figorilli Simone; Vasta Simone; Tocci Francesco; Antonucci Francesca; Imperi Giancarlo; Costa Corrado (2021).Early estimation of olive production from light drone orthophoto, through canopy radius.DRONES, 4, 4,D0I: 10.3390/drones5040118. communication: brief investigation about social media use by some typical food industries in Abruzzo region (Italy).	- Post-doc - n.2 - Fellowships - n.2
DI.OL Defense against harmful organisms in traditional and intensive olive growing	Identification and development of tools and strategies for the biological and integrated protection of Italian olive growing in both contexts managed by traditional and intensive and super-intensive.	P. F. ROVERSI CREA-DC CREA-OFA	- MiPAAF - Ministry of Agricultural, Food and Forestry Policies	- Abstract in atti di convegno Novellis Carmine; Rizzo Pierluigi; Ienco Annamaria; Pellegrini Massimiliano; Zaffina Francesco; Cruceli Giuseppe; Vizzarri Veronica (2021).Dati preliminari dell' effetto sinergico di caolino e di spintorfly i oliveti biologici contro la mosca dell'olivo.. 134-134.	- Defense against harmful organisms in traditional and intensive olive growing 26/11/2021
Fa.Re. Fattoria 3.0...imparare giocando in Rete	Promote a culture of good-being especially of the younger children in a different form of social integration.	E. SANTILLI CREA-OFA	- Regione Calabria		

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND RESEARCH CENTRES	INTERNATIONAL PARTNERSHIP FINANCING BODY	PUBLICATION	OTHER RESEARCH PRODUCTS ¹
FRASCA "The sustainable use of the by-products of the olive-oil production chain to improve the Health and quality of Calabria autochthonous podolic cattle".	Selection, collection and transport of olive tree pruning products (frascame) to a single storage point located at the "La Sella" company Collection and transport of vegetation water from oil mills to the research institution (CREA-OFA Rende) Drying of the AV Encapsulation of bioactive compounds Study of the formulation of food supplementation with the by-products of the olive-oil supply chain in the diet of autochthonous Calabrian podolic cattle. Development of two diets for native Calabria podolic cattle and monitoring of food intake, livestock performance and animal welfare parameters Monitoring of the blood profile and plasma oxidative state Study and characterization of the microbiota of the gastrointestinal tract of animals	I. MUZZALUPO CREA-OFA	- Regione Calabria		

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND RESEARCH CENTRES	INTERNATIONAL PARTNERSHIP FINANCING BODY	PUBLICATION	OTHER RESEARCH PRODUCTS ¹
GEN4OLIVE Mobilization of Olive GenRes through pre-breeding activities to face the future challenges and development of an intelligent interface to ensure a friendly information availability for end users	The overall goal of GEN4OLIVE is to accelerate the mobilization of olive GenRes and to foster pre-breeding activities by developing a smart and user-friendly interface that will implement Artificial Intelligence utilities to leverage the olive GenRes resources; and enhancing breeders and growers' participation through the implementation of two open calls for supporting pre-breeding activities and breeding plans.	E. PERRI CREA-OFA	<ul style="list-style-type: none"> - European Commission- HELLENIC UNION OF NURSERIES - Ministry of agriculture and forestry <ul style="list-style-type: none"> - Focos GbR - HELLINIKOS GEORGIKOS ORGANISMOS - DIMITRA / HELLENIC AGRICULTURAL ORGANIZATION (HAO) - DEMETER - Centre National de la Recherche Scientifique <ul style="list-style-type: none"> - ANKARA UNIVERSITESI - Universidad de Granada - Galvez Productos Agroquimicos SLU - CAMBRICO BIOTECH, S.L. - UNIVERSIDAD DE JAEN - UNIVERSIDAD DE CORDOBA - Fundación Corporación Tecnológica de Andalucía <ul style="list-style-type: none"> - SANTA CRUZ INGENIERIA SL - Institut National de la Recherche Agronomique du Maroc 		<ul style="list-style-type: none"> - GEN4OLIVE INFO DAY 21/09/2021 - Post-doc - n.2 - MATCHMAKING

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND RESEARCH CENTRES	INTERNATIONAL PARTNERSHIP FINANCING BODY	PUBLICATION	OTHER RESEARCH PRODUCTS ¹
INFOLIVA Traceability and product innovations in the oil and table olive supply chain	The project is developed in the framework of the National Olive Growing Plan aimed to enhance the peculiarities of Italian olive growing and the potential the sector can express on the production and quality profile of high quality products.	C. COSTA CREA-IT CREA-OFA	- MiPAAF - Ministry of Agricultural, Food and Forestry Policies	<ul style="list-style-type: none"> - Articolo in rivista Lanza Barbara; Di Marco Sara; Baccelli Martina; Di Serio Maria Gabriella; Di Loreto Giuseppina; Cellini Martina; Simone Nicola (2021).Lactiplantibacillus plantarum Used as Single, Multiple, and Mixed Starter Combined with Candida boidinii for Table Olive Fermentations: Chemical, Textural, and Sensorial Characterization of Final Products.Fermentation, 7, 4, 1-16.DOI: 10.3390/fermentation7040239. - Articolo in rivista Veneziani Gianluca; Nucciarelli Davide; Taticchi Agnese; Esposto Sonia; Selvaggini Roberto; Tomasone Roberto; Pagano Mauro; Servili Maurizio (2021).Application of Low Temperature during the Malaxation Phase of Virgin Olive Oil Mechanical Extraction Processes of Three Different Italian Cultivars.Foods 2021, 10, 7, 1-11.DOI: https://doi.org/10.3390/foods10071578. - Articolo in rivista Manganiello Rossella; Pagano Mauro; Nucciarelli Davide; Ciccoritti Roberto; Tomasone Roberto; Di Serio Maria Gabriella; Giansante Lucia; Del Re Paolo, Servili Maurizio; Veneziani Gianluca (2021).Effects of Ultrasound Technology on the Qualitative Properties of Italian Extra Virgin Olive Oil.FOODS, 10, 11, 1-20.DOI: 10.3390/foods10112884. - Articolo in rivista Romeo Flora Valeria; Granuzzo Gina; Foti Paola; Ballistreri Gabriele; Caggia Cinzia; Rapisarda Paolo (2021).Microbial Application to Improve Olive Mill Wastewater Phenolic Extracts.Molecules, 26, 7, 1-11.DOI: 10.3390/molecules26071944. - Articolo in rivista Ortenzi Luciano; Violino Simona; Pallottino Federico; Figorilli Simone; Vasta Simone; Tocci Francesco; Antonucci Francesca; Imperi Giancarlo; Costa Corrado (2021).Early estimation of olive production from light drone orthophoto, through canopy radius.DRONES, 4, 4,DOI: 10.3390/drones5040118. 	<ul style="list-style-type: none"> - Tracciabilità dell'olio extravergine di oliva, una prospettiva internazionale 04/03/2021 - Extra Virgin Olive Oil traceability, an international perspective 04/03/2021 - Progetto Infoliva "Tracciabilità informativa e innovazione di processo e di prodotto nella filiera di olive da olio e da mensa" - I risultati della ricerca 06/10/2021

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND RESEARCH CENTRES	INTERNATIONAL PARTNERSHIP FINANCING BODY	PUBLICATION	OTHER RESEARCH PRODUCTS ¹
InMiQuOil "An innovative system aimed at improving the quality of the olive supply chain"	Apply efficient systems in olive cultivation and greater innovation in olive oil extraction at the olive mill, to achieve the highest yields and higher quality of oil produced.	F. V. ROMEO CREA-OFA	- Regione Sicilia		N. 3 fellowships

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND RESEARCH CENTRES	INTERNATIONAL PARTNERSHIP FINANCING BODY	PUBLICATION	OTHER RESEARCH PRODUCTS ¹
INNOLITEC “Technological innovations in advanced and sustainable lines of research the oil and table olive supply chain”	Project aimed at developing technological advanced and sustainable lines of research	F. V. ROMEO CREA-OFA CREA-IT	- MiPAAF - Ministero delle politiche agricole alimentari e forestali	<ul style="list-style-type: none"> - Articolo in rivista Tozzini Letizia; Romeo Flora Valeria (2021).Innovazione tecnologica per olive da olio e da mensa.Olivo e Olio, 24, 6, 4-6. - Articolo in rivista Ortenzi Luciano; Violino Simona; Pallottino Federico; Figorilli Simone; Vasta Simone; Tocci Francesco; Antonucci Francesca; Imperi Giancarlo Costa Corrado (2021).Early estimation of olive production from light drone orthophoto, through canopy radius.DRONES, 4, 4,DOI: 10.3390/drones5040118. - Articolo in rivista Ortenzi Luciano; Figorilli Simone; Costa Corrado; Pallottino Federico Violino Simona; Pagano Mauro; Imperi Giancarlo; Manganiello Rossella; Lanza Barbara; Antonucci Francesca (2021).A machine vision rapid method to determine the ripeness degree of olive lots.SENSORS, 21, 9,DOI: 10.3390/s21092940. - Abstract in atti di convegno Brugnoli Marcello; Anguluri Kavitha; Romeo Flora V.; La China Salvatore Gullo Maria (2021).Olive mill wastewater as a potential alternative low cost feedstock for bacterial cellulose production by Komagataeibacter strains. 52- - Articolo in rivista Barbara Lanza, Martina Cellini, Sara Di Marco, Emira D'Amico, Nicol Simone, Lucia Giansante, Arianna Pompilio, Giuseppina Di Loreto, Martina Bacceli, Paolo Del Re, Giovanni Di Bonaventura, Luciana Giacinto and Gitana Maria Aceto (2020). Olive Pâté by Multi-Phase Decanter as Potential Source of Bioactive Compounds of Bot Nutraceutical and Anticancer Effects. Molecules, 25, 5967. DOI: 10.3390/molecules25245967 	-INNOLITEC Project - Technological innovations in the oil and table olive supply chain. Activities and intermediate results of the project 28/09/2021 - N.2 Post-doc - N.6 Fellowships
INNO_OLIVO&OLIO INNOVATION AND TRANSFER ALONG THE OLIVE-OIL CHAIN FOR SUSTAINABILITY AND QUALITY OF PROCESSES AND PRODUCTS - OLIVE & OLIVE OIL OPERATING GROUP	Application of innovative techniques for proper and sustainable olive grove management; Optimization of oil waste management; Dissemination and territorial animation	M. MASTRORILLI CREA-AA	- Regione Basilicata		
MED-GOLD Turning climate-related information into added value for traditional Mediterranean food systems	Setting the scene: appraising the MED-GOLD sectors, assessing existing climate information and development of a common ICT platform Co-design of pilot service for olive/olive; grape wine; durum wheat Engaging validating and exploiting the pilot services with MED-GOLD community Communication and exploitation of MED-GOLD value chain Management and coordination of MED-GOLD	A. ROSATI CREA-OFA	- European Commission		
MICROLIVE Miglioramento della rizosfera in oliveti pilota e valorizzazione di due nuove Cultivar di OLIVE da tavola ('Rossa di Sicilia' e 'Dolce di Sicilia')	Improvement of plant production factors and rhizosphere management in Calabrian olive farms Development and enhancement of new agricultural food products (table olives) able to improve the positioning on the market and determine a greater degree of healthiness and / or quality. Pilot plant production	I. MUZZALUPO CREA-OFA	- Regione Calabria		

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND RESEARCH CENTRES	INTERNATIONAL PARTNERSHIP FINANCING BODY	PUBLICATION	OTHER RESEARCH PRODUCTS ¹
MODELLI Models of Agricultural system management for conservation and protection of water resources	Promote the recovery and management of rainwater for irrigation in horticulture and the self-production and use of various organic preparations (compost from pomace, compost, tea, accumulator of microorganism) to be used in horticulture and olive growing	M. ZACCARDELLI CREA-OF	- Regione Campania	- Articolo in rivista Ronga Domenico; De Falco Enrica; Mellone F.; Lanzara E.; Vitti Antonella; Zaccardelli Massimo; Pane Catello; Caputo Michele. (2021). Biostimolanti su lattuga positivi su produzioni e qualità. L'Informatore Agrario, 22, 40-41.	
MOLTI Improvement of production in traditional and intensive olive groves	Develop innovative techniques for the recovery and the management of traditional olive groves, in particular for the management of the canopy and of the soil, the adaptability to mechanization, for a full exploitation (improvement) of their production potential, reduction in costs thanks to greater use of machines and enhancing of local varieties; Promote the renewal and expansion of the production also by new plant groves.	E. M. LODOLINI CREA-OF CREA-IT CREA-AA	- MiPAAF - Ministry of Agricultural, Food and Forestry Policies	- Articolo in rivista Assirelli Alberto; Romano Elio; Bisaglia Carlo; Lodolini Enrico Maria; Neri Davide; Brambilla Massimo (2021). Canopy index evaluation for precision management in an intensive olive orchard. Sustainability, 13, 15, DOI: 10.3390/su13158266. - Contributo in atti di convegno Lodolini Enrico Maria; Paoletti Andrea; Nolasco Agata; Ferlito Filippo; Cutuli Marcello; Torrisi Biagio Francesco; Santilli Elena; Zaffina Francesca; Demand Manuela; Rosati Adolfo; Cinosi Nicola; Mastroianni Marcello; Modugno Anna Francesca; Ferrara Rossana; Gaeta Liliana; Campasquale Pasquale; Civitarese Vincenzo; Assirelli Alberto (2021). Biomass recovery from olive rejuvenation pruning in different varieties. Proceeding of the 29th EUBCE 2021, 273-278. DOI: 10.5071/29thEUBCE2021-1CV.8.14.	- Post-doc - n. 3 - Scholarship - n. 3
Mon.Oli.Tech Hi-Tech monitoring for the sustainable management of the olive grove ecosystem in the Lazio region	Constitution of the Operating Group for animation and dissemination activities regarding technological innovations in olive growing; design.	M. BIOCCHIA CREA-IT CREA-DC CREA-AA	- Regione Lazio		
MONI.TOSC 2021 Scientific collaboration agreement for the implementation of joint activities in the field of investigations, studies of common interest in the fields of entomology and nematology of ornamental and forest trees and shrubs	Development of emergency and predictive models to be activated in case of discovery of quarantine organisms according to the EU Regulation 2016/2031, refinement of biomolecular diagnostic techniques, development of models of emergency plans phytosanitary.	L. MARIANELLI CREA-DC	- Regione Toscana		
OLGENOME Sequencing of the reference olive genome and gene annotation	Sequencing and assembling olive genome (cv. Leccino), Gene annotation, Identification and characterization of genes expressed in the cv. Leccino for the genome assembly and annotation	F. CARBONE CREA-OF CREA-GB	- MiPAAF - Ministry of Agricultural, Food and Forestry Policies	- Articolo in rivista Salimonti Amelia; Forgione Ivano; Sirangelo Tiziana Maria; Pucci Guglielmo; Mauceri Antonio; Mercati Francesco; Sunseri Francesco; Carbone Fabrizio (2021). A COMPLEX GENE NETWORK MEDIATED BY ETHYLENE SIGNAL TRANSDUCTION TFS DEFINES THE FLOWERING INDUCTION AND DIFFERENTIATION IN OLEA EUROPAEA L. Genes, 12, 4, DOI: 10.3390/genes12040543 - Articolo in rivista Carbone Fabrizio; Salimonti Amelia; Zelasco Samanta (2021). Il genoma dell'olivo sequenziato dal Crea.Olivo e Olio, 24, 4, 22-24 - Abstract in atti di convegno Carbone Fabrizio; Scalabrin Simone; Bagnaresi Paolo; Tacconi Gianni; Salimonti Amelia; Zelasco Samanta; Forgione Ivano; Sirangelo Tiziana Maria; Desiderio Francesca; Cattivelli Luigi; Morgante Michele (2021). NEW REFERENCE GENOME SEQUENCE FOR CULTIVATED OLIVE TREES - Abstract in atti di convegno SIRANGELO TIZIANA MARIA; SALIMONTI AMELIA; FORGIONE IVANO; ZELASCO SAMANTA; VENDRAMIN ELISA; ANGILIO F.; FANIZZI F. P.; BENINCASA CINZIA; CARBONE FABRIZIO (2021). GENETIC AND DEVELOPMENT FACTORS AFFECT THE EXPRESSION OF GENES	- Sequenziamento del genoma dell'olivo: stato dell'arte e prospettive future 30/06/2021 - Progetto OLGENOME: i risultati - Completamento del sequenziamento del genoma dell'olivo e annotazione dei geni 30/04/2021 - Post-doc - n.2

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND RESEARCH CENTRES	INTERNATIONAL PARTNERSHIP FINANCING BODY	PUBLICATION	OTHER RESEARCH PRODUCTS ¹
				INVOLVED IN FATTY ACID AND PHENYLPROPANOID BIOSYNTHESIS AND IN LIGHT SIGNAL TRANSDUCTION IN OLIVE FRUITS.	
OLIDIXIT Olive growing and plant protection against Xylella fastidiosa and insect vectors in Italy	Development of strategies for the control and defense against Xylella fastidiosa (XF), the causal agent of the "complex of rapid drying of the olive tree". Evaluation in the open field of effective products for the control of XF Preparation of new nano-structured pesticides effective against XF Environmentally friendly treatments for XF control Investigations on Phylloxera spumarius and other potential vectors of XF in the olive grove and strategies for their containment	S. LORETI CREA-DC CREA-OFA	- MiPAAF - Ministry of Agricultural, Food and Forestry Policies	- Articolo in rivista Luigi Faino; Valeria Scala; Alessia Albanese; Vanessa Modesti; Alessandra Grottoli; Nicoletta Pucci; Andrea Doddi; Alessia L'Aurora; Tatu Giuseppe; Massimo Reverberi; Stefania Loreti (2021). Nanopore sequencing for the detection and the identification of Xylella fastidiosa subspecies and sequence types from naturally infected plant material. Plant Pathology, 70, 8, 1860-1870. DOI: 10.1111/ppa.13414 - Articolo in rivista Tatulli, G.; Modesti, V.; Pucci, N.; Scala, V.; L'Aurora, A.; Lucchesi, S. Salustri, M.; Scortichini, M.; Loreti, S. (2021). Further In Vitro Assessment and Mid-Term Evaluation of Control Strategy of Xylella fastidiosa subsp. pauca in Olive Groves of Salento (Apulia, Italy). Pathogens, 10, DOI: 10.3390/pathogens10010085.	- Post-doc - n.1
OLIVE MATRIX Olive Management using Innovation and Control	Reduction of the competitiveness gap between the Apulian olive growing model and those of competing countries; Improvement and efficiency of the decision-making model on main cultivation operations that impact on the environment and company budget: plant protection and irrigation management; Definition of operational protocols with precision detection methods, with the use of innovation Technologies, to improve and increase the definition of preventive monitoring activities; Improvement of timing of communication of sensitive data to the stakeholders	S. RUGGIERI CREA-AA	- Regione Puglia		

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND RESEARCH CENTRES	INTERNATIONAL PARTNERSHIP FINANCING BODY	PUBLICATION	OTHER RESEARCH PRODUCTS ¹
OLIVEMAP Mapping of investment needs and monitoring of Italian olive growing	Mapping of investment needs; Harmonization of territorial information layers	M. R. PUPO D'ANDREA CREA-PB CREA-FL	- MiPAAF - Ministry of Agricultural, Food and Forestry Policies	- Monografia o trattato scientifico Petriccione Gaetana; Pupo D'Andrea Maraia Rosaria; Solazzo Robert (2021).L'analisi economico-finanziaria delle OP attraverso i dati di bilancio: un confronto tra le OP olivicolo-olearie e le OP ortofrutticole.L'analisi economico-finanziaria delle OP attraverso i dati di bilancio: un confronto tra le OP olivicolo-olearie e le OP ortofrutticole - Monografia o trattato scientifico Pupo D'Andrea Maria Rosaria; Petriccione Gaetana; Solazzo Robert (2021).L'analisi economico-finanziaria delle OP olivicolo-oleari attraverso i dati di bilancio.L'analisi economico-finanziaria delle OP olivicolo-olearie attraverso i dati di bilancio - Monografia o trattato scientifico Reda Emilia; Pupo D'Andrea Maria Rosaria (2021).PSR 2014-2020 misure di interesse delle OP.PSR 2014-2020 e misure di interesse dell'OP,	
QUALIFITO Lazio Phytosanitary qualification of fruit, grape and olive tree native germplasm of Lazio	Phytosanitary qualification of the fruit, olive and grape native germplasm according to current European and national regulations by a health selection activity aimed at identifying plant material pathogens free and its maintenance in a controlled environment.	L. FERRETTI CREA-DC	- ARSIAL		- Fellowship - n.1
REGEROLI Realization of a collection field of OIL germplasm at High altitude alley to study olive biodiversity and quality of its products	Realization of a collection field of OIL germplasm at High altitude alley to study olive biodiversity and the quality of its products	E. PERRI CREA-OFA	- Ente Parco Nazionale della Sila		
RGV FAO Three-year 2020-2022 program for the conservation, characterization, use and enhancement of plant genetic resources for food and agriculture. Law 6 April 2004, n. 101.	Safely keep the collections of CREA genetic resources for agriculture and food. Particular attention will be directed to tree crops whose maintenance in the field requires additional resources. The seed banks stored at the CREA facilities will be maintained and rejuvenated. The maintaining of these resources is an indispensable condition to guarantee future food security for the Country; Collaborate with institutions, organization associations in the area in order to promote correct "culture" of conservation of plant genetic resources in accordance with the directives of the Guidelines for the conservation of agricultural biodiversity; Provide support to local communities by demonstration activities at the experimental fields where the material is raised; Maintain and help to develop the IT database. In particular, the PlantaRes database will be implemented. Supporting the MiPAAF for national and international actions relating to the Treat	I. VERDE CREA-OFA CREA-IT CREA-OG CREA-CI CREA-DC CREA-FL CREA-ZA CREA-GB CREA-VE CREA-AA	- MiPAAF - Ministero delle politiche agricole alimentari e forestali	- Articolo in rivista Pasquale Tripodi; Gianluca Francese; Vincenzo Onofaro Sanaja; Carlo Cesare; Giovanna Festa; Antonietta D'Alessandro; Giuseppe Mennella (2021).A multi-methodological approach to study genomic footprints and environmental influence on agronomic and metabolic profiles in a panel of Italian traditional sweet pepper varieties.Journal of Food Composition and Analysis, 103,DOI: 10.1016/j.jfca.2021.104114 - Articolo in rivista Marchetti Lucia; Saviane Alessio; Dalla Montà Antonella; Paglia Graziella; Pellati Federica; Benvenuti Stefania; Bertelli Davide; Cappellozza Silvia (2021).Determination of 1-Deoxynojirimycin (1-DNJ) in Leaves of Italian or Italy-Adapted Cultivars of Mulberry (Morus sp.pl.) by HPLC-MS..Plant 10, 8,DOI: 10.3390/plants10081553 - Articolo in rivista Cappellozza Silvia; Demo Edoardo; Saviane Alessio (2021).I gelsi ai tempi dei Dogi: quando Venezia dominava il Mediterraneo..Vita in campagna, 7-8, 10-11 - Abstract in atti di convegno Sciacca Fabiola; Palumbo Massimo; Pagliaro Antonella; Di Stefano Vito; Scandurra Salvatore; Sollima Lucia; Virzi Nino; Melilli Maria Grazia (2021).VALUTAZIONE DELLE CARATTERISTICHE QUALITATIVE NUTRIZIONALI DI PANI FUNZIONALI, ARRICCHITI CON PORTULAC	- Ecotipi tradizionali di patata. Una risorsa da tutelare 30/06/2021 Anzola dell'Emilia - European Research Night 2021: The Potato Show 24/09/2021 - La Patata: tesoro nascosto dai mille colori 24/09/2021

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND RESEARCH CENTRES	INTERNATIONAL PARTNERSHIP FINANCING BODY	PUBLICATION	OTHER RESEARCH PRODUCTS ¹
	<p>through the skills present in the CREA Center participating in the project and the expertise of the involved researchers;</p> <p>Support the MiPAAF at national level, for example with regard to the implementation of the biodiversity law 1 December 2015, n. 194 or in any other support activity necessary for MiPAAF in the context of this program.</p>			<p>OLERACEA L. E OPUNTIA FICUS-INDICA</p> <p>283-284</p> <p>- Abstract in atti di convegno Caputo Angelo Raffaele; Gasparro Marica; Bergamini Carlo; Alba Vittorio; Migliaro Daniele; Roccotelli Sabino; Cirigliano Pasquale; Del Lung Stefano (2021).Il germoplasma viticolo dell'Enotria nel Mezzogiorno d'Italia.</p> <p>- Contributo in atti di convegno Gazza Laura; Galassi Elena; Cacciatori Pierino (2021).Agronomical technological and nutritional characterisation of selected perennial wheat lines grown in Italy. 27-31</p> <p>- Contributo in atti di convegno Pietrella Marco; Giovannini Daniela; Cappellozza Silvia (2021).Simplified sequence repeat markers enabled genetic characterization of mulberry germplasm preserved in the CREA's collection of Padua, Italy.Acta Horticulturae, 1307, 299-305.DOI: 10.17660/ActaHortic.2021.1307.46.</p>	

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND RESEARCH CENTRES	INTERNATIONAL PARTNERSHIP FINANCING BODY	PUBLICATION	OTHER RESEARCH PRODUCTS ¹
SALVAOLIVI SAFEGUARDING AND ENHANCEMENT OF THE ITALIAN OLIVE HERITAGE WITH RESEARCH ACTIONS IN THE SECTOR OF PLANT HEALTH DEFENSE	Plant protection against emerging and re-emerging harmful organisms and microorganisms or at risk of introduction into the national territory, with particular reference to <i>Xylella fastidiosa</i> , including polyphagous species that could also become parasites of the olive tree (<i>Popillia japonica</i> , <i>Halyomorpha halys</i> , etc.);	F. FAGGIOLI CREA-DC CREA-OFA CREA-AA	- MIPAAF - Ministry of Agricultural, Food and Forestry Policies	- Articolo in rivista Tatulli, G.; Modesti, V.; Pucci, N.; Scala, V.; L'Aurora, A.; Lucchesi, S.; Salustri, M.; Scortichini, M.; Loreti, S. (2021). Further In Vitro Assessment and Mid-Term Evaluation of Control Strategy of <i>Xylella fastidiosa</i> subspecies pauca in Olive Groves of Salento (Apulia, Italy). <i>Pathogens</i> , 10, DOI: 10.3390/pathogens10010085. - Abstract in atti di convegno Licciardello Grazia; Di Silvestro Silvia; Russo Maria Patrizia; Sorrentino Guido; Strano Maria Concetta; Caruso Paola (2021). Valutazione della suscettibilità alla rogna dell'olivo di varietà italiane e siciliane presenti nel germoplasma internazionale di "Villa Zagaria".	- Post-doc - n.4 - Fellowships - n.4

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND RESEARCH CENTRES	INTERNATIONAL PARTNERSHIP FINANCING BODY	PUBLICATION	OTHER RESEARCH PRODUCTS ¹
SPREMO Application of "smart" technologies for the monitoring, prevention and early diagnosis of olive tree diseases of economic interest	Support for the establishment and management of the PEI operational groups of agricultural productivity and sustainability	G. SANTANGELO CREA-PB CREA-DC	- Regione Siciliana		- Germoplasma olivicolo 04/10/2021 Campobello di Mazara - La qualità dell'Olio Extravergine d'Olio 15/10/2021 Sciaccia - Il valore della biodiversità autoctona nella nuova olivicoltura siciliana 23/10/2021 Partanna - Assegni di ricerca - n.1
TRIECOL Transfer of innovations in agriculture and eco-sustainable development for quality olive growing.	Dissemination and technical scientific transfer to the agricultural sector	E. SANTILLI CREA-OFA	- Regione Calabria	- Articolo in rivista Pupo D'Andrea Maria Rosaria (2021).Editoriale.AGRIREGIONIEUROPA, 1, 1-1. - Articolo in rivista Pupo D'Andrea Maria Rosaria (2021).Le novità della PAC 2023-2027.AGRIREGIONIEUROPA, 1, 2-6.	
Xf-actors <i>Xylella Fastidiosa</i> Active Containment Through multidisciplinary-Oriented Research Strategy	Improve the prevention, early detection and control of <i>Xylella fastidiosa</i> , in different phytosanitary conditions (EU Implementing Decision 789/2015: pest-free area, buffer zone and infected zone)	S. LORETI CREA-DC	- European Commission		

2.6.2. Patents and Services

Patents (INDUSTRIAL PATENTS)

PRODUCTS/MAIN TOPICS	DENOMINATION/DESCRIPTION	AUTHORS/INVENTORS	CREA RESEARCH CENTRES
Olive	Apparatus for pitting olives (IT)	P. Toscan, M. Cutini, C. Bisaglia	CREA-IT

Services

Collections

PRODUCTS/MAIN TOPICS	DENOMINATION/DESCRIPTION	PERSON IN CHARGE	CREA RESEARCH CENTRES
Olive germplasm collection	Collececco, near Spoleto, there is an important collection of olive trees varieties, with over 350 genotypes.	E.Perri, A.Rosati	CREA-OFA
Olive germplasm collection	CREA-OFA manages, at the ARSAC farmer in Mirto Crosia and in Rende, one of the largest collections of olive germplasm in the world, recognized by FAO and belonging to the international network of collections recognized by the International Olive Council (IOC).	E.Perri	CREA-OFA

Historical libraries

PRODUCTS/MAIN TOPICS	DENOMINATION/DESCRIPTION	PERSON IN CHARGE	CREA RESEARCH CENTRES
Olive and oil	CREA-OFA holds in Spoleto rare and specialized publications, of value and historical interest. Books published between 1500 and 1700, some unique, as well as more recent publications between the 1800s and 1900s including: -Trattato delle lodi et della coltivazione de gl'ulivi. 1569 (autore Vettori Pietro) -Memoria intorno ai sessantadue saggi diversi di olio, presentati alla Maestà di Ferdinando IV, re delle Due Sicilie, ed esame critico dell'antico frantoio, trovato a Stabia, 1788 (Autore Presta Giovanni) -Saggio teorico-pratico sopra gli ulivi l'olio e i saponi. Dedicato alla Santità di Nostro Signore Papa Pio VI ,1793 (Autore Gandolfi Bartolomeo) -Enciclopedia Agraria Italiana, 1880/1882 (redatta da agronomi delle diverse provincie e diretta da Cantoni Gaetano)	E. Perri	CREA-OFA
Olive and oil	CREA-OFA holds in Rende a library with over 1000 books and magazines (from 1800s to the mid-1900s). The process for the inclusion of the library in the Calabrian / national museum system is underway. Important series mainly relate to olive growing and olive oil production but also to sericulture and other disciplines (e.g.: World Atlas for Agriculture; Plant Physiology; The review of applied mycology 1951/1953; Plant Physiology 1961; Informazioni seriche dal 1916 al 1922; Bollettino di sericoltura dal 1927 al 1935; L'industria bacologica 1927/1931)	E.Perri	CREA-OFA

Other scientific and technological infrastructures

PRODUCTS/MAIN TOPICS	DENOMINATION/DESCRIPTION	PERSON IN CHARGE	CREA RESEARCH CENTRES
Chemistry laboratory	In Rende, the Center has a mass spectrometer (IR-MS) for the analysis of the isotope ratios of carbon and nitrogen, an ICP-MS mass spectrometer for the analysis of trace elements, an A 4000 Q TRAP triple quadrupole mass spectrometer for secondary metabolite analysis, as well as a spectrophotometer, three HPLCs with UV and DAD detectors and a gas chromatograph for routine analysis. It also has a Mori tem mini crusher.	C. Benincasa, E. Romano, E. Perri	
Plant defense and protection laboratory	CREA-OFA has in Rende the necessary equipment to develop innovative methods for monitoring, identifying, isolating, characterizing, and containing diseases and pests of the olive tree, the main phytosanitary emergencies, alien arthropods and vector insects (laminar flow hoods, optical microscopes, weather huts and associated traps). It studies the plant-pathogen interaction to identify the molecular mechanisms underlying genetic resistance and performs the morphological and molecular characterization of bacterial and fungal pathogens for the development of diagnostic protocols (Real-Time PCR, homogenizer and Homex extractor 6).	V. Vizzarri, E. Santilli	
Genetic and biotechnology laboratory	CREA-OFA has in Rende the basic instrumentation for molecular biology (PCR thermocyclers, Real-Time PCR, Qubit Fluorimeter, Nanodrop Spectrophotometer and Agilent Bioanalyzer). The research activity concerns the study of the genome sequence, the transcriptome and the metabolome to identify the genes involved in the determination of the main characteristics of agricultural interest (resistance and resilience to biotic and abiotic stress, quality) and to develop new and highly efficient markers to support the breeding. The laboratory promotes varietal innovation with the selection of new genotypes with improved productive, qualitative and resistance characteristics by the latest generation biotechnologies (NBT-New Breeding Techniques, such as cis-genesis and genome editing), after optimization of transformation and regeneration protocols. The laboratory uses the germplasm available in the collection of the Center as a starting point for advanced studies of genotype / phenotype association, obtaining core-collections for its optimization and identifying the loci responsible for the major traits of interest for the genetic improvement.	S. Zelasco, A. Salimonti, F. Carbone	
Bionformatics laboratory	CREA-OFA has in Rende a SERVER equipped with 4 Intel® Xeon® E5-Gold 5118 processors, for a total of 96 CPUs, 2 Threads per core, 12 Cores per socket and 4 Sockets, 256 GB of memory RAM (4 X 64GB RDIMM), 2 HDDs of 300GB each on which a Linux Centos7 Operating System is installed and 3 HDDs of 1.2 TB each with a RAID5 configuration for data storage, used for bionformatics analysis. Equipped with various tools for the analysis and annotation of DNA and RNA sequences, it is configured for parallel computing, a feature that allows the processing of a large amount of data in a short time. To date, it is configured for the development and use of various analytical pipelines for the assembly, annotation and functional classification of genomes and transcriptomes and for metagenomics analysis.		

PRODUCTS/MAIN TOPICS	DENOMINATION/DESCRIPTION	PERSON IN CHARGE	CREA RESEARCH CENTRES
Greenhouses and growth chambers	CREA-OFA has in Rende a greenhouse for the propagation of olive tree cuttings and two growth chambers for setting up experimental tests in controlled light and temperature conditions (from -20 ° C to 30 ° C)	E. Perri	

Technical panels/working groups/institutional partnerships/Editorial activity

PRODUCTS/MAIN TOPICS	DENOMINATION/DESCRIPTION	PERSON IN CHARGE	CREA RESEARCH CENTRES
Various	Accademic Editor of "Hindawi - Advances in Agriculture"	F. Carbone	CREA-OFA
Various	Editor Research Topic in Crop and Product Physiology "Flowering Mechanisms in Fruit Trees as mediated by Light and Nitrogen" Frontiers in Plant Science	F. Carbone	CREA-OFA
Various	Review Editor in Plant Breeding Frontiers in Plant Science	F. Carbone	CREA-OFA
Various	Review Editor in Plant Breeding Frontiers in Plant Nutrition	F. Carbone	CREA-OFA
Various	Accademic Editor of "Hindawi - Advances in Agriculture"	A. Salimonti	CREA-OFA
Various	Review Editor in Plant Breeding Frontiers in Plant Science	A. Salimonti	CREA-OFA
Various	Review Editor in Plant Breeding Frontiers in Plant Nutrition	A. Salimonti	CREA-OFA
Various	Review Editor for Crop and Product Physiology Frontiers in Plant Science	S. Zelasco	CREA-OFA
Olive	Guest Editor Special Issue "The Genetic Diversity, Biotechnological Tools, and Phenotypic Trait Variation of Olea europaea L.: Studies to Support Breeding Programs" MDPI Plants	S. Zelasco	CREA-OFA
Various	Guest Editor Special Issue "Omics Sciences and Biotechnologies to Support Agronomy Applications for Sustainable Agriculture" MDPI Sustainable	A. Salimonti	CREA-OFA
Various	Guest Editor Special Issue "Analyses and Design of Fruit-Tree Based Agroforestry Systems" MDPI Forests	A. Rosati	CREA-OFA
Various	Associate Editor Springer Agroforestry Systems	A. Rosati	CREA-OFA
Various	Review Editor per Frontiers in Plant Science	F. V. Romeo	CREA-OFA
Various	Academic Editor per Hindawi – Journal of Food Quality	F. V. Romeo	CREA-OFA
Various	Editorial Board Open Access Journal by MDPI "Agriculture	E. Perri	CREA-OFA
Various	Editorial Board Journal of Food Science e Nutrition	E. Perri	CREA-OFA
	Guest Editor per la rivista Plants (MDPI)	E. M. Lodolini	CREA-OFA

Publications various

- Timpanaro N., Strano M.C., Allegra M., Foti P., Granuzzo G., Carboni C., Romeo F.V. (2021). Assessing the effect of ozonated water on microbial load and quality of Nocellara Etnea table olives. OZONE: Science & Engineering, 43(6), pp. 571-578.
- Rosati, A., Marchionni, D., Mantovani, D., Ponti, L. e Famiani, F., 2021. Radiazione fotosinteticamente attiva intercettata (PAR) e distribuzione spaziale e temporale di PAR trasmesso in oliveti ad alta densità e super ad alta densità. Agricoltura, 11(4), p.351.
- Paoletti, A., Rosati, A. e Famiani, F., 2021. Effetti della cultivar, della presenza di frutti e dell'età degli alberi sulla ripartizione della sostanza secca vegetale intera negli ulivi giovani. Elione, 7(5), p.e06949.
- Almadi, L., Paoletti, A., Cinosi, N., Daher, E., Rosati, A., Di Vaio, C. and Famiani, F., 2021. Idrolizzati proteici stimolano la crescita di giovani olivi. Olivo & olio, 24(3), pp.36-39.
- Mazeh, M., Almadi, L., Paoletti, A., Cinosi, N., Daher, E., Tucci, M., Lodolini, E.M., Rosati, A. e Famiani, F., 2021. Uso di un fertilizzante organico anche con un'azione biostimolante per promuovere la crescita di giovani ulivi. Agricoltura, 11(7), p.593.
- Spano D. Camilli F. Rosati A. Parigi P. Trabucco A., 2021. Agroforestazione per la transizione verso la sostenibilità e la bioeconomia. Libro di abstract della 5° CONFERENZA AGROFORESTALE EUROPEA, 17-19 maggio 2021 Italia. pp 546.
- Rosati A. Wolz K. Murphy L. Oro M. 2021. Differenze nella radiazione fotosinteticamente attiva misurata e modellata trasmessa in diversi frutteti e il loro impatto sulla fotosintesi delle colture del sottobosco. In Spano D. Camilli F. Rosati A. Paris P. Trabucco A. (a cura di), Libro di abstract della 5° CONFERENZA AGROFORESTALE EUROPEA, 17-19 maggio 2021 Italia. p 379-380.
- Mantovani D. Marchionni D. Ponti L. Rosati A. Quale luce è disponibile per le colture del sottobosco negli oliveti ad alta densità e ad altissima densità? Modelli spaziali e temporali della radiazione fotosinteticamente attiva trasmessa. In Spano D. Camilli F. Rosati A. Paris P. Trabucco A. (a cura di), Libro di abstract della 5° CONFERENZA AGROFORESTALE EUROPEA, 17-19 maggio 2021 Italia. p 410-411.
- Enrico Maria Lodolini, Andrea Paoletti, Agata Nolasco, Filippo Ferlito, Marcello Cutuli, Biagio Francesco Torrisi, Elena Santilli, Francesco Zaffina, Manuela Desando, Adolfo Rosati, Nicola Cinosi, Marcello Mastrorilli, Anna Francesca Modugno, Rossana Ferrara, Liliana Gaeta, Pasquale Campi, Vincenzo Civitarese, Alberto Assirelli. 2021. Recupero di biomassa dalla potatura di ringiovanimento delle olive in diverse varietà. 29th European Biomass Conference and Exhibition, 26-29 aprile 2021, Online.
- Rosati A., 2021. Olivo, asparagi selvatici e policoltura di pollo ruspante. In: Catalogo delle innovazioni del progetto LIVINGAGRO (Cross Border Living Laboratories for Agroforestry) (Grant Contract Number: 38/1315 OP), ENI CBC Med Programme 2014 – 2020, 13-15.

2. CREA RESEARCH LINES BY PRODUCTS

2.7. SEAFOOD INDUSTRY AND AQUACULTURE

In the seafood industry and aquaculture sector, CREA's research has the main goal of increasing productions and improving economic and environmental sustainability. CREA is involved in research dealing with farming of marine and freshwater fish species, crustaceans, and mollusks. The economic and environmental sustainability of aquaculture products and processes need to be improved, despite aquaculture is the livestock activity with the lowest environmental impact. In the field of animal feed, despite the progressive increase of plant origin raw materials use, fish feed remains the main destination of fish meal and oil.

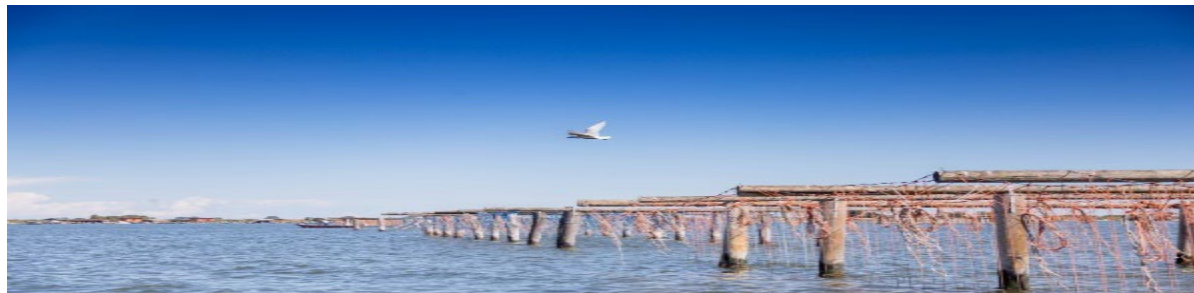
The further expansion of carnivorous fish farming, typical of the Western World, will depend on the ability to identify innovative and effective raw materials and feed and by-products that do not compete with human consumption (e.g., PAPs, insects, microalgae).

The environmental sustainability of farming and the reduction of the carbon footprint of productions, increasingly at the attention of consumers, are being addressed through research aimed at gaining a greater understanding of the impacts generated by farming activities and techniques, in the attempt to reduce and/or mitigate negative ones).

The development of Life Cycle Assessment models in aquaculture, where interactions with the environment are very complex, will make possible quantify the ecological impact of different products. In the case of shellfish farming, LCA models allow to verify the potential CO₂ sequestration capacity in the shells of farmed bivalves, and, therefore, the potential contribution of this farming activity on climate changes mitigation.

The Center is also involved in precision aquaculture and is developing and testing, in collaboration with private companies, sensors and cameras for automatic monitoring of environmental parameters and fish biometries, to improve farm management, with consequent effects on sustainability, profitability and product quality.

The described topics are also CREA projects subjects focused on organic aquaculture, a younger sector if compared to other certified livestock production and one that also raises pivotal questions for improving the sustainability of conventional farming.



2.7.1 Research and research products – Seafood industry and aquaculture

ACRONYMS AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHERS RESEARCH PRODUCTS
AQUADATA 2 Collection and processing of data pertaining to aquaculture-related activities exercised on the national territory in freshwaters and brackish water to ensure compliance with Regulation (EC) No. 762/2008 Years 2019-2020-2021	Italian Aquaculture data collection and elaboration (Reg. (EC) 762/2008)	D. PULCINI CREA-ZA	- MiPAAF		
Foreshell Foreshell Development of predictive health/weather/environmental technology tools to enhance the efficiency and sustainability of shellfish facilities	Innovation and improved management of mussel farming with predictive technological instruments, both sanitary, metrological and environmental. The objective of the project was to give to the farmer easy tools to manage daily activities, optimize production, and avoid losses.	F. CAPOCCIONI CREA-ZA	- Abruzzo Region		- SEALOGY, European exhibition on blue economy 18/11/2021 Ferrara - Launch event of the project FORESHELL 19/05/2021
Holothuria Assessment of the status of the <i>Holothuria</i> spp. resource in the coastal marine environment in Italy; development of lipid biomarkers for stock characterization, and investigation of the economic impact of harvesting	<i>Holothuria</i> spp. Assessment along the Italian coasts. Optimization of rearing protocols aimed at restocking. Analysis of the market.	F. CAPOCCIONI CREA-ZA	- MiPAAF		
INNOFISHFARM Participatory research and technology transfer for the sustainable growth of Italian fish farming	Development of experimental and research activities in the fish farming sector, and technological transfer to farms	F. CAPOCCIONI CREA-ZA	- MiPAAF		
MiReAZoC Microalgae for the treatment and enhancement of livestock waste and dairy by-products.	Use of microalgae for the treatment and enhancement of livestock waste and dairy by-products.	A. C. TAVA CREA-ZA	- Fondazione Cariplo	Ronga, D.; Vitti, A.; Caradonia, F.; Francia, E.; Pinturo B.; Biazzi, E.; Tava, A. Microalghe su pomodoro contro gli stress da freddo. <i>Informatore Agrario</i> , 2021, 2, 42-43. Ronga, D.; Vitti, A.; Caradonia, F.; Francia, E.; Pinturo B.; Biazzi, E.; Tava, A. Microalghe su basilico: influenza su resa e qualità. <i>Informatore Agrario</i> , 2021, 32, 40-41.	- Microalgae for the treatment and valorization of agro-livestock and dairy wastes and by-products 17/12/2021

ACRONYMS AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHERS RESEARCH PRODUCTS
PERILBIO Promotion AND strengthening of long-term devices in Organic Aquaculture	The project involves the drafting of the National Research Plan (PNRR) maintenance, strengthening and dissemination of innovations of the existing Long Term Experimental Devices (DSLTPs) (OFA- AA-OF); and implementation of three new DSLTPs in poultry, mariculture and organic rabbit farming (ZA). The marine experimental device is aimed at testing innovative breeding systems with high sustainability	D. CECCARELLI CREA-OFA CREA-OF CREA-ZA CREA-PB CREA-AA	- MiPAAF	- Peer reviewed paper Ciaccia Corrado; Mele Giuseppe; Testani Elena; Fiori Angelo; Persiani Alessandro; Montemurro Francesco Diacono Mariangela (2021).Agroecologia, il caso studio di Ricerca Partecipativa in Basilicata.Agrifoglio 102, - Peer reviewed paper Ciaccia Corrado; Testani Elena; Fiore Angelo, Iacono Ileana; Di Pierro Marta; Mele Giuseppe; Ferlito Filippo; Cutuli Marcello; Montemurro Francesco Farina Roberta; Ceccarelli Danilo; Persiani Alessandro; Canali Stefano; Diacono Mariangela (2021).Organic Agroforestry Long-Term Field Experiment Designing Through Actors' Knowledge towards Food System Sustainability.Sustainability 13, 10,DOI: 10.3390/su13105532.	SEALOGY, European exhibition on blue economy 18/11/2021 Ferrara - Progetto Scienza - STEM. Episode 10 "CIBO 07/10/2021 Monterotondo - Poultry Living Lab Opening of the long term experimental device for organic poultry 02/12/2021 Monterotondo - N. 1 Research Grants - N. 3 Scholarships
SUSHIN Novel ingredients and underexploited feed resources to improve sustainability of farmed fish species growth, quality, health and food safety issues - SUSHIN (Sustainable fish feeds INnovative ingredients)	SUSHIN represents a challenging initiative deploying a holistic approach to address the important challenge of feed resources for aquaculture fish. As stated by the AGER objectives, the prices for national aquaculture products are systematically higher than the prices of imported fish, which indicates a need to adopt strategies that differentiate and enhance the national aquaculture production and improve its competitiveness. The market price of feed is rising steadily, because of the gradual decrease in the availability of fish meal and oil due to over exploitation of the ocean's fish resources	L. BUTTAZZONI CREA-ZA	- AGER - Agroalimentare e Ricerca Associazione temporanea di scopo	Veroli, M., Martinoli, M., Caprioli, R., Angelici, C., Pulcini, D., and Capoccioni, F. (2021). Population structure and dynamics of the invasive <i>Procambarus clarkii</i> (Girard, 1852) in a Tiber river Ramsar site, Central Italy. International Journal of Aquatic Biology 9, 23–31. doi:10.22034/ijab.v0i0.1006 Pulcini, D., Capoccioni, F., Franceschini, S., Martinoli, M., Faccenda, F., Secci, G., Perugini, A., Tibaldi, E. and Parisi, G. (2021). Muscle pigmentation in rainbow trout (<i>Oncorhynchus mykiss</i>) fed diets rich in natural carotenoids from microalgae and crustaceans. Aquaculture 543, 736988. doi:10.1016/j.aquaculture.2021.736989 Martinoli, M., Pulcini, D., Veroli, M., Renzi, G., Faille, S., and Capoccioni, F. (2021). Effects of <i>Portulaca oleracea</i> whole diet on pigments and fatty acid profiles of juvenile red swamp crayfish <i>Procambarus clarkii</i> (Girard, 1852) under laboratory conditions. Aquaculture Research 52, 5180–5188. doi:10.1111/are.15386	- Final workshop project SUSHIN 07/12/2021 Firenze Research grants - n.3
VALUE-SHELL Economic aspect environmental externalities and policies of the mussel farming sector in Italy: institutional and technical-scientific support activities for the implementation of the Strategic Plan for Aquaculture 2014-2020	Provide a detailed and updated framework of mussel and clam production at both national and European level. Assess the potential environmental impacts of clam farming, with a LCA approach. Identify the main policies supporting the sector. Identify with stakeholders' possible intervention strategies.	L. TUDINI CREA-PB D. PULCINI CREA-ZA	- MiPAAF		- SEALOGY, European exhibition on blue economy 18/11/2021 Ferrara - N. 3 Research Grants

2.7.2. Patents and Services

Patents

PATENTS (INDUSTRIAL PATENTS)

PRODUCTS/MAIN TOPICS	DENOMINATION/DESCRIPTION	AUTHORS/INVENTORS	CREA CENTRES
Molluschi	Sistema e metodo per identificazione e selezione di molluschi (IT)	C. Costa, P. Menesatti, F. Antonucci, F. Pallottino	CREA-IT

Services

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
<u>Technical-scientific assistance</u>			
Aquaculture	Supporting the revision of European regulations on conventional aquaculture for the Fisheries and Aquaculture Directorate of MIPAAF.	D. Pulcini, F. Capoccioni	CREA-ZA
Aquaculture	National focal point for the collection data on aquaculture production statistics through the Information System for the Promotion of Aquaculture in the Mediterranean (SIPAM) of FAO GFCM	F. Capoccioni	CREA-ZA
Aquaculture	Aquaculture production data collection for the Fisheries and Aquaculture Directorate of MIPAAF - EUROSTAT Database	D. Pulcini, F. Capoccioni	CREA-ZA
Organic animal production	Scientific and technical support to the Organic Office of MIPAAF for the implementation and revision of organic farming regulations.	F. Capoccioni, D. Pulcini M. Guarino Amato	CREA-ZA
<u>Analyses on behalf of third parties</u>			
Feed digestibility	In vitro digestibility service analysis of aquaculture ingredient and feed samples.	C. Tripaldi	CREA-ZA

Other Services

Other scientific and technological infrastructures

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
BIOLOGICAL BREEDING OF MARINE SPECIES	As part of the PERILBIO project funded by the Ministry of Agriculture on the Tuscan Island of Capraia, the first experimental aquaculture plant has been set up in copper mesh, a more durable material that increases water oxygenation, requires less maintenance and can also be recycled. With a view to innovation and increasing sustainability, tests are conducted on feed and innovative practices.	F. Capoccioni, D. Pulcini	CREA-ZA

MULTI-STAKEHOLDERS PLATFORM OF THE AQUACULTURE INDUSTRY	<p>Platform ITAQUA http://piattaformaitaqua.it/</p> <p>The ITAQUA Platform was established at the Ministry of Agriculture, Food and Forestry by Ministerial Decree No. 8004 of April 5, 2017 as a working environment available to different stakeholders to gather needs and propose useful solutions for the growth and competitiveness of aquaculture, taking into account the territorial specificities and heterogeneity of needs and production sectors. The ITAQUA platform is managed by MIPAAF's DG PEMAC with technical support from the Council for Agricultural Research and Analysis of Agricultural Economics (CREA). The goal of the initiatives carried out by ITAQUA is to improve organizational coordination and enhance the involvement of operators, institutions and regions.</p>	F. Capoccioni, D. Pulcini	CREA-ZA
CLOUD BASED ITALIAN AQUACULTURE PRODUCTION DATABASE	<p>http://www.acquaculturecrea.it/admin/dashboard Website for the collection and processing of Italian aquaculture production according to EC Reg. 762/2008. All the data collected are uploaded within the dedicated cloud platform (http://www.acquaculturecrea.it/) and are accessible only to CREA staff specifically dedicated to the processing activity (Supervisors) while each surveyor, who collects data directly from the farms, has access to the platform for uploading them and displays only those collected by him.</p> <p>The raw data collected by CREA on national aquaculture productions concern only the trade names of enterprises and facilities addresses of registered offices, and productions of fish, shellfish, crustacean, and seaweed species, but in no way the information is collected on industry operators. Data processing for distribution (sent by Eurostat, FAO/GFCM) consists of aggregation at the regional level or by farmed species, and these aggregates represent the highest level of detail of dissemination of processing.</p>	F. Capoccioni, D. Pulcini	CREA-ZA

2. CREA RESEARCH LINES BY PRODUCTS

2.8 MINOR SUPPLY CHAINS and MEDICINAL PLANTS



Grain legumes are of great importance in human nutrition, due to their high protein content and their relevance for a healthy and balanced diet; in recent years, the food market has recorded an increase in the consumption of vegetable proteins and an increase in areas of cultivation of these species throughout Italy. In addition to economic and food-related reasons, farmers are looking for increasingly sustainable cultivation protocols, and grain legumes are strategic species as they guarantee more balanced alternations and / or species associations in productive systems, instead of cereal monocroppings, a better crop adaptation to the territorial vocation, etc. Furthermore, legumes are essential in organic farming, and they adapt well to Italian marginal environments. Finally, the 2014-2020 European Common Agricultural Policy (CAP) favored the production of legumes for their nitrogen-fixing capacity, thus responding to the European commitments of greening as EFA (ecological areas of interest), and qualifying farmers for access to coupled aid.

Concerning these species, CREA carries out research aimed at various objectives and through increasingly multidisciplinary approaches; for example: i) agronomy, precision farming and soil microbiology to promote new cultivation models for better adaptation to climate change, ii) chemical and biochemical characterizations to identify materials of superior food quality, iii) genomic and advanced phenotyping approaches to identify plant materials better suited to different environments and tolerant to different biotic and abiotic stresses. Thanks to the collaboration of researchers with different scientific backgrounds, breeding activities continue to offer innovative varieties to agricultural stakeholders. Furthermore, studies aimed at the conservation of genetic resources and the enhancement of traditional legumes are also carried out.

Finally, through dissemination works, the awareness of entrepreneurs and agricultural operators about the importance of legumes in horticultural rotations is pursued as a tool to improve soil quality, reduce the incidence of plant diseases and improve company profitability.

Since the reintroduction of industrial hemp cultivation (*Cannabis sativa* L.) in Italy in 1997, following the Ministry of Agriculture and Forestry circular no. 794 of 2 December 1997, hemp cultivation saw a renewed interest among farmers. The intended use of hemp has significantly changed over the years, in search of its stable inclusion in the Italian agricultural panorama, of which up to now it was protagonist since the 1960s. Hemp research was initially aimed at updating and adapting the traditional dioecious varieties of hemp used throughout the last century and particularly those well adapted to specific cultivation areas considering the European regulations fixing the maximum amount of THC content allowed in mature inflorescences. Subsequently, farmers' requests directed research towards the development of new varieties, including monoecious ones, to allow the employment of agricultural machinery already used for other crops' management and harvesting. Finally, in recent years the exponential growth of therapeutic, nutraceutical and cosmetic applications of hemp derivatives (inflorescences for the extraction of active ingredients and oil from the seed) has led to the need to develop real regulations for the various sectors, including specific protocols.

As the largest agricultural research institution of the Country, CREA has played a leading role in research and innovation in the hemp sector since the beginning, with the development of rapid THC control tools for assisted breeding, studies to identify the genetic base of traits of greatest importance for the biosynthesis of pharmaceutical interest compounds (cannabinoids), for the flavor industry (terpenes), as well as with plant breeding efforts to release a number of new monoecious and dioecious varieties of fiber hemp, and of the only two Italian varieties suitable for pharmaceutical use. These two cultivars are protected at EU level under the CPVO (Community Plant Variety Office) and have been officially supplied to the Military Chemical Pharmaceutical Plant of Florence for the national production of THC-based drugs.

Flax (*Linum usitatissimum*) has the characteristics required by the EU to be included in integrated and sustainable agricultural systems: it is a "low input" crop with high adaptability and rusticity, easy to rotate within cereal cultivation systems and easily mechanized, with a short vegetative cycle. In recent decades, the maximization of the use of renewable plant biomass in a circular economy perspective has given a growing interest in flax as product of high added value and with great potential for future development: for fiber (straw and crop residues), in the green building sector (panels for thermal and acoustic insulation), as biocomposites and packaging, and in the transport industry, for oil in the food, nutraceutical and cosmetic sector (high content of Omega 3, carotenoids, vitamin E) and in the industrial sectors for the production of lubricants, polyols, biopolymers and bioplastics, resins, paints, enamels, linoleum, inks, etc. CREA has played a significant role in the recovery, conservation and characterization of flax accessions worldwide. The research activity dealing with conservation of this germplasm also concerns the study of agronomic practices best suited for flax cultivation and its reintegration into crop systems.

In the field of medicinal and aromatic plants, research aimed at the production of bioactive molecules/multifunctional active ingredients is relevant. At the CREA Centers involved in the above outlined research, collections of the different genetic resources are maintained. Compared to 2020, there are also new collections with nutraceutical, pharmaceutical or multifunctional value. The research, also conducted in the context of agreements with private parties, has allowed the production of various plant rights and the release on the market of several varieties with innovative and relevant traits impacting on different aspects of the supply chain.

2.8.1 Research and research products – Minor Supply Chains and Medical Plants

ACRONYMS AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PROJECTS
ABC Campania AgroBiodiversity propagation, conservation, and characterization autochthonous herbaceous plant genetic resources	Multiply and store in situ and ex situ herbaceous local plant varieties of Campania Region; characterization morphophysiological, agronomic biochemical/chemical/nutritional and molecular level; set-up a public database containing all the information about characterization results; expand knowledge about Italian and European legislation and databases available on vegetable biodiversity (Concertated action); dissemination	M. ZACCARDELLI CREA-OF CREA-DC	-Campania Region	Abstract in conference acts of XIII National Congress Biodiversity, Agriculture, Environment and Health, 7 September 2021, Foggia (online): - Enrica De Falco, Rosa Pepe, Francesco Luraghi, Carlo Cardello, Antonella Vitti, Francesco Vairo, Massimo Zaccardelli (19/09/2021) - Caratterizzazione agronomica di varietà genetiche locali di fagiolo del Vallo di Diano (22/02/2021) - Rosa Pepe, Pasquale Tripodi, Riccardo Riccardi, Patrizia Spigno, Massimo Zaccardelli. Il Progetto ABC: un'opportunità per mettere a sistema le RGV Campane e il mondo della ricerca, per la salvaguarda dell'agrobiodiversità e lo sviluppo di nuovi modelli di sviluppo economici e sociali. (18/03/2021) - Rosa Pepe, Pasquale Tripodi e Massimo Zaccardelli. Le banche degli agricoltori custodi: una valida risposta per conservare antiche varietà vegetali di interesse agrario al passo con i cambiamenti climatici. (18/09/2021) - Massimo Zaccardelli. Agrobiodiversity in Campania: un progetto per la moltiplicazione, conservazione e caratterizzazione di risorse genetiche vegetali erbacee autoctone a rischio estinzione. (15/01/2021)	- On-line courses for guardian farmers (2021) - 5° day – Insights into the main issues that emerged during the previous days (08/04/2021) - Laboratory of ABC project - Il Pomodoro del Piennolo vesuviano DOP (19/09/2021) - Cultivation techniques and protection of ornamental plants (22/02/2021) - Presentation of intermediate results of ABC Project - Agro Biodiversity genetic resources of Campania Region: multiplication, storage and characterization of indigenous herbaceous plant genetic resources (30/11/2021) - Laboratory of ABC project – Traditional Campania Region peppers under danger of extinction (18/09/2021) - Cultivation techniques and protection of tomato varieties (18/03/2021) - On-line courses for guardian farmers (2021) - 1° day of genetic resources presentation of ABC Project (18/02/2021) - Laboratory of ABC project – Traditional Campania Region pulses under danger of extinction (18/09/2021) - Principal pathogens transmitted by seeds (15/01/2021) - The Network Agreement for the promotion of Campania Region biodiversity. ABC Project - PSR 2014/20 Measure 10.1 (20/09/2021) - Meeting with adherents of Network Agreement on agro-biodiversity in Campania (10/12/2021) - Meeting with adherents of Network Agreement Operating meeting organized by CREA-Research Centre for vegetable and ornamental crops Pontecagnano, (20/12/2021) On-line courses for guardian farmers (2021) - 2° Technical aspects of seed multiplication: allogamous species. (02/25/2021) N. 4 Research Fellowships in agronomy, phytopathology, genetic and food biochemistry field
BIODiversity2Food Local and ancient varieties for the production of seeds suitable for cereals and legumes for organic farming in different regional pedo-climatic conditions. Development of protocols for cereal and legume selection / reproduction to address the Marche region organic supply	Development of new breeding / selection approach for the production of seeds suitable for organic farming in different regional pedo-climatic conditions. Development of protocols for cereal and legume selection / reproduction to address the Marche region organic supply	P. DE VITA CREA-CI	Marche region		

ACRONYMS AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PROJECTS
chain	main legal, technical, socio-economic and scientific issues related to on-site reproduction of seed. Evaluation of the consumer acceptability of non-functional foods produced using minor and local varieties. Analysis of the economic and environmental sustainability of the supply chain				
BRESOV Breeding for Resilient, Efficient and Sustainable Organic Vegetable production	Breeding for sustainable food production in tomato, bean, brassica	P. Tripodi CREA-OF CREA-IT CREA-CI	EUROPEAN SEED ASSOCIATION (Belgium), UNIVERSIDAD DE ALMERIA (Spain), UNIVERSIDADE TRAS-OS-MONTES E ALTO DOURO (Portugal), RICP (Czechia), FIBL (Switzerland), VEGENOV-BBV, France), THE UNIVERSITY OF LIVERPOOL (UK), UNIVERSITAT POLITÈCNICA DE VALÈNCIA (Spain), STATION DE RECHERCHES DE LA DEZVOLTARE PENTRU LEGUMICULTURA BACAU (Romania), BEIJING ACADEMY OF AGRICULTURE AND FORESTRY SCIENCE (China), ZHEJIANG ACADEMY OF AGRICULTURAL SCIENCES (China), UNIVERSITE DE TUNIS EL MANAR (Tunisia), SERVICIO REGIONAL DE INVESTIGACION Y DESARROLLO AGROALIMENTARIO DEL PRINCIPADO DE ASTURIAS (Spain), PROSPECIERARA (Switzerland), INRA (France), TERRE D'ESSAIS (France), Eurice (Germany), UNIVERSITA POLITECNICA DELLE MARCHE (Italy), ITAKA SRL (Italy), UNIVERSITY OF CATANIA (Italy), European Commission	-Pasquale Tripodi; Salvador Soler; Gabriele Campanella; María José Díez; Salvatore Esposito; Sara Sestili; Maria Elena Soler; Aldo Bertone; Leandro Pereira-Dias; Daniel Figàs; Fabrizio Leteo; Cristina Casanova; Cristiano Plata; Rosa-Martínez; Jaime Prohens; Teodoro Cardí (2021). Genome wide association mapping for agronomic, fruit quality, and root architectural traits in tomato under organic farming conditions. BMC Plant Biology, N.volum 21, N.fascicolo 1, DOI: 10.1186/s12870-021-03271-1. -Salvatore Esposito; Cardí Teodoro; Campanelli Gabriele; Sestili Sara; Díez María José; Soler Salvador; Prohens Jaime; Tripodi Pasquale (2020). ddRAD sequencing-based genotyping for population structure analysis in cultivated tomato provides new insights into the genomic diversity of Mediterranean 'da serbo' type long shelf-life germplasm. Horticulture Research, N.volum 1, N.fascicolo 1, DOI: 10.1038/s41438-020-00353-1	1 Research Fellowship (Breeding, phenotyping e genome wide association in tomato for the development of cultivar for organic breeding) In-depth analysis of the BRESOV project: validation of molecular markers and study of root architecture in tomatoes. CREA OF Monsampolo Tronto 01/27/2021
CAMA Research-based participatory approaches for adopting Conservation Agriculture in the Mediterranean Area	Identifying major social, economic and agronomic barriers to CA implementation by smallholders in Mediterranean countries. Establishing a network of CA experiments and farmer associations adopting CA to apply a participatory research approach. Improving legume-based rotations in rainfed cropping systems, with genomic and farm participatory research aimed to enhance legume crop yield and resilience and research on crop/residue management; Quantifying the effects of CA application on developing agronomic innovation, to increase soil fertility, soil physical status, nitrogen and water use efficiencies, and to decrease soil erosion. Disseminating the CA concept and techniques in Mediterranean countries, tailoring them to the specific pedo-climatic and socio-economic conditions. Increasing technicians', advisors' and farmers' knowledge	M. RINALDI CREA-CI CREA-ZA CREA-PB CREA-AA	Funding: - PRIMA IS Partners: - IAMZ-CIHEAM – Mediterranean Agronomic Institute of Zaragoza - National Institute for Agricultural Research, INRA - APOSOLO - Agencia Estatal Consejo Superior de Investigaciones Científicas (CSIC) - CEBAS - HELLENIKOS GEORGIKOS ORGANISMOS - DIMITRA / HELLENIC AGRICULTURAL ORGANIZATION (HAO) - DEMETER - ARVALIS, International Centre for Arvalis Institut du Végétal - UNIVERSITY OF LLEIDA - Association for Sustainable	Article: - Annicchiarico Paolo; Nazzicari Nelson; Notommaso; Monterrubio Martin Cristina; Romagnolo Massimo; Ferrari Barbara; Pecetti Luciano (2021). Participatory breeding for intercropping with cereals: variation for competitive ability and associated traits, and assessment of phenotypic and genomic selection strategies. Frontiers in Plant Science, 12, DOI: 10.3389/fpls.2021.731949. Article: - Lacolla Giovanni; Rinaldi Michele; Savino Michele; Russo Mario; Caranfa Davide; Cucci Giovanni (2021). Effects of mineral and organic fertilization with the use of wet olive pomace on emmer wheat (Triticum dicoccum Shrank) grain yield and composition. Journal of Cereal Science, 102, 103369, DOI: 10.1016/j.jcs.2021.103369.	- n.2 Research Fellowships

ACRONYMS AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PROJECTS
	how for a better adoption of CA, by the organization two training courses		Agriculture - APAD - ENSA (École Nationale Supérieure Agronomique) - Instituto Nacional de Investigación Agrária e Veterinária (INIAV) - Institut National de la Recherche Agronomique de Tunisie - INRAT		
CAMED National Medical Cannabis innovation and enhancement of the production of therapeutic Cannabis plant material for the National need and research for the selection of new varieties for pharmaceutical use	Establish a research activity to consolidate and expand the infrastructures, scientific knowledge, genotypic and to implement the maintenance and multiplication of Cannabis sativa for pharmaceutical production. The detailed objectives are: - Infrastructural upgrade of the Rovigo site of CREA-CI to implement activities on cannabis; - Maintenance the genetic purity of the mother plants the selected CINBOL and CINRO varieties and supply the cuttings to SCF; - Characterization of the pre-breeding genetic material for cannabis genetic improvement for the traits related to the accumulation of THC and CB; - Development of new genetic lines for pharmaceutical purposes with specific combinations of cannabinoid; - Study of the genetic mechanisms responsible for the synthesis and accumulation of cannabinoids in cannabis; - Characterization of the cannabinoid-terpene phytocomplex in cannabis inflorescence for evaluation of the possible "entourage effect"; - Study of the National regulations and new tools for the supply chain	N. PECCHIONI CREA-CI CREA-PB	- MiPAAF – Ministry of Agriculture and Forestry		
CREALUP Creation of lupine supply chain with innovative varieties free from bitter alkaloids, in organic agricultural systems to support Sicilian animal husbandry.	Introduce new genotypes of lupine (blue and white) free of bitter alkaloids into Sicilian herbaceous organic cultivation systems for feeding beef cattle and pigs. The very high protein content of lupine and its adaptability to sustainable agricultural systems, makes it particularly important protein source for Sicilian animal husbandry, to improve the fertility of the land and the competitiveness and profitability of organic farms	A. SPINA CREA-CI	Sicilian region	- Proceeding Spina Alfio; Cavallaro Valeria; Leonardi Giovanni; Stag Fioresella; Pellegrino Alessandra; Rocuzzo Giancarlo; Leonardi Antonio; La Rosa Salvatore; Barbera Antonio C.(2021).First results of the effects of inoculum and organic matter fertilization on the morphological and eco-physiological parameters on Lupinus albus L. - Proceeding Barbera Antonio C.; Cavallaro Valeria; Leonardi Giovanni; Pellegrino Alessandra; Leonardi Antonio; Spina Alfio (2021).First results on the effects of inoculum and organic matter fertilization on Lupinus angustifolius L. growth..	- n.1 Research Fellowships
FisiCa Creation of short supply chains to produce hemp oil and flours in Sicilia Region.	Process transfer (cultivation protocols), production (extraction, storage and mixing methods for the optimization of transformation processes of hemp seed and flour) and organizational innovations (definition of criteria favoring the sharing of equipment; determination of co-marketing strategies for organic hemp-based productions; promotion of initiatives for the exchange of sociotechnical skills among hemp producers)	N. VIRZÌ CREA-CI	Sicilian region		
FINNOVER Innovative strategies for the development of cross-border green supply chains	Develop minor supply chains related to aromatic medicinal plants, buds, and mushrooms for the extraction of multifunctional active ingredients	B. RUFFONI CREA-OF	Institut Sophie Agrobiotech Nice (France) - NIXE Sarl Nice - CCI Nice (France) - Université Sophia Antipolis Nice (France)/ European Commission	-Turrini Federica; Beruto Margherita; Mela Luciano; Cuccia Paolo; Triglia Giorgia; Boggia Raffaella; Zunin Paolo; Monroy Fernando (2021). Ultrasound-Assisted Extraction of Lavender (Lavandula angustifolia Miller, Cultivar Rosea) Solid By-Products Remaining after the Distillation of the Essential Oil. Applied Sciences, N.volume 11, N.fascicolo 11, 2021.	

ACRONYMS AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PROJECTS
				12, DOI: 10.3390/app11125495	
INCREASE Intelligent Collections of Food Legumes Genetic Resources for European Agrofood Systems	The general aim will be to simplify the conservation and the employment of legume plant genetic resources with the final scope to support the biodiversity and increase their use in the agriculture. Notably, the project aimed to catalogize and characterize the genetic resources belonging to four main species legumes, that are of great European interest (chickpea, lentil and lupine), by promoting their conservation and employment in the Europe. Thus, the project will improve the methodologies and methods that could be applied to any single genetic resource with special attention to those cultivated.	M. ZACCARDELLI CREA-OF	UNIVPM, UNIBAS, USASK, IPK, MP, SERIDA, INRA, SCDL-BACAU, IGR PAN, UCP, TERRES INOVIA, BRGM, Suceava, CNRS- Le Moulon, FAO ICARDA, KIS, EURICE, IHAR-PIB, INIA, ISEA-SRL, DCS-Fuerth, MASIR, VIR, UNLP-CONICET, UC-Davis, ICRISAT, INDSU - European Commission	- Elisa Bellucci, Orlando Mario Aguilar, Saleh Alseel, Kirstin Bett, Creola Brezeanu, Douglas Cook, Lucia De Rosa, Massimo Delledonne, Denise F. Dostatny, Juan Ferreira, Valerie Geffroy, Sofia Ghitarrini, Magdalen Kroc, Shiv Kumar Agrawal, Giuseppina Logozzo, Marina, Tristan Mary-Huard, Phil McClean, Vladimir Meglič, Tamara Messer, Frédéric Muel, Laura Nanciger, Kerstin Neumann, Filippo Servalli, Silvia Sträjeru, Rajesh K. Varshney, Marta W. Vasconcelos, Massimo Zaccardelli, Aleksei Zavarzin, Elena Bitocchi, Emanuele Fronto, Alisdair R. Fernie, Tania Gioia, Andreas Graner, Leticia Guasch, Lena Prochnow, Markus Oppermann, Karoline Susek, Maud Tenailon and Roberto Papa. 2021. T INCREASE Project: Intelligent Collections of food-legume genetic resources for European agrofood systems. T Plant Journal, doi: 10.1111/tpj.15472	
INNOVALEGUMI Novel cropping systems based on legumes for cereal farms in Puglia region	Improve profitability, competitiveness, and sustainability of Apulian cereal companies by favoring the crop rotation of grain legumes and cereals, in order to reduce soil quality degradation, favor carbon sequestration and increase land fertility in terms of nitrogen and organic matter. Chickpea, broad bean, lentil and pea will be studied. Innovations will affect both the cultivation and transformation phases.	P. DE VITA CREA-CI	Puglia region		
LG2021 Contract for the assignment of the service of experimental trials on grain legumes	The research program is aimed at the in-field phenotypic characterization of accessions of chickpea (<i>Cicer arietinum</i> L.) and lentil (<i>Lens culinaris</i> Medik.), to identify genetic resources that can be used for their improvement	A. del GATTO CREA-CI	Polytechnic University of Marche		
INFLAME Improvement of secondary metabolite production for human health by flax cell in vitro technology	Optimize the production of bioactive molecules from flax cell cultures	B. RUFFONI CREA-OF	Cariolo Foundation		
LEGUBIOCER Introduction of grain legumes in organic cereal systems for food chain consumption and innovations in cultivation techniques, to increase the income of organic cereal farmers in Campania	Promote the introduction of grain legumes in the organic cereal systems of the internal areas of Campania Region, thus favoring innovation transfer and cultivation technique of both grain legumes and wheat like the introduction of a new seeder (Seminbio) more suitable for sowing in organic, combined or not with the technique of false sowing and minimal tillage. Furthermore, the introduction of seed tanning with rhizobia, PGPR microorganisms / antagonists and mycorrhizae is proposed. The project also includes economic analysis of the proposed innovations and widespread dissemination activity throughout the territory.	M. ZACCARDELLI CREA-OF CREA-CI CREA-PB	- Campania Region		- n.2 Research Fellowships
PROCAFAA Hemp production for food and other uses	The project aims at research and genetic selection of hemp varieties adapted to the cultivation environment.	M. MONTANARI CREA-CI	Veneto region	Proceeding: Sheyla Arango; Elisabetta Bacchin; Federico Fontana; Massimo Montanari; Lucia Bailoni (2021). Agronomic traits and chemical characterization of whole plant and botanical fractions of six varieties of hemp cultivated in the Veneto region. Italian Journal of Animal Science, 2021, 20, sup 1, 57-58. DOI: 10.1080/1828051X.2021.1968172 - Proceeding: Giulio Balestrieri; Massimo Montanari; Linda Avesani; Lorena Malagu	Producing hemp in the food and agro-industrial supply chain 15/07/2020 Rovigo

ACRONYMS AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PROJECTS
				Anna Moschella; Luisa Ugolini; Flavia Fulvio; Ila Alberti.(2021).Composition in fatty acids and to polyphenols in different genotypes of Cannabis sativa 109-109.	
PROHEMPIL Project for the holistic revaluation of hemp beyond GDP	Evaluate, period 2018 - 2019, in five Campania regions (AV, NA, BN, CE, SA), the biometric, agronomic and productive characteristics of monoecious and dioecious varieties of industrial hemp (at least three registered in the national register or in the common European catalog, to ascertain those with the best adaptability and most suitable for the production of fiber and see Define agrotechnics, according to the production destination, using an agroecological approach, with attention to the use of water and mineral fertilizers. Assess the environmental impact of the agrotechnics measuring the emissions of the main greenhouse gases (CO2 and N2O). Verify the quality and quantity of products and by-products from the experimental fields, under different agronomic practices, for seed milling and oil extraction through qualitative and quantitative analysis of the metabolic profile and evaluation of nutraceutical and cosmeceutical properties of products as such formulated; Evaluate the effects of the environment and agronomic and extractive practices on the quality of hemp seed for food use; Define ways of valorizing the by-products deriving from field activities and from the initial processing phases	F. RAIMO CREA-CI	Campania region	Article: Roberto Sorrentino; Gian Maria Baldi; Valerio Battaglia; Francesco Raimo; Giulio Piccirillo; Ernesto Lahoz(2021).First Report of white root rot of hemp (Cannabis sativa L.) caused by Dematophora necatrix in Campania region (Southern Italy).Plant Disease, 105(10),DOI: 10.1094/PDIS-07-20-1521-PDN.	
PROLEGUM Improvement of production yields, sustainability and profitability of some legumes, i.e. chickpea and bean, for human consumption.	Improvement of production yields, sustainability and profitability of some legumes, i.e. chickpea and bean, by identifying a list of varieties with determined characteristics for the production of dry grains, capable of: • double the yield per hectare (identification of improved ideotypes, better standing ability, synchronization of ripening, etc.) • greater resistance to biotic and abiotic adversities • more efficient response to symbiosis with rhizobium and mycorrhizal fungi • better tolerance of the root systems to water stress and / or low irrigability • supplying plant-based foods to improve the relationship between nutrition and health Development of the most suitable cultivation techniques for the different cultivation areas; Innovations in the harvest technique (reduction of waste and valorization of by-products, such as seed broken and with anomalies in color, size and shape) Implementation of Advanced Decision Systems that integrate the agricultural experience of technicians and farmers to give targeted and timely responses to agronomic issues that may arise for example, correct management of weeds, anomalous climatic trends, parasites and pathogens, as well as changes in the economic scenario Actions against the impoverishment of soil	A. CARBONI CREA-CI CREA-OF CREA-AN	MIPAAF Italian Ministry of Agriculture and Forestry		

ACRONYMS AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PROJECTS
	reintroduction of organic matter, supply of nitrogen through microbial fixation, rebalance of the microbial flora by counteracting the presence / permanence of some biotic stresses, improvement of the structure of the soils in the long term, reduction of the infestation load, etc.				
QUINOAPUGLIA Consolidation of Quinoa supply chain	Consolidate the quinoa supply chain in Puglia through the optimization of agronomic practices, weed control and product harvesting and the production of flours for niche markets (celiac, vegan), with particular attention to environmental, economic and social sustainability. The validation of the results obtained from the research activity on QUINOA, in progress at CREA-CI since 2016, aimed at the establishment of a "made in Italy variety of quinoa" is under completion.	G. de SANCTIS CREA-CI	Puglia region		
ROSTRI Rotations as a tool to reduce environmental impact and improve farms profitability	The general objective of the project is to create a dissemination program on good agricultural practices that use crop rotations to improve the soil physical, chemical and biological quality and its organic matter supply, reducing the need to resort to massive use of inorganic fertilizers and pesticides. Emphasis will be given to the importance of introducing legumes in crop rotations to improve soil quality and farms profitability.	P. IOVENO CREA-OF	Campania Region		
SOFT Innovations for the improvement of sustainability and productivity of organic farming engaged in the herbaceous and industrial crop sectors in Puglia - Smart Organic Farming Techniques	Optimization of crop rotation in organic farming (durum wheat, legumes, tomatoes) through the genetic improvement of plant species to increase productivity and agricultural management based on sustainability and functionality of the soils (shallow plowing, maintenance of organic matter and maintenance of green infrastructures, valorization of soil biodiversity, carbon sequestration, water retention, ecosystem stability and resilience and pollination) and integrated spatial planning (biological district - optimization of the use of genetic resources and increase in genetic diversity in agriculture with innovative adaptation strategies to climate change).	P. De VITA CREA-CI	Puglia region		
UNIHEMP Use of Industrial Hemp Biomass for Energy and New Biochemicals Production	Integration of an agro-industrial chain to increase energy efficiency through the development of eco-compatible cultivation and transformation process and production of biochemicals and energy from renewable sources into a new circular economy model. Respond to the needs of energy and high added value biochemicals (manufacturing, pharmaceutical and cosmetic products) by utilizing wastes from the hemp chain, therefore not in competition with the food chain, to define a new model of industrial development based on a circular economy that can contribute to the revival of the regional economy. This can be accomplished by integrating the environment and the productive capacities of the agricultural area of the least developed regions. The developed system aims to valorize the agro-industrial waste in a concept of eco-sustainable industrial development for a model of economy based on the requalification of rural areas.	R. PARIS CREA-CI CREA-AA CREA-DC	MUR Ministry of University and Research	- Fulvio Flavia; Paris Roberta; Montanari Massimo; Cinzia; Bassolino Laura; Moschella Anna; Cannata Giuseppe; Pecchioni Nicola; Mandolino Giuseppe (2021). Lights and shades in the way for cannabinoid biosynthesis: a focus on the variability of THCA-sinapoyl-CoA synthase and their possible involvement in the chemical phenotype of Cannabis sativa L. - Pieracci Ylenia; Ascrizzi Roberta; Terreni Valentina; Pistelli Luisa; Flamini Guido; Bassolino Laura; Fulvio Flavia; Montanari Massimo; Paris Roberta (2021). Essential Oil of Cannabis sativa L: Comparison of Yield and Chemical Composition of 11 Hemp Genotypes. Molecules, 26, 13, DOI: https://doi.org/10.3390/molecules26134088 - Backer R.G.; Mandolino G.; Wilkins O.; ElSohly M.; Smith D.L. (2020). Cannabis genomics, breeding and production. Frontiers in Plant Science, 11, DOI: https://doi.org/10.3389/fpls.2020.591445 .	Proceedings of the 3 Research Fellowships

ACRONYMS AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PROJECTS
				<p>- Article Linciano Pasquale; Russo Fabiana Russo; Citti Cinzia; Tolomeo Francesco; Paris Roberta; Fulvio Flavia; Pecchioni Nicola; Vandelli Maria Angela; Laganà Alcega; Capriotti Anna Laura; Biagini Giuseppe; Carbone Luigi; Gilgi Giuseppe; Cannazza Giuseppe (2021).The novel heptyl phorolic acid cannabinoids content in different Cannabis sativa L. accessions.Talanta , 235,DOI: 10.1016/j.talanta.2021.122704.</p> <p>-Article Cerrato Andrea; Citti Cinzia; Cannazza Giuseppe; Capriotti Anna Laura; Cavaliere Chiara; Grassi Gianpaolo; Marini Federico; Montone Carmela Maria; Paris Roberta; Piovesana Susy; Laganà Alcega (2021).Phytocannabinomics: Untargeted metabolomics as a tool for cannabis chemovar differentiation. .Talanta 230,DOI: 10.1016/j.talanta.2021.122311</p> <p>- Article Fulvio Flavia; Paris Roberta; Montanari Massimo; Citti Cinzia; Cilento Vincenzo; Bassolino Laura; Moschetti Anna; Alberti Ilaria; Pecchioni Nicola; Cannazza Giuseppe; Mandolino Giuseppe (2021).Analysis of Sequence Variability and Transcriptional Profile of Cannabinoid synthase Genes in Cannabis sativa Chemotypes with a Focus on Cannabichromenic acid synthase.Plants 10, 9,DOI: 10.3390/plants10091895</p> <p>- Article Bassolino L.; Buti M.; Fulvio F.; Pennesi A.; Mandolino C.; Milc J.; Francia E.; Paris R. (2020).In silico identification of MYB and bHLH families reveals candidate transcription factors for secondary metabolic pathways in Cannabis sativa L. .Plants, 9, 11,DOI: 10.3390/plants9111544</p> <p>- Proceeding Fulvio Flavia; Pieracci Ylenia; Ascrizzi Roberta; Pistone Luisa; Flamini Guido; Bassolino Laura; Montanari Massimo; Paris Roberta (2021).Characterization and comparison of essential oils composition from Cannabis sativa genotypes from two cultivation seasons.Book of Proceedings, 3</p> <p>- Proceeding Paris Roberta; Fulvio Flavia; Montanari Massimo; Bassolino Laura; Citti Cinzia; Pastore Chiara; Mandolino Giuseppe (2021).BY-PRODUCTS FROM INDUSTRIAL HEMP INFLORESCENCES.Book of Proceedings, 25-</p>	

2.8.1 Patents and services

Patents (INDUSTRIAL PATENTS)

PRODUCTS/MAIN TOPICS	DENOMINATION DESCRIPTION	AUTHORS/INVENTORS
greenhouse	Naturally ventilated greenhouse (IT + MA + DZ + TN) Joint ownership: Opus et Vita firm	L. Santonicola
mulching method	Composition and method for mulching (IT) Joint ownership: Barzaghi firm	D. Massa, G. Burchi, A. Benedetti

PLANT VARIETY RIGHTS -Minor supply chain

PRODUCTS	DENOMINATION DESCRIPTION	AUTHORS/INVENTORS	PRODUCTS/MAIN TOPICS
hemp	Asso	M. Di Candilo	CREA-CI
	Carmaleonte	G. Grassi	CREA-CI
	Carmono	G. Grassi	CREA-CI
	Cinbol	G. Grassi, G. Magagnini	CREA-CI
	Cinro	G. Grassi	CREA-CI
	Ermo	G. Grassi	CREA-CI
	Fibrante	M. Di Candilo	CREA-CI
	Red Petiole	P. Ranalli	CREA-CI
dwarf bean	Achille	B. Parisi	CREA-CI
	Buran	B. Parisi	CREA-CI
	Eracle	B. Parisi	CREA-CI
	Ettore	B. Parisi	CREA-CI
	Grecale	B. Parisi	CREA-CI
climbing bean	Arechi	P.Ranalli, B. Parisi	CREA-CI
quinoa	Quigiudy-1	G. De Santis	CREA-CI

CREA VARIETIES INCLUDED IN THE ITALIAN OFFICIAL LISTS

PRODUCTS	DENOMINATION	CREA CENTRES	PRODUCTS	DENOMINATION	CREA CENTRES
hemp	Asso	CREA-CI	dwarf bean	Grecale	CREA-CI
	Carmagnola	CREA-CI	fagiolo nano	Levante	CREA-CI
	CS	CREA-CI		Libeccio	CREA-CI
	Camaleonte	CREA-CI		Luxor	CREA-CI
	Codimono	CREA-CI		Merit	CREA-CI
	Eletta Campana	CREA-CI		Ponente	CREA-CI
	Fibranova	CREA-CI		Radames	CREA-CI
	Fibrante	CREA-CI		Ulisse	CREA-CI
dwarf bean	Achille	CREA-CI		White Top	CREA-CI

PRODUCTS	DENOMINATION	CREA CENTRES	PRODUCTS	DENOMINATION	CREA CENTRES
fagiolo nano	Adone	CREA-CI		Montalbano	CREA-GB
	Buran	CREA-CI		Giulia	CREA-OF
	Ciclope	CREA-CI		Occhio di luna	CREA-OF
	Efesto	CREA-CI		Solfi	CREA-OF
	Eracle	CREA-CI			
	Ettore	CREA-CI			
	Fiorino	CREA-CI	climbing bean	Arechi	CREA-CI
	Furore	CREA-CI		Kaimano	CREA-CI
	Giulia	CREA-GB		Kondor	CREA-CI

Services

Collections

PRODUCTS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Legumes, vegetables in general	Maintenance of a collection of about 300 accessions of local cultivars of herbaceous species belonging to different botanical families including Leguminosae (in addition to Solanaceae, Cucurbitaceae and Graminaceae)	M.Zaccardelli/P. Tripodi	CREA-OF
pathogenic fungi and bacteria	Collection of pathogenic fungi and bacteria in long and short term storage	L. Sigillo	CREA-OF
sage	Maintenance of 180 accessions of sage with multifunctional uses in the form of seeds and/or potted plants	C. Cervelli	CREA-OF
helichrysis	Maintenance of 90 accessions of Helichrysum with multifunctional uses in the form of seeds and/or potted plants	C. Cervelli	CREA-OF
apiaceae	Maintenance of 40 accessions of Apiaceae with several functionalities	A. Giovannini	CREA-OF
rosemary	Maintenance of 150 accessions of Rosemary with multifunctional uses - potted plant	C. Cervelli	CREA-OF
hemp <i>Cannabis sativa L.</i>	about 300 accessions stored at controlled conditions (temperature and humidity)	M. Montanari	CREA-CI
common bean <i>Phaseolus vulgaris L.</i>	about 800 accessions (landraces, local varieties, wild relatives, breeding lines, experimental populations for genetic studies, improved varieties, etc)	A. Carboni	CREA-CI
<i>Linum usitatissimum</i>	300 accessions of different origin, 40% for fiber production, 31% for oil and the remainder with a dual or unknown aptitude. Stored in the medium and long term, renewed on a five-year base, available upon request	M. Bagatta, M. Montanari	CREA-CI
White, blue and yellow lupine	16 accessions of Lupinus spp. , stored in cold chamber, renewed on annual base, as backup seeds are maintained under vacuum and in airtight jars, small quantities are available upon request	A. Spina	CREA-CI

Other scientific and technological infrastructures

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Nutritional quality of vegetables	Metabolomics facilities for the determination of the nutritional quality of vegetables equipped with the following instrumentation: 1) HPLC WATERS e2695 with UV-Vis photodiode detector and refractive index (IR) detector: analysis of carotenoids, phenolic compounds, ascorbic acid, organic acids and sugars 2) GC-MS Bruker SCION single quadrupole with PAL3 autosampler for liquid injection, static and dynamic headspace and solid phase microextraction (SPME): analysis of volatile compounds and waxes of the cuticle of vegetable species 3) UPLC-MS, mass spectrometer (linear trap, LTQ XL): analysis of secondary polar targeted metabolites (flavonoids, polyamines, glucosinolates, phenolic anthocyanins, etc.).	G. Francese	CREA-OF Pontecagnaro
plant biotechnologies	Plant biotechnology facilities: 1) Laboratory for in vitro culture, equipped for embryo rescue, haploid cultures, somatic embryogenesis, in vitro regeneration protocols, propagation in solid and liquid substrates 2) Molecular biology laboratory, equipped for extraction, analysis, quantification of nucleic acids, gene expression studies, molecular markers 3) Biochemistry laboratory, equipped for isolation and quantification of plant compounds and microbiology laboratory of microorganisms associated with plants and soil	B. Ruffoni	CREA-OF Sanremo

Other services

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Biostimulants	BIOALOV - Biostimulants and microorganisms for the qualitative improvement of <i>Aloe vera</i> cultivation and defence. To study the use of biostimulants and microorganisms in the qualitative improvement of organic cultivation and defence of <i>Aloe vera</i> . Indications will also be given for optimising the cultivation conditions in the greenhouse and for setting up a small laboratory for the first treatment of harvested leaves	D. Prisa	CREA-OF Pescia
Mosses	MOSKIN In vitro culture and biomass production of mosses for green building	A. Copetta	CREA-OF Sanremo
Aromatic plants	ROSMARINO BLU Activities of propagation and cultivation in small pots of aromatic plants of numerous species and varieties for the realization of demonstration and didactic areas at the structure of the client company. A bibliographic survey will also be carried out, with its summary report, on the most important phytochemical and agronomic characteristics of these species, with particular attention to the composition and properties of the essential oil	C. Cervelli	CREA-OF Sanremo
Chickpeas	SOREMARTEC: Varietal comparison of chickpeas The aim will be to identify the best chickpea varieties	M. Zaccardelli	CREA-OF Pontecagnaro
Basil	TA-BASIL - Scientific support and coordination actions in experimental activities aimed at the sustainable control of basil downy mildew through the application of resistance inducers Scientific support for the development of an innovative protocol for the sustainable control of basil downy mildew through the application of resistance inducers.	C. Pane	CREA-OF Pontecagnaro
hemp	VCU Registration Trials - Chemical analysis for the determination of THC in hemp varieties under registration.	G. Mandolino	CREA-CI
hemp	Analysis of the content of Δ^9-Tetrahydrocannabinol (Δ^9- THC) in fiber hemp -AGEA 2020-2021 Collaboration agreement for the control of the tetrahydrocannabinol THC content of hemp on the cultivated surfaces reported in the single application.	G. Mandolino	CREA-CI

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
medical hemp	Agreement with SCFM of Florence, Italy, for the supply of medical hemp var. CINRO and CINBOL cuttings and mother plants	M. Montanari, I. Albert	CREA-CI
grain legumes	Varietal evaluation and reproduction tests of grain legume lines – Agreement with UNIVPM	A. Del Gatto	CREA-CI

Technical tables/working group/Institutional partnership/ Editorial board..

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Aromatic plants	Technical Table of aromatic plants -Working group "research and training"	M. Cardarelli	CREA-OF
Aromatic plants	Technical Table of aromatic plants -Working group "research and training"	B. Ruffoni	CREA-OF
Industrial hemp	National Working Table for Industrial Hemp of MiPAAF (DM Mipaaf n. 9385830 del 17/12/2020	G. Mandolino, R. Paris	CREA-CI
Hemp	Collaboration Agreement for the control of the Tetrahydrocannabinol (THC) content of hemp on the cultivation surfaces reported in the applications - Year 2021	G. Mandolino	CREA-CI
Hemp	Scientific Collaboration Agreement between CREA-CI and the Pharmacy Department of the University of Pisa	L. Bassolino, R. Paris	CREA-CI
Hemp	Collaboration Agreement between the Veneto Region, the Department of Agronomy, Animals, Food, Natural Resources and the Environment of the University of Padua, the Venetian Agency for Innovation in the Primary Sector and the Council for Research in Agriculture and Analysis of the Agricultural Economy for the optimization of hemp seed production in the Veneto area	S. Vaccari	CREA-AC
Hemp	National Medical Cannabis : innovation and enhancement of the production of therapeutic Cannabis plant material for the National needs and research for the selection of new varieties for pharmaceutical use	N. Pecchioni	CREA-CI
Hemp	Study and multiplication of Cannabis sativa for the production of seed varieties for horticulture	M. Montanari	CREA-CI
Hemp	Research Advisory Committee of the McGill Research Center for Cannabis, McGill University, Canada (membership)	G. Mandolino, R. Paris	CREA-CI

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Najar B., Nardi V., Cervelli C., Mancianti F., Nardoni S., Ebani V.V., Pistelli L. (2020) *Helichrysum araxinum* Takht. ex Kirp. grown in Italy: volatiloma composition and *in vitro* antimicrobial activity. *Zeitschrift fur Naturforschung - Section C Journal of Biosciences* 75(7-8)c: 265–270

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Book chapters

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Other publications

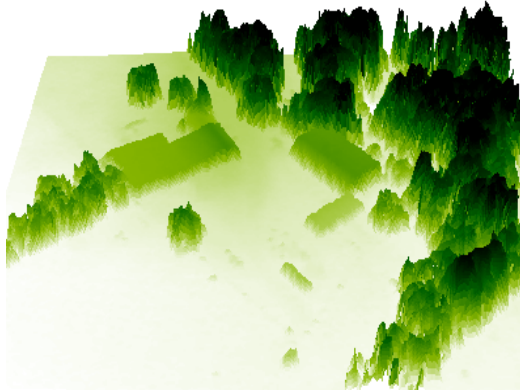
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2. CREA RESEARCH LINES BY PRODUCTS

2.9 FORESTS AND WOOD PRODUCTIONS

In the forest sector, the most significant strategic research issues concern sustainable management and forest crops under agricultural farming, conservation of natural resources and biodiversity, as well as the enhancement of wood and non-wood products of forests and forest plantations. Research activities are consistent with the new objectives of the European Common Agricultural Policy (CAP) and its Green Deal, as well as with the strategy on "Biodiversity for 2030" and the objective of adaptation to climate change. Activities are aimed at ensuring the availability of wood supplies for the national industry and for energy production, protecting forest genetic resources, developing tools, techniques and methods for monitoring planning and sustainable management of forests and forest plantations.



Actions aimed at enhancing the resilience of forest ecosystems essentially concern the development of forecasting models which consider the role of forests in mitigating climate change. Efficient data collection and forest management protocols easy to apply in the forest planning process are developed by implementing short-term growth forecasting models for different species, in response to climatic variables, in which resilience and resistance of forests to disturbance events are jointly assessed. Conservation and improvement of forest genetic resources are carried out through selection and by conventional and innovative genetic breeding programs aimed at improving overall adaptability and tolerance to biotic and abiotic stresses. In comparative plots distributed all over the national territory, the adaptive phenotypic characters of the various genotypes are detected through digital ICT technologies to allow evaluation at a larger scale. The maintenance and expansion of models of in situ dynamic conservation, of assisted gene flow and assisted migration activities are considered for the long-term assessment of the migration capacity of forest species under the pressure of climate change.

The research carried out so far made it possible to obtain important results, to be promptly transferred to the production sector. In particular, the selection and constitution of clones of poplar and willow characterized by high adaptability, productivity and resistance to biotic and abiotic disturbances is considered of economic interest for the timber supply chain, both in Italy and in Europe. To offer income opportunities to farmers in disadvantaged mountain areas, research is also conducted on biodiversity of food, aromatic and medicinal alpine plants subject to harvesting from spontaneous populations, to obtain non-wood forest products. Other research lines supporting the forest-wood supply chain concern the use of innovative geomatic technologies for the assessment of forest attributes such as biomass, wood volume, dendro-structural characteristics and tree growth, as well as of the ecological and phenological characteristics of forest stands. Various technologies are tested and validated, such as laser and proximal optical sensors (Terrestrial Laser Scanner, photography), transported by drones, planes or satellites, with satellite sensors available on a large scale under open access (Copernicus-Sentinel). Distinctive attention is also paid to the identification of information relating to logistics and availability of data on climate scenarios to contribute, on the one hand, to wood security and, on the other, to the development of forest districts using adaptive planning with high technological content (precision and smart forestry). Land suitability and land availability of woody crops for bioenergy are estimated by integrated data systems. Another aspect of interest is the ecological and economic evaluation of the use of harvesting residues from forest plantations. In mixed agroforestry plantations, based on the cultivation of poplar and other fast-growing species combined with shrubs and herbaceous species, studies are carried out on the interactions with the agricultural crops and the effects on biodiversity, to enhance their ecological role and the ability to adapt to climate change. Studies and research in support of the National Forest Inventory aim at quantifying and enhancing ecosystem services of forests as well as monitoring and inventorying forests and trees outside forests, with a view to ecosystem resilience and sustainable management of natural resources and landscapes. The methods for multi-scalar estimation are based on remote and proximal observation, on the use of predictive models and on socio-economic investigations. Other investigations concern the ecological role of dead wood in forests, carbon storage, monitoring of land use, assessment of ozone and pollutant damage on forests and urban and peri-urban vegetation, development of tree-and stand-growth models to support the inventory of forest resources, improving the ability to predict the growth of forests in relation to climate change.

2.9.1. Research and research products – Forests and wood productions

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹¹
Agridigit_Selvicoltura AGRIDIGIT - Precision Forestry	Develop and test innovative methods and technologies for the enhancement of the national forest heritage and the development of its production chains.	N. PULETTI CREA-FL CREA-IT CREA-PB	- MiPAAF - Ministero delle politiche agricole alimentari e forestali	- Articolo in rivista "Agricoltura del futuro: entrano in campo i droni - Innovazioni in ricerca sviluppo, sicurezza al servizio dell'agricoltura e delle foreste", Civitarese Vincenzo; Figorilli Simone; Scarfone Antonio (2021). Misurazione e mappatura continua dei carichi trasportati. Proposta di un sistema implementabile anche su mezzi meccanici tradizionali. Sherwood – Foreste ed alberi oggi 250, 21-24. - Contributo in atti di convegno "Agricoltura del futuro: entrano in campo i droni - Innovazioni in ricerca sviluppo, sicurezza al servizio dell'agricoltura e delle foreste", Civitarese Vincenzo; Figorilli Simone; Acampora Andrea; Sperandio Giulio; Assirelli Alberto; Scarfone Antonio; Bascietto Marco (2021). Innovative system for monitoring and mapping loads in logs forwarding. 265-267. - Contributo in atti di convegno "Agricoltura del futuro: entrano in campo i droni - Innovazioni in ricerca sviluppo, sicurezza al servizio dell'agricoltura e delle foreste", Ortenzi Luciano; Colle Giacomo; Costa Corrado; Moscovini Lavinia (2021). Italian Speech Commands for Forestry applications. Proceedings of 2021 IEEE International Workshop on Metrology for Agriculture and Forestry, 401-404. - Contributo in atti di convegno "Agricoltura del futuro: entrano in campo i droni - Innovazioni in ricerca sviluppo, sicurezza al servizio dell'agricoltura e delle foreste", Figorilli Simone; Bruzzese Stefano; Proto Andrea; Rosario; Costa Corrado; Moscovini Lavinia; Blar Simone; Brun Filippo (2021). A Blockchain implemented App for forestry nursery management. Proceedings of 2021 IEEE International Workshop on Metrology for Agriculture and Forestry, 396-400.	- Agricoltura del futuro: entrano in campo i droni - Innovazioni in ricerca sviluppo, sicurezza al servizio dell'agricoltura e delle foreste 14/12/2021

¹¹ prototypes; dissemination activities (conferences, seminars, reports, sites and videos, etc.); training activities (scholarships, research grants and PhD scholarships).

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹¹
AGROMIX AGROforestry and MIXed farming systems Participatory research to drive the transition to a resilient and efficient land use in Europe	Exploit the full potential of synergies in mixed forest and agricultural systems Develop and promote value chains and infrastructures for mixed forest and agricultural products Develop tools to co-design and manage mixed forest and agricultural systems Identify and model transition scenarios Develop policy recommendations and action plans for successful transition Maximize the impact and the future of the project for the construction of low-carbon and climate-resistant agricultural systems	P.M. CHIARABAGLIO CREA-FL	- Commissione Europea	- UNIVERSITAET KOBLENZ-LANDAU - Cranfield University - Environmental Science and technology department school of applied - CEEweb a Biológiai Sokféleségért - AGRIFOOD AND BIOSCIENCES INSTITUT - EESTI MAAULIKOOL - REVOLV - Ogólnopolskie Stowarzyszenie Agrolodów - STICHTING WAGENINGEN RESEARCH - Coventry University - HOCHSCHULE TRIER - Eidgenössisches Departement für Wirtschaft, Bildung und Forschung (WBF), - Agroecology Europe - Mreza za ruralni razvoj Srbije - EIGEN VERMOGEN VAN HET INSTITUUT VOOR LANDBOUW- EN VISSERIJONDERZOEK - ZÜRCHER HOCHSCHULE FÜR ANGEWANDTE WISSENSCHAFTEN - UNIVERSIDAD DE EXTREMADURA - TEAGASC - AGRICULTURE AND FOOD DEVELOPMENT AUTHORITY (TEAGASC) - INSTITUT TECHNIQUE DE L'AGRICULTURE BIOLOGIQUE - WERKGROEP VOOR EEN RECHTVAARDIG EN VERANTWOORDE LANDBOUW - LEIBNIZ-ZENTRUM FÜR UMLANDSCHAFTS- UND AGRARLANDSCHAFTSFORSCHUNG (ZALF) e.V. - PROGRESSIVE FARMING TRUST LTD LTD - INSTITUT NATIONAL DE LA RECHERCHE AGRONOMIQUE - MVarc	

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹¹
AMISEL Multifunctionality and enhancement of the chestnut and beech stands of Moura and Amiata	Multifunctionality and economic enhancement of chestnut coppices. Define innovative cultivation techniques capable of enhancing the potential of chestnut by improving the quality of wood products, increasing the stability and functionality of stands, differentiating structures and the landscape. Enhancement and differentiation of beech stands. Evaluate and define the silvicultural methods to differentiate chronologically and structurally the beech stands.	M. C. MANETTI CREA-FL	- Unione dei Comuni della Val d'Orcia	Manetti M.C., Conedera M., Pelleri F., Montini P., Maltoni A., Mariotti B., Pividori M., Marcolin E. 2022. Optimizing quality wood production in chestnut (<i>Castanea sativa</i> Mill.) coppices. <i>Forest Ecology and Management</i> 523 (2022) 120490. https://doi.org/10.1016/j.foreco.2022.120490 Marini F., Manetti M.C., Corona P., Portoghesi L., Vinciguerra V., Tamantini S., Kuzminsky E., Zike F., Romagnoli M. 2021. <i>Influence of forest stand characteristics on physical, mechanical properties and chemistry of chestnut wood</i> . Scientific Reports (2021) 11:154. https://doi.org/10.1038/s41598-020-80558-w Marcolin E., Pividori M., Colombari F., Manetti M.C., Pelleri F., Conedera M., Gehring E. 2021. <i>Impact of the Asian gall wasp (Dryocosmus kuriphilus) on the radial growth of the European chestnut (Castanea sativa)</i> . <i>Journal of applied ecology</i> . https://doi.org/10.1111/1365-2664.13861 Marini F., Portoghesi L., Manetti M.C., Salvati L., Romagnoli M. 2021. Gaps and perspectives for the improvement of the sweet chestnut forest wood chain in Italy. <i>Annals of Silvicultural Research</i> , vol 46, No2 39 pp. http://dx.doi.org/10.12899/asr-2203 Pelleri F., Becagli C., Sansone D., Bianchetto B., Bidini C., Manetti M.C. 2021. New silvicultural approaches for multipurpose management in beech forests. <i>Annals of Forest Research</i> 64 (2021) 87-103. https://doi.org/10.15287/afr.2021.222	
ARSIAL Protection and enhancement of the Lazio landscape: reconstitution and management of eucalyptus windbreaks.	Provide specialist advice and eucalyptus planting material to support ARSIAL activities in the maintenance windbreaks in the Lazio region.	A. ALIVERNINI CREA-FL	- Agenzia Regionale per lo Sviluppo Agricolo del Lazio (ARSIAL)		
B4EST Adaptive BREEDING for productive, sustainable and resilient FORESTS under climate change	The goal of B4EST is to increase forest survival, health, resilience and productivity under climate change and natural disturbances, while maintaining genetic diversity and key ecological functions, and fostering a competitive EU bioeconomy. B4EST will provide forest tree breeders, forest managers and owners, and policy makers with: Better scientific knowledge on adaptation profiles and sustainable productivity, an added value of raw materials in important European tree species for forestry, New and flexible adaptive tree breeding strategies, Tree genotypes of highly adaptive and economical value. Decision-support tools for the choice and use of Forest Reproductive Material (FRM) while balancing production, resilience and genetic diversity, including case studies developed with industrial partners, Integrative performance models to guide FRM deployment at stand and landscape level, Economic analyses of risks/benefits/costs, Policy recommendation. B4EST will capitalise on the resources developed by past and	G. NERVO CREA-FL CREA-GB	- Commissione Europea National Forest Research Centre (CIFOR), National Institute for Agricultural and Food Research and Technology (INIA) - INRA - Institut National de la Recherche Agronomique - Skogforsk - The Forestry Research Institute of Sweden - FORESTRY COMMISSION RESEARCH AGENCY		

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹¹
	current EU projects to produce -together with tree breeder forest managers and owners, and the industry- operation solutions to better adapt forests to climate change and reinforce the competitiveness of the EU forest-based sector.				
BIOTECH Innovative genetic improvement of poplar clones for use in production chains.	PIOPPINGEN The main objective of the project is to obtain new poplar clones modified for the plant habit and the cellulose and lignin content, to be used for industrial and bioenergy uses.	G. NERVO CREA-FL CREA-GB	- MiPAAF - Ministero delle politiche agricole alimentari e forestali		
CARTER Conservation and sequestration of carbon in the soil.	Contribute to the increase in the sequestration of carbon dioxide from the atmosphere and organic matter in the soil.	P.M. CHIARABAGLIO CREA-FL	- AVEPA Agenzia Veneta per i Pagamenti in Agricoltura		
CASPOR2018 Monitoring network of climatic parameters and implementation of data in the research and management area of the Presidential Estate service of Castelporziano starting in 2018, optimization of the water resources of the Estate and monitoring of depositions and atmospheric particulate matter.	Climatic, forest and environmental weather monitoring of the Presidential Estate of Castelporziano	S. FARES CREA-FL CREA-AA	- ACCADEMIA NAZIONALE DELLE SCIENZE DETTA DEI XL		
CONECOFOR Forest growth monitoring in the level of Italian ConEcoFor plots.	Growth monitoring in CONEFOFOR areas according to the ICP Forests protocols.	A. CUTINI G. BERTINI CREA-FL	- CUFA - Comando Unità Forestali Ambientali e Agroalimentari Carabinieri		
CREAFORNEC (Management of NEC Italia monitoring infrastructure "Terrestrial Ecosystems and forest growth").	Contribute to monitoring tree growth and weather parameters at the monitoring plots of the CONEFOFOR national network, according to the NEC Directive.	A. CUTINI S. FARES CREA-FL	- CUFA - Comando Unità Forestali Ambientali e Agroalimentari Carabinieri		

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹¹
ESC360 LIFE ESC 360 360 Volunteers for monitoring forest biodiversity in Italian Natura 2000 Network	This call embodies a joint initiative of the European Union Programme for the Environment and Climate Action (LIFE) and the European Agricultural Fund for Rural Development (EAFRD) aimed at concretely exploring the potential of using volunteer work for environmental protection activities mainly targeted to Natura 2000 sites and species protected by the Birds and Habitats Directive. This initiative will be implemented by means of LIFE preparatory projects and builds on the mobilisation and deployment opportunities of volunteers provided by the European Solidarity Corps	G. SABBATINI PEVERIERI CREA-DC	- Commissione Europea		- Natura 2000 21/05/2021 - Un'esperienza di volontariato a contatto con la natura. Il progetto europeo LIFE ESC360 19/04/2021 - Incontro nazionale Citizen Science Italia 11/11/2021 Grosseto - Corso di formazione per volontari LIFE ESC360 (corso 4/2021) 06/09/2021 - Racconti di biodiversità 23/09/2021 - Cambiamento climatico: il futuro è green?! L'esperienza del progetto LIFE ESC360 29/09/2021 Milano - Corso di formazione per volontari LIFE ESC360 (corso 1/2021) 22/03/2021 - Corso di formazione per volontari LIFE ESC360 (corso 2/2021) 17/05/2021
FOR.CIRCULAR Decision Support System to improve the performance of the forest-wood chain in perspective of circular bioeconomy	Increase efficiency and sustainability of the forest-wood chain in the Tuscany region in order to reduce the negative impacts on environment and the dependence from non-renewable resources (i.e. fossil fuels) in accordance with the objectives of the National Strategy for the Sustainable Development and the Paris Agreement on Climate Change. The specific objectives can be summarized as follows: - To increase the theoretical knowledge and practical application based on the principles of circular bioeconomy applied to the forest-wood chain at national and regional level. - To promote a participatory process with the actors of the forest-wood chain to implement a Decision Support System (DSS) and to define strategies for the ecological, economic and social valorisation of the forest-wood chain in Tuscan region. - To develop a DSS for the forest-wood chain based on the principles of circular bioeconomy aimed to assess the sustainability and the performance of the forest-wood chain with the collaboration of decision makers. - To assess efficiency and outputs of the DSS in a case study in order to understand the applicability and replicability of the tool.	A.PALETTO CREA FL CREA AA	-Ministry of Ecological Transition	- Peer-review article Paletto A.; Becagli C.; Bianchetto E.; Sacchelli S.; De Meo, I. (2021). Measuring and assessing the potential of forest-based circular bioeconomy to implement the National Sustainable Development Strategy in Italy. Austrian Journal of Forest Science, 138, 251-278. Paletto A, Becagli C, Geri F, Sacchelli S, De Meo I (2022). Use of Participatory Processes in Wood Residue Management from a Circular Bioeconomy Perspective: An Approach Adopted in Italy. Energies 15(3): 1011.	- Il Progetto FOR.CIRCULAR project and strategies for the valorisation of the forest-wood chain 10/11/2021 Rufina - Grants - n.2
FORCELL Reforestation with 2000 plants in the Cellulose Park (Parco della Cellulosa)	Implement an urban forestry intervention through the planting of 2,000 forest plants within surfaces available at the Ovile Farm, included in the Cellulose Park.	G. PIGNATTI CREA-FL	AzzeroCO2 srl		

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹¹
FORMIPAAF - cooperatio agreement “Programma del attività di base, pe organizzare le struttur permanenti al fine di dar attuazione a quanto previst all’art. 15 del decret legislativo 3 aprile 2018 n. 34	Implementation of all the aims in accordance with art. 1 TUFF Implementation of all the aims in accordance with art. 1 TUFF	W.MATTIOLI CREA-FL	Ministry of Agricultural, Food and Forestry Policies (MiPAAF)		
FUCAM Establishment of a mixed forest with a prevalence of chestnut in Monte Amiata; preparation of the material planting and monitoring of survival	Establishment of a mixed forest with a prevalence of chestnut	M.C. MANETTI CREA-FL	- UNIONE DEI COMUNI AMIATA VAL D'ORCIA		
FWC934340-SC20 Specific contract No. 2 implementing Framework Contract No. 934340 - Use of National Forest Inventories data to harmonise and improve the current knowledge on forest increment in Europe	Implementation of the Framework Contract 934340 between EC-JRC and a consortium of 19 European National Forest Inventories that won the tender JRC/IPR/2017/D.1/0003/N of 10/03/2107; discussion and proposal of a reference definition and of a harmonized method to calculate forest increment	P. GASPARINI CREA-FL	- European Commission	- Institut national de l'information géographique et forestière - Swiss Federal Institute for Forest, Snow and Landscape Research (WSL) - Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria - Johann Heinrich von Thünen-Institut - Federal Research Institute for Rural Areas, Forestry and Fisheries (BFH) German - Natural Resources Institute Finland LUK - Federal Research and Training Centre for Forests, Natural Hazards and Landscape (BFW) - National Institute for Research and Development in Forestry Marin Drace - Swedish University of Agricultural Sciences (SLU)	
Implementation of the Framework Contract 934340 between EC-JRC and a consortium of 19 European National Forest Inventories that won the tender JRC/IPR/2017/D.1/0003/N of 10/03/2107	Implementation of the Framework Contract 934340 between EC-JRC and a consortium of 19 European National Forest Inventories that won the tender JRC/IPR/2017/D.1/0003/N of 10/03/2017; application of the reference definition to estimate the annual volume and biomass increment of forests using the E-Forest platform	P. GASPARINI CREA-FL	- European Commission	- Johann Heinrich von Thünen-Institut - Federal Research Institute for Rural Areas, Forestry and Fisheries (BFH) German - Bureau for Forest Management and Geodesy BULIGL - Swedish University of Agricultural Sciences (SLU) - Federal Research and Training Centre for Forests, Natural Hazards and Landscape (BFW) - Forest Management Institute (UHU) - Institut national de l'information géographique et forestière - National Institute for Research and Development in Forestry Marin Drace	
GO SURF Decision support for sustainable forest planning	DSS operability demonstration for farm-scale forest management in Tuscany	W. MATTIOLI CREA-FL	-Tuscany Region		- Study grant - n.1
GOProFOR LIFE GOod PRactice implementation netwOrk for FORest biodiversit conservation	The project aims to identify and disseminate forest management tools aimed at increasing the uses compatible with conservation issues within the Natura 2000 network. These tools will derive mainly from good practices from the 25-year experience of the LIFE Program and the projects of forestry interest that it co-financed.	A. CUTINI CREA-FL	- European Commission		

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	LIFE GoProFOR intends to encourage the exchange of experiences and best practices for the management of the biodiversity of forest habitats in the Natura 2000 network with the aim of increasing the level of awareness both by the institutional managers of these areas and by all operators who carry out their influence with their activities on the conservation of habitats and species.				
IFN13-RIL-2&3 Collaboration agreement for activities to support the design, construction and management of the third National Inventory of Forests and Forest Carbon Pool (INFC2015) - Third executive plan - Part 2 and 3	Implementation of activities related to the third INFC2015 National Forest Inventory, third executive plan, part 2 and 3	P. GASPARINI CREA-FL	- CUFA - Comando Unità Forestali Ambientali e Agroalimentari Carabinieri		Research grant - n.1 - Study grant - n.1
Lake Faguglia Effects of climate change and water level fluctuations on Bracciano Lake on tree growth dynamics in the beech thermophilic priority habitat.	Evaluating: i) the effect of the main hydro-climatic variable potentially correlated with the growth dynamics of beech trees, ii) their resistance and resilience capacity to increasing drought condition, and iii) the natural regeneration pattern of beech stands.	G. MAZZA CREA-FL	- Regional Natural Park of Bracciano-Martignano (Italy)		
Life AForClimate Adaptation of Forest management to CLIMATE variability: an ecological approach	Obtain the maximum effectiveness of silvicultural actions for Beech forest formations in a limiting context due to climate change, and ensure that the ecosystem efficiency of the forest can be preserved and improved over time. Set up a methodological approach capable of measuring the climatic factors predisposing (predictors of) a specific phenological behavior and the growth, also of the main characters that influence forest resilience (seed production renewal, etc.).	U. CHIAVETTA CREA-FL	- Commissione Europea	- Articolo in rivista Chiavetta Ugo; Marzio Sebastian(2021).foreMast: an R package for predicting beech (Fagus sylvatica L.) mast events in European countries. Annals of Forest Science, 78, 4, 1-10. DOI: 10.1007/s13595-021-01109-5. - Articolo in rivista Serena Antonucci; Giovanni Santopuoli; Marco Marchetti; Roberto Tognetti; Ugo Chiavetta Vittorio Garfi (2021).What Is Known About the Management of European Beech Forests Facing Climate Change? A Review. Current Forestry Reports, 7, 4, 321-333. DOI: 10.1007/s40725-021-00149-4.	- LIFE Soria ForestAdapt - First Expert Meeting 04/05/2021 - Cambiamenti Climatici, origine e principali impatti a livello locale globale sui sistemi foresta 10/06/2021 - Monitoraggio degli impatti e previsione degli effetti dei cambiamenti climatici nei sistemi foresta 21/10/2021 - Mitigazione e adattamento nella gestione delle foreste mediterranee 04/10/2021 - Comunità di pratiche su adattamento delle foreste di faggio al cambiamento climatico - Secondo incontro 19/07/2021 - Gestione e pianificazione adattativa nel contesto dei cambiamenti climatici 28/10/2021 - Principali impatti dei Cambiamenti Climatici sui sistemi foresta naturali e semi-naturali 22/06/2021 - Assegni di ricerca - n.2
LIFE FOLIAGE Forest planning and earth observation for a well grounded governance	Support forestry policy at regional level in Lazio and Umbria based on a complete, dynamically and periodically updated cognitive framework, given by the survey of forestry operations and by sustainable management indicators based on remote sensing	M. BASCIETTO CREA-IT CREA-FL	- Commissione Europea		- Presentazione del LIFE Foliage ai portatori di interesse 16/03/2021 - Dati statistici forestali verso uno standard unico nazionale Contributi alla governance forestale regionale e nazionale 18/06/2021 - Assegni di ricerca - n.2

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹¹
LIFE MODERN (NEC) new Monitoring system to Detect the Effects of Reduced pollutants emissions resulting from NEC Directive adoption	Fulfil the needs of the National Emissions Ceilings (NEC) Directive (2016/2284/EU) on the establishment of national emissions ceilings of certain atmospheric pollutants, linking them to the impacts on ecosystems.	A. CUTINI G. BERTINI CREA-FL	- European Commission		
LIFE SPAN Saproxylic Habitat Network planning and management for European forests	The project will preserve the value of the wood products that forests can sustainably deliver, maintaining a high productivity, while ensuring biodiversity protection. It will demonstrate management criteria that can be applied in different contexts to combine planning, production and biodiversity conservation, significantly improving the conservation status of forest species and habitats	U. DI SALVATORE CREA-PB CREA-FL	- Unione Europea	- Università di Würzburg - EFI European Forest Institute	- Progetto LIFE SPAN (LIFE19 NAT/IT/000104) Saproxylic Habitat Network: planning and management for European forests Conferenza 21/06/2021 - Assegni di ricerca - n.1
NEWTON NetWork per l'agrosilvicoltura in Toscana NetWork for agro-forestry in Tuscany	Promote agro-forestry (ASC) through the participatory dissemination of innovative technical-scientific knowledge among stakeholders, to: (i) enhance traditional ASC systems such as mixed olive growing, (ii) promote innovative ASC systems such as "forestry systems with polycyclic rows". The specific objectives of the GO are: (1) the creation of the regional network of knowledge for the ASC, (2) the development of the network of innovations by case studies in private and public companies and (3) the dissemination of knowledge and innovations through the opening of a web portal dedicated to ASC systems in Tuscany: www.newton.eu .	R. ACQUISTUCCI CREA-AA CREA-FL	- Regione Toscana		- Assegni di ricerca - n.2
Pasciona Monitoring of seed production of forest tree species, natural regeneration and relations with wildlife in the Forest Casentinesi, Monte Falterona, Campigna National Park	Analyze and predict the seed production of the main forest tree species within the Park in order to correctly manage the forests, and maintain their stability, taking care of the relations with the wildlife	A. CUTINI CREA-FL	- Foreste Casentinesi, Monte Falterona, Campigna National Park		
PAULOWNIA TRIA Influence of different doses of mineral fertilizer and water on the qualitative and quantitative production of timber in a clone of Paulownia spp.	Evaluation of the effects of fertilization and irrigation cultivation interventions on the qualitative and quantitative production of timber from a Paulownia spp.	G. NERVO CREA-FL	- TRONCHETTO RESEARCH S.r.l.		

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PRECISIONPOP Development of a multiscale monitoring system to support poplar plantation forestry in Lombardy region	Develop a multiscale monitoring system of poplar plantations in Lombardy region integrating precision forestry technologies	F. CHIANUCCI CREA-FL CREA-IT CREA-AA	- Regione Lombardia	- Articolo in rivista CHIANUCCI F.; PULETTI N.; GROTTI M.; BISAGLIA C.; GIANNETTI F.; ROMANO E.; BRAMBILLA M.; MATTIOLI W.; CABASSI G.; BAJOCCHI S.; LINYUANG L.; CHIRICI G.; CORONA P.; TATTONI C.(2021).Influence of image pixel resolution on canopy cover estimation in poplar plantation from field, aerial and satellite optical imagery.Annals of Silvicultural Research, 46, 1, 8-13. - Articolo in rivista D'Amico G; Francini S; Giannetti F; Vangi O; Travaglini D; Chianucci F; Mattioli W; Grotti M; Puletti N; Corona P.; Chirici G(2021).A deep learning approach for automatic mapping of poplar plantations using Sentinel-2 imagery.GIScience Remote Sensing, 58, 8, 1352-1368.DOI: 10.1080/15481603.2021.1988427.	- Workshop: Technical innovations to support poplar plantation forestry 13/10/2021 Viadana Final conference on Precision plantation forestry in Lombardy Mantova 27/09/2022
PREVAIL Statistical and econometric analysis of the efficiency of fire-fighting activities in the countries of Mediterranean Europe	Statistical and econometric analysis of the efficiency of fire-fighting activities in the countries of Mediterranean Europe	P. CORONA CREA-FL	- Università degli Studi della Toscana Dipartimento di Scienze dell'Ambiente Forestale e delle Su Risorse (DISAFRI)		
PROICOSMED Strengthening of the ICOS (Integrated Carbon Observation System) in which CREA participates with the Italy Observation Network in the Mediterranean	Strengthen the ICOS network (Integrated Carbon Observation System) in which CREA participates with the experimental site of Castelporziano. ICOS is an ESFRI strategic infrastructure of the European Community which includes marine, terrestrial sites and other sites where the main atmospheric parameters are studied to monitor the impact of climate change on ecosystems.	S. FARES CREA-FL	- MUR - Ministero dell'Università e della Ricerca		Assegni di ricerca - n.1
RINNOBIO Renewable Energy: advanced statistical analysis of the relationship between mechanization and reuse of lignocellulosic biomasses	Advanced statistical analysis of the relationship between mechanization and reuse of lignocellulosic biomasses	P. CORONA CREA-FL	- Università degli Studi della Toscana Dipartimento di tecnologie, ingegneria e scienze dell' Ambiente e delle Foreste (D.A.F.)		
S.M.A.R.T. School as world between Environment, Responsibility and Territory, the alliance that takes care of the Person	(Increase the demand of schools and teachers for outdoor learning by exploration of the surrounding natural environment. Support schools and teachers in the design of experiential outdoor paths using local spaces and helping them to include them in the curricular offer. Create virtuous and effective networks between public and private to design high quality learning ways outside the classroom in the natural environment.	G. PIGNATTI CREA-FL	- MUR – Ministry for University and Research		
S.I.MO.VA. Innovative tools for monitoring and estimating wood availability, for the	Provide Calabrian forestry companies with fast innovative systems and tools to monitor and quantify the consistency of their stands, to provide Decision Support Systems in order to better evaluate the business planning options, to classify the	R. TURCO CREA-FL	- Regione Calabria		

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹¹
enhancement and protection of forest biodiversity on corporate scale in Calabria	quality of the assortments before cuts, to enhance and protect biodiversity, in the general perspective of sustainable forest management.				
SU Start Up Azienda Forestale Alta Irpinia	Cooperazione per il supporto alla competitività delle filiere forestali attraverso la sperimentazione di una gestione attiva del patrimonio forestale dell'Alta Irpinia; Studi tecnici, analisi del contesto ambientale e socioeconomico dell'Area Interna dell'alta irpinia, anche attraverso mappatura, delle funzioni eco-sistemiche presenti o da incrementare sul territorio al fine di dare attuazione ad un Piano strategico e valorizzazione del patrimonio forestale dell'Area Interna	C. SALERNO CREA-PB	- Regione Campania		- Risorsa Acqua e Dissesto Idrogeologico nell'Area Interna Alta Irpinia 14/01/2021
TECNOVERDE Precision geomatic and environmental technologies for the monitoring and enhancement of ecosystem services of urban and peri-urban green infrastructures	Provide operational solutions aimed at the planning and integrated management of urban and peri-urban green areas; support the planning and management of urban green areas through inventories carried out by citizens (citizen science) and professionals;	S. FARES CREA-FL	- Regione Lazio		- Assegni di ricerca - n.1
VALAGRHO Agronomic evaluation of accessions of <i>Rhodiola rosea</i>	Compare from the agronomic point of view, by carrying out an experimental test in the open field, accessions of different origins of the plant species of medicinal interest <i>Rhodiola rosea</i> L. (Crassulaceae).	P. FUSANI CREA-FL	- INDENA S.P.A.		
VEG-GAP Vegetation for Urban Green Air Quality Plans	Provide and disseminate new information in urban areas regarding i) the simultaneous contribution of ecosystems as a source of atmospheric pollution removal; ii) the effects of ecosystems on urban air temperature (thermal island effect) and, consequently, on air pollution; iii) the risks to human health and forest ecosystems caused by climate change with particular reference to air pollution. The project aims to raise the awareness of stakeholders on the role of plants in biodiversity, on the extension of green areas and on the relationship with pollution levels, for ozone concentration (O3). The proposed approaches promote an integrated vision in space and time of pollution and of the role of green spaces / ecosystems to contrast it. The project will also provide support to the local strategy for the management of green infrastructures and to raise awareness among those interested in protecting and enhancing green areas.	S.FARES CREA- FL	Commissione Europea		
VigoForPoplar A short supply chain in the poplar system to enhance quality production	Creation of an Operational Group to develop a supply chain for poplar wood production, with benefits for all participants in the supply chain, from nursery to transformation industry	P.M. CHIARABAGLIO CREA- FL	Regione Piemonte		

2.9.2 Patents and Services

Patents INDUSTRIAL PATENTS

Products/ main topics	Denominazione/Descrizione	Autori/Inventori CREA	Centri CREA
wood production	Metodo speditivo supportato per la stima della massa legnosa di cataste organizzate (IT) <i>Co-titolarità: CNR + Università Reggio Calabria + Società F360</i>	S. Figorilli, C. Costa	CREA-IT

CREA PLANT VARIETY RIGHTS

PRODUCTS	DENOMINATION	AUTHORS	CREA CCENTRES
eucalyptus	VELINO	G.Mughini	CREA-FL
eucalyptus	VIGLIO	G.Mughini	CREA-FL
poplar	ALERAMO	CREA-FL	CREA-FL
poplar	BALDO	CREA-FL	CREA-FL
poplar	BRENTA	G.Lapietra	CREA-FL
poplar	DIVA	CREA-FL	CREA-FL
poplar	LENA	G.Lapietra	CREA-FL
poplar	MELLA	G.Lapietra	CREA-FL
poplar	MOLETO	Gras Maria De Los Angeles, G. Nervo, A. Giorcelli, G. Allegro, L. Vietto, S. Bisoffi, G. Castro	CREA-FL
poplar	MOMBELLO	Gras Maria De Los Angeles, G. Nervo, A. Giorcelli, G. Allegro, L. Vietto, S. Bisoffi, G. Castro	CREA-FL
poplar	MONCLAVO	Gras Maria De Los Angeles, G. Nervo, A. Giorcelli, G. Allegro, L. Vietto, S. Bisoffi, G. Castro	CREA-FL
poplar	OGLIO	CREA-FL	CREA-FL
poplar	ORION	CREA-FL	CREA-FL
poplar	SENNA	Gras Maria De Los Angeles, G. Nervo, A. Giorcelli, G. Allegro, L. Vietto, S. Bisoffi, G. Castro	CREA-FL
poplar	SOLIGO	G. Lapietra	CREA-FL
poplar	TARO	G. Lapietra	CREA-FL
poplar	TUCANO	CREA-FL	CREA-FL

CREA CLONES INCLUDED IN THE ITALIAN OFFICIAL LISTS

PRODUCTS	DENOMINATION	CREA CENTRES	PRODUCTS	DENOMINATION	CREA CENTRES
poplar	Adda	CREA-FL	poplar	Dvina	CREA-FL
poplar	Aleramo (83.141.020)	CREA-FL	poplar	Eridano	CREA-FL
poplar	Arno	CREA-FL	poplar	Guardi	CREA-FL
poplar	Baldo	CREA-FL	poplar	Harvard	CREA-FL
poplar	Bellini	CREA-FL	poplar	I-154	CREA-FL
poplar	Boccalari	CREA-FL	poplar	I-214	CREA-FL
poplar	Brenta	CREA-FL	poplar	I-262	CREA-FL
poplar	Carpaccio	CREA-FL	poplar	I-45/51	CREA-FL
poplar	Cima	CREA-FL	poplar	I-455	CREA-FL
poplar	Diva (83.002.031)	CREA-FL	poplar	Imola (83.160.029)	CREA-FL

poplar	Jean Pourtet	CREA-FL	poplar	Orion	CREA-FL
poplar	Lambro	CREA-FL	poplar	Panaro	CREA-FL
poplar	Lena	CREA-FL	poplar	San Martino	CREA-FL
poplar	Lima	CREA-FL	poplar	Senna (83.002.011)	CREA-FL
poplar	Luisa Avanzo	CREA-FL	poplar	Sesia	CREA-FL
poplar	Lux	CREA-FL	poplar	Sile	CREA-FL
poplar	Mella	CREA-FL	poplar	Soligo	CREA-FL
poplar	Moletto (83.190.012)	CREA-FL	poplar	Stura	CREA-FL
poplar	Mombello (84.048.032)	CREA-FL	poplar	Taro	CREA-FL
poplar	Moncalvo (83.024.017)	CREA-FL	poplar	Timavo	CREA-FL
poplar	Neva	CREA-FL	poplar	Triplo	CREA-FL
poplar	Oglio	CREA-FL	poplar	Tucano (84.260.003)	CREA-FL
poplar	Onda	CREA-FL	poplar	Villafranca	CREA-FL

3. CREA RESEARCH LINES BY CROSS CUTTING ISSUES

3.1. GENOMICS, BIOTECHNOLOGIES AND BIOINFORMATICS

Genome and its interaction with environment determine the development and performance of every living species. Advanced genomics coupled with the most recent bioinformatics knowledge are revolutionizing the way in which cultivated varieties are selected. CREA supports the international competitiveness of Italy in the field of genetics and genomics for the most important Italian crops, according to a vision that makes the genomic know-how a strategic asset for national agriculture.

The research in genomics area, to which the Research Centre for Genomics and Bioinformatics is dedicated, is characterized by scientific excellence testified by the high quality of the publications and relevant results ready to marker, including analytical methods and protocols for traceability and food safety, patents and varieties selected through genomic assisted breeding.

The genomic research has been applied to many crop species, both annual plant and trees, in addition to the microbial communities of the soil. They involve the following main themes:

Genome sequencing. CREA took part at the international initiatives for the sequencing of bread wheat, eggplant and olive genomes and coordinated the international consortium for the sequencing of the durum wheat genome. New research programs aiming to sequence several accessions representing large part of a species genetic diversity are currently in progress to describe the entire gene set of a crop (pangenome).

Study of genetic diversity and identification of genes that control important characters in cereal and vegetable species. Large collections of germplasm of barley, bread wheat, durum wheat, oats, rice, eggplant, asparagus, poplar, have been assembled and genotyped with the most advanced technologies. The work led to the identification and characterization of genes/genomic regions for traits involved in adaptation to the environment and climate change, genes controlling plant development and coding for resistance to diseases. This information is translated into plant selection programs to implement a work assisted by molecular markers and genomic selection for a knowledge-based plant breeding.

CREA bioinformatics facility. CREA has developed expertise in the field of bioinformatics dedicated to genome annotation, genomic selection, microbial genomics and metagenomics analysis of pangenomes (allele mining, copy number variation, etc.). These skills have contributed to CREA's action in the genome sequencing programs of bread and durum wheat and olive trees, in the study of genomic diversity for adaptation to the environment, in cereals and in the identification of key genes for domestication of aubergine.

A platform for functional genomics and genome editing. CREA coordinates the BIOTECH project (national project for genome editing and cisgenesis) and has developed a platform for genome editing and cisgenesis in several agricultural species (e. g. barley, wheat, rice, eggplant, tomato, basil, peach, citrus, grapevine, kiwi, poplar). The research has led to the acquisition of functional genomics knowledge on many genes, and to the selection of plants resistant to diseases or abiotic stresses as well as plants with improved quality traits or yield potential.

Genomic assisted breeding: models and programs for plant genetic improvement. CREA works for the development of genomic selection models applied to the main crop species in collaboration with private industry. Genomic selection protocols and methods for marker-assisted introgression of resistant gene and other traits (forward and background selection) are operational for many loci of significant interest. This action underlies an intense technology transfer activity that has led to the registration of numerous varieties of cereals, fruits, and horticulture crops.

Genomic strategies for assessment of quality and safety and traceability along the agri-food production. CREA has developed advanced analytical protocols for varietal fingerprinting and for



the identification and quantification of plant species, genomic tools for the study of kinship relationships between vines, diagnostic assays for the traceability of pathogens, characterization of the metagenome, molecular knowledge on the interactions between plant and soil microbiota in relation to the safety and quality of crops, both in conventional and organic farming. In this context, many collaborations have been activated with private sector (food industry and large-scale distribution).



3.1. Research and research products-Genomics, Biotechnologies and Bioinformatics

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹²
BARISTA Advanced tools for breeding BARley for Intensive and SusTainable Agriculture under climate change scenarios	BARISTA integrates Crop Simulation Modelling, Crop Ideotyping, Genomic Prediction and Genetic Analysis of key traits for barley resilience in order to make current breeding methods more efficient and develop genetic materials that can counteract the effects of climate change in different agro-ecological areas of Europe. BARISTA is based on phenotypic and genotypic data accumulated in previous projects on different genetic materials of interest for barley genetic improvement. Wp1. Development of predictive tools in the service of genetic improvement. Wp2. Genetic and physiological analysis of resilience traits to biotic and abiotic stresses Wp3. Development of new populations using haploid doublets and/or introgression lines through targeted backcrossing, based on the results obtained in Wp2 Wp4. Validation of the predictive models developed in Wp1 and selection of new genotypes within the populations developed in Wp3 Wp5. Project coordination and dissemination of results.	L. Cattivelli CREA-GB	MUR - Ministero dell'Università e della Ricerca Commissione europea	Latterini Francesco, Stefanoni Walter, Pari Luigi, Lazzarini Sandro, Sandu, Venanzi R., Di Marzio N, Tocci D., Picchio Rodolfo (2021). Heavy Gravity Cable Yarding in Italian Alps: Operation Planning and Logistic. Proceedings of the 29th European Biomass Conference and Exhibition (e-EUBC Virtual), 26-29 April 2021, pp. 298-300.	

¹² prototypes; dissemination activities (conferences, seminars, reports, sites and videos, etc.); training activities (scholarships, research grants and PhD scholarships).

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹²
BIOTECH_BIOSOSFRU	<ul style="list-style-type: none"> - To improve productivity and quality aspects of fruit species through interventions aimed at modifying plant and fruit architecture, promoting better interception of light energy and also facilitating cultural operations (pruning, harvesting) and improving pomological characteristics. To this end, genes involved in the determinism of plant architecture (PpTAC and orthologs) will be edited in peach, cherry and apricot. - To improve production stability by modifying the floral biology of self-incompatible species and mechanisms of flower differentiation. S gene responsible for self-incompatibility will be edited with CRISPR/Cas9 in pear. - Accelerating traditional genetic improvement programs by shortening the unproductive juvenile period. The FT gene will be introduced into peach through cisgenesis approaches. - To reduce the environmental impact of fruit production by introducing resistance factors to major diseases and pests, contributing to production stability, crop profitability and protection of operator health. For this objective, several Sharka susceptibility genes in peach will be edited with the aim of modifying host factors necessary for virus replication. In addition, the mirabolan Ma gene that confers wide-ranging resistance to nematodes of the genus Meloidogine will be introduced in peach or alternatively the nonfunctional ortholog of peach will be edited. 	I. VERDE CREA-OFA CREA-DC CREA-GB	MiPAAF - Ministero delle politiche agricole alimentari e forestali	Latterini Francesco, Stefanoni Walter, Pari Luigi, Lazzarini Sandu, Venanzi R, Tocci D., Picchio Rodolfo (2021) Precision Forest Harvesting: Wood Extraction Planning and Validation of Gis Models. Proceedings of the 29th European Biomass Conference and Exhibition (e-EUBC Virtual), 26-29 April 2021, pp. 32-35.	

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹²
BIOTECH_CISGET Cisgenesi e genome editing in pomodoro	The objectives that this project proposal intends to pursue are related to the great potential that new plant breeding techniques (NPBTs) can have in accelerating genetic improvement programs in tomato on the issues of environmental sustainability of cultivation, resistance to biotic and abiotic stresses, and improvement of organoleptic, nutritional, and technological quality of fruits. Specifically, it is intended to (i) introduce resistance to pest species; (ii) improve tolerance to water and excess salt stress; (iii) obtain new genotypes with improved nutritional characteristics and enhanced post harvest berry shelf life; and (iv) modulate the photosynthetic process by acting on genes responsible for photoprotection and dissipation of light energy.	A.NICOLIA CREA-OF	MiPAAF - Ministero delle politiche agricole alimentari e forestali	- Contributo in atti di convegno	
BIOTECH_COBIO BIOTECH	Coordinate the scientific and dissemination activities of the entire BIOTECH project, which consists of 13 subprojects each working on specific issues but all accumulating a common approach. The BIOTECH project acts on cereal species, horticultural species, fruit plant grapevine, olive tree and poplar with the aim of improving yield, resistance and quality characteristics of currently cultivated species. The activities planned within CoBio will help to have a common thread of the entire BIOTECH project, to define common operational strategies and to support the solution of experimental problems that could be shared by several business units.	L. CATTIVELLI CREA-GB	MiPAAF - Ministero delle politiche agricole alimentari e forestali	Latterini Francesco, Stefanoni Walter, Pari Luigi, Lazar Sandu, Venanzi R., Tocci D., Di Marzio N., Picchio Rodolfo (2021). Work Productivity Analysis in Thinnir Intervention of Chestnut Coppice in Central Italy. Proceedings of the 29th European Biomass Conference and Exhibition (e-EUBCE Virtual), 26-29 April 2021, pp. 301-303.	
BIOTECH_GENOLICS	To create the prerequisites for the application of modern biotechnology in olive trees as well. The project has two specific goals: to develop regeneration protocols in olive tree and to identify editable alleles/variants for the application of genome editing technique.	S. ZELASCO CREA-OFA CREA-OF	MiPAAF - Ministero delle politiche agricole alimentari e forestali	- Contributo in atti di convegno	
BIOTECH_GEO Genome editing per il miglioramento della resistenza di <i>Ocimum basilicum</i> a <i>Peronospora belbahrii</i>	To deepen the knowledge regarding the resistance of <i>Ocimum basilicum</i> to <i>Peronospora belbahrii</i> , and to use genome editing technology to obtain downy mildew-resistant basil plant clones of a commercial cultivar. Specifically, the objectives of GEO are to i) Identify the key factors of host-pathogen interaction ii) Characterize the molecular function of the genes involved iii) Obtain constructs for genome editing, iiiii) Produce edited basil plants, putatively resistant to <i>P. belbahrii</i> .	M. SAVONA CREA-OF	MiPAAF - Ministero delle politiche agricole alimentari e forestali	Picchio Rodolfo, Stefanoni Walter, Pari Luigi, Lazar Sandu, Venanzi R., Tocci D., Latterini Francesco (2021). Work Productivity Evaluation of Different Harvesting Systems in Oak Coppice Stands. Proceedings of the 29th European Biomass Conference and Exhibition (e-EUBCE Virtual), 26-29 April 2021, pp. 260-262.	
BIOTECH_PATHORES	The objectives of this project are to (i) learn about the genetic variability and geographic distribution of phytopathogenic microorganisms of species of agricultural interest and their interaction with the host plant, and (ii) develop rapid, effective and economical screening methods.	A. INFANTINO CREA-DC	MiPAAF - Ministero delle politiche agricole alimentari e forestali	- Contributo in volume (Capitolo o Saggio) Aragona Maria; Infantino Alessandro; Valente Maria Teresa; Grottoli Alessandro; Haegi Anita (2021).Genome Evolution of Fungal Plant Pathogens.Encyclopedia of Mycology, 1, 123-133.DOI: 10.1016/B978-0-12-819990-9.00053-6. - Curatore La Torre Anna; Polito Alessandro (2021).STRATEGIE DI BASSO IMPATTO AMBIENTALE PER LA DIFESA DELLA VITICOLTURA DA ERYSIPHE NECATOR.	

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹²
BIOTECH_QUALIMEC	Exploiting cisgenesis and genome editing, to improve some agronomically relevant traits of two typical 'made in Italy' vegetable species such as eggplant (<i>S. melongena</i> L.) and artichoke (<i>Cynara cardunculus</i> var. <i>scolymus</i> L.). Eggplant is a typical Mediterranean vegetable with Italy, Spain and Greece among the countries most involved in its cultivation in the EC, along with Turkey and Egypt. There are many local varieties that differ in fruit characteristics (skin and flesh coloration, shape and size, texture etc) and multiple culinary preparations and typical dishes. Italy is the world's largest producer of artichoke and hosts the richest germplasm in cultivation that differs in numerous phenotypic and biological characteristics (e.g., earliness, thorniness, bract coloration). Artichoke is cultivated both for fresh consumption or industrial processing/preservation and for the extraction of compounds having, among others, nutraceutical/healthy action.	G.L. ROTINO CREA-GB CREA-DC			- Borse di studio - n.4
BIOTECH_SBEVAL	1. Evaluation of the economic and social impact of the introduction of new genetic traits in typical Italian food crops 2. Identification of economic, regulatory, and legal obstacles to the application of research results	A. ZEZZA CREA-PB	MiPAAF - Ministero delle politiche agricole alimentari e forestali		
BIOTECH_SUSRICE	The objectives of this subproject are aimed at improving the above mentioned traits (water and nitrogen use efficiency and plant architecture) through the introduction of favorable traits, obtained by genome editing and cisgenesis, in the traditional Italian rice variety Vialone Nano, whose cultivation is widespread in Italy (about 5,000 ha in 2017, which also includes a PGI production in the Veronese region). These actions will make it possible to increase the yield, environmental adaptability, and resource use efficiency of this traditional variety and will be the starting point for the extension of these improvement procedures to other traditional and nontraditional rice varieties.	P. VACCINO CREA-CI CREA-GB			
BIOTECH_WHEADIT	Exploiting genome editing, to accelerate the genetic improvement of straw cereals and in particular of durum wheat, a species that represents a significant part of the made-in-Italy food but for which domestic production is largely insufficient. Specifically, WHEADIT aspires to (i) identify the key factors that determine yield in straw cereals, (ii) characterize their molecular function, and (iii) modify their activity in order to develop varieties with increased yield compared to current varieties.	L.CATTIVELLI CREA-GB		- Articolo in rivista Anna Maria Mastrangelo; Luigi Cattivelli (2021). What Makes Bread and Durum Wheat Different?. Trends in Plant Science, 26, 7, 677-684. DOI: 10.1016/j.tplants.2021.01.004. - Articolo in rivista Francesco Citiulo; Cristina Crosatti; Luigi Cattivelli; Chiara Biselli (2021). Frontiers in the Standardization of the Platform for High Scale Production of Vaccines. Plant 10:9 DOI: 10.3390/plants10091828	

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹²
Bras Explor Wide exploration of genetic diversity in Brassica species for sustainable crop production	<p>Mediterranean agriculture has to face great challenges to overcome global warming and improve farming system sustainability while maintaining crop production and quality. Regarding crop improvement there are at least two main questions to consider: (i) which type of genetic diversity should we produce to withstand the new climate regime and (ii) on which material can we develop relevant varieties in this erratic context. Intensive farming systems and particularly modern breeding methods have driven a drastic decrease of cultivated genetic diversity. However, local landraces and wild forms are a great source of new genetic diversity. They represent the main levers to tackle the above mentioned challenges but for most crop species this material was never collected or is not available or has been poorly analyzed. The Mediterranean region comprises a large diversity of landscapes and exhibits highly contrasted environmental conditions (climate, soils and biotic factors). The phenotypic and genetic variations of natural populations or traditionally cultivated populations growing along these environmental gradients have been shaped by the local environmental contexts. Exploring such populations represents a unique opportunity to identify relevant material and their adaptive traits to face upcoming climate change in the Mediterranean area and so to contribute to biodiversity-based agriculture in this area.</p> <p>Here, we propose to explore the diversity of two economically important vegetable species of the Brassica genus, <i>B. oleracea</i> and <i>B. rapa</i>. We will collect locally cultivated varieties such as cauliflower, broccoli, cabbage, kale, kohlrabi for <i>B. oleracea</i> and turnip or turnip rape for <i>B. rapa</i>. In addition, we will collect natural populations of these two species across a broad environmental gradient encompassing climate and soil variation. This broad sampling will be used to (i) identify genomic regions involved in the adaptation of <i>B. oleracea</i> and <i>B. rapa</i> to environmental variation, (ii) determine the genetic bases of these traits underlying local adaptation and (iii) develop new agronomic material with relevant traits in the context of climate change for both Brassica species. To this aim, we propose to analyze genome-wide patterns of nucleotide variation over environmental gradients and to investigate for specific associations between environmental variables (climate variables and soil edaphic and biotic variables) and DNA variation, reflecting an adaptive role of the underlying genetic variation. Brassica oleracea (cabbage, cauliflower, kale and broccoli) and <i>B. rapa</i> (turnip) are particularly relevant models for this analysis because both species are native of the Mediterranean basin (Qi et al. 2017; Bird et al. 2017) and are worldwide consumed. They are originally present from the north of France to the south of North Africa and their distribution areas cover highly contrasted climates (temperatures, water availability) and soils (structure, microbiome conditions). The wild diversity of these two plant species has not been gathered yet and is poorly characterized. In this project, we will provide in collaboration with end-users, (i) a new strategy to identify relevant variability, (ii) new genetic resources for these species, by collecting both natural populations and local landraces from a large set of countries around the Mediterranean basin, (iii) management strategies for this material and (iv) agronomic uses of this genetic diversity in biodiversity-based farming systems through both the resources themselves and original pre-breeding population.</p> <p>When collecting local landraces, we will conduct surveys on the use and farming practices associated with the different collected varieties by asking local farmers. For both natural populations and local landraces, we</p>	V. TERZI CREA-GB	¹³ MUR - Ministero dell'Università e della Ricerca		

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ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹²
	will also gather data on climate (using the WorldClim database) and soil properties, including physical characteristics and microbiome diversity. Both climate and soil data will be used in genomic association methodologies, which are designed to detect genes or genomic regions associated with the adaptation of populations to environmental variables (see for example Hancock et al., 2011; Burgarella et al., 2016). The investigation of how plant genetic diversity can be related to the soil microbiome diversity and composition is an original and pioneering component in these two Brassica species of our project. Indeed, numerous studies have shown that plants selectively recruit microbes (bacteria, fungi and protists) from the soil to establish a complex, yet stable and predictable community of root microbiota (Weinert et al. 2010; Thompson et al. 2015). It is assumed that (i) physico-chemical soil properties (Bakker et al., 2015), and (ii) rhizodeposits (Haichar et al. 2008) act as environmental filters for the enrichment of specific microorganisms (Bulgarelli et al., 2012; 2013), while (iii) host genotype-dependent fine-tuning at the rhizosphere, further selects specific root-associated microbial consortia (van der Heijden & Schlaeppi, 2015). By adopting a novel Genomic-Environmental-Association (GEA) approach (Frachon et al. 2018; 2019), controlling for both abiotic factors and plant population structure (Gautier 2015), we will provide insights into the role of plant genetics on the functional variation occurring into the soil microbiome of highly variable <i>Brassica species</i> .				
BRUGEN	Development of a diagnostic test based on cell-mediated immunity to support brucellosis diagnosis. Study of mechanisms underlying resistance to brucella infection. WGS sequencing of the genome of brucella isolated in outbreaks with the aim of fine characterizing the different strains that may be present. Study of changes in lymphocytic and monocytic subsets during Brucella infection.	L. ORRU' CREA-GB	Ministero della salute		
C4C CropsForChange Tackling the global warming effects in crops.	Select eggplant and grain lines tolerant to dryness and high temperatures	G. LEONARDO ROTINO CREA-GB	¹⁴ Commissione europea		
CEREALMED Enhancing diversity in Mediterranean cereal farming systems	Development of sustainable strategies to increase cultivated biodiversity in Mediterranean environments, with special reference to cereal cropping systems	E. MAZZUCOTELLI CREA-GB CREA-CI CREA-AA	¹⁵ MUR - Ministero dell'Università e della Ricerca	- Articolo in rivista Tuberose Roberto; Cattivelli Luigi; Ceriotti Aldo; Gadalete Agata; Beres Brian; Pozniak Curtis (2021). Editorial Proceedings of FSTP3 Congress – A sustainable durum wheat chain for food security and healthy lives. Frontiers in Plant Science, 12, DOI: 10.3389/fpls.2021.675511 - Articolo in rivista Soresi Daniela; Bagnaresi Paolo; Crescente Juan Manuel; Díaz Marina; Cattivelli Luigi; Vanzetti Leonardo; Carretero Alicia (2021). Genetic characterization of a Fusarium head blight resistance QTL from Triticum turgidum ssp. dicoccoides. Plant Molecular Biology Reporter, 39, 710-726. DOI: 10.1007/s11105-020-01277-0.	

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• Université Mohammed Premier (UMP)
• UMKO, University of Kasdi Merbah • Stellenbosch University • MIPAAF - Ministero delle politiche agricole alimentari e forestali

¹⁵ • National Institute For Agricultural Research (INRA-Morocco) • University Hassan 1st, FST de Settat • University of Cukurova • Beni-Suef University • American University of Beirut (AUB) • Agencia Estatal Consejo Superior de Investigaciones Científicas
• UNIVERSIDADE DE SANTIAGO DE COMPOSTELA USC

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹²
				- Articolo in rivista Andrea Volante; Delfina Barabaschi; Rosanna Marin Andrea Brandolini Genome-wide association study for morphological phenological, quality, and yield traits in einkorn (Triticum monococcum L. subsp. monococcum) G3 Genomes, Genetics 11: 11 DO 10.1093/g3journal/jkab281	
Certificazione Aposcaligera Contratto per la realizzazione di servizio di certificazione genetica sanitaria del materiale di propagazione vegetale della fragola della fragola in Veneto.	Apo Scaligera, adhering to the National Strawberry Certification Process is interested in acquiring the certification service for strawberry plants; CREA-OFA, as a Conservation Center for Premultiplication (CCP) (M.D. 30245, 07.09.2005 and M.D. 05.04.2018) and Premultiplication Center (M.D. 30245, 07.09.2005) - first stage (CP1) for strawberry plant propagation plant material, recognized under the National Voluntary Certification Service for Fruit Plant Material has the necessary skills and knowledge to carry out: to provide the requested service.	G. BARUZZI CREA-OFA	A.P.O. SCALIGERA SOC.COOP.		
COCOTETRA Trattamento con agente poliploidizzante in anguria	Induction of tetraploidy in watermelon by in vivo treatment with polyploidizing agent	G.L. ROTINO CREA-GB	ESASEM		
	Molecular Traceability, Plant Growth Promoting Rhizobacteria, Use of High Functional Impact Plant Species and Varieties to Obtain High Value Foods	V. TERZI CREA-GB	Gruppo industriale italiano		
ConnectFarms Connecting sustainable agroecosystems and farming with circular bioeconomy and new technologies	-demonstrate how to improve production and quality of crop (food/feed) and livestock, integrating them in specific European context -showcase the exploitation of precision farming and ICT resources for achieving integration of crops and livestock -use novel methods of data mining tools, machine learning algorithms and big data analysis to manage and georeference spatio-temporal data; -use amendments from reuse of residues and byproducts, such as biochar, to improve soil quality and boost plant production -explore alternative uses of biochar and char in livestock welfare improvement; -conduct research on soil functionalities -show how integrated and organic farming with precision agriculture can be adopted together, optimising their benefits -perform life cycle analysis and ecosystem services evaluation of the proposed solutions in view of EU policies and compliance with circular economy -deliver a toolbox for surplus productivity for stakeholders, politicians and farmers.	V. TERZI CREA-GB CREA-ZA	MiPAAF - Ministero delle politiche agricole alimentari e forestali Commissione europea		
CORE-SAVE	Biodiversity exploration within some plant species, phenotypic and molecular characterization of horticultural/cereal species	L. TOPPINO CREA-GB	Regione Lombardia		

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COST Action CA15223 IPLANTA Modifying plants to produce interfering RNA.	COST Action CA15223 IPLANTA-Modifying plants to produce interfering RNA.	V. ILARDI CREA-DC	European Commission and others Austria, Belgio, Bosnia - Herzegovina, Bulgaria, Croatia, Czech Republic, Danimarca, Estonia, Finlandia, Francia, Germania, Grecia, Ungheria, Irlanda, Israele, Latvia, Lituania, Paesi Bassi, Macedonia, Norvegia, Polonia, Portogallo Romania, Serbia, Slovakia, Slovenia, Spagna, Svezia, Svizzera, Turchia, UK		
DIBIO_BIOPRIME Composti naturali e microorganismi per la difesa ed il PRiming di colture BIOlogiche MEDiterranee	Identification and evaluation of natural botanical microorganism molecules and compounds useful for biological crop defense.	V. TERZI CREA-GB CREA-ZA CREA-VE CREA-AA	MiPAAF - Ministero delle politiche agricole alimentari e forestali	- Contributo in volume (Capitolo o Saggio) di Gacem Mohamed Amine; Terzi Valeria; Khelil Aminat Houli-El-Hadj(2021).Zinc nanostructures: Detection and elimination of toxigenic fungi and mycotoxins.Zinc-Based Nanostructures for Environmental and Agricultural Applications Nanobiotechnology for Plant Protection, Part II, 403-430.DOI: 10.1016/B978-0-12-822836-4.00006-9.	
DIBIO_Coordinamento	DIBIO has three macro-objectives, which are: 1. the development of phytopathological defense strategies in organic agriculture in light of the reduction of the possibility of using copper; 2. the definition of means and protocols afferent to the use of natural biocidal substances, resistance inducers, biocontrol agents allowed in organic farming for seed treatment; 3. the selection of varieties resistant to major seed-borne diseases based on the expertise and germplasm conserved and developed under breeding programs. Each of the three macro-objectives is broken down into specific objectives, identified in the BIOPRIME, INSOBTEC, CUPROSUI, CONCIABIO and CERESBIO sub-project sheets.	V. TERZI CREA-GB	MiPAAF - Ministero delle politiche agricole alimentari e forestali		
FRAMONT	To evaluate the influence of genotype (strawberry variety) on the productivity and expression of the main quality characteristics of strawberry fruit (e.g., color, texture, Brix, polyphenol and vitamin content) in an upland environment.	F. SCOSSA CREA-GB CREA-OFA	ARSIAL		

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹²
G2P-SOL Linking genetic resources, genome and phenotypes of Solanaceous crops	Genetic and phenotypic characterization of eggplant and bell pepper collections. Utilization of useful agronomic and quality traits in eggplant and bell pepper genetic improvement programs.	G. L. ROTINO CREA-GB CREA-OF	¹⁶ Commissione Europea	<p>- Contributo in volume (Capitolo o Saggio) Laura Toppino; Jaime Prohens; Giuseppe Leonardo Rotino; Mariola Plazas; Mario Parisi; Carolina Carriz Garcia; Pasquale Tripodi (2021).Pepper and Eggplant Genetic Resources .The Wild Solanums Genome Compendium of Plant Genomes. , 6, 119-154.DOI: 10.1007/978-3-030-30343-3_6.</p> <p>- Articolo in rivista Florio Elia Francesco; Gattolin Stefano; Toppino Laura; Bassolino Laura; Marta Fibiani; Lo Scalzo Roberto; Rotino Leonardo Giuseppe (2021).A SmelAAT Acyltransferase Variant Causes a Major Difference in Eggplant (Solanum melongena L.) Peel Anthocyanin Composition.International Journal of Molecular Science 22,DOI: 10.3390/ijms221791717.</p> <p>- Articolo in rivista Pasquale Tripodi; Mark Timothy Rabanus-Wallace; Lorenzo Barchi; Sandip Kale; Salvatore Esposito; Alberto Acquadro; Roland Schafleitner; Maarten van Zonneveld; Jaime Prohens; Maria José Diez Andreas Börner; Jérémy Salinier; Bernard Carome Arnaud Bovy; Filiz Boyaci; Gancho Pase Ronny Brandt;Axel Himmelbach; Ezio Portis; Richard Finker; Sergio Lanteri; Ilan Paran; Véronique Lefebvre; Giovanni Giuliano; Neil Stein.(2021).Global range expansion history of pepper (Capsicum spp.) revealed by over 10,000 genebank accessions.Proceedings of the National Academy of Sciences (Proceedings of the National Academy of Sciences USA, 118, 34,DOI: 10.1073/pnas.2104315118).</p> <p>- Articolo in rivista Maria Sulli; Lorenzo Barchi; Laura Toppino; Gianfranco Diretto; Tea Sala; Sergio Lanteri; Giuseppe Leonardo Rotino; Giovanni Giuliano (2021).An eggplant recombinant inbred population allows the discovery of metabolic QTLs controlling fruit nutrition quality.Frontiers in Plant Science, 12, 614-.DOI: 10.3389/fpls.2021.639336.</p> <p>- Articolo in rivista Lorenzo Barchi; Mark Timothy Rabanus-Wallace; Jaime Prohens; Laura Toppino; Sudharsan Padmarasu; Ezio Portis; Giuseppe Leonardo Rotino; Neil Stein; Sergio Lanteri; Giovanni Giuliano (2021).Improved genome assembly and pan-genome provide key insights on eggplant domestication and breeding.Plant Journal, 102, 579-596.DOI: 10.1111/tpj.15311.</p> <p>- Articolo in rivista Pietro Gramazio; Jaime Prohens; Laura Toppino; Mario Plazas(2021).Editorial: Introgression Breeding in</p>	

¹⁶¹⁶ Agricultural Research Organisation of Israel - The Volcani Centre ARO • The World Vegetable Center (AVRDC) • The James Hutton Institute (JHI) • Hebrew University of Jerusalem (HUJI) • INRA - Institut National de la Recherche Agronomique • Centro Internacional de la Papa (CIP)• Leibniz Institute of Plant Genetics and CROP Plant Research IPK• Universitat Politècnica de Valencia• Plant Breeding and Acclimatization Institute (IHAR)• Ministry of Food, Agriculture and Livestock (BATEM)• Stichting Dienst Landbouwkrunderzoek - Research institute Praktijkonderzoek Plant Omgeving / Plant Research International• Maritsa Vegetable Crops Research Institute (MVCRI)• Phenom Networks• Eurice - European Research and Project Office GmbH

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹²
				Cultivated Plants..Frontiers in Plant Science, 12, 1-2.DO 10.3389/fpls.2021.764533.	

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹²
GEN4OLIVE Mobilization of Olive GenRes through pre-breeding activities to face the future challenges and development of an intelligent interface to ensure a friendly information availability for end users	The overall goal of GEN4OLIVE is to accelerate the mobilization of olive GenRes and to foster pre-breeding activities by (1) developing a smart and user-friendly interface that will implement Artificial Intelligence utilities to leverage the olive GenRes resources; and (2) enhancing breeders and growers' participation through the implementation of two open calls for supporting pre-breeding activities and breeding plans.	E.PERRI CREA-OFA	¹⁷		- GEN4OLIVE INFODAY MATCHMAKING 21/09/2021 - Assegni di ricerca - n.2

¹⁷ HELLENIC UNION OF NURSERIES • Ministry of agriculture and forestry • Focos GbR • HELLINIKOS GEORGIKOS ORGANISMOS - DIMITRA / HELLENIC AGRICULTURAL ORGANIZATION (HAO) - DEMETER • Centre National de la Recherche Scientifique • ANKARA UNIVERSITESI • Universidad de Granada • Galvez Productos Agroquímicos SLU • CAMBRICO BIOTECH, S.L. • UNIVERSIDAD DE JAEN • UNIVERSIDAD DE CORDOBA • Fundación Corporación Tecnológica de Andalucía • SANTA CRUZ INGENIERIA SL • Institut National de la Recherche Agronomique du Maroc

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹²
GENDIBAR Utilization of local genetic diversity to understand and exploit barley adaptation to harsh environments and for pre-breeding	Climate change in the Mediterranean environments is projected to rise day and night average temperatures, reduce rainfall and increase the risk of heat waves [1–4]. This is expected to have a profound impact on Mediterranean agriculture and plant productivity, particularly winter cereal crops, which are strategically and economically important in the region. Therefore, GENDIBAR intends to provide new knowledge to fill the research gaps for adapting barley farming to the future environment to secure the production of cereal foods across Mediterranean countries. By focusing in barley, GENDIBAR will capitalize on the large genomic resources, germplasm collections and phenotypic data produced for this crop in the framework of other European projects and transnational initiatives (1.3.3). Specifically, GENDIBAR aims to achieve the following objectives: 1. Assembling a collection of local geo-referenced barley landraces, along with crucial bioclimatic variables of collection sites in Mediterranean agro-ecological zones (WP1; scientific objective). 2. Identifying genetic signatures of barley adaptation at whole genome and adaptation syndromes at wellknown key genes, along with alleles for biotic stress resistance (WP2; scientific objective) 3. Characterizing the morphological, histological and genetic basis of heat response in the development of the reproductive structures of a selected panel of barley Mediterranean genotypes and of nearisogenic lines (WP3; scientific objective). 4. Improving model-aided design for creating realistic and achievable barley ideotypes based on actual field data for the different Mediterranean agro-ecological zones and future climate conditions along with the implementation of pre-breeding programs to enable the creation of tolerant and resilient barley varieties (WP4; technological and industrial objective). 5. Transferring of the established genetic material knowledge and technologies to the stakeholders and providing hypotheses for new good agricultural practices aimed at minimizing the effects of climate change in current and future Mediterranean environments (WP5; technological and industrial objective)	A. FRICANO CREA-GB	MUR - Ministero dell'Università e della Ricerca		

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹²
iBarMed Innovative barley breeding approaches to tackle the impact of climatic change in the Mediterranean region	The project objectives are to 1) develop a genetic improvement program based on genomic selection in barley in the Mediterranean region, 2) identify drought-tolerant barley lines 3) identify and map traits that confer drought tolerance in barley.	A. FRICANO CREA-GB	MIPAAF - Ministero delle politiche agricole alimentari e forestali	<ul style="list-style-type: none"> - Contributo in volume (Capitolo o Saggio) Fricano Agostino; Battaglia Raffaella; Mica Erica; Tondelli Alessandro; Crosatt Cristina; Guerra Davide; Cattivelli Luigi (2021).Genetic Diversity for Barley Adaptation to Stressful Environments.Genomic Designing for Abiotic Stress Resistant Cereal Crops, 153-192.DOI: 10.1007/978-3-030-75875-2. - Articolo in rivista Puglisi Damiano; Delbono Stefano; Visioni Andrea; Ozkan Hakan; Kara Ibrahim; Casas Ana M; Igartua Ernesto; Valenti Giampiero; Lo Piero Angela Roberta; Cattivelli Luigi; Tondelli Alessandro; Fricano Agostino (2021).Genomic Prediction of Grain Yield in a Barley MAGIC Population: Modeling Genotype per Environment Interaction.Frontiers in Plant Science, 12,DOI: 10.3389/fpls.2021.664148. 	

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹²
INVITE INnovations in plant Variety Testing in Europe to foster the introduction of new varieties better adapted to varying biotic and abiotic conditions and to more sustainable crop management practices	<p>The aim of the INVITE project is to foster the introduction of new varieties with high resilience towards biotic and abiotic stresses, high adaptation to sustainable management practices, and high resource use efficiency (RUE), through improved variety testing and better information to stakeholders on variety performance under a range of contrasting production conditions. This will be exemplified by major crop species that represent the main features of propagation, food and feed uses, and exhibit significant breeding activity in the EU.</p> <p>To reach this overall objective, INVITE will:</p> <ol style="list-style-type: none"> 1. Identify crop characteristics and bioindicators associated with plant RUE, adaptation to sustainable cropping systems, and resilience to variable and more challenging environmental conditions. (WP1) 2. Develop new phenotyping and genotyping tools to assess bioindicators related to better adaptation to more sustainable crop management practices and variable climatic conditions; as well as to enhance the speed, accuracy and efficiency of variety testing. (WP2 & WP3) 3. Build crop models and statistical tools allowing prediction of variety performance under a range of agro-ecological environments and crop management practices, while considering the economic return for producers and other supply chain actors. (WP4) 4. Improve existing variety testing protocols for variety characterisation (Distinctness, Uniformity and Stability –DUS) and performance testing (including, but not limited to, Value for Cultivation and Use – VCU) to enhance speed, precision and efficiency, and, where appropriate, to integrate sustainability criteria. (WP5) 5. Define new procedures for the management of reference collection (WPS) 6. Propose organisational innovations to improve variety testing networks, taking into account their socio-economic and environmental impacts. (WP6) 7. Deliver recommendations to policy makers to improve harmonisation of DUS and VCU testing at the EU-level, including, where appropriate, new traits in DUS and VCU testing, and for the testing of heterogeneous plant material. (WP5 & WP6) 8. Facilitate data interoperability and exchanges within the consortium and set up of a prototype of common database to store phenotypic and genotypic variety data and provide a user-friendly interface for Examination Offices (EOs) and Post-Registration Organisations (PROs) (WP7) 9. Design a prototype Decision Support System for Variety Choice (DSSVC) based on expectations of breeders and farmers which will include predictions of variety performance for various environmental and production conditions. (WP4 & WP8) 10. Disseminate the results and the new technologies to relevant stakeholders to optimise their exploitation. (WP8) 	V. TERZI CREA-GB CREA-DC CREA-ZA	Commissione Europea	<p>- Articolo in rivista Morcia, Caterina; Terzi, Valeria; Ghizzoni, Roberto; Vaiuso, Chiara; Delogu, Chiara; Andreani, Lorella; Venturini, Andrea; Carnevali, Paola; Pompa, Pier Paolo; Tumino, Giorgio (2021). Digital PCR for Genotype Quantification: A Case Study in a Pasta Production Chain. <i>Biology</i>, 10, 5, DOI: 10.3390/biology10050415</p> <p>- Articolo in rivista Caterina Morcia; Raffaella Bergami; Sonia Scaramaglia; Chiara Delogu; Lorella Andreani; Paola Carnevali; Giorgio Tumino; Roberta Ghizzoni; Valeria Terzi (2021). A Digital PCR Assay to Quantify the Percentages of Hulled vs. Hulled Wheat in Flours and Flour-Based Products. <i>Biology</i>, 10, 11, DOI: 10.3390/biology10111138</p>	
MIGLIORE	Produce innovation in the regional horticultural supply chain with the validation of new products and processes. In particular, new genotype of two key crops for the Sicily region, tomato and eggplant, efficient for nitrate uptake, will be introduced into the horticultural production system. The introduction and support of new biostimulant/bio-fertilizer formulations will allow the definition of agronomic and cultivation specifications better suited to a low environmental impact agriculture that favors the use of high resilience genotypes in conventional and non-conventional horticultural systems.	G.L. ROTINO CREA-GB	Regione Siciliana		- Borse di studio - n.1

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MIRALO	Selection of maize genotypes with higher root system efficiency according to the following logical-temporal steps: - characterization of maize lines genotypically and phenotypically (by root system traits under controlled condition); - use of Genomic Prediction (GP) for the identification of the most promising lines through an index taking into account root traits, historical agronomic traits and genetic distances; - crossing of selected lines according to an NCII scheme and evaluation of hybrids by agronomic traits, Water Use Efficiency (WUE) and root characteristics. - possible registration of the hybrids obtained for cultivation in the Lombardy environment.	G. MAZZINELLI CREA-CI	Regione Lombardia		
MULTIFLORA	The project intervenes on Focus area 1: Stimulating innovation and knowledge base in rural areas and aims to lay the foundations and stimulate the start-up of a production chain for the floriculture sector that can make the most of the multifunctionality of ornamental species. It is therefore intended to introduce innovative ornamental products to the market in form (e.g., new products), content (e.g., zero residues) and uses (e.g., parallel extractive uses dedicated to wellness) or to identify new species or varieties from the biodiversity of the area	B. RUFFONI CREA-OF	Regione Liguria		- Borse di studio - n.1
NINGIA-SOS	Obtaining new natural bio-insecticides based on plant extracts from Brassicaceae and Solanaceae, also obtained from agro-industrial supply chain wastes, for sustainable control of phytophagous insects for horticultural farms in Latium (Romanesco broccoli, cauliflower, lettuce and lamb's lettuce).	S. BAIMA CREA-GB	Regione Lazio		

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OLGENOME	Sequencing and assembling of the olive (cv. Leccino) genome, Gene annotation, Identification and characterization of genes expressed in cv. Leccino for genome assembling and annotation.	F.CARBONE CREA-OFA CREA-GB	MiPAAF - Ministero delle politiche agricole alimentari e forestali	<ul style="list-style-type: none"> - Articolo in rivista Salimonti Amelia; Forgione Ivano; Sirangelo Tiziana Maria; Puccio Guglielmo; Mauceri Antonio; Mercati Francesco; Sunseri Francesco; Carbone Fabrizio (2021).A COMPLETE GENE NETWORK MEDIATED BY ETHYLENE SIGNAL TRANSDUCTION TFS DEFINES THE FLOWER INDUCTION AND DIFFERENTIATION IN OLEA EUROPAEA L. .Genes, 12, 4,D0I: 10.3390/genes12040541 - Articolo in rivista Carbone Fabrizio; Salimonti Amelia; Zelasco Samanta (2021).Il genoma dell'olivo sequenziato dal Crea.Olivo Olio, 24, 4, 22-23 - Abstract in atti di convegno Carbone Fabrizio; Scalabrin Simone; Bagnaresi Paolo; Tacconi Gianni; Salimonti Amelia; Zelasco Samanta; Forgione Ivano; Sirangelo Tiziana Maria; Desideri Francesca; Cattivelli Luigi; Morgante Michele (2021).NEW REFERENCE GENOME SEQUENCE FOR CULTIVATED OLIVE TREES - Abstract in atti di convegno SIRANGELO TIZIANA MARIA; SALIMONTI AMELIA; FORGIONE IVANO ZELASCO SAMANTA; VENDRAMI ELISA; ANGILBERG F.;FANIZZI F. P.; BENINCASA CINZIA; CARBONE FABRIZIO (2021).GENETIC AND DEVELOPMENT FACTORS AFFECT THE EXPRESSION OF GENES INVOLVED IN FATTY ACID AND PHENYLPROPANOID BIOSYNTHESIS AND IN LIGHT SIGNAL TRANSDUCTION IN OLIVE FRUITS. 	<ul style="list-style-type: none"> - Sequenziamento del genoma dell'olivo: stato dell'arte e prospettive future 30/06/2021 - Progetto OLGENOME: i risultati - Completamento del sequenziamento del genoma dell'olivo e annotazione dei geni 30/04/2021 - Assegni di ricerca - n.2
PEPERANT Coltura d'arter finalizzata alla fornitura di piante androgenetiche di peperoncino	Obtaining androgenic pepper seedlings	G.L.ROTINO CREA-GB	SASEM		
Plant-RED Exploiting the "PlantArray" physiologic phenotyping platform for improving wheat and barley RESilience to Drought	The proposal falls under the area 2. Development of climate resilient crop varieties in the overall scenario of ongoing changes in the Mediterranean basin.	A.TONDELLI CREA-GB	Hebrew University of Jerusalem (HUJI) - MAEC Ministero degli affari esteri e cooperazione internazionale		
PreBreAsp Sviluppo di materiali pre-breeding in asparago	Obtaining pre-breeding genetic material of asparagus	A. LOSA CREA-GB	Rijk Zwaan Zaadteelt en Zaadhandel B.V.		

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PROCAFAA Produrre canapa nella filiera alimentare e agroindustriale.	The Partner plays a role in research and genetic selection of hemp varieties adapted to the cultivation environment, which has already produced some varieties certified and allowed for cultivation. The specific scientific and professional expertise of CREA CI in Rovigo in the study and genetic improvement of hemp is recognized both nationally and internationally and is called upon by the Plan to play a major role in developing and transferring the most innovative scientific acquisitions to farm-level field trials and to the world of production. The specificity of research expertise in the problem of hemp cultivation over the past few years and the location centered precisely in the reference territory of the Project, make it a natural, reliable and scientifically significant to whom to also entrust a role of scientific technical support for related to the project training and communication, in collaboration with the other GO actors. CREA-CI in Rovigo, given its established knowledge and experience, represents an reference and an important resource to carry out specialized and qualified training courses both for agricultural operators and for information and communication courses and events aimed at consumers, stakeholders, citizens.	M. MONTANARI CREA-CI	Regione Veneto	<ul style="list-style-type: none"> - Abstract in atti di convegno Sheyla Arango; Elisabetta Bacchin; Federico Fontana; Massimo Montanari; Lucia Bailoni (2021).Agronomic traits and chemical characterization of whole plant and botanical fractions of six varieties of hemp cultivated in the Veneto region. Italian Journal of Animal Science , 2021, sup 1, 57-58.DOI: 10.1080/1828051X.2021.1968176 - Abstract in atti di convegno Giulio Balestrierio; Massimo Montanari; Linda Avesani; Lorena Malaguti; Anna Moschella; Luisa Ugolini; Flavia Fulvio; Ilario Alberti.(2021).Composition in fatty acids and total polyphenols in different genotypes of Cannabis sativa L. 109-109. 	<ul style="list-style-type: none"> - Produrre canapa nella filiera alimentare e agroindustriale 15/07/2021 - Il CREA Cerealcoltura e Colture Industriali di Rovigo protagonista del progetto Canapa: test su 13 varietà visita ai campi sperimentali 21/07/2020 - Rovigo

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PROLEGU PROgramma di rilancio LEguminos da Granella per alimentazione Umana	<p>The project is structured with 5 main objectives:</p> <ol style="list-style-type: none"> 1. Improvement of production yields, sustainability and profitability of some Leguminous crops, chickpea and bean in primis, by identifying a list of varieties with determined habitus for dry grain production, capable of: <ul style="list-style-type: none"> - achieve a doubled hectare yield compared to today's average yield (identification of improved ideotypes, better standing ability, simultaneous ripening, etc.), - greater resistance to biotic and abiotic adversities, - capable of more efficient symbiosis response with rhizobia and mycorrhizae, - better tolerance of root systems to water stress and/or low impact irrigation protocols. 2. Fine-tuning of the most suitable cultivation techniques for different growing areas. 3. Innovations in harvesting technique (less waste and valorization of by-products, such as broken seeds, anomalies in color, size and shape). 4. Development of Evolved Decision Systems that integrate the agricultural experience of the technician and the farmer, capable of suggesting targeted and timely responses to individual agronomic problems that may arise: e.g., proper weed management, abnormal weather patterns, presence of pests or pathogens, as well as changing economic scenarios. 5. Counteracting soil depletion by reintroducing organic matter providing nitrogen through microbial fixation, rebalancing microbial flora by counteracting the presence/permanence of certain biotic stresses improving soil structure in the long run, reducing weed load, etc. 	A. CARBONI CREA-CI CREA-AN CREA-OF	MiPAAF - Ministero delle politiche agricole alimentari e forestali		
QG2021	Productivity evaluation and adaptation of commercial sunflower hybrid	A. DEL GATTO CREA-CI	ASSOSEMENTI		
RECUPEVO RECUpero e valorizzazione dell'ecotipo lombardo "PEperone" di VOghera	Biodiversity exploration within some plant species, phenotypic and molecular characterization of horticultural/cereal species.	L. TOPPINO CREA-GB CREA-IT CREA-OF	Regione Lombardia		

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RET2020.	<p>The overall objective is to consolidate the achievements of the "Cereal Quality Network" through restructuring with a view to continuity of the network, and proposing innovative technological solutions aimed at improving the sustainability and competitiveness of cereal supply chain. In particular, through a single coordination under the CREA Cereal and Industrial Crops Research Center, the following specific objectives will be pursued:</p> <ul style="list-style-type: none"> - consolidation of mycotoxin monitoring network in cereals and development of innovative methods of alerting and countering the occurrence of mycotoxigenic fungi; - strengthening of the National Maize Varietal Comparison Network and implementation of the project line on Maize in relation to what specified in the "Maize Sector Plan" - research innovation; - expanding the dissemination of the Guidelines for the control of mycotoxins in maize and wheat grain among stakeholders through targeted initiatives; - consolidate the national soft and durum wheat varietal comparison network; - innovation of cereal networks through the creation of easily searchable online database; - consolidation of malting barley varietal network as a specialty for brewing supply chains; - genetic innovation and varietal comparison of major and minor cereals for the development of Gluten Free supply chains; - implementation of preliminary study aimed at the valorization of minor cereals in relation to new market trends. 	N. PECCHIONI CREA-CI CREA-IT CREA-GB CREA-PB	MiPAAF - Ministero delle politiche agricole alimentari e forestali	<ul style="list-style-type: none"> - Articolo in rivista Vaccino Patrizia; Mazzinelli Gianfranco; Di Siena Simonetta; Masserano Greta (2021).Le varietà di grano tenero per semine 2021.L'Informatore Agrario, 28, 35-43. - Articolo in rivista Palumbo Massimo; Virzi Nino; Sciacca Fabiola; Licciardello Stefania; Anastasi Umberto; Scepi Concetta; Frenco Alfonso Salvatore; Amato Gaetano; Giambalvo Dario; Salafia Lucio; Randazzo Biagio; Mortaro Roberto; Pecchioni Nicola (2021).Speciale grano duro - Dettaglio regionale dei risultati 2021 - Sicilia.L'Informatore Agrario, 29, 53-54. - Articolo in rivista Cattivelli L.; Faccini N.; Gianinetti A.; Alberici R.; Alussi G.; Anastasi U.; Attene G.; Baronchelli M.; Belocchi A.; Cacciatori P.; Calvi A.; Caprara F.; Delbono S.; Fornara M.; Fuselli D.; Ghizzoni R.; Giordano M.; Governatori C.; Gualtieri P.; Invernizzi C.; Licciardello S.; Mameli L.; Mazzone V.; Pagani D.; Palumbo M.; Petrini A.; Pilati A.; Piredda A.; Pons R.; Preiti G.; Quaranta F.; Ravaglia S.; Reggiani F.; Rodriguez M.; Rossini F.; Ruggeri R.; Severi D.; Signor M.; Tagliaferri I.; Troccoli A.; Viola P.; Virdis A.; Virzi N.(2021).Un buon 2021 per l'orzo da birra - Risultati produttivi delle prove varietali 2020-2021..L'Informatore Agrario, 77, 26, 43-44. - Articolo in rivista Virzi Nino; Troccoli Antonio; Anastasi Umberto; Randazzo Biagio; Paone Silvana; de Gregorio Vito; Olivieri Angelo; Aniello Cosimo; Virgillito Santo; Li Puma Ezio; Licciardello Stefania; Sciacca Fabiola; Palumbo Massimo; Pecchioni Nicola (2021).Speciale grano tenero - Dettaglio regionale dei risultati 2021 - Puglia e Sicilia.L'Informatore Agrario, 28, 54-55. - Abstract in atti di convegno Gazza Laura; Taddei Federica; Nocente Francesco; Galassi Elena; Natale Chiara; Ciccioritti Roberto (2021).Micronization and air fractionation to improve technological, sensory and nutritional quality of whole grain pasta. 87-88. 	
SMART-BREED Tecnologie molecolari innovative per l'adattamento delle specie ortive al cambiamento climatico mediante breeding di precisione	The goal of the project is to develop innovative molecular technologies to study the effects of genetic variability and use this information to accelerate the breeding of new resilient varieties.	F.D'ORSO CREA-GB	Regione Lazio		

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SOLNUE Tomato and eggplant nitrogen utilization efficiency in Mediterranean environments	The main objective of SOLNUE is to provide useful knowledge and strategies for developing sustainable horticultural systems through reduced use of nitrogen fertilizers. Tomato and eggplant, already important horticultural species, will be used as target species, and the results obtained can be extended to other important horticultural species. One of the main objectives of the SOLNUE project is to identify tomato and eggplant genotypes with high nitrogen use efficiency (NUE) that are compatible with low-impact cropping systems. The development of high NUE genotypes is much more complex than developing localized fertilization systems as part of nitrogen resource management. The main objectives of the SOLNUE project will be: 1. the identification and selection of tomato and eggplant genotypes contrasting in nitrogen utilization capacity (NUE); 2. improve knowledge on morpho-physiological and genetic traits related to NUE using the above genotypes; 3. select segregating populations to identify quantitative traits (QTL)/associated with plant responses to limited nitrogen availability with special focus on expressed traits (eQTL); 4. develop genome-based selection systems using information already available for both species. Genomic-based prediction models for high productivity and production quality will be proposed.	G.L. ROTINO CREA-GB	MUR - Ministero dell'Università e della Ricerca Commissione europea	- Articolo in rivista Antonio Mauceri; Maria Rosa Abenavoli; Laura Toppino; Sayantan Panda; Francesco Mercati; Meriem Miyassa Ad; Asaph Aharoni; Francesco Sunseri; Giuseppe Leonardo Rotino; Antonio Lupini (2021). Transcriptomics reveal new insights into molecular regulation of nitrogen use efficiency in <i>Solanum melongena</i> . <i>Journal of Experimental Botany</i> , 72, 12, 4237-4253. DOI: 10.1093/jxb/erab121.	
SYSTEMIC - NutriSUSFood An integrated approach to the challenge of sustainable food systems: adaptive and mitigation strategies to address climate change and malnutrition - Nutrition: SecUrity for healthy and Sustainable Food consumption	Tackle the challenges of climate change impacts on food systems and encourage healthy and sustainable diets. To characterize and to manage the impact of climate change on nutritional properties of food and to propose adaptive strategies/measures, ensure nutrition security of populations, achieving a more inclusive, sustainable, healthy and safe future for all.	A. LOSA CREA-GB CREA-AN CREA-CI CREA-PB	MiPAAF - Ministero delle politiche agricole alimentari e forestali Commissione europea		
SYSTEMIC_1063 ERA HDHL KH FNS An integrated approach to the challenge of sustainable food systems: adaptive and mitigatory strategies to address climate change and malnutrition. E.N. 1063 From cereal diversity to plant breeding	SYSTEMIC_1063 aims to develop a proof of concept to demonstrate how genetic diversity can be used to increase sustainable grain production under future climatic conditions. Existing germplasm of wheat and barley will allow for (i) mapping the loci underlying traits related to adaptation; (ii) develop new cereal ideotypes, and (iii) develop new genomic prediction models.	L. CATTIVELLI CREA-GB	MiPAAF - Ministero delle politiche agricole alimentari e forestali	- Articolo in rivista Puglisi Damiano; Delbono Stefano; Visioni Andrea; Ozkan Hakan; Kara Ibrahim; Casas Ana M; Igarua Ernesto; Val Giampiero; Lo Piero Angela Roberta; Cattivelli Luigi Tondelli Alessandro; Fricano Agostino (2021). Genomic Prediction of Grain Yield in a Barley MAGIC Population Modeling Genotype per Environment Interaction. <i>Frontiers in Plant Science</i> , 12, DOI: 10.3389/fpls.2021.664148.	
WAKE-APT Seed WAKE-up with APTamers: new technology for dormancy release and improved seed priming	WAKE-APT aims to: 1) Develop a pre-commercial level method to modify dormancy times in vegetable seeds such as eggplant; 2) identify tools to quantify germination aptitude; and 3) develop molecular markers for early discrimination between dormant seeds and seeds with good germination.	L. TOPPINO CREA-GB	Fondazione Cariplo	- Articolo in rivista Forti Chiara; Ottobri Valentino; Doria Enrico; Bassolino Laura; Toppino Laura; Rotino GL; Pagano Andrea; Macov Anca; Balestrazzi Alma (2021). Hydropriming Applied to Fast Germinating <i>Solanum villosum</i> Miller Seeds: Impact on Pre-germinative Metabolism. <i>Frontiers in Plant Science</i> , 12, DOI: 10.3389/fpls.2021.639336.	- Borse di studio - n.1

3.1.2. Patents and Services – Genomics, Biotechnologies and Bioinformatics

Services

Collections and Data Banks

PRODUCTS/MAIN TOPIC	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
asparagus	Maintenance, phenotypic and molecular characterization of a collection of about 200 asparagus lines.	A. Losa	CREA-GB
landraces	Maintenance, phenotypic and molecular characterization of a collection of about 500 cultivars, landraces and wild progenitors.	V. Terzi	CREA-GB
frumenti esaploidi	Maintenance, phenotypic and molecular characterization of a collection of about 500 common wheat accessions and about 200 accessions belonging to 5 subspecies of common wheat (<i>Triticum aestivum</i> ssp <i>compactum</i> , <i>sphaerococcum</i> , <i>macha</i> and <i>spelt</i>).	D. Barabaschi	CREA-GB
frumenti tetraploidi	Maintenance, phenotypic and molecular characterization of a tetraploid wheat collection consisting of about 500 varieties/lines, 700 landraces, 400 wild emmer, constituting the bulk of world reference collections.	E. Mazzucotelli	CREA-GB
melanzana	Maintenance, phenotypic and molecular characterization of a collection of about 400 eggplant accessions, cultivars, landraces and wild progenitors.	L. Toppino	CREA-GB
orzo	Maintenance, phenotypic and molecular characterization of a collection of several thousand cultivars, landraces and wild progenitors.	A. Tondelli	CREA-GB
riso	Maintenance, phenotypic and molecular characterization of a collection of about 500 cultivars, landraces and wild progenitors.	C. Marè	CREA-GB
Triticale	Maintenance, phenotypic characterization of a collection of more than 200 lines.	N. Faccini	CREA-GB

Other scientific and technological infrastructures

MAIN TOPICS/PRODUCTS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
genomics and bioinformatics	CREA has an Instrumental Platform for Advanced Genomics and Bioinformatics, consisting of robotic systems for nucleic acid extraction and sample handling; instruments for nucleic acid quality/quantity assessment, thermal cyclers, multicapillary sequencer; a next generation sequencing instrumentation (Illumina MiSeq); qPCR, HRM-PCR, digital-PCR systems; mass spectrometer (ESI-MS/MS), HPLC; systems for purification separation and characterization of proteins; phase contrast microscopy, DIC (Differential Interference Contrast) microscopy and confocal microscopy (Zeiss, LSM700) (Rome site). There are also laboratories for in vitro culture and transformation by biolistic method or by agrobacterium of straw cereals and horticultural species, and finally high-capacity platform for SNP analysis (IntelliQube)	L. Cattivelli	CREA-GB varie sedi

Other Services

Certificazioni, prove, saggi, servizi vari in conto terzi

MAIN TOPICS/PRODUCTS	DESCRIZIONE	PERSON IN CHARGE	CREA CENTRES
Prove Centro di Saggio			
Cereali vari	Bioinformatic analyses for species/variety identification sequences	V. Terzi	CREA-GB
Frumento	Evaluation of advanced lines and varieties in experimental fields	N. Faccini	CREA-GB
Frumento	Analysis of markers for molecular selection	D. Barabaschi	CREA-GB

MAIN TOPICS/PRODUCTS	DESCRIZIONE	PERSON IN CHARGE	CREA CENTRES
Orzo	Evaluation of advanced lines and varieties in experimental fields	N. Faccini	CREA-GB
Orzo	Qualitative analysis of malting aptitude under the Straw cereal enrollment trials coordination.	M. Baronchelli	CREA-GB
Orzo	Analysis of β -glucan content within the Straw cereal enrollment trials coordination.	R. Ghizzoni	CREA-GB
Orzo	Analysis of disease resistance within Straw cereal enrollment trials Coordination.	N. Faccini	CREA-GB
Pomodoro	Development of in vitro protocols.	F. D'Orso	CREA-GB
Riso	Analysis of markers for molecular selection	C. Marè	CREA-GB
Specie orticole	Ploidy analysis	L. Toppino	CREA-GB
Triticale	Evaluation of advanced lines and varieties in experimental fields	N. Faccini	CREA-GB

Tavoli/gruppi di lavoro/partnership istituzionali/ Riviste di Centro/Editorial Board di Riviste

MAIN TOPICS/PRODUCTS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Genomica e bioinformatica	Agreement on Scientific Cooperation between the Council for Agricultural Research and Economics Analysis (CREA) and the Chengdu University	L. Cattivelli	CREA-GB
Genomica e bioinformatica	Collaboration Agreement between the Universitat Politècnica de Valencia and the Council for Agricultural Research and Economics (Research Center for Genomics and Bioinformatics) for the realization of a TFG/TFM without an internship	L. Cattivelli	CREA-GB
Risorse genetiche	CREA representative at DivSeekInternational, an international organization for the promotion of the use of genetic resources	L. Cattivelli	CREA-GB
Frumento	Italian representative in the research committee of Wheat Initiative, the international agency for the coordination of wheat research	L. Cattivelli	CREA-GB
Frumento duro - EWG	Coordinator of the Expert Working Group on Durum Wheat Genomics and Breeding formed within wheat initiative	L. Cattivelli	CREA-GB
Risorse genetiche. European Cooperative Program for Genetic Resources	Italian representative at ECPGR Barley working group	A. Tondelli	CREA-GB
Risorse genetiche -European Cooperative Program for Genetic Resources	Italian representative at ECPGR Oats working group	V. Terzi	CREA-GB
Cereali vari -EVA - Wheat and Barley European Evaluation Network (ECPGR)	Multiplication and valorization of genetic accessions of durum and common wheat, and barley conserved at European germplasm banks. Genotyping and analysis of phenotypic evaluations in the field, sharing of results in the EURISCO database.	D. Barabaschi	CREA-GB
IWGC	Members of the Coordinating Committee of the International Wheat Genome Sequence Consortium.	L. Cattivelli, D. Barabaschi	CREA-GB
Editorial board member	Associated Editor of Frontiers in Plant Science	L. Cattivelli	CREA-GB
Editorial board member	Editor of Plant Science	L. Cattivelli	CREA-GB
Editorial board member	Editor of Journal Cereal Science	L. Cattivelli	CREA-GB
Editorial board member	Associated Editor of International Journal of Molecular Science	L. Cattivelli	CREA-GB
Editorial board member	Editor of the Special issue of Frontiers in Plant Science Proceedings of FSTP3 Congress—A Sustainable Durum Wheat Chain for Food Security and Healthy Lives	L. Cattivelli	CREA-GB
Editorial board member	Editor of Plants	A. Gianinetti	CREA-GB
Editorial board member	Review editor of Frontiers in Plant Science	D. Barabaschi	CREA-GB
Editorial board member	Associated editor of Frontiers in Plant Science	A. Tondelli	CREA-GB
Editorial board member	Topic editor of Frontiers in Plant Science ("Women in Plant Development and EvoDevo" article collection)	R. Battaglia	CREA-GB
Vari	Gruppo di lavoro tecnico-scientifico "Moria del Kiwi" costituito dal Comitato Fitosanitario Nazionale (MIPAAF - DISR 05 - Prot. Uscita N.9238869 del 14/10/2020)	G. Tacconi	CREA-GB

3. CREA RESEARCH LINES BY CROSS CUTTING ISSUES

3.2 PLANT PROTECTION RESILIENCE AND CERTIFICATION

In the coming years, our country will face strategic challenges in the context of a European Green Deal and Farm to Fork strategies designed for a new model of society placing sustainability at the top of its list of priorities. Similarly, agriculture, agricultural products and the management of forests as well as natural areas will also be interpreted in terms of protecting citizen health, reversing the loss of biodiversity, achieving climate neutrality and increasing competitiveness for a more ecological, digital and resilient Union.

In this general framework, it is highlighted that a balanced socio-economic development and an effectively sustainable management of food resources and environment cannot neglect the search for innovative phytosanitary control strategies against arthropod pests and plant pathogens threatening the main agricultural systems and forests.

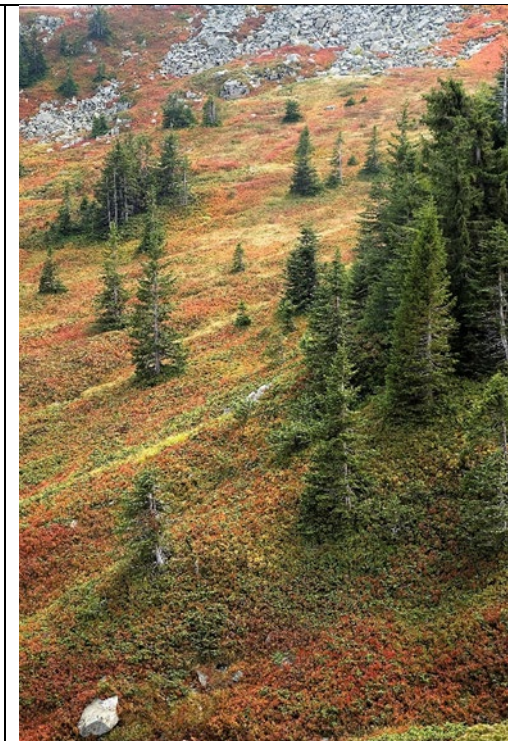
CREA-DC, which with Legislative Decree N.19 of 2 February 2021 has become the National Reference Institute for the Plants Protection, is a key element of the strategic network represented by basic and applied research, both national and international, on the protection of plants from biotic and abiotic adversities and on the production of quality and certified propagation material.

In this context, the seed genetic and technological quality has a key role: seed is the starting point of the production chains for human and animal nutrition.

The introduction of new and more resilient varieties and the verification of the quality of the seed material represent strategic and extremely important activities regulated by international and national legislation. The application of these legislations guarantees the traceability of the lots, the quality of the seed and the product of crops.

CREA operates the control and certification of seed materials and the examination of the requirements for the registration or issue of plant variety rights in the framework of national and international regulations. CREA develops research activities related to certification issues by tests for genetic, health and technological analysis of seeds and assess the quality of propagating materials.

Four strategic lines have been identified to frame the priority objectives and the research-related activities of the Centre:



1. Advances in phytopathological diagnostics - The development of innovative identification tools for Pest identification is the primary and most complex issue to face in case of accidental introduction and/or risk of transfer of new harmful alien organisms.
2. Plant protection - Development of innovative plant protection strategies and low environmental impact tools aimed at preventing or controlling damages caused by either native or established harmful organisms/microorganisms.
3. Institutional Controls and Innovations for the Seed Certification - Seed certification activities and research for the enhancement of monitoring systems in relation to the various issues related to the production and marketing of seeds, including methods for verifying the absence of GMOs.
4. Biodiversity protection - The mission of the CREA-DC Research Center highlights the attention to the protection of plants, whether they are inserted in agricultural, forestry or protected areas, achieved by protecting the biodiversity of ecosystems and the networks of relationships that allow their functioning and determine homeostatic abilities.

3.2.1 Research and research products

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	FINANCING BODY	INTERNATIONAL PARTNERSHIP	OTHER RESEARCH PRODUCTS
AGLIOSANO Phytosanitary requalification of two varieties of Red Garlic in Latium Region.	Restoration, from a phytopathological standpoint, of native varieties of Red Garlic of Proceno and Castelliri through monitoring, treatment of pathogenic fungi, and in vitro virus elimination	A. TAGLIENTI CREA-DC	ARSIAL		
ANALLERGO Collaboration and study relationships aimed at obtaining biological material suitable to produce desensitizing extracts from mites <i>Dermatophagoides pteronyssinus</i> , <i>D. farinae</i> , <i>Euroglyphus maynei</i> and other allergenic dust mites in at home and workplace	Protection of stored material, environments, and warehouses from dust and food mite pests	S. SIMONI CREA DC	Anallergo		
ASPASS Varietal and agricultural innovation for a successful and sustainable asparagus cultivation in Sicily	Implementation and sharing with agribusiness companies involved in the programs of varietal innovation of sustainable protocols for the cultivation and biochemical characterization of <i>Asparagus officinalis</i> L.	G. FASCELLA CREA-DC	Sicilian REgion		- First event ProjectASPASS 14/10/2021 Naro
AUTOFITOVIV Good practice in the self-regulation and phytosanitary management of ornamental plant nursery business	Implementation of integrated pest management strategies and control activities	SAURO SIMONI CREA DC	Toscana Region		
Project ME18M001 The polerovirus complex inducing yellows disease, a serious threat to pepper crops in the Mediterranean zone. Executive Programme for scientific and technologic cooperation between the government of the Italian Republic and the Government of Montenegro 2018-2020	Provide essential knowledge on the emerging viral complex in pepper that is currently poorly understood and contribute to the development of the disease management in the Mediterranean area	L. TOMASSOLI CREA-DC	MAECI	University of Montenegro, Biotechnical Faculty (Podgorica, Montenegro)	
BIOSEME-SIB2 Technical-scientific support for the operation of the Seed Database (BDSB) referred to in the Ministerial Decree 24 February 2017 and support for the evolution of the European regulation provided for by Reg UE) n.2018/848	Improvement of the functionality of the Biological Seed Database (BDSB) referred to in the Ministerial Decree 24 February 2017 and support for the evolution of the European regulation provided for by Reg UE) n.2018/848	P. G. BIANCHI CREA-DC	MiPAAF		
BIOTECH-BIOSOS FRU A new generation biotechnological approach aimed at improving the productivity and the sustainability of fruit tree species	Acquiring resistance to plum pox virus (PPV) in <i>Prunus</i> spp. cisgenic clones and/or in those obtained through genome editing	L. CATTIVELLI CREA-GB CREA-OFA CREA DC	MiPAAF		Research grant - n.1

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	FINANCING BODY	INTERNATIONAL PARTNERSHIP	OTHER RESEARCH PRODUCTS
PATHORES Investigations on the resistance to pathogenic fungi and bacteria for the screening of varieties obtained by genome editing	Analyse and characterise different pathogens of species of agricultural interest and assess disease resistance of genetically modified ('genome edited') material in order to increase its productivity	A. INFANTINO CREA DC	MiPAAF		- Research grant n.1 - Scholarship - n.1
QUALIMEC Improvement of quality properties in aubergine and artichoke using genome editing and dysgenesis approaches	Improving the quality of eggplant and artichoke and resistance to wilt disease of eggplant caused by <i>Fusarium oxysporum</i> f.sp. <i>melongenae</i> .	G. L. ROTINO CREA-GB	MiPAAF -		
BREED4BIO Regulated organic seed supply chains of wheat populations: an important resource for the Organic business	Study of the seed systems of some wheat populations. The agronomic experimentation will take place in the hills and mountains, to understand the performance of the different populations in different areas. The project will have to develop a system that guarantees the traceability of populations. The project will also work on strengthening supply chain relationships, to connect the network of operators at different levels. The economic analysis will therefore have to study the economic sustainability of a system that includes this support. These support services will also need to be defined. Finally, to strengthen the supply chain, training activities for bakers and pizza chefs will be undertaken.	A. SOMMOVIGO CREA-DC	Region Emilia Romagna		
CA.VA.SI.F.D. Characterization of Sicilian indigenous varieties of durum wheat	Morphological, genetic and biochemical characterization of at least 10 varieties of durum wheat (some of which are already registered, others are being registered in the National Register of Conservation Varieties of agricultural species) stored on farm at the companies responsible for pure conservation or custodian farmers and allow registration in the National Biodiversity Register; in this way it will also be possible to verify the authenticity of the food matrix to protect the supply chain and consumers, as provided for in Art. 3 paragraph 3 of law 194/2015.	C. MICELI CREA-DC	Regione Siciliana		
CBS Italy - EFSA Pilot application of smart surveillance tools for citrus black spot pathogen in Italy	Monitoring by use of captaspore traps, both aerial and from rain leaching, the presence der quarantine fungus <i>Phyllosticta citricarpa</i> , at the site in Trebisacce, Cosenza	L. RICCIONI CREA-DC	EFSA – European Food Safety Authority		- Study grant - n.1
COST Action CA15223 IPLANTA-Modifying plants to produce interfering RNA	Examine the scientific challenges in manipulating RNAi production for disease and pest control, and metabolic enhancement of plants	V. ILARDI CREA DC	European Commission and others	Austria, Belgium, Bosnia - Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Israel, Latvia, Lithuania, Netherlands, Macedonia, Norway, Poland, Portugal Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom	
CO.XI.BO Funds for control of phytosanitary emergencies caused by <i>Xylosandrus compactus</i> , <i>Xylella fastidiosa</i> , <i>Botrytis cinerea</i>	Control of phytosanitary emergencies caused by the pests, <i>Xylosandrus compactus</i> , <i>Xylella fastidiosa</i> , <i>Botrytis cinerea</i>	V. FRANCARDI CREA DC	MiPAAF -		- Study grant - n.1

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	FINANCING BODY	INTERNATIONAL PARTNERSHIP	OTHER RESEARCH PRODUCTS
CORYNE Corylinnova Nebrodi: characterization, conservation and valorisation of the hazelnut germplasm; genetic-sanitary certification in plant nurseries; quality improvement of the hazelnuts produced	Define and enhance the genotypic, organoleptic, and nutritional characteristics of the main hazelnut cultivars grown in Italy	R. RIZZO CREA DC	Sicilian Region		
CUCURBIOMID Ecofriendly strategies for the control of key pathogens of Cucurbitaceae in Lazio: Evaluation of biostimulants, microorganisms and plant hydrolates.	Identify effective and eco-sustainable solutions to control/mitigate the destructive action of viruses of vegetable crops; Develop eco-sustainable control strategies, alternative to those currently used with a high environmental impact, for the control of insect's vectors of viruses Identify new control strategies of soil fungi and phytopathogenic bacteria	L. FERRETTI CREA DC	Lazio region		
DI.OL Plant protection in traditional and intensive olive farming	Plant protection in traditional and intensive olive farming	P.F. ROVERSI CREA DC CREA OFA	MIPAAF		Roma 26/11/2021 Convegno nazionale
DIBIO_CONCI.A.BIO. Controlling major seed-borne pathogens in Triticum spp. and Oryza sativa: seed dressing and control strategies for organic farming	Implementation of alternative methods of seed dressing compatible with the organic farming scheme	L. TAMBORINI CREA DC CREA CI CREA AA	MIPAAF		- Rice Seed Certification and Experimental Activity - Season 2020-2021 09/02/2021 - Research grants – no.1 - Scholarships – no. 2
Cereals resistant to seed borne fungal diseases suitable for organic agriculture. Subproject DIBIO.	Develop new resistant cultivars to control diseases caused by fungal pathogens and transmitted by seed.	V. CAMPANELLA CREA-DC	MIPAAF -		1 CTER part-time per 7 mesi

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	FINANCING BODY	INTERNATIONAL PARTNERSHIP	OTHER RESEARCH PRODUCTS
DURDU Stools Integration of molecular data into DUS testing in durum wheat: development of a common online molecular database and a genetic distance calculation tool	Ensure the long-term usability of the results achieved in the DURDUS project, i.e. the molecular information and the genetic distance defined implementing the MODEL. The tools resulting from the follow-up project are expected to substantially strengthen the decision-making system supporting the choice of comparators for the benefit of all CPVO entrusted EOs for durum wheat. This aim will be achieved through two main aspects: - The setup of a common online molecular database for long-term storage and access to the DNA profiles of all varieties from the durum wheat reference collection. - The development of an online genetic distance (GD) calculation tool linked to the common molecular database for simple and harmonized use by all EOs of the molecular data information and the GD for the choice of comparators in DUS tests. - Practical implementation of the developed online molecular database and GD calculation tool for DUS field trials planning. The final version of the GD calculation tool will be tested by the participating EOs when setting up their routine DUS growing trials. - Draft Partnership Agreement. To ensure lasting usability, the routine management of the molecular database beyond the project duration will be discussed and defined. This will be the basis for preparing a partnership agreement, which is an additional key objective of the project.	A. P. M. GIULINI CREA-DC	- COMMUNITY PLANT VARIETY OFFICE (CPVO)		
ECO.DIF. Environmentally sustainable systems for pest management of vegetable crops	Adoption of environmentally friendly measures for phytosanitary defence of horticultural crops in the Lazio Region, the improvement of the health and protection of the biodiversity of agricultural land. Application of bio fumigation by green manure of Brassica juncea for the control of telluric diseases of melon in greenhouses in Upper Latium, and the use of natural substances for the control of powdery mildew of melon	A. INFANTINO CREA-DC	Regione Lazio		
ESC360 LIFE17 ESC/IT/001 360 Volunteers for monitoring forest biodiversity in the Italian Natura 2000 Network	This call embodies a joint initiative of the European Programme for the Environment and Climate Action (LIFE) and the European Agricultural Fund for Rural Development (EAFRD) aimed at concretely exploring the potential of using volunteer work for environmental protection activities, mainly targeted to Natura 2000 sites and species protected by the Birds and Habitats Directive. This initiative will be implemented by means of LIFE preparatory projects and builds on the mobilisation and deployment opportunities of volunteers provided by the European Solidarity Corps	A. CAMPANARO CREA-DC	Commissione Europea		Webinars and events “ESCaTHE’ 24/02/2021, LIFE ESC360 22-26/03/2021, LIFE ESC360 19/04/2021, LIFE ESC360 17-21/05/2021, “Natura 2000 Day” 21/05/2021, LIFE ESC360 3/2021, 12-16/07/2021, LIFE ESC360 10/09/2021, All4Climate PreCop26, Citizen Science” 11/11/2021 Grosseto,
ESPAS Enhancement of native Sicilian and Tunisian plant species characterized by high nutritional value and health benefits	Eco-sustainability of agrifood productions. Integrated protection of agricultural crops/Nutraceuticals. Protection and promotion of plant biodiversity	M. M. MAMMANO CREA DC CREA AA	Commissione Europea	Institut National de Recherches en Génie Rural Eaux et Forêts - INGREF (partner tunisino) L’Agence de Vulgarisation et de Formation Agricole - AVFA (partner tunisino) Banque Nationale de Gènes de Tunisie - BNGT (partner tunisino)	- international press conference for the presentation of the project Espas - Valorisation des espèces végétales autochtones siciliennes et tunisiennes avec un intérêt nutritif et bon pour la santé 13/10/2021
EUPHRESKO 2018-2023 – A275 Use of new diagnostic tools for the detection of <i>Pantoea stewartii</i> subsp. <i>stewartii</i> , from plant and seeds	NGS technology and meta-barcoding for the characterization of isolates of <i>Pantoea stewartii</i> subsp. <i>stewartii</i> .	V. SCALA CREA DC	In kind	ANSES -Laboratoire de la santé de végétaux Unité de Mycologie [Ente Coordinatore] Difesa e certificazione [Centro Capofila CREA] 1. All-Russian Plant Quarantine Centre, Russia [Partner] 2. ANSES -Laboratoire de la santé de végétaux Unité de Mycologie [Partner] 3.	

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	FINANCING BODY	INTERNATIONAL PARTNERSHIP	OTHER RESEARCH PRODUCTS
				AUSTRIAN AGENCY FOR HEALTH AND FOOD SAFETY [Partner] 4. Difesa e certificazione - Roma [Partner] 5. Eurofins-Plant Pathology Laboratory, France [Partner] 6. Ministry of Agriculture Forestry and Food, Slovenia [Partner]	
PHYFOR Study on the diversity of phytoplasmas detected in European forests	Monitoring the European forest by possible decline associated with the presence of phytoplasmas and their insect vectors, especially of exotic origin	L. FERRETTI CREA DC CREA VE	In Kind	AGES (AT); ANSES (FR); NIB (SLO); THUENEN (DE); AGDIA EMEA (FR); IPEP (SRB)/ European Commission	
EUPHRESO project 2020-A-344: Development of efficient methods and identification of barcodes for discriminating Grapevine flavescence dorée sensu-stricto from other related phytoplasmas and investigation of potential correlation between taxonomic identity and grapevine, alders and hazelnut plant hosts (FLADO-VIGILANT)	Evaluate the possibility to develop a reliable test to distinguish between GFD phytoplasma sensu stricto and other 16SrV phytoplasmas. In the framework of this project, DNA and/or sequences of several grapevine isolates of 16SrV phytoplasma group will be collected and different grapevine phytoplasmas from the group 16SrV will be studied. Collected DNA and/or sequences will be used for the development/ evaluation of molecular tests, which will be further validated; Determine the occurrence and geographic distribution of hazelnut trees infected with GFD-related isolates. Isolates and sequences of GFD-related phytoplasmas infecting hazelnuts in different countries will be collected and compared with those found on grapevines. Additionally, evaluation of the potential vectors of this hazelnut phytoplasma isolates will be studied with the aim to define the epidemiological routes	L. FERRETTI CREA-DC	In Kind	NIB (SLO); ANSES (FR); INRAE (FR); Julius Kühn-Institut (DE); APHIS (USA); INIAV (PT); Oklahoma State University (USA); DLR (DE); Università di Milano; Università di Catania; Agroscope (CH).	
EUPHRESO 2019-A-318 -Sampling and analysis of asymptomatic Citrus fruits and leaf litter to detect the infection of <i>Phyllosticta citricarpa</i> (CBS-ETECT)	Development of diagnostic techniques for <i>Phyllosticta citricarpa</i> using asymptomatic material	L.RICCIONI CREA DC		Anses (Francia), NIB (Slovenia), Inia (Spagna), Brasile, Tunisia/ European Commission	
EUPHRESO 2019-A-324 Reliable detection of plant pathogens in soil	Harmonised validated protocol for the extraction of total nuclear acid (TNA) from specific soilborne pathogens from soil	A. R. HAEGI CREA DC		Naktuinbouw (NL), ANSES (FR), Ministry of Agriculture (IL, CY, SI), UCD (IE) AFBINI (UK), AGES (AT), FNPPPT (FR)/ European Commission	
EUPHRESO: PHYLIB - 3 The biology and epidemiology of <i>Candidatus Liberibacter solanacearum</i> and potato phytoplasmas and their contribution to risk management in potato and other crops	Investigations on 'Candidatus Liberibacter solanacearum' and its vectors.	V. ILARDI CREA DC	In kind	SASA (GB); AGES (AT); FPS (BE); ANSES (FR); VNIIR (RU); CFIA (CA); MOA (CY); UKUZ (CZ); UNIBO (IT); PPCRI (TR); IAES (EE); ARO (IL); FN3PT (FR); MINPOLJ (RS); DAFM (IE); UWI (WI); UNIBL (BIH); NHM (UK); CIP (EC); MPI (NZ)	Bertin S., Tizzani L., Mosconi F., Gentili A. and Ilardi V. Activities of CREA-DC (Italy): surveys on psyllid vectors of CaLSol and Influence of heat treatments on carrot seed germination. PHYLIB III Meeting. Online. 18 October 2021
000302_20_PAF_ Third mission	Hydroponic crops in schools: a modular biological-plant and technological laboratory for the creation of a sustainable model to produce Km 0 healthy food	V. SCALA CREA-DC	MIUR		
EUPHRESO 2020-A-343 2020-A-343 Resistance breaking strains of Tomato spotted wilt tospovirus: distribution and evaluation of their impact on tomato and pepper production	The aim of this project is to determine the distribution of TSWV RB isolates in participating countries and to estimate the potential impact of the RB TSWV isolates on tomato and pepper production	A. GENTILI CREA-DC	In kind	Department of Agriculture and Fisheries, Queensland, Australia NIB (Slovenia)	

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	FINANCING BODY	INTERNATIONAL PARTNERSHIP	OTHER RESEARCH PRODUCTS
FERRERO Research agreement on "rotten hazelnut" disease	Monitoring of fungal microorganisms involved in the "rotten hazelnut" disease	S. VITALE CREA DC	Ferrero Trading Lux S.p.A.		
FITOVAR Phytosanitary upgrading of native herbaceous genetic resources listed in the Voluntary Regional Register of the Lazio Region	Identification of the causal agents of the main diseases in crops of herbaceous species of local protected varieties (Regional Law No 15/2000) to develop effective strategies for their control	A. INFANTINO CREA DC	ARSIAL		
GS PES-NET-21 Study and dissemination actions aimed at reducing and optimizing the use of pesticides in peach and nectarine crops, and at identifying good agronomic practices to preserve the environment and bees	Study and dissemination actions aimed at reducing and optimizing the use of pesticides in peach and nectarine crops, and at identifying good agronomic practices to preserve the environment and bees	S. LANDI CREA DC	GS S.p.A.		
GS-CITRUS-21 Study and dissemination actions aimed at reducing and optimizing the use of pesticides in citrus crops, and identifying good agronomic practices in order to preserve the environment and bees	The activity concerns the updating of specific phytosanitary guidelines, to be adopted in the citrus fruit chain grown in the open field in the Regions of Puglia, Calabria and Sicily, currently marketed under the Carrefour Quality Chain brand; with the aim of eliminating and / or limiting the use of active ingredients harmful to bees and Apoidea to reduce the environmental impact	S. LANDI CREA DC	GS S.p.A.		
INNOVALUPPOLO Sustainable innovation for hop cultivation	Improve results obtained by the previous LUPPOLO.IT project, i.e., the building-up of a database including all relevant technical and scientific information on the evaluated hop productions; Develop a sustainable hop cropping, by recovery and exploitation models of production and transformation wastes; Define innovative crop protection strategies aimed at the sanitation of propagation material, use of natural compounds for the control of hop phytopathogenic fungi and the monitoring of quarantine phytophage <i>Popilia japonica</i> ; Develop process innovations in hop cropping, by the study of interactions between hop and beer-producing yeasts with high aromatic character	L.FERRETTI CREA DC	MiPAAF		
IMODDUS International harmonization and validation of a SNP set for the management of tomato reference collection	The possibility of combining phenotypic and genetic distances based on the use of DNA-based molecular markers in the management of reference collections (UPOV-Model 2) has been successfully applied in some species such as Corn (GEVES-FR) and Potato (Database-CPVO) The aim of the project is to extend this model to the Pomodoro species and then select and validate a set of SNP markers that can be used to genotype the varieties included in the reference collections of the examination offices (EO) accredited for the issue of the patent	R. BRAVI CREA-DC	COMMUNITY PLANT VARIETY OFFICE (CPVO)	Naktuinbouw (NL),GEVES (F),NEBIH(HU), INIA (ES),DGAV(P), IVF(CN),KSVS(KR), NARO (JP)	
IN-SYDE-CAR Innovative systems for the development of the Carob supply chain	Phytopathological monitoring of carob stands and product traceability of the carob food chain	A. GIOVINO CREA DC	Sicilia Region		CONFERENCE: INNOVATIVE SYSTEMS FOR THE DEVELOPMENT OF THE CAROB CHAIN

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					20 DICEMBRE 2021 ZOOM on line.
IN.T.A.E (Innovation. Technique. Land-snail rearing)	Implementation and sharing of protocols for the sustainable cultivation of native and introduced plant species of agricultural interest, rich in "Allantoin" and essential oils. The purpose is to provide diets used in land-snail rearing. Essential oils may be used to sanitize rearing facilities in protected areas	G. FASCELLA CREA DC	Sicilia Region		
INNOVAR Next generation variety testing for improved cropping on European farmland.	Identify crop characteristics and sustainability criteria which indicate the capacity of varieties to maintain yield under more variable conditions and more sustainable crop management practices. Develop precise, rapid and automated methods for DUS testing in compliance with European/international requirements and the granting of PVR for new varieties. Revise and develop VCU trialling processes to provide data on characters that contribute to the capacity of new varieties to maintain yield under more variable conditions and sustainable crop management practices. Exploit synergies between DUS and VCU testing using genomics, phenomics, weather and soil data, and machine learning to set up databases and reference collections. Apply the methods and techniques developed for wheat to other cereals and other crop types, including oilseeds, grasses, legumes, sugar beet, maize, etc. Develop new tools for the evaluation and detection of variety characteristics, using genomic, phenomic and digital technologies. Analyse and review existing systems for providing and delivering information about varieties and facilitate variety specialists in adopting and developing new effective methods and tools for dissemination	A.P.M. GIULINI CREA DC	Commissione Europea	- Consejo Superior de Investigaciones Cientificas - Instituto de la Grasa (IG-CSIC) - INTERNATIONAL CENTER FOR AGRICULTURAL RESEARCH IN THE DRY AREAS - ICARDA - Agri-Food and Biosciences Institute - University College Dublin, National University of Ireland, Dublin - Department of Agriculture, Food and the Marine - Forest Service - LESPROJEKT SLUZBY SRO (LESPRO) - DEBRECENI EGYETEM - UNIVERSITY OF DEBRECEN DE	- technologist i/researcher- n.1
INTESA Innovation in technologies to support a sustainable development of Agro - industry	Innovation, and know -how transfer focused on the sustainable management of the greenhouse industry through "pilot activities" aimed at reducing energy inputs by preventing water waste and decreasing phytosanitary treatments	G. GUGLIUZZA CREA DC	European commission	Union Tunisienne de l'Agriculture et de la Pêche - UTAP (Tunisia) Ecole Nationale des Ingénieurs de Sfax ENIS (Tunisia) North American Privante Universisty IIT Sfax (Tunisia)	Kik off meeting 1° feb 2021 1° Living Lab 17 december 2021 n 1 Research grant
INVITE INnovations in plant Variety Testing in Europe to foster the introduction of new varieties better adapted to varying biotic and abiotic conditions and to more sustainable crop management practices	Foster the introduction of new varieties with high resilience towards biotic and abiotic stresses, high adaptation to sustainable management practices, and high resource use efficiency (RUE), through improved variety testing and better information to stakeholders on variety performance under a range of contrasting production conditions. This will be exemplified by major crop species that represent the main features of propagation, food and feed uses, and exhibit significant breeding activity in the EU.	V. TERZI CREA-GB CREA-DC CREA-ZA	European commission Horizon 2020 grant number 817970		Jennuary 20-21 Maize workshop – experimental approaches cross WPs (on line meeting) Februuary 19, 2021 update on historical data collection and encoding (online-meeting)

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IPM-POPILLIA Integrated Pest Management of the invasive Japanese Beetle, <i>Popillia japonica</i>	Address the challenge of a new risk to plant health in Europe, the invasion of the Japanese beetle, <i>Popillia japonica</i> . Help to confine the spread of the new pest and prevent the build-up of high population densities that cause economic loss to agricultural crops and increase migration pressure of the Japanese beetles.	L. MARIANELLI CREA-DC	Commissione Europea	- INRA - UMR IGEPP - E-NEMA - Agroscope - SPOTTERON GMBH - PESSL INSTRUMENTS GMBH - JARDIN SUISSE - SERVIZIO FITOSANITARIO TICINO - SFTi - TUM-Technische Universität München - FUNDACAO GASPAR FRUTUOSO	- Research grant - n.2
MODIFORTI Models for protection of horticultural crops	Support for the establishment and management of the EIP Operational Groups on agricultural productivity and sustainability	E. MARINELLI CREA-DC	Regione Lazio		
Scientific collaboration agreement for the implementation of joint activities in the field of investigations, studies of common interest in the fields of entomology and nematology of ornamental and forest trees and shrubs	Scientific collaboration agreement for the implementation of joint activities in the field of investigations, studies of common interest in the fields of entomology and nematology of ornamental and forest trees and shrubs	L. MARIANELLI CREA-DC	Regione Toscana		
NOC.ERE.HAL Research activities focused on high quality production of Hazelnut.	Experimental trials focused on Halyomorpha halys transmission and transmission efficiency of the dry rot (<i>Eremothecium coryli</i>) on Hazelnut	S. VITALE CREA DC	Ferrero Trading Lux SA		
NOCETO 09 Research agreement focused on phytopathological diseases of Walnut	The objectives of the convention are to diagnosing and resolve phytopathological problems during the 2021/2022 season in the specialized walnut culture in Veneto region	S. VITALE CREA DC	IL NOCETO - SCA		
OLIDIXIIT Olive production and protection from Xylella fastidiosa and its vectors in Italy	Development of a molecular diagnostic protocol for the identification and characterization of bacteria and the acquisition of new strategies for the containment of the bacterium and vector insects to avoid their dissemination in pest-free areas but also with the aim of achieving a possibility of coexistence with the bacterium in the now infected areas. The three-year project envisages an interdisciplinary approach aimed at tackling different strategies for the control of the Xylella fastidiosa bacterium and vector insect in traditional olive groves.	S. LORETI CREA DC CREA OFA	MiPAAF		Research grant - n.1
EUPHRESCO PROJECT 2020-A-352 (7/2021-6/2023) - <i>Curtobacterium flaccumfaciens</i> on bean and soybean: engaging the old enemy	Validation studies of diagnostic methods for <i>Curtobacterium flaccumfaciens</i> on vegetable extracts and extracts of legumes and soya seeds; characterisation of virulence of reference strains on different legume and soya cv	S. LORETI CREA DC		ILVO (BE), ANSES (FR); Naktuinbouw/NWVA (The Netherland); UNIFI/CREA-DC (IT); NIB (Slovenia); DEFRA (UK); University of Tehran (UT) / Iran;	
PAV-NOC 3 Research agreement on pathogens affecting hazelnut	Monitoring and diagnosis of fungal pathogens affecting hazelnut in specialized orchards of Piemonte and Campania	S. VITALE CREA DC	SAGEA Centro di Saggio s.r.l.		

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PEPERANT anthers culture aimed at supplying androgenetic pepper plants	Androgenetic plants from pepper seedlings	G. LEONARDO ROTINO CREA-GB	ESASEM		
PEST SURVEY 2020 Survey in free area for pests of plants and their product according to Regulations EU 652/2014	Coordination and submission of technical and financial reports of survey 2020 and 2021 to European Commission SANTE	L. TOMASSOLI CREA DC	MiPAAF -		- Research grant - n.1
PORT.NOC Evaluation of rootstocks for tolerance/resistance to Phytophthora and black-line and valorisation of compatible Juglans regia varieties" – 2° period of activity	Evaluation of tolerance of a walnut progenies (Juglans regia x J. major x J. nigra and J. microcarpa) to crown and root rot disease caused by Phytophthora cinnamomi and decline for black-line. Definition of protocols for in vitro propagation in <i>Juglans microcarpa</i> , J. major, and their hybrids with J. regia and in J. regia, for their micrografting and for CLRV sanification of Juglans spp. genotypes applying in vitro culture techniques	S. VITALE CREA DC CREA OFA CREA FL	MiPAAF		
PR.E.VA.N.I.A High nutritional value and low environmental impact products	Support for the establishment and management of the EIP operational groups on agricultural productivity and sustainability	M. M. MAMMANO CREA DC	Sicilia Region		- Conference to present the general and specific objectives and the results obtained in the first year of the project Products with high nutritional value and low impact - PREVANIA PSR 2014-20 17/12/2021 Palermo
PROMOREG Monitoring programme for the verification of the seed health, of the presence of GMOs and of the improving of the Plant Variety Register	Monitoring programme for the verification of the quality of maize and soybean (plant health status, adventitious presence of genetically modified organisms). Plant Varieties Register Improvement, for seed certification	R. B. ZECCHINELLI CREA DC	MiPAAF		
PROTEGGO 1.3 Support action to the Italian Agricultural Ministry	Scientific insights on emerging harmful organisms for the definition of prevention and contrast measures by CREA-DC such as: Preparation of Pest Risk Analysis (PRA) at the request of the National Phytosanitary Committee. Scientific technical support for the development and updating of an emergency plan for each priority pest on the recommendation of the National Phytosanitary Committee Operational and administrative technical support of the Plant Protection and Seeds Certification Center (CREA DC) to the actions of the DISR V Central Phytosanitary Service of MiPAAF on plant protection Definition and / or validation of diagnostic methods for organisms and microorganisms harmful to plants of main importance for the application of Regulations (EU) 2016/2031 and 2017/625. Conducting confirmatory (second level) or first level analysis at the request of the DISR V. Audits to the National Official Laboratories in application of Reg. 2017/625 and to the SFR.	G. SABBATINI PEVERIERI CREA DC CREA VE	MiPAAF		

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	FINANCING BODY	INTERNATIONAL PARTNERSHIP	OTHER RESEARCH PRODUCTS
	<p>Technical / operational support in the organization of training and / or refresher courses for laboratory technicians, phytosanitary inspectors and phytosanitary agents on harmful organisms of main importance for the application of regulation (EU) 2016/2031 and on basis of the annual calendar shared with the DISR V.</p> <p>Support in the organization of training courses on the Risk Based Estimate of System Sensitivity Update Tool (RIBEES +) IT platform.</p> <p>Development of Monitoring Methods applicable in Ports and Airports also with reference to the use of Dogs specially trained to detect volatile organic compounds (VOC) characteristic of particular groups of "pests" at high risk of introduction into our country.</p> <p>Continuation and expansion of scientific investigations on emerging bacteria (i.e. <i>Candidatus liberibacter</i>, <i>Pantoea stewartii</i>), their known and potential vectors, diagnostics and heat treatments.</p> <p>Scientific support to the Central Phytosanitary Service for the control of alien bedbugs harmful to plants (<i>Halyomorpha halys</i>): continuation of Control Programs in progress and Studies for Risk Analysis. Scientific support for the control of <i>Toumeyella parvicornis</i>: development of a biological control program; identification of pheromones; carrying out efficacy tests with endotherapy products.</p> <p>Software development of the IT Manual on national official control procedures divided into the Import, National Production and Export sections.</p> <p>Creation of a Manual of official national control procedures divided into the Import, National Production and Export sections.</p> <p>Elaboration of scientific sheets on Organisms / Microorganisms harmful to plants.</p> <p>Scientific support to the Central Phytosanitary Service on Nematodes, Mites and Xylophages of agricultural and forestry interest.</p> <p>Kiwi die-off.</p> <p>Expansion and shared management of the contents of the Website of the National Phytosanitary Service, as a reference site for all sectors related to plant protection (defence of plants, seeds, propagating materials, phytosanitary products, fertilizers).</p> <p>Implementation of functions, management, verification and processing of data deriving from the use of the Citizen Science Morgana APP created for the collection of georeferenced information on new "pests" with the help of citizens.</p> <p>Implementation of functions, management, verification and processing of data deriving from the use of the Citizen Science Morgana APP created for the collection of georeferenced information on new "pests" with the help of citizens.</p> <p>Preparation and printing of signs in application of Regulation (EU) 2017/625.</p> <p>Creation and registration of an international trademark of the National Phytosanitary Service and preparation of supporting documentation.</p> <p>Updating the pesticides database.</p> <p>Operational and administrative technical support in the field of plant protection products.</p>				

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	Maintaining and updating the reference varietal collections for the strengthening of the certification and control systems for propagating materials. Seed resistance analysis. Improved seed monitoring and control, including verification and absence of GMOs. Control and certification of vine propagation materials of the initial and basic categories (art.24, Legislative Decree February 2, 2021, n.16). Maintenance of the field catalog of vine varieties (Article 11, Legislative Decree February 2, 2021, n. 16). Technical / operational support for maintain and updating the register of vine varieties.				
QUALIFITO Lazio Phytosanitary qualification of fruit, grapevine and olive germplasm native to the Lazio Region	Sanitary qualification of fruit germplasm (pomaceae, drupaceae, pomegranate, hazelnut, chestnut, blueberry), olive and grapevine germplasm native to Latium in order to select germplasm that is sanitarly valid or attempt to restore it; protect it from attacks of phytopathogenic microorganisms and thus allowing its better conservation; encourage its cultivation by identifying or obtaining propagation material that complies with European and national phytosanitary regulations and can therefore be used by local producers	L. FERRETTI CREA DC	ARSIAL		- Scholarship - n.1
RISANAMENTO VITE Elimination of viral pathogens from grape germplasm native to the region Lazio	Identify or obtain vine accessions belonging to varieties native to Lazio that are exempt from the ORNQs provided for by EU Regulation 2019/2072, to preserve germplasm in optimal phytosanitary conditions, to allow its marketing in compliance with the phytosanitary regulations in force and to have healthy primary sources as a starting point for the possible inclusion of these varieties in the channels of voluntary certification of propagation material.	A. GENTILI CREA DC	ARSIAL		1 CTER part-time 80%
SALVAOLIVI Safeguarding And Enhancing The Italian Olive Heritage With Research	Defence of national olive growing against emerging and harmful organisms and microorganisms	F. FAGGIOLI CREA DC CREA OFA CREA AA	MIPAAF - Ministero delle politiche agricole alimentari e forestali		- Research grant - n.7 - Scholarships - n.4
SCREENBIOSTERRE20 Monitoring and biodiversity assessment of mesofauna on wine-growing areas in the Park	Evaluation of soil biodiversity in terraced vineyards as an index of sustainability and the effect of treatments	S. SIMONI CREA DC	Parco Nazionale delle Cinque Terre		Scarpellini P., Simoni S., Gagnarli E. Perrone M. Azioni progettuali Direttive MATTM ex cap 1551 per l'anno 2019-2020-2021 Guidelines on "Tools for monitoring and conservation of pollinator communities in terraced habitats" at MITE. Protocol N.0010428 / 2021 of 02/11/2021 + Tecnical Report.. Information activities / News: -CREA of 21/12/2021: Terraced Agro-ecosystems: CREA Defense and Certification in System Action with 5 National Parks (Cinque Terre, Majella, Pantelleria, Tuscan Archipelago, Vesuvius) in the SCREENBIO-5Terre project https://www.crea.gov.it/en/web/defense-and-certification/-/agro-ecosystems-terraced-creates-dc-florence-in-action-of-system-with-5-national-parks-cinque-terre-majella-pantelleria-

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					<p>archipelago-toscana-vesuvio- nel-progetto-screenbio- Sterre.?fbclid=IwAR2LcE- L6BcQCdUUKSaipAdCDIS2bV96e0IS_k3GPwArVe_pPh_ QEvCZVBY</p> <p>-ANSA -4/11/2021: Parks: recovery of terraced areas, the role of Maiella and Cinque Terre pollinators, sustainable agronomic practices project. https://www.ansa.it/canale_terraegusto/notizie/mondo_agricolo/2021/11/04/parchirecupero-aree-terrazzateil-role-degli-pollinatori_3ebf383f-3700-4230-8bf8-5a5e3164ecba.html</p> <p>- XIX CENTURY of 11/6/2021 "Let's save the bees and moths of the Cinque Terre"</p>
SILAVIRUS Investigations on the most common viruses and new strains of PVY on potatoes in the SILA territory	Monitoring of Sila potato germplasm against viral agents	L. TOMASSOLI CREA DC	Consorzio Produttori Patate Associati		
START2000 Development of coordination tools aimed at the implementation of conservation objectives and measures in the Natura 2000 sites included in the reserves and other state-owned areas managed by Carabinieri corp	Monitoring, in the Natura 2000 sites managed by the CUFA, the state of planning and concrete implementation of the objectives set for the conservation measures, their effectiveness and integration within the management tools of the administered areas. In addition, to facilitate the functionality of the management system in the aforementioned sites, the project provides for the information and training of CUFA staff and the adoption of procedures aimed at improving the flow of information between CUFA and MATTM	A. CAMPANARO CREA DC	CUFA - Comando Unità Forestali Ambientali e Agroalimentari Carabinieri		<p>-Meeting LEAF ("heal the planet's Future") " 23/09/2021</p> <p>- All4Climate PreCop26 30/09/2021</p> <p>Museo di Storia Naturale di Milano</p> <p>-Citizen Science Itali 11/11/2021</p> <p>Museo di Storia Naturale della Maremma (Grosseto)</p>
SYSTEMIC_1063 ERA HDHL KH FNS An integrated approach to the challenge of sustainable food systems: adaptive and mitigatory strategies to address climate change and malnutrition. Eol N. 1063 From cereal diversity to plant breeding	Develop a proof of concept to demonstrate how genetic diversity can be used to increase sustainable grain production in future climatic conditions. The existing germplasm of wheat and barley will allow i) to map the loci at the base of the characters related to adaptation, ii) to develop new ideotypes of cereals and iii) to develop new models of genomic prediction.	L. CATTIVELLI CREA GB	MiPAAF -		
TETURBAS_21_22 – Evaluation of components to be used with <i>Beauveria bassiana</i> and of epigenetic processes in the resistance to spider mites' acaricides	Evaluation and assessment of fungal tools in Biologica Control	S. SIMONI CREA DC	CBC (EUROPE) SRL BIOGARD DIVISION		
URCOFI VI Unit of coordination and enhancement of surveillance, research, monitoring and training activities in the phytosanitary area	Monitoring of harmful organisms of phytosanitary concern and strategic interest. Morpho-phenological, bio agronomic and qualitative characterization of chestnut ecotypes tolerant/resistant to <i>Dryocosmus kuriphilus</i> in Campania Region	M. SCORTICHINI CREA OFA CREA DC	Campania Region		
URCOFI VII Unit of coordination and enhancement of surveillance, research, monitoring and training activities in the phytosanitary area	Detection and identification of alien organisms, stop at borders of plants infected/infested with alien organisms at a living stage. Brief phytosanitary card and EPPO report of new detected species, including images and brief description. Support to Region staff for the identification of harmful alien organisms. Exploitation and virus elimination of native plant germplasm	F. FAGGIOLI CREA DC CREA OFA	Campania Region		

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URCOFI VII Unit of coordination and enhancement of surveillance, research, monitoring and training activities in the phytosanitary area	Detection and identification of alien organisms, stop at borders of plants infected/infested with alien organisms at a living stage. Brief phytosanitary card and EPPO report of new detected species, including images and brief description. Support to Region staff for the identification of harmful alien organisms. Exploitation and virus elimination of native plant germplasm	A. TAGLIENTI CREA DC CREA OFA	Campania Region		
Val.Inn.P.O. Validation of innovative protocols for the cultivation of official plants of nutraceutical interest	Support for the establishment and management of the EIP operational groups on agricultural productivity and sustainability	M. MAMMANO CREA DC	Regione Siciliana		-Meeting Val.Inn.P.O. - Validation of innovative protocols for the cultivation of Sicilian official plants of nutraceutical interest. Conference 17/12/2021 Palermo
VALITEST Validation of diagnostic tests to support plant health	Validation of diagnostic tools for animal and plant health	F. FAGGIOLI CREA DC	European commission	- EIDGENOESSISCHES DEPARTEMENT FUER WIRTSCHAFT, BILDUNG UND FORSCHUNG (WBF), - GLOWNY INSPEKTORAT OCHRONY ROSLIN I NASIENNICHTWA (GIORIN) - BIOREBA - STICHTING WAGENINGEN RESEARCH (WR) - LOEWE BIOCHEMICA GMBH (LOEWE) - UNIVERSITE DE LIEGE (ULG), - CLEARDETECTIONS B.V. (CD), - FERA SCIENCE LIMITED - NEDERLANDSE VOEDSEL EN WARENAUTORITEIT (NVWA), - European and Mediterranean Plant Protection Organization (EPPO) - SEDIAG (SEDIAG) - Agence Nationale de Securite' Sanitaire de l'Alim. de l'Environnement - NACIONALNI INSTITUT ZA BIOLOGIJO (NIB),	- Training sessions "How to organise Test Performance Studies?" 15/03/2021- 17/03/2021 - Webinar "From TPS organisation to analysis of the results: example of the TPS on ToBRFV" 07/04/2021
XF-ACTORS Xylella fastidiosa Active Containment Through a multidisciplinary - oriented Research Strategy	Accomplish research and innovation actions to improve the prevention, early detection and control of <i>Xylella fastidiosa</i> , under different phytosanitary conditions (EU Implementing Decision 789/2015: pest-free area, buffer zone and infected zone). Specific objectives Strengthen preventive measures by consolidating expertise and awareness of plant health agencies, decision-makers and relevant stakeholders, to build up competences and elaborate effective contingency plans targeting Xf emergence. Develop techniques for the early detection of Xf symptoms from the leaf level to the landscape scale through the automated analysis of high-resolution thermal and hyperspectral remote-sensing data. Fill the research gaps on the Xf biology, population genetics, and mechanisms of interaction with the host, in order to forecast the potential epidemiological risk associated with the establishment of novel strains in the EU, and determine the major crops and areas under threat.	S. LORETI CREA DC	European commission		

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	Extend the knowledge on the xylem-sap feeder bio-ecology, to identify processes involving Xf vectoring and transmission, as a prerequisite for an integrated vector control in infected zones and a rational risk assessment in Xf-free areas. Develop new and innovative management strategies and establish an integrated framework of sustainable approaches aiming at minimizing the economic, environmental and social impacts of Xf infections in the EU territory. Integrate research data outcomes and predictive modelling to develop pest risk assessment (PRA) tools at a regional scale for prevention and control of Xf spread and capitalize research information through a dynamic Xf portal. Establish a platform for adequate communication and dissemination, to create knowledge and critical awareness about project goals and accomplishments, besides ensuring an effective knowledge transfer among the various actors involved.				
SPREMO Application of "smart" technologies for monitoring, prevention and quick diagnosis of economically relevant diseases of the Olive tree	Prevention of diseases, viruses and plant parasites in both plant nurseries and open field implementing rapid, economic and user-friendly diagnostic methods	A. GIOVINO CREA DC	Regione Sicilia		Research grant N. 1
Progetto EU EURL-BAC (2019-2024) EURL for BACTERIA IN PLANTS (European Reference Laboratories for bacteriology)	Provide National Reference Laboratories (NRLs) with high standard methods for the detection of phytopathogenic bacteria, ensuring their high performance, providing scientific and technical support to the EU and other organisations and ensuring reference collections and quality standards of reagents used for diagnostic protocols. The Commission, for the period 2019-2021, has focused the activities on the priority pests designated among those listed as quarantine pests	S. LORETI CREA DC	European Commission	NIVIP (NL), NIB (SL), ILVO (BE)	Training session "Difficulties in results interpretation of real-time PCR in routine analyses" Involvement in TPS "Test performance study for molecular detection of 'Candidatus Liberibacter africanus', 'Candidatus Liberibacter americanus' and 'Candidatus Liberibacter asiaticus'"
Project EU EURL-VIR (2019-2024) EURL for VIRUSES IN PLANTS (European Union Reference Laboratory for Virology)	Provide National Reference Laboratories (NRLs) with high standard tests for the detection of viruses, viroids and phytoplasmas of plant pathogens; ensuring their high performance; providing scientific and technical support to the EU and other organizations; ensuring reference collections and quality standards of reagents used for diagnostic protocols. The Commission, for the period 2019-2021, has focused the activities on priority pests designated among those listed as quarantine pests	F. FAGGIOLI CREA-DC	EU Commission	NIVIP (NL), NIB (SL)	Training session "Online training on seed testing" 8-10/09/2021
UNIHEMP Use of biomasses deriving from industrial hemp to produce energy and new biochemicals	Valorisation of industrial hemp for the relaunch of its cultivation. CREA-DC is involved in the study of major diseases.	L. RICCONI CREA-DC CREA-CI CREA-AA	MUR		
QUALITYKIWI Innovations for the improvement of qualitative standards of Kiwi in Lazio	Implementation of a DSS to manage irrigation, fertilization and diseases of kiwi	L. RICCONI CREA DC	Regione Lazio		

Servizi di comunicazione	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Students, citizens, sector operators, other, Control / Certification	II° EDITION - BIO IN SICILY 2021 " Legumes in the Mediterranean Diet" " date 1 - 2 - 3 October 2021 Villa Palagonia, Bagheria (PA) Title of talk " Common bean (Phaseolus vulgaris L) conservation and characterisation of Sicilian germplasm"	M.C. Fiore	CREA DC
Students, citizens, sector operators, other, Control / Certification	Webinar AIPP – Italian Plant Protection Association 2021. Phytosanitary status of Halyomorpha halys on Apple in North Italy. In :“Phytosanitary status of 2020 and 2021 of Apples”. Webinar, 4/11/2021.	G.Sabbatini.	CREA DC
Students, citizens, sector operators, other, Control / Certification	Webinar AIPP - Italian Plant Protection Association 2021. Phytosanitary status of Halyomorpha halys on Kiwi in North Italy. In :“Phytosanitary status of 2020 and 2021 of Kiwi”. Webinar, 11/11/2021.	G.Sabbatini	CREA DC
Students, citizens, sector operators, other, Control / Certification	Webinar - Halyomorpha halys: presence on the natinal territory and Trissolcus japonicus control action. In: “The biological control ofHalyomorpha halys: experiences in the Marche region Webinar, 1/12/2021.	P.F.Roversi G.Sabatini	CREA DC
Students, citizens, sector operators, other, Control / Certification	Webinar – The dossier onTrissolcus japonicus: preliminary studies for introduction. In: “Focus on Halyomorpha halys: results of national and international works”. Webinar, 3/3/2021.	P.F.Roversi G.Sabatini	CREA DC
Students, citizens, sector operators, other, Control / Certification	Webinar Technical updates on the fig focus on cultivation, planting, propagation, pruning, defense and post-harvest. Phytosanitary problems caused by insects and defense, 30 June 2021	E. Gargani	CREA DC
Students, citizens, sector operators, other, Control / Certification	Training seminar for SFR Toscana e comando regionale Carabinieri Forestali. Title of the presentation: “The epidemic spread in Italy of Toumeyella parvicornis: implications for the protection of Tuscan pine forests, trees and ornamental greenery”. December 16, 2021.	G.Mazza L.Marianelli, P.F.Roversi	CREA DC
Students, citizens, sector operators, other, Control / Certification	Webinar AIPP – Italian Plant Protection Association 2020 - 2021. Actinidia In:“Phytosanitary status of 2020 and 2021 of Actinidia”. Webinar, 11/11/2021.	S. Simoni	CREA DC
Students, citizens, sector operators, other, Control / Certification	Participation in the Journal Day IRET Florence as a speaker with a presentation entitled "Monitoring and management of alien species" at the CNR Research Institute on Terrestrial Ecosystems (Florence office). December 1, 2021.	G.Mazza	CREA DC
Students, citizens, sector operators, other, Control / Certification	Mazza, G., Roversi, P.F., Viviano, A., Pucci, C., Senserini, D., Mori, E., 2021. Effects of the presence of the beaver on the riparian vegetation. THE RE-APPEARANCE OF THE BEAVER (Castor fiber) IN CENTRAL ITALY: REASON FOR WORRY OR GREAT OPPORTUNITY? A presence to monitor and manage. Accademia dei Fisiocritici (Siena), 15 DECEMBER 2021. (Oral communication).	G.Mazza	CREA DC
Students, citizens, sector operators, other, Control / Certification	Seminar for the Degree in Defence of plants of agricultural interest; Department of Science, Roma Tre University 20-10-2021 Diseases caused by the main phytopathogenic fungi: cycle and symptoms. 29-11-2021 Principles for prophylaxis, treatment and resistance in plant disease control. 15-12-2021 Principles of chemical, biological and integrated control of plant diseases	N. Pucci	CREA DC
Students, citizens, sector operators, other, Control / Certification	Workshops FEASR PSR Tuscany Region 2014-2020, ANCI Tuscany 16.06.2021, 17.06.2021, 24.06.2021 and 25.06.2021 Recognition and control of the main adversities of forest and ornamental plants in the province of Piombino (LI), Pistoia (PT), Arezzo (AR) and Siena (SI), Italy	S. Vitale	CREA DC
Students, citizens, sector operators, other, Control / Certification	Workshops FEASR PSR Tuscany Region 2014-2020, ANCI Tuscany 09.06.2021, 28.06.2021, 29.06.2021 Recognition and control of the main adversities of forest and ornamental plants in the province of Pisa (PI), Prato (PO) and Massa Carrara (MS), Italy	N. Pucci	CREA DC
Crop protection	Beccaccioli M., Scala V. Reverberi M. 2021, Communication With Plants, Encyclopedia of Mycology. Elsevier, Pages 114-122, ISBN 9780323851800, https://doi.org/10.1016/B978-0-12-819990-9.00051-2 . Editor(s): Óscar Zaragoza, Arturo Casadevall, (Book Chapter). Codice Scopus 2-s2.0-85117809151.	V. Scala	CREA DC
Crop protection	Technical note for the monitoring of "Pantoea stewartii" 2021. MIPAAF-DISR 05-	V. Scala	CREA DC
Crop protection	Webminar 15-17 Settembre 2021, XXVI Congresso Nazionale SIPaV (Società Italiana di Patologia Vegetale), Verona, Role of lipid signals in the bacterial-plant pathogen Xylella fastidiosa dual state and during the interaction with the host.	V. Scala	CREA DC

Servizi di comunicazione	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Crop protection	Webinar 26-30 April 2021, 3rd European conference on Xylella fastidiosa and XF-ACTORS final meeting. Signals in pathogen and host sensing: free fatty acid and oxylipins.	V. Scala	CREA DC
Biodiversity Protection	Webinar: "ESCaTHE": Simply chatting about the volunteer project LIFE ESC360" 24/02/2021	A.Campanaro	CREA-DC
Biodiversity Protection	Training course for volunteers LIFE ESC360 (corso 1/2021) 22-26/03/2021	A.Campanaro	CREA-DC
Biodiversity Protection	Webinar "Volunteer experience in contact with nature. The European project LIFE ESC360" 19/04/2021	A.Campanaro	CREA-DC
Biodiversity Protection	Training course for volunteers LIFE ESC360 (corso 2/2021) 17-21/05/2021	A.Campanaro	CREA-DC
Biodiversity Protection	Webinar "Natura 2000 Day" 21/05/2021	A.Campanaro	CREA-DC
Biodiversity Protection	Training course for volunteers LIFE ESC360 (corso 3/2021) 12-16/07/2021	A.Campanaro	CREA-DC
Biodiversity Protection	Training course for volunteers LIFE ESC360 (corso 4/2021) 6-10/09/2021	A.Campanaro	CREA-DC
Biodiversity Protection	Webinar "Biodiversity tales" European Night of Research context 23/09/2021	A.Campanaro	CREA-DC
Biodiversity Protection	Technical and in-depth meetings for the staff of the Carabinieri Departments Biodiversity 07-10/06/2021 Castel di Sangro	A.Campanaro	CREA-DC

Docenze	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Plant Protection	Seminar Prevention action ... for exotic insects in nurseries at the Educational and Scientific Services of the University of Florence.	E. Gargani	CREA-DC
Plant Protection	Webinar "Molecular approaches for virus resistance. Two case studies" in the frame of the course "IPM of plants of food interest", Faculty of Food Science and Technology, University la Sapienza, Rome	V. Ilardi	CREA-DC
Plant Protection	Webinar "IPM strategies against insect pests" in the frame of the course "IPM of plants of food interest", Faculty of Food Science and Technology, University la Sapienza, Rome	S. Bertin	CREA-DC
Plant Protection	Seminar "Application of a NGS system for the diagnosis and identification of Xylella fastidiosa ", 9-06- 2021. Alma Mater Studiorum, University of Bologna	S. Loreti	CREA-DC
Plant Protection	Adjunct professor of Degree in Defense of plants of agricultural interest; Dipartment of Science, Roma Tre University	S. Loreti	CREA-DC
Plant Protection	Professor in charge of the course "Communication in Nutrition" (SSD: MED 49- 2 CFU-12 hours) in the Master's Degree in Human Nutrition Sciences - Faculty of Medicine, University of Rome Tor Vergata from A.Y. 2014-15		CREA-DC
Certification	Tutoring from 20-10-2021 to 20-07-2021 University of Milan CdS Agricultural Sciences and Technologies (student Fabio Carelli)	Giulini A.P.	CREA-DC
Crop protection	Tutoring Bachelor's Degree in Agribusiness Biotechnology Martina Rico: "Characterization of isolates of Ascochyta spp. agents of anthracnose in grasspea (Lathyrus sativus L.) "	Infantino A.	CREA-DC
Crop protection	Tutoring Bachelor's degree in agroindustrial biotechnology Ilaria Montaina Quantification of Fusarium spp. biomass in soft wheat samples using SYBR-GREEN technique	Infantino A.	CREA-DC

Docenze	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Crop protection	Supervisor of thesis "Accreditation procedure, according to European ISO 17025 regulations, of Real-Time PCR for the diagnosis of Xylella fastidiosa in olive leaves (European Olea)" Sapienza University of Rome, aa 2020-2021. Student Chiara Santaera 2020-2021	N. Pucci	DC CREA-
Crop protection	Supervisor of thesis "Verification of a Real-Time PCR diagnostic system for the detection of Pseudomonas savastanoi pv. savastanoi in symptomatic and asymptomatic plants of Olea europaea L. Sapienza University of Rome, aa 2020-2021. Student Eleonora Zago	S. Loreti	DC CREA-
Plant Protection	Supervisor of thesis "Genetic transformation of Venturia inaequalis by Green Fluorescent Protein expression for analysing host-pathogen interaction". Sapienza University of Rome, aa 2020-2021. Student Alessia Iobbi.	M. Aragona	DC CREA-
Plant Protection	Supervisor of thesis: "Expression analysis of Phytophthora cinnamomi effectors in interaction with walnut" Sapienza University of Rome, aa 2020-2021. Student Andrea Greci	A. R. Haegi	DC CRE-
Plant Protection	Adjunct professor for "macromolecular structures" (ssd BIO-10, 6 CFU, 60 h) for Nanotechnology Engineering, Faculty of Civil Engineering, Sapienza University, Rome, Italy, aa 2020-2021 and 2021/2022.	F. Costantini	DC CREA-
Plant Protection	December 13, 2021. Lecture on the presentation of the activities carried out at CREA-DC in Florence and on biological control for the Course of B029162 - GENERAL AND APPLIED ENTOMOLOGY, degree in Science of Nature and Man (B093), Curriculum CONSERVATION AND MANAGEMENT OF NATURE (D28), held by Prof. Rita Cervo. 3 hours.	G. Mazza	DC CREA-
Plant Protection	May 27, 2021. Lecture on "Alien insects in Italy" for the Applied Entomology course for the master's degree in Crops and Plant Sciences held by Prof. Matteo Montagna, Department of Agricultural and Environmental Sciences (DISAA), University of Milan. Via Celoria 2, 20133 Milan (Italy). 1 hour.	G. Mazza	DC CREA-
Plant Protection	April 30, 2021. Lecture on "Economic impact and human well-being caused by alien invasive species" for the course of Biological Animal Invasions for the master's degree in Conservation and management of nature, held by Dr.ssa Tricarico Elena. Master's Degree Course - Sciences of Nature and Man, Curriculum CONSERVATION AND MANAGEMENT OF NATURE. 2 hours.	G. Mazza	DC CREA-
Plant Protection	April 14, 2021. Conference "New methods of control of Bactrocera oleae in organic olive oil and table" within the course Ecosustainable strategies in the protection of agricultural crops, module of "Strategies in Agricultural Entomology" for the master's degree course in Agricultural and Environmental Sciences LM69 provided by the Department of Agricultural and Forestry Sciences of the University of Tuscia in Viterbo.	R. Rizzo	DC CREA-
Plant Protection	November 03, 2021. Lecture on insects' vector of phyto virus: methods of acquisition and transmission in agricultural crops "within the course Plant Pathology of the Degree Course in Agroengineering L-25 Held by Prof. S. Davino. University of Palermo	R. Rizzo	DC CREA-
Plant Protection	March 25, 2021. Conference entitled "Hazel bugs: possible strategies for sustainable control" within the course Eco-sustainable strategies in the protection of agricultural crops, module of "Strategies in Agricultural Entomology" for the Master's Degree in Agricultural Sciences and Environmental LM69 provided by the Department of Agricultural and Forestry Sciences of the University of Tuscia in Viterbo	R. Rizzo	DC CREA-
Crop protection	Adjunct professor of Degree in Defense of plants of agricultural interest; Department of Science, Roma Tre University	V. Scala	DC CREA-
Crop protection	Scientific Contact person for the Executive Protocol of Collaboration within the agreement CREA-DC-Roma Tre University	V. Scala	DC CREA-
Crop protection	Phd Supervisor, Thesis title: "Lipids in Xylella fastidiosa-Olea europaea interaction" Student Manuel Salustri, PhD in Environmental and Evolutionary Sciences of the University Sapienza of Rome.	V. Scala	DC CREA-
Plant Protection	Co-tutor of Alberto Bastianelli for a three-year thesis in Agro-Industrial Biotechnology, Sapienza University. Title: Taxonomic framework of a new pathogenic fungus for olive trees by Sanger sequencing of six loci of taxonomic importance	M. Pilotti	
Plant Protection	Co-tutor of Lorenzo Sciarri for a three-year thesis in Agro-Industrial Biotechnology, Sapienza University. Title: Study of the effect of treatments based on resistance inducers / biostimulants	M. Pilotti	

Altre infrastrutture scientifiche e tecnologiche	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Plant protection	Rearing facilities		CREA-DC
Plant protection	Quarantine greenhouses The Crea-DC, Rome, has a quarantine greenhouse divided into 8 boxes each equipped with suitable vacuum filters, air conditioning and lighting. In these boxes, tests of artificial infection with quarantine pathogens (viruses, bacteria and fungi) are carried out.	L. Riccioni	CREA-DC
Plant Protection	CREA-DC Rome hosts overall 15 screenhouses of which 4 are in Rome and 11 at the experimental farm at Tormancina, belonging to the Centre. All the screenhouses at Tormancina are dedicated to the maintenance under protected conditions of accessions of apricot (26), peach (9), plum (36), cherry (8), walnut (7), olive (64), grapevine (87) virus-free certified and most of them already included in the National Voluntary Certification System for plant propagation material. One out of the 4 screenhouses located in Rome is dedicated to the maintenance of grapevine accessions under evaluation for their phytosanitary status, whereas the remaining 3 are dedicated to the in vivo preservation, on indicator plants, of viral isolates of concern, used for diagnostic and research purposes. CREA-DC in Rome also hosts 3 glasshouses dedicated to the growth under controlled conditions of indicator plants, performing of biological diagnostic tests and the execution of trials to assess pathogenicity to various harmful organisms and resistance of different plant varieties.	E. Marinelli, L. Tomassoli, F. Faggioli, L. Ferretti	CREA-DC

Attività verso le scuole	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Certification	MuBAJ Aurelia Jozs Botanical Museum of the Municipality of Milan Green Area, Agriculture and Urban Furniture: design of the "Maze of cereals".	A.P. Giuliani	CREA DC

Servizi di formazione professionale	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Plant Protection	Teacher in the course for the issue of authorization to carry out checks under official supervision for the certification of seeds: "Controllers under official supervision" entitled: "Generalities on seed certification: phytopathological aspects"	Campanella	EA-DC
Seed Protection	Course for professional technicians: "Innovative diagnostic techniques for main pathogens of ornamental crops". Organized by Educational and Scientific Services for Florence University	R. Haegi	EA-DC
Official seed certification	Teacher at Training course for seed certification technicians operating under official supervision. Title of the presentations: Laboratory seed tests: general Organization of a seed testing laboratory"	Perri	EA-DC
Official seed certification	Member of the examination board for the training course for seed certification technicians operating under official supervision.	Perri	EA-DC
Official seed certification	Teacher at Training course for seed certification technicians operating under official supervision. Title of the presentations Introduction to seed certifications: the seed testing"	Villa	EA-DC
Seed Certification	Training course for technicians operating under official supervision in the field of seed certification and official technicians.	Miceli Vaccarella Lo Presti	EA-DC
Official seed certification	Teacher at Training course for seed certification technicians operating under official supervision.	Giulini	EA DC
Functional Reference Laboratory - LNR	Organization of a proficiency test (PT) for the diagnosis of Ceratocystis platani (CREA-DC_PT2021_06_CP)	Pilotti	EA-DC

MAIN TOPICS/PRODUCTS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
THIRD-PARTY SERVICE			
Activities: development of protocol on plant diagnosis based on transcriptomics, assistance in genome annotation and functional analysis of pistachio	(March 2021) Funded project under international call 2020 SMRT Grant PACBIO "2020 HiFi for All - Collaborations SMRT Grant Program". Research project title: "HiFi pan-genome and pan-transcriptome for pistachio adaptation to climate change". PacBio (Pacific Biosciences of California) is an American biotechnology company founded in 2004 that develops and manufactures systems for gene sequencing and some new biological observations in real time. (certificate / declaration) https://www.pacb.com/blog/smrt-grant-collaboration/	A. Giovino	CREA-DC
Phytopathological monitoring and assessment of resistance to biotic stress of the different olive cultivars in relation to the inherent pruning interventions.	On behalf of the University of Palermo, SAAF department. 20,000 euros As part of the Project "Precision crop management in innovative olive planting models for improving the sustainability and quality of oils - SOPROQUAOLI" funded by MIPAAF University of Palermo - SAAF, contract dated 01.10.2019 - Ministerial Decree 18177/7110/2019 of 24 April 2019.	A. Giovino	CREA-DC
Varietal comparison	Agronomic and varietal comparison at the request of private stakeholders	G. Corsi, M. Giannini, F. Govoni	CREA DC
Varietal comparison	National post-registration network of agronomic trials of rapeseed and sunflower at the request of agricultural associations	F. Govoni	CREA DC
Seeds	Private inspections on request and issuing of documentation for sugar beet, fodder beet, sunflower and rapeseed	A. Sommovigo, D. Iraci Capuccinello, G. Diliberto, M. Venali	CREA DC
Varietal comparisons	Morphological and physiological (distinguishability, uniformity, and stability) characterization on behalf of private parties.	L. Tamborini, P. Titone, G. Mongiano	CREA-DC
Varietal analysis: Quality controls of the raw material in the food processing chain	Laboratory tests on behalf of processing industries to verify the identity and varietal purity of samples of different species, mainly soft and hard wheat and processed products. Total samples analyzed: 178	C. Delogu, L. S. Seminari, R. Cremona, A. Venturini, B. Musetti	CREA-DC
Varietal analysis: Control of the seed's genetic quality at the request of the seed company	Laboratory tests with molecular and biochemical markers at the request of the seed companies for the control of the genetic quality of the seed of agricultural and horticultural species Total samples analyzed: 39	C. Delogu, L. S. Seminari, A. Venturini, R. Cremona, B. Musetti	CREA-DC
Varietal analysis Description of the formula of corn hybrids upon request of the breeders for the purpose of varietal registration	Laboratory tests on breeders' requests for varietal characterization of corn samples Total samples analyzed: 271	C. Delogu, L. Silvia Seminari, R. Cremona, A. Venturini, B. Musetti	CREA-DC
Seed quality tests	Private tests for the evaluation of the technological quality of seeds. Total 3163 carried out on 196 species.	R. Zecchinelli E. Perri C. Delogu A. Barbante A. Arioli L. Bettoni R. Cremona Sara Gaudenzi R. Bonetti L. Cassinetti N. Enea F. Cerri E. Crippa T. Amato C. Tamagni F. Riva	CREA-DC
GMO Tests	Private tests for the detection of GMOs in conventional seed lots. Total 4525 on 14 species	E. Perri A. Barbante D. Villa S. Gaudenzi G. Libertini Ali M. Bertolotti F. Colombani A. Ciurlia	CREA-DC
ISTA accredited tests	Private tests for the issuance of ISTA Orange and Blue certificates. Total 3624 performed on 116 species	R. Zecchinelli E. Perri C. Delogu A. Barbante A. Arioli L. Bettoni R. Cremona S. Gaudenzi R. Bonetti L. Cassinetti N. Enea F. Cerri E. Crippa T. Amato C. Tamagni F.	CREA-DC

MAIN TOPICS/PRODUCTS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
		Riva	
Phytopathological analysis	First- and second-level third-party analyses, under conventions or privately, for the diagnosis of bacteria, fungi and phytopathogenic viruses of herbaceous, tree and ornamental plant species. Total: 708 samples analyzed.		CREA-DC Roma
Phytopathological analysis	Third party analysis, under agreements or privately, for the diagnosis of phytopathogenic bacteria, fungi and viruses.		CREA-DC Sede di Palermo
Phytopathological analysis	Private analysis for the diagnosis of plant pathogenic fungi. 15 samples analyzed		CREA-DC Sede di Battipaglia
Seed Analysis	Third party analysis, under conventions or privately		CREA-DC Sede di Palermo
Technological analysis on seed	Third party analysis, under conventions or privately. About 50 samples.		CREA-DC Sede di Battipaglia

EDITORIAL BOARD	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Editorial board	Editor "MDPI" Reviewer board per Microorganisms.		
Editorial Board	"Frontiers" Editorial Board Special Issue Frontiers in Microbiology.	V.Scala	CREA-DC
Editorial Board	"Research Journal of Plant Pathology". Publishing "Insight Medical Publishing"	V.Iardi	CREA-DC
Editorial Board	"Medical Safety & Global Health", "OMICS "Publishing group.	V.Iardi	CREA-DC
Editorial Board	"GM Crops & Food: Biotechnology in Agriculture and the Food Chain". Publishing "Taylor & Francis"	V.Iardi	CREA-DC
Editorial Board	"Plants". Publishing "MDPI".	V.Iardi	CREA-DC
Editorial Board	MDPI Publisher, Topic Editor	Mazza, G. Sabbatini, F. Faggioli	CREA-DC
Editorial Board	MDPI Publisher, Topic Editor for the journal "INSECTS"	F.Paoli	CREA-DC
Editorial Board	"Redia" Editor/Editorial Board	P.F. Roversi, S.Simoni, F. Paoli	CREA-DC
Editorial Board	Editor Science Publishing Group. Editorial Board Member for "Journal of Plant Sciences"	M. Pagano	CREA-DC
Editorial board	"Elite" Editorial Board Special Issue Frontiers in Bioscience.	V.Scala	CREA-DC
Editorial board	"MDPI" Editorial member per ANTIBIOTICS, PLANT'S DEFENCE AGAINST PATHOGENS	V.Scala	CREA-DC
Editorial board	Casa editrice MDPI Journal Topic Board Member for "Biology" (I.F. 3,796)	M. Pagano	CREA-DC
Editorial board	MDPI Publisher, Special Issue Editor	G. Sabbatini	CREA-DC
Editorial board	"Bulletin of Insectology" Editorial Board.	P.F. Roversi	CREA-DC
Editorial board	"Fragmenta Entomologica". Università La Sapienza. Roma	P.F. Roversi	CREA-DC
Editorial board	Editorial Board Editor of "Annals of Warsaw University of Life Sciences"	S. Simoni	CREA-DC
Editorial board	"Frontiers in Plant Science"	G. Fascella	CREA-DC
Editorial board	Editor MDPI "Plants"	G. Fascella	CREA-DC
Editorial board	"Caryologia"	A. Giovino	CREA DC
Editorial board	'Quaderni di Botanica Ambientale e Applicata'	A. Giovino	CREA DC

EDITORIAL BOARD	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Reviewer Board	"Microorganism" (MDPI)	S. Loreti	CREA-DC
Reviewer board	"Agronomy" (MDPI)	G. Mongiano	
Editorial board	Publisher, Topic Editor "Sustainability" (MDPI)	R. Rizzo	CREA-DC
Review editor		A. Giovino	CREA DC
Editorial board	Guest editor for the special issue Nanomaterials for Healthcare, Environmental Monitoring and Food Quality Control for "Materials"	F. Costantini	CREA-DC
Editorial board	Editor "Wiley", Microscope Research and Techniques	E. Maurizi	CREA-DC
Editorial board	Editor MDPI, "Insects, Sustainability, Diversity, Agriculture and Microscopy and Microanalysis" Editorial board	E. Maurizi	CREA-DC
Guest Editor	Editor "MDPI", guest editor per la special issue "The Citizen Science Approach for Expanding the Research on Insects" for "Insects" journal	A. Campanaro	CREA-DC
Subject Editor	Subject editor for "Nature Conservation", Pensoft	A. Campanaro	
Guest Editor	Special issue "Progress on Understanding and Management of Xylella fastidiosa Infections", Pathogens MDPI	S. Loreti	CREA-DC
Editorial board	Topical advisory panel member of plants "PLANTS" MDPI	G. Gugliuzza	CREA DC
Guest Editor	Microorganisms (issn 2076-2607; coden: micrkn) Special Issue "Animal–fungi interactions, plant–fungi interactions, and aspects of antifungals and fungicides related to understanding the mechanism underlying the pathogenicity and the means for controlling diseases in different hosts". https://www.mdpi.com/journal/microorganisms/special_issues/ECFG15	V. Scala	CREA DC
Guest associate editor and Review Editor	Frontiers in microbiology (electronic issn: 1664-302x)- Section microbial physiology and metabolism. https://loop.frontiersin.org/people/138790/overview	V. Scala	CREA DC
Project evaluator	Dutch Research Council code 2021/ENW/01090197	V. Scala	CREA DC
Member of Scientific Committee	Congress: "International Advances in Plant Virology 2021" organised by Association of Applied Biologists (UK) (on-line, April, 20 th -22 th 2021)	S. Bertin	CREA-DC

MAIN TOPICS/PRODUCTS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Crop protection	MIPAAF-EPPO 'Ad hoc Panel on harmonization of data on plant protection products on EPPO codes.	L. Donnarumma	CREA DC
Crop protection	MiPAAF-EPPO 'EU Commodity Expert Group minor uses fruits and vegetables.	L. Donnarumma	CREA DC
Crop protection	MIPAAF - Technical - Scientific committee for <i>Xylella fastidiosa</i> in support of the National Phytosanitary Committee	S. Loreti	CREA DC
Crop protection	Ministry of Health - Technical Committee for Nutrition and Animal Health - Consultative Section for Phytosanitary.	L. Donnarumma	CREA DC
Crop protection	Ministry of Health – Member of Technical Committee for biotechnology assessment	M. Aragona	CREA DC
Crop protection	MIPAAF - Technical Commission "Products used as corroborants, enhancers of the natural defences of plants".	C. La Torre	CREA DC
Crop protection	MIPAAF- "Member of permanent working Group Gruppo for Plant Protection". "Phytosanitary Barriers" sector.	S. Simoni	CREA DC
Crop protection	MIPAAF -Workgroup "Export control".	S. Simoni, G. Sabbatini	CREA DC
Crop protection	MIPAAF – Member of the Working Group "Export Controls".	L. Riccioni, S. Bertin	CREA DC
Crop protection	MIPAAF- PAC - Technical-Scientific Table topic 6 ' Biological Agriculture 6	S. Simoni	CREA-DC
Crop protection	National Academy Entomology (member)	S. Simoni	CREA DC
Crop protection	Technical-scientific table Nuova PAC - Subgroup "Organic Agriculture".	La Torre	CREA DC
Crop protection	Viticultural Breeders Association - Board of Directors of ACOVIT (Viticultural Breeders Association).	F. Faggioli	CREA DC

MAIN TOPICS/PRODUCTS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Crop protection	Member of Organizing Committee di Euraac 2022 IX Symposium of the European Association of AcarologistsAcarology 1.0 to 2.0: Progress in Changing Times” (Bari, Italia)	S. Simoni	CREA DC
Crop protection	Member of International Scientific Committee XVI International Congress of Acarology (ICA) (Auckland, New Zealand)	S. Simoni	CREA DC
Crop protection	MIPAAF- Working group “Defence and certification, Luppulo table”.	E. Gargani	CREA DC
Crop protection	MiPAAF-EPPO (European and Mediterranean Plant Protection Organization https://www.eppo.int/) panel “Diagnostics and Quality Assurance”.	L. Ferretti	CREA DC
Crop protection	MIPAAF-EPPO 'Phytosanitary Measures for Potatoes (P POTATO MEAS).	S. Loreti	CREA DC
Crop protection	Ministry of Health - Technical Committee for Nutrition and Animal Health - Phytosanitary defence of the consultative section for phytosanitary products.	A.La Torre	CREA DC
Crop protection	MiPAAF/EPPO Expert for EPPO PRA and DP for vegetable viruses.	L. Tomassoli	CREA DC
Cro protection	MIPAAF- GdL Pest Survey.	L. Tomassoli, L. Marianelli, L. Damiano	CREA DC
Crop protection	MIPAAF Working group “Mobile seed sorters”.	A. Infantino	CREA DC
Crop protection	MIPAAF – Member of the Working Group “Thousand Canker Disease”.	S. Vitale	CREA DC
Crop protection	MIPAAF – Working Group “Bactrocera dorsalis”.	L. Marianelli, P.F. Roversi	CREA DC
Crop protection	MIPAAF- Member of the Working Group for Organic Farming, Phytosanitary Protection Section	L. Riccioni	CREA DC
Crop protection	MIPAAF- Permanent Working Group "Plant Protection" - Phytosanitary Products.	C. Morgia L.Marianelli, P. Roversi	CREA DC
Crop protection	MIPAAF - Permanent Working Group " Plant Protection " section " Certification of fruit trees, vegetables and ornamental plants ".	F.Faggioli	CREA DC
Crop protection	MIPAAF - Permanent Working Group "Protezione delle Piante", Section "Vine multiplication materials ".	A.Gentili, F.Faggioli	CREA DC
Crop protection	MIPAAF- Permanent Working Group " Plant Protection " - Phytosanitary Products.	L.Marianelli, P. Roversi	CREA DC
Crop protection	MIPAAF- Working group on “Plant Protection”, Section “Multiplication material of fruit trees, horticultural and ornamental crops” ornamentali”.	L.Ferretti	CREA DC
Crop protection	MIPAAF- Working group on “Plant Protection”, Section “Multiplication material of fruit trees, horticultural and ornamental crops”, Evaluation group for the registration of new accessions to the National Service for Voluntary Certification	L. Ferretti	CREA DC
Crop protection	MIPAAF- Working Group " Plant Protection " - Phytosanitary Barriers”.	L. Donnarumma L. Riccioni	CREA DC
Crop protection	MIPAAF –Technical-scientific Working Group "Kiwi die off”	M. Pilotti	CREA DC
Crop protection	MIPAAF – Working group “National phytosanitary legislation on citrus”	L. Ferretti	CREA DC
Crop protection	MIPAAF – Working group “Laboratory network”	F. Faggioli, L. Ferretti, L. Marianelli, E. Gargani, S. Simoni, G. Torrini	CREA DC
Crop protection	Lazio Region - Technical-scientific Working Group “Kiwi die off Gruppo di lavoro tecnico-scientifico regionale “Moria del kiwi”.	L. Riccioni, M. Pilotti, S. Vitale	CREA DC
Crop protection	SOI Working Group ‘Dried Fruit’.	M. Pilotti	CREA DC
Crop protection	EU Italian leader EWG Plant Health Survey.	L.Tomassoli	CREA DC
Crop protection	EPPO Member of Panel for diagnostics (Entomology).	E. Gargani	CREA DC
Crop protection	AAB -Association of Applied Biologists – UK: Member of the Virology Group.	S. Bertin	CREA DC
Plant protection	MIPAAF –Working group for quarantine pest “Pantoea stewartii”.	V. Scala	CREA DC
Crop protection	MIPAAF - National technical table "Emergency measures to prevent the spread of Popillia japonica Newman in the territory of the Italian Republic", National Phytosanitary Committee.	L.Marianelli, P.F. Roversi	CREA DC
Crop protection	MIPAAF- Working Group Halyomorpha halys control	P.F. Roversi , Sabatini	CREA DC
Crop protection	MIPAAF - Coordination of the technical table for the control of <i>Drosophila suzukii</i>	P.F. Roversi, S. Bertin	CREA DC
Crop protection	MIPAAF -EPPO National Contact Point per EUPHRESKO I e II (Era-Net Project).	S. Simoni	CREA DC

MAIN TOPICS/PRODUCTS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Crop protection	MIPAAF- New CAP, Defence Sector - Sustainable Use of Pesticides.	L. Riccioni	CREA DC
Crop protection	MIPAAF-EPPO Panel for the drafting of the Diagnostic Protocol of <i>Xylella fastidiosa</i> .	S. Loreti	CREA DC
Crop protection	MIPAAF -EPPO Panel diagnostics in virology and phytoplasmology.	F.Faggioli	CREA DC
Crop protection	MIPAAF EPPO Fungal Diagnostics Panel	L. Riccioni	CREA DC
Crop protection	MIPAAF - Ministerial table drafting the national emergency plan "Xylella fastidiosa".	E. Gargani	CREA DC
Crop protection	MATM- Cartagena Protocol (http://bch.cbd.int/protocol/) an international agreement which aims to ensure the safe handling, transport and use of living modified organisms (LMOs) resulting from modern biotechnology. In The roster of experts on OGM biosafety (http://bch.cbd.int/protocol/cpb_roster.shtml).	V. Ilardi	CREA DC
Crop protection	Italian Society of Iris SIDI. Executive protocol for monitoring and mass capture of "Oxythorea funesta".	V. Francardi	CREA DC
Crop protection	MIPAAF - Permanent working group for plant protection, sub-group "Registration and labeling of plant protection products".	C. Morgia	CREA DC
Crop protection	MIPAAF - Permanent working group for plant protection Subgroup "Minor Uses".	L. Donnarumma	CREA DC
Crop protection	MIPAAF-SQNPI National quality system for integrated production - "Integrated Defence" Group.	L. Donnarumma	CREA DC
Crop protection	MIPAAF-SQNPI National quality system of integrated production - Scientific Technical Body (OTS).	L. Donnarumma	CREA DC
Plant protection	Sicilian Region - Member of Working Group of Agroecology and Organic Agriculture of Sicilian Region "Scientific technical support in the field of plants protection and ecology (D.A. n. 69 of 3/7/2019).	R. Rizzo	CREA DC
Plant protection	Autofitoviv Project: meeting on line on effects of mites (context "Phytosanitary Control and sustainability")	S. Simoni	CREA DC
Plant protection	Autofitoviv Project field workshop (Pistoia area) in field (context "Phytosanitary Control and sustainability")	S. Simoni	CREA DC
Plant protection	NCP (National Contact Point) for EUPHRESKO I e II (Era-Net Project) (now coordinated by EPPO Secretariat)	S. Simoni	CREA DC
Plant protection	MIPAAF – Member of the Technical Table of NUT – Hazelnut section	S. Vitale	CREA DC
Crop protection	MIPAAF- Technical Table on Hop production chain "Certification, quality and phytosanitary aspects"	L. Ferretti	CREA DC
Crop protection	MIPAAF –Technical Table 'Dried Fruit'.	M. Pilotti	CREA DC
Plant protection	Plant protection MIPAAF - Technical table "Official plants".	L. Donnarumma, L. Andreani, C. Delogu	CREA DC
Plant protection	MIPAAF – Coordinator of the Working Group of Nut Supply Protection Chain "Hazelnut section"	R. Rizzo	CREA DC
Crop protection	MIPAAF -EPPO- Working group EPPO Regulated non Quarantine Pests (RNQP).	F. Faggioli	CREA DC
Crop protection	AISSA (Italian Association of Scientific Agrarian Societies)- Italian Society of Nematology.	P.F. Roversi	CREA DC
Crop protection	(FISNA) Italian Federation of naturalistic and environmental Sciences. Italian Society of Nematology.	P.F. Roversi, S. Bertin	CREA DC
Crop protection	MIPAAF- Members of the Technical Table on <i>Toumeyella parvicornis</i>	S. Bertin, P. F. Roversi	CREA DC
Crop protection	EFSA, Representing for CREA area 4.11 "Environmental risk assessment (ERA) Alien Pest."	G. Sabbatini	CREA DC
Crop protection	Toscana Region Technical Table as part of the CREA DC Tuscany Region scientific collaboration agreements for the year 2021 for the implementation of joint activities in the field of entomology and nematology of arboreal, shrub, ornamental and forest plants (MONI.TOSC 2021).	L. Marianelli, G. Torrini, G. Sabbatini, F. Paoli, G. Mazza, E. Gargani	CREA DC
Crop Protection	EURL European Reference Laboratories, Insects and mites	P.F. Roversi, E. Gargani, S. Simoni, L. Marianelli, G. Mazza, A. Strangi	CREA DC
Plant protection	EURL European Reference Laboratories for Bacteria	S. Loreti, N. Pucci, V. Scala, V. Ilardi	CREA-DC

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Plant protection	EURL European Reference Laboratories for Virology	F. Faggioli, L. Ferretti	CREA-DC
Plant protection	EFSA Working Group for the drafting of pest survey card on <i>Erwinia amylovora</i>	S. Loreti	CREA-DC
Plant protection	Member of the MIPAAF technical and scientific Working Group for the development of the contingency plan for <i>Xylella fastidiosa</i> in accordance with the Regulation (EU) 2020/2021	S. Loreti	CREA-DC
Certification	ISTA 2021 Working Group 2nd Comparative test for the introduction in the ISTA standards of a new protocol for the varietal identification in pea using microsatellite markers (SSR).	C. Delogu L. Andreani A. Venturini	CREA DC
Certification	WG Biobanche ACCREDIA Accreditamento per "UNI/ISO 20387 Biotechnology – Biobanking – General requirements for biobanking" ispezioni alle biobanche vegetali di specie agrarie.	C. Delogu	CREA DC
Seed certification	ISTA Germination committee.	R. Zecchinelli	CREA DC
Seed certification	ISTA Flower seed testing committee. ISTA working group on flower seed samples.	R. Zecchinelli	CREA DC
Seed certification	MIPAAF -Italian Ministry of Agriculture working party "Criteria and technical procedures for listing in the voluntary National catalogue of new varieties of <i>Triticum turgidum</i> subsp. <i>turanicum</i> ."	C. Miceli; G Corsi; C. Delogu	CREA DC
Certification	Sicilian Region - Technical Table of the cereal supply chain including processing.	C. Miceli	CREA DC
Certification	Sicilian Region - Committee for the evaluation and approval of the control plans proposed by the Control Bodies to carry out the control and certification of products bearing the "Safe Quality guaranteed by the Sicilian Region" brand.	C. Miceli	CREA DC
Certification	Sicilian Region - Local Orientation Committee of the LIFE ADAPT2CLIMA Project.	C.Miceli	CREA DC
Certification	Sicilian Region - Examining Commission for the acquisition of the requisite of professionalism of the seed activity pursuant to art. 19 of the legislative decree 214/05 and D.M. 12/11/2009.	C.Miceli	CREA DC
Seed certification	Working party to Revision of "Criteria and technical procedures for listing in the voluntary National catalogue of new varieties of Soybean. " Add new methodology to determinate the characteristic "peroxidase activity in seed coat ".	C. Delogu, L.Andreani R.Cremona, B.Seminari, A.Musetti A.Venturini G. Corsi, S. Tonti, M. M. Giannini, V. Moschini	CREA DC
Seed certification	Sicilian Region Regional Department of Agriculture, Rural Development and Mediterranean Fisheries - Commission for evaluating application for registration in the national register for conservation varieties (legge 6 aprile 2000, n° 46 art. 2-bis e succ. d.m. 17 dicembre 2010 attuativo del d.lgs 29 dicembre 2009 n°149)	C. Miceli M.C.Fiore	CREA DC
Seed certification	Piedmont Region- Plant Resources conservation committee.	L. Tamborini P. Titone	CREA DC
Certification	Working Group 'Post Control for seed certification.	V. Battaglia	CREA DC
Certification	ISTA- variety committee DNA working group.	C. Delogu	CREA DC
Seed certification	ENGL WG DNA extraction European Network of GMO Laboratories Working group on DNA extraction.	D. Villa	CREA DC
Seed certification	European Network of GMO Laboratories (ENGL) Working group on Multiplex Real Time PCR Methods.	E. Perri A.Barbante	CREA DC
Seed certification	Executive committee ISTA.	R. Zecchinelli	CREA DC
certification	MIPAAF – Technical Table 'Officinal Plants' Working Group 'Research and Experimentation'.	L. Andreani	CREA DC
certification	'Post control' working group for agricultural species for the implementation of the samplings' registration program.	CREA-DC	CREA DC
Certification	Technical Working group UNI / CT 003 / GL 23 "Food authenticity".	L. Andreani	CREA DC
Certification	Scientific coordinator CREA-DC working group CREA technology transfer network	L. Andreani	CREA-DC
Plant protection	Executive protocol of collaboration within the Agreement University Roma Tre - CREA.	V.Scala	CREA DC
Seed certification	Working group: Review of technical provisions applying the seed law.	A.Arioli P.Mazzola E.Perri P.G. Bianchi	CREA DC
Seed certification	Lombardy Region –Field inspections on behalf of Italy's NPPO	L. Tamborini P.Titone	CREA DC
Seed certification	ISTA- tetrazolium committee.	A.Arioli	CREA DC
Seed certification	ISTA- GMO committee.	E. Perri	CREA DC
Seed certification	ISTA- Proficiency test committee.	R. Zecchinelli	CREA DC
Seed certification	ISTA- rules committee.	R. Zecchinelli	CREA DC

MAIN TOPICS/PRODUCTS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Certification	CPVO Technical Transfer Working Group - Accreditation Quality Manual.	CREA-DC	CREA-DC
Certification	MIPAAF- Evaluation group on registration of new accessions to the National Voluntary Certification Service	L.Ferretti, F. Faggioli	CREA-DC
Seed certification	Member of the UNI/PDR working group "Third party conformity assessment on "NON-GMO" products	D. Villa	CREA-DC
Seed certification	CEN/ISO T 003 observer "Agroalimentare" (ISO/TC34/SC16 mirror group)	E. Perri D. Villa	CREA-DC
Seed certification	CREA Deputy for EFSA section 4.11 "Environmental risk assesment (ERA) GMOs."	E. Perri	CREA-DC
Certification	Lombardy Region - Regional Team for the evaluation of food and agricultural regional diversity (within the meaning of Ministerial decree 18/01/2018, n. 1862)	G. Spataro	CREA DC
Certification	Internal working group for the development of statistical elaboration methods in the framework of DUS and VCU trials of fodder varieties.	B. Frangipane, G. Spataro, C. Miceli, S. Gualanduzzi, G. Campanella, E. Barolo, M. Faina, V. Fusillo	CREA DC
Certification	Internal working group for the improvement of the certification portal "INODE" about the transmission of results of post control trials on agricultural species.	P.G. Bianchi, R. Bravi, E. Frusciant, C. Miceli, A. Sommovigo, L. Tamborini, G. Carbone, P. Titone, M. Franchini, G. Conte, M. Mele, M. Faina, M. Venali, D. Iraci Capuccinello, V. Spina, D. Zito, C. Di Benedetto, F. Teri, L. Antonietti, M. Cremonesi, F. Cuciniello, E. Visentin, V. Battaglia, M. Lo Presti, N. Pelazza, Simone Pagnoncelli, Tomaso Amato, L. Cavion, G. Spataro	CREA DC
Certification	Internal working group for the updating of the certification portal "INODE"	P. G. Bianchi, R. Bravi, E. Frusciant, C. Miceli, E. Perri, A. Sommovigo, L. Tamborini, F. Baulo, A.M. Aulizio, D. Iraci Capuccinello, M. Venali, G. Diliberto, M. Velitti, C. Gretter, C. Di Benedetto, M. Lo Presti, L. Raimondo, F. Teri, P. Titone, M. Franchini, G. Conte, N. Pelazza, G. Roncarolo, E. Crippa, A. Barbante, T. Amato, E. Barolo, M. Cantieri, G. Anastasi, B. De Angelis, A. Mondillo, G. Serratore, D. Zito, M. Vaccarella, F. Teri, G. Spataro. N. Pelazza, S. Pagnoncelli, G. Campanella, V. Moschini, S. Gualanduzzi, L. Cavion, E. Visentin, V. Spina, M. Mele, V. Battaglia, G. Spataro.	CREA DC
Certification	Internal working group for the updating of the Applicative Technical Rules about Official seed controls and certification.	P.G. Bianchi, R. Bravi, E. Frusciant, C. Miceli, A. Sommovigo, L. Tamborini, E. Perri, P. Titone, N. Pelazza, S. Pagnoncelli, S. Gualanduzzi, D. Iraci Capuccinello, M. Venali, G. Diliberto, G. Campanella, Paola Mazzola, A. Airol, C. Gretter, G. Anastasi, M. Lo Presti, L. Raimondo, M. Vaccarella, N. Trotta, A. Mondillo, B. De Angelis, D. Zito, G. Spataro.	CREA DC
Certification	MIPAAF- "Permanent working group for plant protection - Seed section".	P. G. Bianchi, A.P. Giulini, G Corsi, A Sommovigo, R.Bravi, E. Frusciant	CREA DC
Certification	Internal working group for the organization of the international meeting EU-VCU Seminar 2022.	A.P. Giulini, G. Corsi, P.G. Bianchi, A. Crippa, M. R. Vaghi, M. Mervini, I. Pepe	CREA DC
Certification	Internal working group for the management of agricultural plots on the farms of CREA DC	A. P. Giulini, M. Zuffada, L. Antonietti, E. Novarina, D. Sacco, E. Visentin, L. Cavion, G. Corsi, F. Govoni, N. Trotta, M. Mele, D. Zito, V. Angileri, E. Marinelli, S. Simoni, S. Simoncini.	CREA DC
Certification	K06 Biotechnology Steering Committee of the Faculty of Biotechnology of the University of Milan.	A.P. Giulini	CREA DC

MAIN TOPICS/PRODUCTS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Seed certification	UPOV: TWA – Technical Working party of Agricultural crops.	G. Corsi	CREA DC
Seed certification	CPVO: AEM - Meeting of Agricultural Experts	A.P. Giulini, G Corsi	CREA DC
Seed certification	EUROPEAN-VCU: 14th EU-VCU Experts Seminar	A.P. Giulini, G corsi	CREA DC
Seed certification	UPOV-BMT-meeting Biochemical and molecular technical working group	C. Delogu	CREA-DC
Seed certification	CPVO –VEM – Meeting of Vegetable Experts	R. Bravi, M.C.Napoli	CREA-DC
Seed certification	UPOV- TWV- Technical Working Party of Vegetable Species	R. Bravi, M.C.Napoli	CREA-DC
Seed certification	Regional Seed Commission - Veneto Region	R. Bravi	CREA-DC
Seed certifications	Committee “Piante allogame Legge 2/98” Emilia Romagna Region	A. Sommovigo, G. Corsi	CREA-DC
Seed certifications	Regional Seed Committee – Emilia Romagna and Marche Regions	A. Sommovigo	CREA-DC
Biodiversity protection	Member COST Action CA18207 Biodiversity of Temperate forest Taxa orienting Management Sustainability by Unifying Perspectives (Bottoms-up) , working groups: 1. Towards common tools for forest multi-taxon research and monitoring 3. Effect of management on biodiversity based on experiments 4. Habitat structures: quantity and quality needed for the conservation of forest biodiversity 5. Definition of relevant indicators and thresholds for sustainable forest management	A.Campanaro	CREA-DC
Biodiversity protection	Member of the Coordination Committee of the LTER-Italia network (Italian Network for Long-Term Ecological Research)	A.Campanaro	CREA-DC

MAIN TOPICS/PRODUCTS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Rice, varietal characterization	Work as an entrusted Examination Office for the Community Plant Variety Office to perform testes needed for Plant Variety Rights grants. Deliverables: 9 technical exams (morphological and physiological characterization of new rice varieties), 11 take-overs (validation of results of prior characterizations carried out for inclusion in the Common Catalogue)	L. Tamborini, P. Titone, G. Mongiano	CREA-DC
Seed certification	Official fields inspections of areas for seed production in Italy (216,308.33 hectares of seed crops of all species controlled during the 2020-2021 by the Milan, Vercelli, Bologna, Battipaglia, Palermo offices). Quantities of seeds of all varieties certified during the year 2020-2021: 568,585.38 t	L. Tamborini, A. Sommovigo, C. Miceli, E. Frusciantè	CREA-DC
Corn, durum wheat, emmer wheat	Activity as examination office accredited to the CPVO (Community Plant Variety Office) for the issue of a community right for plant varieties. Products: technical reports	A.P. Giulini, M. Zuffada, M. Cremonesi, L. Antonietti, S. Pezzetti, F. Alagna	CREA-DC
Alexandrian clover and Pannonian vetch	Activity as examination office accredited to the CPVO (Community Plant Variety Office) for the issue of a community right for plant varieties. Products: technical reports	C. Miceli, B. Frangipane, M. Genduso, V. Angileri, M. Vaccarella, L. Raimondo,	CREA-DC
Vegetable species and Narbonne vetch	Activities as an examination Office entrusted by CPVO (Community Plant Variety Office) for release of Community variety right for tomato, melon and cardoon.	E.L. Frusciantè, M.C.Napoli	CREA-DC

	5 Take overs: field plot testing and resistance tests.		
Rescue grass and bermuda grass	Untrusted Examination Office for the DUS trials of Rescue Grass and Bermuda grass aimed to production of technical report for granting of the European plant breeder right.		
Seed certification/Plant protection	Phytosanitary certification: field surveys and seed sampling during seed crops inspections on behalf of Italy's NPPO to identify quarantine pests and related organisms. Deliverables: Total seed crops area covered (Lombardy, hectares) - Rice 5183 - Corn 2589 - Swiss chard 189 - Alfalfa 541 - Soybean 309 - Sunflower 70 No. 648 seed samples collected	L. Tamborini, P. Titone	CREA-DC
Seed certification/Plant protection	Phytosanitary activities field inspections and sampling on behalf of the Regional Phytosanitary Services and private entities. Sampling and husking of rice for the evaluation of the presence of <i>Aphelenoides besseyi</i> ; field inspections for the research of <i>Orobanche</i> spp. on seed vegetable cultivations for the purpose of exemption for international marketing.	A. Sommovigo, G. Campanella	CREA DC
Certification	Descriptive parcel tests, agronomic and intended use tests, complementary analysis tests (e.g. resistance to herbicides, resistance to pathogens and technological tests such as bread-making or biometrics for the classification of the type of rice). About 1600 varieties.	A. Sommovigo G. Corsi L. Tamborini P. Titone A. Giulini	CREA-DC
Seed Certification	Post control trials of vegetable species (about 300 plots)	S. Gualanduzzi, G. Campanella, V. Moschini	CREA-DC
Seed certification	Seed certification data dissemination to stakeholders. Technical meeting: "Rice Seed Certification and Experimental Activity - Campaign 2020-2021" streamed on CREA Facebook and Youtube social channels (https://www.youtube.com/watch?v=HE6YSsLWPXU&t=3600s); 1700 views total.	L. Tamborini, P. Titone, G. Mongiano	CREA-DC
Seed Certification	Agronomic tests for variety registration in the Variety Register (1376 plots), post-variety control tests for horticultural and agricultural species (642 plots), seed quality analysis and phytosanitary analysis of oil species (9230 samples) - Tests' location: CREA DC Lonigo	R.Bravi, E. Visentin, C. Gretter	CREA-DC
Seed certification	Analysis for the assessment of the technological quality of seeds as part of the official certification. Total samples 5811 carried out on 31 species.	E. Frusciant, De Angelis, Mondillo.	CREA - DC
Seed certification	Precontrol seed potato- ELISA test. Carried out on 82 samples.	E. Frusciant, D. Zito	Certificazione sementi
Official tests for seed certification	Tests to assess the technological quality of seeds within the official certification for the labelling. Total 5660 performed on 69 species.	R. Zecchinelli E. Perri C. Delogu A. Barbante A. Arioli L. Bettoni R. Cremona S. Gaudenzi R. Bonetti L. Cassinetti N. Enea F. Cerr E. Crippa T. Amato C. Tamagni F. Riva R. Bonetti	CREA-DC Tavazzano Seed Testing Laboratory
Registration into the National list of plant varieties	Laboratory tests for the biochemical and molecular characterization of the new varieties under the registration procedure: 1693 samples divided between different species of cereals, soybeans, corn, sunflower Verification of specific characters with molecular markers: 35 samples	C. Delogu L. Andreani, A. Venturini, R. Cremona, B. Musetti, S. Seminari	CREA-DC - Tavazzano -
Counteracting fraud in the seed sector- (CREA ICQRF agreement for trade associations)	Laboratory tests with molecular markers to ascertain the varietal identity of samples taken officially by ICQR or at the direct request of the CTU and Prosecutors Analyzed samples 26 of different vegetable and cereal species	C. Delogu L. Andreani, A. Venturini	CREA-DC - Tavazzano -
Registration into the National list of plant varieties	DUS and VCU trials for the registration into the National list of new grass and legume varieties	G. Spataro, V. Fusillo	CREA DC
Registration into the National list of plant varieties	Distinguishability, uniformity, and stability tests and value of cultivation use tests for inclusion of new rice varieties in the National Register and the Common Catalogue.	L. Tamborini, P. Titone, G. Mongiano	CREA-DC - Vercelli
Registration into the National list of plant varieties	DUS tests for registration in the National list of new vegetable and agricultural varieties.	E.L.Frusciant, M.C.Napoli, M.Faina	CREA-DC
Registration to national Register	Descriptive, agronomic parcel tests and intended use of new varieties of rice for registration in the National Register and the Community Catalog.	C. Miceli, B. Frangipane, M. Genduso, V. Angileri, M. Vaccarella	CREA-DC - Palermo
Registration into the National list of plant varieties	DUS and VCU trials for the registration into the National list and the Common Catalog of new maize and cereals varieties.	A.P. Giulini, M. Zuffada, M. Cremonesi, L. Antonietti, S. Pezzetti, F. Alagna	CREA DC Milano-Tavazzano
Plant Protection	Activities as an examination office accredited to the CPVO (Community Plant Variety Office) for the issue of a Community Plant Variety License for the following species: maize, durum and bread wheat and spelt.	A.P. Giulini, M. Zuffada, M. Cremonesi, L. Antonietti, S. Pezzetti, F. Alagna	CREA DC Milano-Tavazzano
Registration into the National list of plant varieties	DUS and VCU trials for the registration into the National list and the Common Catalogue of new varieties of sunflower, grain e fodder sorghum, sudan grass, sugarbeet, soybean, sunflower, rapeseed, flax.	G. Corsi, M. Giannini, V Moschini, S. Tonti, F. Govoni, M Iannucci, F. Brunetti	CREA-DC Bologna

Official monitoring programme on maize and soybean seed lots for the adventitious presence of GMOs	Official monitoring programme for the control of conventional seed lots of maize and soybeans for the verification of the absence of genetically modified organisms according to D.M 27/11/2003 (351samples)	E. Perri A. Barbante D. Villa S. Gaudenzi G. Libertini Ali M. Bertolotti F. Colombani A. Ciurlia	CREA-DC Tavazzano Seed Testing Laboratory
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Historical libraries

Tematiche prevalenti/prodotti	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Plant Protection Historical and Scientific Library - Florence	<p>The Library of the Florence office belongs to the Plant Defense area and includes the one derives from the Royal Experimental Station of Agricultural Zoology, as well as what was acquired later. The library offers an on-site consultation service, on request, where databases and catalogs are available. The library has access to the National Collective Archive of Periodicals (ACNP).</p> <p>Other important news about the library.</p> <p>The library of CREA-DC Florence - Zoology section, is one of the most important libraries in the country in the disciplines "Entomology" and "Agricultural Zoology" (Mites, Insects and Nematodes of agricultural interest) for the number of periodicals owned (at least 510 accessions).It was activated in 1875 with the foundation of the "Agricultural Entomology Station" established by decree of the Royal Ministry of Agriculture, Industry and Commerce in agreement with the Royal Ministry of Public Education and with the Board of Directors of the Royal Institute of Higher Practical Studies and of Improvement; the "Stazione" and its library were housed in the Royal Museum of Physics and Natural History (La Specola) in Florence.</p> <p>The "Agricultural Entomology Station" in 1967 took the name of "Experimental Institute for Agricultural Zoology" and maintained its headquarters in Florence, via Romana 17 in the same building as the Institute of Zoology and Museum of Zoology of the University of Florence. In 1976 the headquarters of the Institute was moved to Cascine del Riccio and in 1993 the Institute became part of the Council for Research and Experimentation in Agriculture (CRA), changing its name to Research Center for Agrobiology and Pedology. The connotation of the library has remained unchanged since its activation and today it is certainly among the most specialized libraries in Entomology and Agricultural Zoology in the country. At the time of activation, it already owned 27 magazines, dedicated to the subject and at the beginning of the 1900s the magazines reached the number of 256; the first entomological "Magazines" present began in 1802 and 1813. In the early 1900s the "Entomology Station", on the initiative of the past Director Prof. Antonio Berlese, began the publication of its own technical-scientific magazine, dedicated to Agricultural zoology, entitled Redia in honor of Francesco Redi. The success of the magazine and the numerous exchanges carried out with other Entomology and Zoology journals from all over the world, led to a notable increase in the number of magazines in the library; in 1910 there were nearly 300 warheads and by 1930 their number had almost doubled. In the 1976 transfer, a reorganization work was carried out and a paper catalog was created with progressive numbering of the magazines.</p>		CREA-DC
Plant Protection Historical and Scientific Library - Rome	<p>The Library of the Rome office belongs to the Plant Defense area dealing with plant pathology (bacteria, fungi, oomycetes, viruses, viroids and phytoplasmas) and also includes the library heritage deriving from the Royal Experimental Plant Pathology Station established by Royal Decree in 1887. The collection of ancient books dates back to the 19th century and a precious herbarium to around the middle of the century. In 1925 the Regia Stazione moved to via Casal de 'Pazzi where it remained, first becoming the Experimental Institute for Plant Pathology, then the Research Center for Plant Pathology and now the Rome headquarters of the Defense and Certification Research Center of CREA. In 1948 the director Prof. Sibilia allocated 20 million lire from a UNRRA (United Nations Relief and Rehabilitation Administration) fund to the construction of a new part of the building where, on the ground floor, there are the most modern volumes and periodicals. The ancient and modern heritage, for a total of 7846 volumes including periodicals, makes the library one of the most important in Italy in the discipline of plant pathology. The library offers an on-site consultation service, on request, where databases and catalogues are available. The library has access to the National Collective Archive of Periodicals (ACNP).</p>		CREA-DC
Library and Acaroteca 'A. Berlese'	<p>Berlese Acaroteca, set up between '800 and '900, is maintained in in CREA DC (Florence). The collection is maintained in original way and by Berlese methodology. Material is included in 11194 slides and 2348 vials</p>	S. Simoni	CREA-DC

Other scientific and technological infrastructures

MAIN TOPICS/PRODUCTS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Plant Protection Accredited Laboratory ACCREDIA DIALAB-Multisite	Phytopathology analysis Laboratory for public and private customers. CREA-DC hosts the phytopathology analysis laboratory DIALAB with ISO 17025 accreditation for the diagnosis on viruses, viroids, phytoplasmas, fungi, bacteria, insects and nematodes. DIALAB is a multi-site laboratory with its main venue located in Rome and another in Florence.	P.F. Roversi, F. Faggioli, E. Gargani, L. Ferretti	CREA-DC
Plant Protection National Reference Laboratory for Virology	National Reference Laboratory for Virology, designated by MiPPAF (Italian NPPO) for the management of the national laboratory network, following Reg. EU 2015/625. Venue: CREA-DC Rome Output: release of official diagnostic tests, participation in international TPS and PT, national PT organization, release of diagnosis reports for virological analyses. Production of biological reference material.	L. Ferretti; F Faggioli	CREA-DC
Plant Protection National Laboratory – Reference Lab for Acarology	Acarology National Laboratory (by MiPAAF (Italian NPPO) in the frame of the National labs'web (Reg. EU 2017/625). Venue: CREA-DC Firenze	P.F. Roversi, S. Simoni	CREA-DC
Plant Protection National Reference Laboratory for Nematology	National Reference Laboratory for Nematology, designated by the MiPAAF (Italian NPPO) for the coordination of the National Laboratory Network pursuant to EU Reg. 2017/625. Location: CREA-DC Florence Products: Biological reference material, Proficiency Test for phytosanitary diagnosis for the national laboratory network	P.F. Roversi, G. Torrini	CREA-DC
Plant Protection National Reference Laboratory for Bacteriology	National Reference Laboratory for Bacteriology, designated by MiPPAF (Italian NPPO) for the management of the national laboratory network, following Reg. EU 2015/625. Venue: CREA-DC Rome Output: release of official diagnostic tests, participation in international TPS and PT, national PT organization, release of diagnosis reports for bacteriological analyses. Production of biological reference material TPS Organisation for molecular detection of <i>Xylella fastidiosa</i> subspecies. Involved in the following European PT: "Proficiency test for molecular detection of 'Candidatus Liberibacter africanus', 'Candidatus Liberibacter americanus' and 'Candidatus Liberibacter asiaticus'" "Proficiency Test on identification of <i>Ralstonia solanacearum</i> " "Proficiency test for molecular detection of <i>Xylella fastidiosa</i> in plant material" "Proficiency test for molecular detection of <i>Xylella fastidiosa</i> "	S.Loreti, N. Pucci, V.a Scala	CREA-DC
Plant Protection National Laboratory – Reference Lab for mycology	Mycology National Laboratory (by MiPAAF (Italian NPPO) in the frame of the National labs'web (Reg. EU 2017/625). Localisation: CREA-DC Roma Output: European Proficiency Test for <i>Phytophthora ramorum</i> sensu lato	L. Riccioni	CREA-DC
Plant Protection National Reference Laboratory for Entomology	National Reference Laboratory for Entomology, designated by the MiPAAF (Italian NPPO) for the coordination of the National Laboratory Network pursuant to EU Reg. 2017/625. CREA-DC Florence location Products Biological reference material, Proficiency test for phytosanitary diagnosis for the national laboratory network	P.F. Roversi, L. Marianelli	CREA-DC
Crop protection	Laboratory for testing of resistance to viral pathogens of new lines of varieties and/or species; service addressed to seed companies, breeders and other public and private bodies	L.Tomassoli, A. Tiberini	CREA-DC
Plant Protection	Laboratory of tissue culture for micropropagation, preservation and virus elimination of relevant plant species. Products: in vitro preservation of 1 native, virus-free grapevine variety 'Forastera'; 4 potato virus-free ecotypes; 1 red garlic virus-free variety. In vitro plantlets of tomato, apple, grapevine, potato and hop from tissue culture, involved in micropropagation experiments.	A. Taglienti	CREA-DC

MAIN TOPICS/PRODUCTS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Plant Protection	Laboratory for resistance tests to Root Knot Nematodes <i>Meloidogyne incognita</i> on varieties and/or species of Solanaceae spp. Resistance induction studies by co-cultivation technique with resistant species. Investigations on the resistance of <i>S. torvum</i> . In vitro test for plant-nematode interaction, or fungus-nematode. Services for seed companies, breeders and other public and private organizations	T. Irdani	CREA-DC
Plant Protection	Laboratory of Cryobiology and Cryopreservation. Localization: CREA-DC Firenze. Products: Cryogenic samples of nematological species of agronomic and forestry interest; Model species such as <i>Caenorhabditis elegans</i> ; Endophytic microorganisms of seeds: yeasts, fungi and bacteria. Strains of <i>Saccharomyces</i> and other bacteria: <i>E.coli</i> , OP50, <i>Bacillus clausii</i> , etc. Ultra-low temperature survival studies for multi- and unicellular organisms, mesenchymal cells.	P. Roversi, T. Irdani	CREA-DC
Plant protection	Noxious insects biological control laboratory Location: CREA-DC site in Florence	G. Sabbatini, P.F. Roversi	CREA-DC
Plant protection	Laboratory for the Microbiological Control of pests Location: CREA-DC, Florence. .	G.P. Barzanti, C. Benvenuti, P.F. Roversi	CREA-DC
Plant protection	Molecular Biology Location CREA-DC Florence Laboratory office.	I. Cutino, A. Strangi, I. Iovinella, P.F. Roversi	CREA-DC
Plant protection	Laboratory of Applied Entomology for tests of botanical pesticides Location: CREA-DC in Bagheria Equipment: Laminar and chemical flow hood, stereoscopic binoculars, images, autoclave, incubators, refrigerators, freezer and ultra-freezer for the storage of biological material, freeze-dryer, centrifuges products	R. Rizzo P.F. Roversi	CREA-DC
Plant protection	Agricultural and forest applied entomology Location: CREA-DC site in Florence Laboratory of Acarology In CREA-DC (Firenze).		
Plant protection	Agricultural and forest applied entomology Location: CREA-DC site in Florence Laboratory of Acarology In CREA-DC (Firenze).		
Plant protection	Nematology laboratory Location: CREA-DC Florence office.	G. Torrini, S. Simoncini	CREA-DC
Plant protection	Laboratory of Electron Microscopy Place– Firenze, Roma. Products: Analysis of the sperm ultrastructure of insect pests. Analysis of the translocation of chitofosetil-Al nanoparticles in tobacco seedlings	F. Paoli, C. Benvenuti, I. Garaguso, P.F. Roversi	CREA-DC
Seed Certification ISTA accredited seed testing laboratory (ITDL0300) sampling of seed lots	Located in Tavazzano – Output: seed lots sampling for the issue of ISTA Orange International Certificates	R. Zecchinelli E. Crippa N. Enea	CREA-DC
Seed Certification ISTA accredited seed testing laboratory (ITDL0300) reduction to laboratory sample	Located in Tavazzano – Output: laboratory samples for the seed testing to issue ISTA Orange international certificates	R.Zecchinelli T. Amato C. Tamagni F. Riva R. Bonetti	CREA-DC

MAIN TOPICS/PRODUCTS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Seed Certification ISTA accredited seed testing laboratory (ITDL0300) Standard Test	Located in Tavazzano – Output: purity and other seed determination tests, germination tests for the international marketing of seed lots (issue of ISTA International certificates) Validation studies of Felicia and Eustoma testing methods for the inclusion in the ISTA Rules.	R. Zecchinelli E. Perri, P. Mazzola M. L. Fusari E. Mallozza R. Bonetti L. Bettoni A. Arioli, N. Enea L. Cassinetti, R. Spelta F. Fenocchi F. Cerri E. Crippa	CREA-DC
Seed Certification ISTA accredited laboratory (ITDL0300) Species and varieties Verification	Located in Tavazzano	C. Delogu L. Andreani, A. Venturini, R. Cremona, S. Seminari, B. Musetti	CREA-DC
Seed Certification ISTA accredited seed testing laboratory (ITDL0300) GMO Test	Located in Tavazzano – Output: GMO committee membership, GMO tests for the issue of ISTA International Certificates	E. Perri A. Barbante D. Villa S. Gaudenzi G. Libertini Ali M. Bertolotti F. Colombani A. Ciurlia	CREA-DC
Seed Certification ISTA accredited seed testing laboratory (ITDL0300) Seed viability tests, moisture tests, thousand seeds weight test and vigor test	Located in Tavazzano Output: Seed viability tests, moisture tests, thousand seeds weight test and vigor test for the issue of ISTA International Certificates	R. Zecchinelli E. Perri C. Delogu A. Barbante A. Arioli L. Bettoni R. Cremona S. Gaudenzi R. Bonetti L. Cassinetti N. Enea F. Cerri E. Crippa	CREA-DC
Official Seed Certification Seed viability tests, moisture tests, thousand seeds weight test and vigor test	Located in Tavazzano Output: issue of official certificates for the marketing authorization and tests for the issuing of private test certificates	R. Zecchinelli E. Perri C. Delogu A. Barbante A. Arioli L. Bettoni R. Cremona S. Gaudenzi R. Bonetti L. Cassinetti N. Enea F. Cerri E. Crippa T. Amato C. Tamagni F. Riva R. Bonetti	CREA-DC
Seed Certification Variety listing Protein and molecular profiles description of new varieties	Located in Tavazzano - Output: Characterization with Biochemical and molecular profiles of new varieties of corn, sunflower, cereals, barley, soybean and rice to support the registration of the new varieties	C. Delogu L. Andreani, A. Venturini, R. Cremona, S. Seminari B. Musetti	CREA-DC
Seed Certification Listing of varieties Ploidy level	Located in Tavazzano – Output: Cytological characterisation reports on ploidy level for the listing of varieties in the national and European varietal registers	E. Perri A. Barbante S. Gaudenzi M. Bertolotti	CREA-DC
Plant varieties and species verification	Located in Tavazzano	C. Delogu L. Andreani, A. Venturini, R. Cremona, S. Seminari B. Musetti	CREA-DC
Plant varieties and species verification: Counteract fraud in the seed sector	Located in Tavazzano Output: Analytical reports to support counteract fraud in seeds in the context of collaboration with the Breeder associations and ICQRF. Convocations to court as experts to support the analytical results	C. Delogu L. Andreani, A. Venturini, R. Cremona, B. Musetti, S. Seminari	CREA-DC

MAIN TOPICS/PRODUCTS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Plant varieties and species verification: Rescue of ancient local varieties	Located in Tavazzano – activities in collaboration with the Natural Park of the Island of ELBA as part of the project for the genetic characterization of Elba varieties at risk of extinction Output: Scientific report (molecular data and statistical re-elaboration) to be included in the results of the project	C. Delogu L. Andreani, A. Venturini	CREA-DC
Seed certification, listing in the variety Register and Community variety right	Battipaglia seed analysis laboratory Release of certificate of analysis for certification and private analysis Battipaglia laboratory of phytopathology Products: Official seed potato certification (detection of PVY - PLRV- PVA – PVM – PVX - PVS) and mycological screening on flax seeds RNV registration: mandatory resistance analysis report required by CPVO/UPOV Bean: Bean common mosaic necrosis virus, C. lindemuthianum race 6; Melon : Fusarium oxysporum pv. melonis races 0-1-2; Pea: Fusarium oxysporum pv. pisi race 1; Tomato: Meloidogyne incognita, Fusarium oxysporum pv. lycopersici races 0-1, Verticillium dahliae race 0, Tomato mosaic virus strain 0; Pepper: Tobamovirus P0, P1-2, P1.2-3, Potato virus Y strain 0. Optional resistance analysis report required by CPVO/UPOV protocols: Tomato spotted wilt virus strain 0 of tomato, pepper and LMV of lettuce.	De Angelis, Mondillo, Frusciantè G.Serratore V. Spina , D.Zito M.C.Napoli, E. Frusciantè.	CREA-DC
Certification	Seed Analysis Laboratory of Lonigo Location: CREA DC Lonigo Phytopathological Analysis Laboratory of Lonigo Laminar and chemical flow hoods, thermostatic cells and cabinets, scales, optical microscope, demineralizer, pure water machine, ELISA plate reader, centrifugal homogenizer, thermocycler, transilluminator, electrophoretic cells, autoclave, thermostatic bath, spectrophotometer, -80 ° freezer	R. Bravi, C. Gretter, M. Dal Prà	CREA-DC
Seed certification and Registration in the Variety Register and release of the Community patent	Seed Analysis Laboratory of Palermo Location: CREA-DC Palermo office. Products: Official and private certificates of analysis	C. Miceli, M. Vaccarella, L. Raimondo, A. Rigoglioso	CREA-DC
Plant Protection	Palermo phytosanitary diagnosis laboratory Location: CREA-DC Palermo office. Products: Certificates of analysis	V.Campanella A. Salamone	CREA-DC
Seed certification	Seed testing laboratory in Vercelli. Location: CREA-DC Laboratorio di Vercelli	L. Tamborini, N. Pelazza, G. Roncarolo	CREA-DC
Protection of biodiversity	Laboratory for the protection of functional biodiversity in forest ecosystems Location: CREA DC Florence office	A.Campanaro,	CREA-DC
Environmental sustainability - Support to the New European Green Deal	Experimental modules for green roof simulations. Technological systems: three types of systems, different for the water accumulation (AGRILIT®) and cultivation (AgriTERRAM®) layers. Study and evaluation of resistance to abiotic stress Location: CREA DC, Bagheria (PA)		
Biodiversity Conservation	Propagation greenhouse, shade greenhouse, plant growth greenhouse. Propagation laboratory, Stereomicroscopea Nikon, growth chambers	G.Gugliuzza M.C Fiore. S. Aprile G.Fascella, S.Lazzara A. Giovino.	CREA DC
Plant ecophysiology	Ecophysiology laboratory: Leaves gas exchanges Licor 6400, Chlorophyll content measurement SPAD, Leaves /stem water potential Sholander Chamber, Leaf area meter: WinDias, Colorimeter Minolta, Light measurement: luxometer, radiometer, PAR.	G.Gugliuzza	CREA DC

MAIN TOPICS/PRODUCTS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
DNA of plant-parasitic nematodes	Genomic DNA collection of plant parasitic nematodes. Morphologically and molecularly identified and preserved at -30°C	T. Irdani	CREA- DC
Certified Drupaceae germplasm	Collection of 130 certified Drupaceae ecotypes, pre-basic material in screenhouse	F. Faggioli, E. Marinelli, L. Ferretti	CREA- DC
Certified olive germplasm	Collection of 32 certified olive ecotypes, pre-basic material in screenhouse and pre-multiplication material in open field	F. Faggioli, E. Marinelli, L. Ferretti	CREA- DC
Certified grapevine germplasm	Collection of 84 grapevine clones, pre-basic material in screenhouse	F. Faggioli, A. Gentili	CREA- DC
phytopathogenic microorganisms	Collections of phytopathogenic microorganisms, fungi, bacteria, viruses, viroids and phytoplasmas of agricultural interest characterised by phenotypic and molecular analysis	L. Luongo	CREA- DC
phytopathogenic microorganisms, endophytes of tree species Sycamore germplasm	Collection of colonizing and pathogenic fungal microorganisms of tree species characterized phenotypically and molecularly. Collection of more than 40 accessions of plane trees with different phenotypic and disease resistance characteristics	M. Pilotti	CREA- DC
Entomopathogen microorganisms	Collection of entomopathogenic nematodes of various origins and provenance	G. Torrini	CREA- DC
Entomopathogenic micro-organisms	Collection of entomopathogenic fungi from different origins and provenances.	G. P. Barzanti	CREA- DC
Seed Endophytic microorganisms	Bacterial and yeast strains collection	T. Irdani	Seed Endophytic microorganisms
Vegetable and agricultural species	Collection and maintenance of official pathogenic strains used for in vivo resistance tests for the listing of new varieties of vegetable in the National Register and tests for the release of Community variety right of tomato and melon species.	M.Mele, V. Spina, M. Faina, F. Cuciniello, M.C. Napoli	Vegetable and agricultural species
Vegetable species	Collection and maintenance of official pathogenic strains used for in vivo resistance tests for the listing of new varieties of vegetable in the National Register and tests for the release of Community variety right of tomato and melon species	M.C.Napoli, G.Serratore e V. Spina	Vegetable species
Soybean, sunflower, sugarbeet, sorghum, sudan grass, flax, sunflower, rapeseed, brown mustard.	Reference collections of agricultural crops species to listing new varieties to National and European catalogues	G. Corsi, M. Giannini, V. Moschini, S. Tonti	CREA DC
Root Knot nematode (RKN) and Pine Wood Nematode (PWN)	<i>In vivo</i> maintenance of populations of RKN <i>Meloidogyne incognita</i> and forest plant-parasites (genus <i>Bursaphelenchus</i> spp.)	T. Irdani, G. Torrini	CREA- DC
Phytophagous and predator mite species	Rearing and maintenance of phytoseid mites (e.g. <i>Neoseiulus californicus</i> , <i>Kampimodromus aberrans</i>) on <i>Tetranychus urticae</i> and various food/substrates, including experimental ones. <i>In vivo</i> maintenance of populations of <i>T. urticae</i> on leaf.	S. Simoni, E. Gagnarli	Phytophagous and predator mite species
House dust and stored products' mites	<i>In vivo</i> maintenance of dust mite populations (HDM) of Italian domestic and production environments due to their allergological importance and the quality of food products	S. Simoni, E. Gagnarli	CREA DC
Cryopreservation of plant-parasitic nematode species	Storage in LN2 (-196°C) of populations of plant-parasitic nematodes (PPN), included quarantine nematodes.	T. Irdani, P. Roversi	CREA- DC
Rice germplasm conservation	Rice seed bank comprising over 800 cultivars released in Italy (including all the cultivars enlisted in the Common Catalogue or protected under CPVO plant variety rights system), European Union, and non-EU countries; it is composed of seed samples and a digital archive of morphological and physiological description, pictures, and biometric data. Deliverables: <ul style="list-style-type: none"> • Promotion of European rice germplasm and knowledge transfer to the industry via the book: Luigi Tamborini - Patrizia Titone - Gabriele Mongiano - Carlo Legnani "Le varietà di riso coltivate in Europa 2006-2021. Caratteristiche e criteri di scelta" (Rice varieties grown in Europe 2006-2021), pp. 624, ISBN 9788897314653 • Book launch at the 2021 Food Journalism Festival • CREA-Break (Tamborini): "Discovering the rice atlas: the rice varieties grown in Europe since 2006" • CREA-Break (Titone): "Discovering the rice atlas: what changed since 2006" • CREA-Break (Mongiano): "Discovering the rice atlas: between history and science, 150 years of Italian rice evolution" 	L. Tamborini - G. Mongiano- P. Titone	CREA- DC
Seeds	ISTA seeds reference collection – seed collection from the ISTA Universal List of species (130 accessions).	P. Mazzola – L. Fusari	CREA- DC
Crop seeds and weeds	Seeds reference collection of crops seeds and weeds used for seeds identification within the activity of the seed testing laboratory (1800 accessions).	P. Mazzola – L. Fusari	CREA- DC

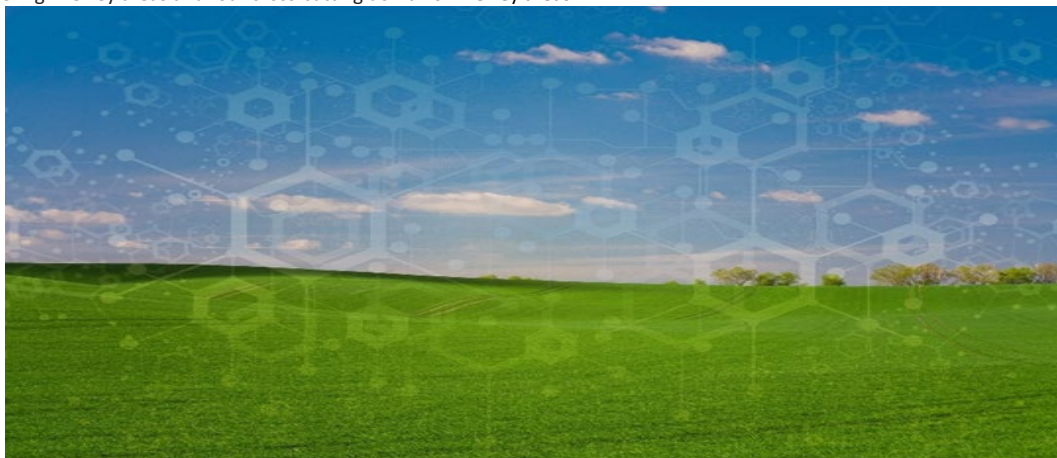
Sementi	Reference collection of seeds of cultivated and weed species physics and computer science (34 families, 230 species) Location: CREA-DC Palermo	C. Miceli, M. Vaccarella, L. Raimondo, A. Rigoglioso	
	In vitro collection of over 50 Mediterranean and exotic plant species (herbaceous, shrubs and trees) of agri-food, nutraceutical, ecological and environmental interest	G. Fascella, M. Mammano	CREA- DC
Plants from Mediterranean	Dna BARCODING COLLECTION of Mediterranean plant germplasm	A.Giovino M. Fiore	CREA- DC
Plants from Mediterranean germplasm	Collection of Mediterranean plant germplasm in vivo: shrubs, upholstery and herbaceous scrub, garrigue and halophytes.	S. Aprile, G. Fascella, A. Giovino, G. Gugliuzza, S. Lazzara, M. Mammano	CREA- DC
Alexandrian Clover	Variety collection registered in the national and community registers of Alexandrian Clover	C. Miceli, B. Frangipane, M. Genduso, L. Raimondo	CREA- DC
Vicia pannonica	Variety collection registered in the national and community registers of Vicia pannonica	C. Miceli, B. Frangipane, M. Genduso, L. Raimondo	CREA- DC
Mediterranean fodder, Cotton, Brassica carinata	Reference collection for agrarian species for registration in varietal list, cotton, Brassica carinata	C. Miceli, B. Frangipane, M. Genduso, L. Raimondo	CREA- DC
Forage grasses and legumes	Collection of Registered Varieties indicated in national and community registers of Vicia pannonica	G. Spataro, V. Fusillo	CREA DC
Conservation varieties of hard and soft Sicilian wheat	Collection of accessions of conservation varieties registered in the national registers	C. Miceli, B. Frangipane, M. Genduso, L. Raimondo	CREA DC
Maize	Reference collection of maize to listing new varieties to national and European catalogues.	A. Giulini, M. Zuffada, L. Antonietti	CREA DC
Durum and bread wheat	Reference collection of wheat to listing new varieties to national and European catalogues.	A. Giulini, F. Alagna, S. Pezzetti	CREA DC
Spelt	Reference collection of spelt to listing new varieties to national and European catalogues.	A. Giulini, F. Alagna, Silvio Pezzetti	CREA DC
Fungal microorganisms belonging to Fusarium genus	Collection of fungi (over a hundred isolates) afferent to the genus Fusarium (including: F. acuminatum, F. avenaceum, F. compactum, F. culmorum, F. equiseti, F. graminearum, F. oxysporum, F. poae, F. verticillioides) from seeds and plants of cereals and from the soil and characterized morpho-physiologically, molecularly (in part) and for pathogenicity (in part).	V. Campanella	
Phytopathogenic bacterial micro-organisms	Collection of the main genera of phytopathogenic bacteria (including <i>Pseudomonas</i> , <i>Xanthomonas</i> , <i>Clavibacter</i> , <i>Ralstonia</i> , <i>Brenneria</i> , <i>Pantoea</i> , <i>Xylella</i> , <i>Erwinia</i>) isolated from different plant species (vegetable, fruit, ornamental, cereals, forestry) and characterized by biochemical, nutritional, physiological, molecular and pathogenicity tests.	S. Loreti N. Pucci V.a Scala	CREA DC
Bacterial microorganisms (PGPR)	Collection of bacterial endophytes afferent to the species <i>Pantoea agglomerans</i> (3) and <i>Paenibacillus polymixa</i> (2) <i>Pseudomonas fluorescens</i> (2) <i>Pseudomonas putida</i> (2) <i>Pseudomonas savanastoi</i> (1) characterized morpho-physiologically, molecularly and for their antagonistic and pathogenetic activity.	A. Salamone V. Campanella	CREA DC
Fruit trees of sicilian germplasm	Collection of Sicilian fruit trees at Bagheria and Bisacquino and Castronovo di Sicilia. Pear, apple, quince, peach, cherry, azeruolo, etc.	G.Gugliuzza, M. C. Fiore	CREA DC
Obtaining mass farms of st antagonists (phytoseid predatory mites) International patent (PCT)	<p>https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2007075081&tab=PCTBIBLIO</p> <p>PATENT PCT / NL2005 / 000899 validity IN PROGRESS</p> <p>Combination of glycyphagid mites and phytoseid mites to create a method of breeding predatory mites, to be used in biological control on agricultural crops</p> <p>Development and combination of a method that involves the use of mites from different families for the establishment of predatory mite farms to be used for the biological control of crop systems in agriculture</p> <p>'Mite composition comprising glycyphagidae and phytoseiid mites, use thereof, method for rearing a phytoseiid predatory mite, rearing system for rearing said phytoseiid predatory mite and methods for biological pest control on a crop'</p> <p>https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2007075081&tab=PCTBIBLIO</p>		

3.CREA RESEARCH LINES BY CROSS CUTTING ISSUES

3.3 SUSTAINABILITY (ECOSYSTEMS, CLIMATE, WATER, SOIL, BIOTA)

CREA Research Center activities are oriented to the study of properties and functions of the four agricultural-environmental sectors (soil, water, air, and biota) from the point of view of sustainability. Research activities are focused on the production and sharing of new knowledge regarding *i)* agricultural systems productive potential in terms of food, fiber, and fuels, and *ii)* ecosystem support and regulation services.

In accordance with the scientific mission of the Center, studies are carried out at different scales (territory, agroecosystem, farm), considering five key areas and four cross-cutting domains. The key areas:



Mitigation and adaptation to climate change Research activities are aimed at studying how the design, evaluation and optimization of cropping and farming systems can help the adaptation, trying to reduce the negative effects of climate change and, at the same time, to mitigate the effects. Strategies aimed at increasing the adaptation and mitigation capacity of organic, conservative, integrated and newly conceived cultivation models, such as precision and digital agriculture models, are therefore being studied. Studies in this area of research involve the use of a wide range of methodologies such as the application and development of cutting-edge techniques for the measurement of GHG and ammonia emission flows, the use of biophysical models for the evaluation and prediction of the functioning of crop systems. Emphasis is given to the sustainable use of water resources, an increasingly limiting factor for the productivity of crop systems, with interventions aimed at optimizing irrigation, reducing losses and increasing the water retention capacity of soils. Monitoring the state of degradation of agricultural soils and their resilience, functional to the development of sustainable management strategies, is a peculiarity of the AA Center. This activity is also preparatory to identifying the agronomic interventions most suitable for mitigation and adaptation to climate change.

Circularity in agro-food systems In recent decades, agricultural and livestock production have become increasingly specialized and less interconnected. Furthermore, agro-industrial activities are often centralized and the increase in urbanization has disconnected cities from rural areas. Consequences include the alteration and malfunctioning of the recycling chains, i.e. those which, by operating in the opposite direction to the supply chains, guarantee the return of waste materials and energy from human activities, ensuring an ecological balance. Therefore, most of the AA Center's research aims to reactivate circularity to close the cycle of resources, by preventing or reusing residues. Indeed, exploiting the potential offered by the (re)combination of agriculture and livestock, as well as linking rural areas with agro-industrial districts according to the concept of circularity, requires a renewed knowledge that embraces current production and market conditions.

Management of agro-biodiversity in sustainable agri-food systems Agrobiodiversity can foster agro-systemic services provided by agricultural systems. Agrobiodiversity, defined as the diversity of organisms living in agricultural managed soils and landscapes, does not only include genetic resources (varieties, races, etc.) for food production, fodder, fiber, fuel, and pharmaceutical products, but also diversity associated with that supports production (e.g. soil microorganisms, natural weeds, pollinators). In addition to studying and understanding the links between agrobiodiversity and agro-systemic services to optimize research strategies aimed at favoring increasingly environmentally sustainable production systems, the AA Center maintains and enhances its genetic resources in the plant and animal fields. In particular, the plant germplasm is represented by varietal collections of almond and mulberry, while the animal one by accessions of insects (bees, wild pollinators, and silkworms). The entomological genetic resources take on the double role of "useful insects", whose breeding techniques and biotechnological applications are studied, and environmental bioindicators.

Diversification of crop, business, and territorial systems Highly diversified crop systems depend to a lesser extent on inputs external to the farm (fertilizers and pesticides) and, compared to less diversified systems, reduce negative impacts on environment and soil, while improving the level of biodiversity (soil microorganisms, birds, insects). The AA Center carries out research aimed at addressing and solving the challenges related to achieving a sustainable balance between agricultural production and environmental protection, dealing with the study of the transition phenomena of European agriculture from current production cultivation systems dependent on external inputs, to alternative ones based on biodiversity, with a greater "ecological" connotation, namely based on the diversification of crops to field and farm scale (large rotations, multiple cultivation, crop association). This diversification area also includes the Centre's activities aimed at developing interactions with the maintenance of the rural landscape, traditional cultural and sociological aspects, the development of slow and eco-sustainable rural tourism, the enhancement of the environment, and rural products to be part of the creative industries.

Evaluation of agro-environmental sustainability Sustainability assessment of agri-food systems is a complex issue because the coexistence of conflicting objectives and the multidimensionality of the products and services offered. The agri-environmental, economic, and social pillars must be considered simultaneously to evaluate the potential synergies and trade-offs generated in the context of production processes and between the dimensions of sustainability. The AA Center conducts studies using a wide range of methods and tools such as Life Cycle Assessment (LCA), Energy Analysis (EA), and multicriteria analysis (MCA), the latter being based on indicators of sustainability

3.3.1. Research and research products- Sustainability (ecosystems, climate, water, biota)

ACRONYMS AND RESEARCH TITLE	AIMS	PERSON IN CHARGE	INTERNATIONAL PARTNERSHIPS FINANCIAL BODY	PUBLICATIONS	OTHER SCIENTIFIC PRODUCTS
AE4EU Agroecology for Europe	Accelerate the transition to sustainable agricultural and food systems through i) the development of strengthened networks and ii) the connection of a wide variety of relevant actors across Europe	S. CANALI CREA- AA	European Commission ¹⁸		
AGROTECH BASILICATA Pilot and demonstrative activities of precision agriculture technologies	Dissemination of innovation and applications of precision agriculture to businesses and local area.	M. MASTRORILLI CREA-AA	Basilicata Administrative Region		
AMi Almond Management Innovations (Approach to an organic and innovative almond growing)	Transfer and validation of innovative protocols to rationalize the use of production inputs and increase productivity, quality and cost-effectiveness of Apulian organic almond growing. Making the first transformation phase more efficient by applying emerging technologies already applied in other sectors of the food processing. Enhance the regional almond production through the characterization and development of new products.	L. GAETA CREA-AA	Apulia Administrative Region		- Assegni di ricerca - n.1 - Borse di studio - n.1
APIPARCHI Abruzzo / Latium / Molise Monitoring of the state of honeybee populations and taxonomic analysis of wild bee populations (Hymenoptera, Apoidea) in the National Parks of the Central Apennines	Monitoring of the honeybee state populations and taxonomic analyzes of wild bee populations (Hymenoptera, Apoidea), recognizing the irreplaceable role for ecosystem balance, including the role played by domestic bees and beekeeping activity	C. COSTA CREA-AA	Abruzzo, Latium and Molise National Park		

¹⁸ • European Coordination Via Campesina (ECVC) • Agroecologiki - Gkisakis • Johann Heinrich von Thuenen-institut, Bundesforschungsinstitut fuer Laendliche Raeume, Wald und Fischerei • Coventry University • Swedish University of Agricultural Sciences (SLU) • Institut Supérieur d'Agriculture Rhone Alpes, ISARA • Agroecology Europe • Asociatia Eco Ruralis-in Sprijnulfermieril or Ecologici Ssitraditionali (Eco Ruralis) • Universidade de Santiago de Compostela • Stichting Wageningen Research

BeeNet RRN bees and biodiversity in environmental monitoring	Project for the assessment of the state of health of the Italian agro-environment through bees and wild apoidea	L. BORTOLOTTI CREA-AA	MiPAAF - Ministry of Agricultural, Food and Forestry Policies	<p>- Publication Nanetti A.; Bortolotti L.; Cilia G. (2021). Pathogens spillover from honey bees to other arthropods. Pathogens, 10, 8. DOI: 10.3390/pathogens10081044.</p> <p>- Publication Giovanetti M.; Quaranta M.; Zavatta L.; Flaminio S.; Bortolotti L. (2021). BeeNet: l'ambiente attraverso le api. Informatore Agrario, 15, 40.</p> <p>- Publication Albertazzi S.; Monterastelli E.; Giovanetti M.; Zenga E.L.; Flaminio S.; Galloni M.; Quaranta M.; Bortolotti L. (2021). Biodiversity evaluation: from endorsed indexes to inclusion of a pollinator indicator. Diversity, 13, 10. DOI: 10.3390/d13100477.</p> <p>- Publication Flaminio S.; Ranalli R.; Zavatta L.; Galloni M.; Bortolotti L. (2021). Beewatching: a project for monitoring bees through photos. Insects, 12, 9. DOI: 10.3390/insects12090841.</p> <p>- Publication Bortolotti L.; Carpana E.; Ranalli R.; Albertazzi S.; Giovanetti M. (2021). Progetto BeeNet: le api sentinelle dell'ambiente. Vita in campagna, 39, 5, 55-56.</p> <p>- Publication rivista Giovanetti M.; Albertazzi S.; Flaminio S.; Ranalli R.; Bortolotti L.; Quaranta M. (2021). Pollination in agroecosystems: a review of the conceptual framework with a view to sound monitoring. Land, 10, 5. DOI: 10.3390/land10050540.</p>	
Bio4Food High quality and nutrient rich food through crop waste-derived biostimulant and biopesticide	Promote the diversity within food systems for ensuring healthy and sustainable diets, strengthening resilience and enhancing socio-economic and environmental benefits; preserve the ingredients and provide high quality, healthy and sustainable food (including organic) to the consumers; development of smart packaging to protect the food product and reduce waste before spoilage – e.g. by visualising the quality of food via packaging or by applying environmentally friendly resources	M. DIACONO CREA-AA	<p>- University of York</p> <p>- Abdelmalek Essaadi University</p> <p>- Institute for Food and Environmental Research</p> <p>- Ajinomoto Omnicheem Natural Specialties and Tensiofix - MiPAAF - Ministry of Agricultural, Food and Forestry Policies</p> <p>- European Commission</p>	<p>- Publication Diacono M.; Montemurro F. (2021). Un riciclo virtuoso della sostanza organica: dal suolo al suolo. CREAfuturo,</p>	
BIOFOSF-WINE Tools for resolving the phosphite emergency in organic grapes and wines	Provide the PQAI Office 1 (Organic Agriculture and National Food Quality Systems and General Affairs) of the Mipaaf the knowledge and the technical-scientific tools useful to formulate an official document (position paper) from the Italian side that clarifies the causes of the detection of phosphorous acid in organic wines, taking into account that the use of derivatives of phosphonates and ethylphosphonates is not allowed in organic farming	A. TRINCHERA CREA-AA	MiPAAF - Ministry of Agricultural, Food and Forestry Policies		
COBRAf Coproducts from Biorefinery	Creation of a logistic platform for oil crops with the aim of obtaining the maximum enhancement of the different components of the biomass of innovative crops, usable in rotation with cereals and organically grown. The aim is to obtain the best income for arable farms and for the Tuscan supply chains of first transformation and the highest efficiency and flexibility in the use of biomass for industrial uses. Residual raw materials are	L. D'AVINO CREA-AA CREA-CI	Tuscany Administrative Region		

	enhanced by creating more sustainable and innovative bioproducts				
DIBIO_INSOB TEC Bio-based technologies to support the production and quality of organic vegetable seeds	Promoting the production of organic vegetable seeds with low-impact means, aimed at adequately using the microbial heritage already present in cultivated soils and therefore already naturally adapted to colonize soils and plants. The design hypothesis is to induce a regeneration of the soil microbiome to improve its functionality and to favor the useful colonization of the seed carrier plant and the relative seed produced with two technical paths	L. M. MANICI CREA-AA	MiPAAF - Ministry of Agricultural, Food and Forestry Policies		
DIVERFARMING Crop diversification and low-input farming across Europe: from practitioners engagement and ecosystems services to increased revenues and chain organization	Diverfarming aims at increasing the long-term sustainability, resilience, and economic convenience of European agriculture, through the evaluation of the real advantages and limitations, barriers, and obstacles to the use of diversified agricultural systems. Innovative agricultural systems and the entire supply chain will be selected and tested to meet the needs of each European soil climate	R. FARINA CREA-AA CREA-CI CREA-GB	19. European Commission	- Publication Cuartero Jessica; Onurcan Özbolat; Virginia Sánchez-Navarro; Marcos Egea-Cortines; Raúl Zornoza; Loredana Canfora; Luigi Orrù; Jose A. Pascual; Juana-María Vivo; Margarita Ros(2021). Changes in Bacterial and Fungal Soil Communities in Long-Term Organic Cropping Systems. Agriculture, 11, 5. DOI: 10.3390/agriculture11050445. - Publication Luigi Orrù; Loredana Canfora; Alessandra Trinchera; Melania Migliore; Bruno Pennelli; Andrea Marcucci; Roberta Farina; Flavia Pinzari (2021). How tillage and crop rotation change the distribution pattern of fungi. Frontiers in Microbiology, 12. DOI: 10.3389/fmicb.2021.634325.	
DiverIMPACTS DIVERsification through Rotation, Intercropping, Multiple Cropping, Promoted by Actors and value Chains Towards Sustainability	Design, implement, and demonstrate the feasibility of sustainable cultivation systems through the diversification of crops, their optimal rotation, intercropping and multicropping. The project aims to demonstrate the technical, economic and environmental benefits for farmers and the whole society, operating on a local and territorial scale and considering the value chain as a whole.	S. CANALI CREA-AA CREA-OF CRE-CI CREA-PB	20. European Commission	- Congress abstract Ilocola Ileana; Angevin F.; Bocksteller C.; Cetarino R.; Curran M.; Messean A.; Schader C.; Stilment D.; Van Stappen F.; Vanhove P.; Ahnemann H.; Berthomier J.; Colombo L.; Dara Guccione G.; Merot E.; Palumbo M.; Virzi N.; Canali S. (2021). Il ruolo della valutazione multicriteriale per sostenere la transizione verso un'agricoltura sostenibile basata sulla diversificazione culturale. Biodiversity 2021, Foggia (IT). Zenodo. https://doi.org/10.5281/zenodo.5549737 .	
EJP-SOIL Towards climate-smart sustainable management of agricultural soils.	Boost soil research with main emphasis on agricultural soil management and its contribution to climate change mitigation and adaptation; construct a sustainable framework for an integrated community of research groups working on related aspects of agricultural soil management.	R. NAPOLI CREA-AA CREA-PB CREA-VE	European Commission		

¹⁹ ● Dienstleistungszentrum ländlicher Raum Rheinhessen - Nahe - Hunsrück ● Arento grupo cooperativo agroalimentario de Aragón ● Paavolan kotijuuustola ● AKA Kereskedelmi és Szolgáltató Kft ● RAZOL ● Agencia estatal consejo superior de investigaciones científicas - CSIC ● Kaasmakerij Henri Willig B.V. ● Luke-National Resource Institute, Finland ● PECSI Tudományegyetem - University of Pecs ● Universität Trier ● Eidgenössische Technische Hochschule Zuerich ● Weingut Dr. Frey ● polven juustola ● Nedel-Market Keresked. és Szolg. Kft. ● ADEA ASAJA Asociación Regional de Empresas Agrícolas y Ganaderas de la Comunidad Autónoma ● Disfrimur Logistica SL ● Wageningen University ● University of Portsmouth Higher Education Corporation ● Niversidad de Córdoba ● Firma Nieuw Bromo van Tilburg

20 ● INRA ● Hushallningssall-Skapet Skane ● Assemblée Permanente des Chambres d'Agriculture ● WALAGRI SA ● Stichting Wageningen Research ● Centre Wallon de Recherches Agronomiques ● B.V. Exploitatie Reservegronden Flevoland ● INAGRO, Provinciaal Extern Verzelfstandigd Agentschap in Privaatrechtelijke Vorm ● Johann Heinrich von Thuenen-institut, Bundesforschungsinstitut fuer Laendliche Raume, Wald und Fischerei ● Linking Environment and Farming ● Quality Responsible R SRL ● Baertschi aArartecnic ● Ass groupe Ecole Supérieure Agriculture ● Universiteit VAN Amsterdam ● Stichting Bionext ● Instytut Uprawy Nawożenia i Gleboznawstwa, Panstwowy Instytut Badawczy ● Forschungsinstitut für Biologischen Landbau Stiftung ● AGROSOLUTIONS ● Association de Coordination Technique Agricole (ACTA) ● INRA ● Obszanski Tomasz ● Services opérationnels du college des producteurs ● Okologiai mezogazdasági kutatóintézet közhasznú nonprofit ● Université Catholique de Louvain ● Wageningen University ● Progressive farming trust ltd ● BIOFORUM VLAANDEREN ● Landwirtschafts-kammer Niedersachsen ● Sveriges Lantbruksuniversitet ● MUHLE RYTZ ● Asociatia Aider Agricultura Integrata Durabil Economic Rentabil

EVOLAT Precision feeding with pomace from extra virgin olive oil: modulation of the metabolism of dairy cows for the development of new nutraceutical dairy products.	Selection procedure for the granting of grants aimed at carrying out research projects in the context of the investment fund in the dairy sector, pursuant Article 8 of Decree no. 4293, and subsequent amendments, concerning the allocation of the resources of the investment fund in the dairy sector pursuant to article 1, paragraphs 214-217, of the law of 23 December 2014, n. 190 (2015 Stability Law).	R. PASTORELLI CREA-AA	MiPAAF - Ministry of Agricultural, Food and Forestry Policies		- BIOMetano per una Società Sostenibile: sviluppo di un Laboratorio Italiano di Circular Economy da biometano: BIOMASS HUI 09/06/2021 - Assegni di ricerca - n.4
EXCALIBUR Exploiting the multifunctional potential of belowground biodiversity in horticultural farming	Improving the resistance of crops (tomato, apple, strawberry) to biotic/abiotic stresses by means of multifunctional microbial bioinoculi according to the native biodiversity of the soil	S. MOCALI CREA-AA CREA-IT	<ul style="list-style-type: none"> - NSF Euro Consultants - Universidad de Granada - Kompetenzzentrum Obstbau Bodensee (KOB) - Kobenhavns Universitet (UCPH) - Instytut Ogródnictwa - Fruit Plant Protection - Natural History Museum - kmetijski Inštitut Slovenije KIS - INTERMAG - InoculumPlus - Technische Universitaet Graz - Koninklijke Nederlandse Akademie Van Wetenschappen - NIAB EMR - Fordergemeinschaft Ökologischer Obstbau EV (FOEKO)- European Commission 	<ul style="list-style-type: none"> - Publication Malusà Eligio; Berg Gabriele; Biere Arjen; Bohr Anne; Canfora Loredana; Jungblut Anne; Kepka Wojciech; Kienze Jutta; Kusstatscher Peter; Masquelier Sylvie; Pugliese Massimo; Razinger Jaka; Tommasini Maria Grazia; Vassilev Nikolay; Vitt Meyling Nicolai; Xu Xiangming; Mocali Stefano (2021). A Holistic Approach for Enhancing the Efficacy of Soil Microbial Inoculants in Agriculture: From Lab to Field Scale. Global Journal of Agricultural Innovation, Research Development, 176-190. DOI: 10.15377/2409-9813.2021.08.14. - Publication Vassileva M.; Malusà E.; Sas-Paszt L.; Trzcinski P.; Galvez A.; Flor-Peregrin E.; Shilev S.; Canfora L.; Mocali S.; Vassilev N. (2021). Fermentation Strategies to Improve Soil Bio-Inoculant Production and Quality. Microorganisms, 9, 6. DOI: 10.3390/microorganisms9061254. - Publication Canfora Loredana; Costa Corrado; Pallottino Federico; Mocali Stefano (2021). Trends in soil microbial inoculants research: a science mapping approach to unravel strengths and weakness of their application. AGRICULTURE, 11, 2. DOI: 10.3390/agriculture11020158. 	
FeDE Research and development project to develop product innovation in the sectors of ecological fertilizers and depolluting agents	Obtain new eco-sustainable formulations for soil fertilization and the remediation of contaminated sites	R. FARINA CREA-AA	CARBOSULCIS SpA.		

FERDI'2 Evaluation of the biological fertility and microbial diversity of soils cultivated with maize and analysis of the metabolically active microbial communities in paddy soil	Evaluating the effect of different agronomic management on biological fertility and microbial diversity of soils cultivated with corn. Evaluating the effect of different agronomic management on the metabolically active microbial communities in paddy soils	L. CANFORA CREA-AA	Acqua Sole Ltd.		
FERT-NEC Evaluation of emissions related to the use of nitrogen fertilizers under the NEC directive	Evaluation of emissions related to the use of nitrogen fertilizers, with particular attention to urea, and the impact of possible measures to reduce their use for each significant crop, to support the definition and evaluation of policies and measures for the reduction of emissions harmful and climate-altering	C. DI BENE CREA-AA	ISPRA-ISTITUTO SUPERIORE PROTEZIONE E RICERCA AMBIENTALE		
GRASCIARIRIUNITI Circular economy in agriculture: proper management of organic waste and corporate self-production of biomass to increase the fertility of agricultural land in the Marche Region	Application of new strategies for the virtuous management of corporate organic waste, residues as matrices to be reused in agriculture, energy, and other sectors. These, combined with self-production actions of biomass for fertilization and crop protection, will allow the current company organic residue to undertake other innovative paths, becoming a new product with high added value: a biomaterial or an active ingredient with a specific action (biomolecules), thermal energy or biomethane, fertilizers, biostimulants, etc., thus starting a virtuous path aimed at increasing self-sufficiency, with good repercussions on the company budget and positive effects on the sustainability of the Marche agricultural systems	L. D'AVINO CRE-AA	Marche Administrative Region		
GREENRESILIENT Organic and biodynamic vegetable production in low-energy GREENhouses – sustainable, resilient, and innovative food production systems	Demonstrate that an agroecological approach to organic greenhouse production is feasible in different European regions. We want to demonstrate that the adoption of less intensive production systems, based on low energy consumption, appropriate crop rotations, the use of ecological service crops such as legume and cruciferous mixtures and local organic inputs is possible in almost all latitudes, in Europe	F. TITTARELLI CREA-AA CRE-CI	<ul style="list-style-type: none"> - Institute for Agricultural and Fisheries Research (ILVO) - FiBL - Research Institute of Organic Agriculture - Agroscope - Swedish University of Agricultural Sciences (SLU) - Vegetable Research Centre Kruishoutem (PCG)- MUR - Italian Ministry of University and Research 		<ul style="list-style-type: none"> - La Certificazione delle sementi di riso e attività sperimentale - Campagna 2020-2021 - Assegni di ricerca - n.1 - Borse di studio - n.2

INNO-OLIVO&OLIO Innovation and transfer along the olive-oil supply chain for sustainability and quality of processes and products - olive & oil operating group	Application of innovative techniques for proper and sustainable olive grove management; optimization of oil waste management; dissemination and territorial animation	M. MASTRORILLI CREA-AA	Basilicata Administrative Region		
INNOFRUIT Sustainability and innovation of Apulian table viticulture	Favoring the recovery of competitiveness and profitability of Apulian table grape producers compared to the main competitors. This objective can only be pursued by working organically on the improvement of the product offered and on the efficiency of the entire production process. In particular, the provision to producers of new seedless varieties more responsive to demand and the development of more efficient and sustainable production processes from an environmental and economic point of view will constitute the fulcrum of the project.	A. F. MODUGNO CREA-AA	Apulia Administrative Region		<ul style="list-style-type: none"> - Joint meeting DIVERIMPACTS-DIVERFARMING 04/10/2021 Rome - Webinar-Series DIVERFARMING: Sistemi coltura diversificati per un'agricoltura sostenibile 25/06/2021 - Webinar-Series DIVERFARMING - L'esperienza del progetto diversificazione in Italia: L'esperienza del progetto Diverfarming su frumento, pomodoro e pisello da industria 05/07/2021 - Research grant: 1
INNOVAPE Focus area 2A. Operational Group Plan - Innovative tools to support the beekeeping sector for the enhancement of local bees and associated productions	Constitution of an Operating Group, partnership aimed at creating a plan for the development of an innovative process/service for the beekeeping sector, in the field of honey selection and product	E. CARPANA CREA-AA	Emilia-Romagna Administrative Region		<ul style="list-style-type: none"> - Webinar-Series DIVERFARMING: Sistemi coltura diversificati per un'agricoltura sostenibile 25/06/2021 - Diversificazione culturale, agroecologia e PAC sinergie ed opportunità 23/11/2021 Rome - Joint meeting DIVERIMPACTS-DIVERFARMING 04/10/2021 Rome
JINGOLD 2.0 Preliminary protocol for the use of a dormancy switch in kiwi (cv. Jintao) calibrated according to the time and dose of distribution	Develop an objective and repeatable protocol for the application of a dormancy switch on actinidia cv Jintao	L. GAETA CREA-AA	JINGOLD S.P.A.		
LG 2020 II Keeping herd book of bees - year 2020 - Second excerpt	Continue the activity of keeping the National Register of Italian Bee Breeders as provided for in the Regulations of the same in Chapter V, Art. 14, of the National Register of Experts in Sensory Analysis of Honey and Melissopalinalogy	C. COSTA CREA-AA	MiPAAF - Ministry of Agricultural, Food and Forestry Policies		
LG 2021 Keeping Herd Book of Bees. Activity program for the year 2021	Initiatives related to the genetic program of conservation and/or genetic improvement of the Italian subspecies of Apis mellifera and for the enhancement of their productions	C. COSTA CREA-AA	MiPAAF - Ministry of Agricultural, Food and Forestry Policies		<ul style="list-style-type: none"> - Produzione biologica e biodinamica in serra l'agroecologia per la progettazione di sistemi sostenibili e resilienti - Progetto GREENRESILIENT Confronto tra sistemi di produzione: risultati e prospettive 19/05/2021 Capua - Research grant: 1

LIFE 4 POLLINATORS Involving people to protect wild bees and other pollinators in the Mediterranean	Raise public awareness on the main environmental problems of pollinator decline, involving citizens and farmers to adopt "pollinator-friendly" attitudes and behaviors, and stimulating institutions to implement measures in favor of pollinators	L. BORTOLOTTI CREA-AA	- Universidade de Vigo - IMEDEA - University of the Aegean - E-zavod - European Commission	- Publication Barberis Marta; Bogo Gherardo; Bortolotti Laura; Conte Lucia; Alessandrini Mattia; Nepi Massimo; Galloni Marta (2021). Gender-biased nectar targets different behavioural traits of flower visitors. Plant Ecology, 222, 2, 233-246. DOI: 10.1007/s11258-020-01101-5. - Publication Flaminio Simone; Ranalli Rosa; Zavatta Laura; Galloni Marta; Bortolotti Laura (2021). Beewatching: a project for monitoring bees through photos. Insects, 12, 9. DOI: 10.3390/insects12090841. - Publication Bogo Gherardo; Fisogni Alessandro; Rabassa-Juvanteny Joan; Bortolotti Laura; Nepi Massimo; Guarnieri Massimo; Conte Lucia; Galloni Marta (2021). Nectar chemistry is not only a plant's affair: floral visitors affect nectar sugar and amino acid composition. Oikos, 130, 7, 1180-1192. DOI: 10.1111/oik.08176. - Publication Albertazzi Sergio; Monterastelli Elisa; Giovanetti Manuela; Zenga Emanuele Luigi; Flaminio Simone; Galloni Marta; Quaranta Marino; Bortolotti Laura (2021). Biodiversity evaluation: from endorsed indexes to inclusion of a pollinator indicator. Diversity, 13, 10. DOI: 10.3390/d13100477. - Publication Bortolotti Laura; Flaminio Simone; Quaranta Marino; Galloni Marta (2021). Beewatching: un progetto per conoscere le api selvatiche italiane. Entomata, 14, 11-25. - Publication Fontana Paolo; Bortolotti Laura (2021). Bees conservation is not 'child's play'. Bees for Development Journal, 140, 3-6.	- Assegni di ricerca - n.3
MAR E TIARIS Cooperation strategy for territorial development	Enhance the two main characteristics of the area: i) rurality, with its agricultural tradition and professionalism, and ii) tourist, cultural, historical, naturalistic and food and wine offerings. The municipalities of the partnership intend to improve and expand the offer with a project that aims to network the entire territory and raise awareness of citizens and tourists about sustainable development, proposing good practices (waste reduction, health paths, healthy food) towards a better lifestyle	S. CAPPELLOZZA CREA-AA	Friuli Venezia Giulia Administrative Region		- Outlook economico-statistico del comparto luppola 21/06/2021
MATHILDE Models for Hazelnut DisEases	Developing reliable simulation models aimed at predicting hazelnut pest and disease outbreaks and quantifying the corresponding yield losses and quality defects. The expected benefits consist of decision support tools, which can help decision makers to limit the impacts of quality issues in a context of economic, social, technological and climatic changes	S.U. M. BREGAGLIO CREA-AA	Fonds National de la Recherche Luxembourg		- Biologico autentico: una ricerca sul cavolfiore attraverso un approccio chimico multivariato e isotopico - Il progetto INNOVABIO 18/02/2021
MEDIBEES Monitoring the Mediterranean honeybee subspecies and their resilience to climate change for the improvement of sustainable agro-ecosystems	Genetic mapping of Apis mellifera subspecies in participating countries to determine the genetic traits that control their adaptation to Mediterranean environments. Enhance the local Mediterranean subspecies. Based on the adaptation to local conditions, the use of local subspecies/ecotypes will be promoted in the beekeeping community of the participating countries. Actions will be taken to promote local honey production and the agricultural use of beekeeping by-products	A. NANETTI CREA-AA	21		

METAMORFOSI (EASY-LOCK) Methodologies, applied technologies and research models for an operational chain of Italian silk	Design and implementation of an innovative mulberry cultivation system that allows to obtain raw material available for the silkworm nourishment on a continuous basis throughout the year. Creation of an intensive silkworm breeding system in controlled climatic and hygienic conditions that allows the availability of silk cocoons beyond the limit linked to the natural cycle currently at the base of the natural production system. Creation of machinery and plants for the transformation of the cocoon into silk yarns with high added value. Transformation and enhancement of secondary products of the silk supply chain. Creation of a "widespread economy" type production model based on the principles of Life Cycle Management	S. CAPPELLOZZA CREA-AA	EASY-LOCK		
METinBIO Address and technical support for the management of the registers/databases of the Technical Means of the Ministry of Agricultural, Food, Forestry and Tourism Policies	Reorganization of the procedures for registering fertilizers and corroborants in organic farming through: i) examination of the criticalities that emerged within the technical means; ii) definition of the eligibility criteria for the technical means in organic farming and for the information to be acquired for inclusion in the register; iii) support to Mipaaft in the technological upgrade of the Register of Fertilizers/Strengtheners; iv) support to the ICQRF in identifying "control packages" for technical means; v) preparation of guidelines on technical means in organic farming, according to the inspiring principles of agroecology	A. TRINCHERA CREA-AA CREA-DC	MiPAAFT - Ministry of Agricultural, Food, Forestry and Tourism Policies		
MICOVIT Biotechnologies applied to the mycorrhization of vines in nursery and geomatic systems for measuring the performance of mycorrhizal plants in the vineyard	Strengthen the research system capacity and promote the competitiveness of the Latium production system	S. VANINO CREA-AA	Lazio Administrative Region		
NControl Reduction of greenhouse gas and ammonia emissions in the livestock supply chain	Control of nitrogen losses in the livestock sector by monitoring greenhouse gas and ammonia emissions from the soil (ryegrass-corn and semi-permanent fodder crops like alfalfa and fescue) and stored sewage; monitoring of N losses by leaching. Biochar is used as a means of reducing emissions, added to the soil - alone and together with chemical and organic fertilization (digestate, livestock waste) - and slurry. The project will carry out demonstration and dissemination activities of these innovative techniques addressed to the players in the livestock sector	A. LAGOMARSINO CREA-AA	Lombardy Administrative Region		
NoMaPHEN Phenological data management and modelling for North Macedonia	Provide check of the meteorological and phenological data, preparing for a future application of the IPHEN phenological model to North Macedonia. S	C. EPIFANI CREA-AA	FAO Food and Agriculture Organization of the United Nations		

	Support North Macedonia to develop a monitoring and modelling campaign and set up a weekly phenological bulletin				
OLIVE MATRIX Olive grove management by innovative and control techniques	Reduction of the competitiveness gap between the Apulian olive growing model and those of competing countries. Improvement of the decision-making model on the main cultivation operations that impact on environment and company budget. Defense and irrigation management. Definition of operational protocols with precision detection methods, with the use of innovation technologies to improve and increase the definition of preventive monitoring activities. Improvement of timing of communication of sensitive data to recipients and end users	S. RUGGIERI CREA-AA	Apulia Administrative Region		- I mezzi tecnici in agricoltura biologica (METinBIO) opportunità e criticità emergenti alla luce dei recenti aggiornamenti normativi 20/10/2021 -Research grant: -Scholarships: 3
PAPILIOTREMA Evaluation of the effects of Papiliotrema terrestris on honeybees	Assessing the attractiveness and health effects of honeybees of the new yeast-based plant protection product	P. MEDRZYCKI CREA-AA	-AGROVENTURES S.R.L.		- Research grant: 1
POSHBEE Pan-European assessment, monitoring, and mitigation of stressors on the health of bees	Monitoring program for assessing the impact of agricultural/environmental practices on the well-being of Apoidea (bees, bumblebees and other solitary bees)	C. COSTA CREA-AA	22. European Commission		
PROMENADE 2 Implementation of Ferrero's support system for forecasting hazelnut yields	Further develop the HADES yield forecasting system through (i) the implementation of the impact of pollen on interannual yield variability, (ii) the extension of the system to Chilean areas and its consolidation in Italy, and (iii) the improved prediction of "spoiled" and "bug" quality defects. In addition, the HAZEL model needs revision regarding the representation of the crown architecture and associated evapotranspiration flows	S. U. M. BREGAGLIO CREA-AA	Ferrero Trading Lux S.p.A.		

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• Université de Mons • The Red Beehive Company • Imkerverband Sachsen-Anhalt • Institute of Bee Health, University of Bern • Wildbiene+Partner • Association Plateforme BioPark d'Archamps • Vita (Europe) Limited • Estonian Professional Beekeepers Association • Biobest Group • Estonian University of Life Sciences • Bauernverband Sachsen-Anhalt • Teagasc agriculture and food development authority - Ireland • The Estonian Chamber of Agriculture and Commerce • ADEA ASAJA Asociación Regional de Empresas Agrícolas y Ganaderas de la Comunidad Autónoma de Andalucía • Atlantic Pollination Ltd • MLU - Martin Luther University of Halle-Wittenberg • Panstwowy Instytut Weterynaryjny (National Veterinary Research Institute) • Federation of Beekeepers of Ireland Associations • Federation of Swedish Farmers (LRF) Lantbrukarnas Riksförbund • Eidgenössisches Departement fuer Wirtschaft, Bildung und Forschung (wbf) • Nemzeti Élelmiszerlánc-Biztonsági Hivatal (National Food Chain Safety Office) • Helmholtz-Zentrum für Umweltforschung GmbH • British Beekeepers Association • French Agency for food, environmental and occupational health safety • Union Suisse des Paysans - Swiss Farmers Union • Swedish University of Agricultural Sciences • University of Aarhus • Albert-Ludwigs-University Freiburg • The University of Reading • Universidad de Murcia • Pensoft Publishers Ltd • Apisuisse • Centre National de la Recherche Scientifique • The National Farmers Union (UK) • Biodlingsföretagarna • University of Dublin Trinity College • INRA

REG(UE)1308/2013 anno 2021 National Triennial Program 2020-22 in favor of the beekeeping sector, for the improvement of the production and marketing of beekeeping products	Improvement of honey quality and enhancement of beekeeping products on the market. Defense of beekeeping and bee from pathologies and pollutants. Research activities strictly aimed at improving beekeeping and overcoming existing criticalities, shared with beekeeping organizations	E. CARPANA CREA-AA	MiPAAF - Ministry of Agricultural, Food and Forestry Policies		
RONASAS Recovery of Organics and Nutrients from Sludge on Apulian Soils	Set up and conduct full field tests in a private company and in the experimental company of CREA-AA (Podere 124, at Foggia) and laboratory tests to evaluate the effects of defecation gypsum produced by the sewage sludge of the aqueduct, applied as fertilizers and amendments, on the main soil chemical-physical properties and on the productive responses of crops	R. LEOGRANDE CREA-AA	Acquedotto Pugliese S.p.A. (AQP)		
Saline Soils Poland Microbial biodiversity and biotechnological potential of saline soils with various pedoclimatic characteristics		R. NAPOLI CREA-AA	Lodz University of Technology (LUT)- MAECI – Italian Ministry of Foreign Affairs and International Cooperation		- La compagnia del suolo. Contro la desertificazione dei suoli serve un'altra agricoltura. 13/10/2021 Bari
SARAGRI Use of multi-frequency SAR data to support agriculture	Develop and/or consolidate and validate a set of algorithms/products using multi-frequency SAR data in the "Agriculture" area of primary interest to ASI	S. RUGGIERI CREA-AA CREA-CI	Instituto Tecnológico Agrario de Castilla y Leon (ITACYL)- Italian Space Agency		
SFOF - Smart Future Organic Farm An innovative method (monitorable, measurable, and certifiable) of organic production towards zero CO ₂ emissions agriculture	Increase the decision-making efficiency of the agricultural entrepreneur to improve sustainability of organic cereal systems in terms of productivity, resource efficiency, soil fertility and environmental impact, greenhouse gas emissions, and water consumption in contexts of long term and typical of Apulian agriculture strategic areas. The proposal intends to develop and make available a system to support decisions and an application for estimating the water and carbon footprint of typical cereal systems	D. VENTRELLA CREA-AA	Apulia Administrative Region		
SILK PLUS Re-evaluation of the by-products of the silk supply chain in the cosmetic and food fields	Finding new applications that can give greater economic value to current regional production. In particular, the project focuses on the recovery and reuse of the silkworm chrysalis coming from cocoons unsuitable for reeling, recognizing an additional economic value to a by-product.	S. CAPPELLOZZA CREA-AA	Veneto Administrative Region		

SILK Innovation in tradition: relaunch of sericulture through new production and processing systems	Contribute to the promotion of sericulture in Friuli Venezia Giulia Region, through the enhancement of the final product of the silkworm. Contribute to the innovation of silkworm breeding and cocoon production techniques, with the introduction of rational management systems and machinery that can reduce production costs. Contribute to improving the mulberry growing, through the characterization of the traditional arboreal heritage of plains, hills and mountains, the choice of varieties with different earliness of development for a more rational management of the leaf harvest. Contribute to creating synergies and multisectoral actions between production, tourism, and transformation sectors of the silkworm end product	S. CAPPELLOZZA CREA-AA	Friuli Venezia Giulia Administrative Region	- Publication Brady D.; Saviane A.; Cappellozza S.; Sandrelli F.(2021). The circadian clock in Lepidoptera. Frontiers in Physiology, 12. DOI: 10.3389/fphys.2021.776826.	
Soil_HUB Creation of an Italian HUB to support Italy's participation in the Global Soil Partnership and the European network of excellence on soil research	Harmonization and integration of soil data and information, including quality indicator databases. Land ownership and management Science-policy interaction, with reference to CAP, climate, soil management Contribute to make available all the information useful for calculating indicators and identifying the knowledge gaps that will be filled for this purpose with further research efforts. In this context, the Soil HUB project will also contribute to evaluating the opportunity of zoning the priorities for increasing organic matter and reducing erosion phenomena, also evaluating any knowledge gap to be filled for this purpose.	R. FARINA CREA-AA CREA-PB	MiPAAF - Ministry of Agricultural, Food and Forestry Policies		
SOSFERA Guidelines to support organic substance, biological fertility, and the quality of Emilia-Romagna waters and soils	Reduction of pollutant release and improvement of water and soil quality. Adversity control with low impact methods. Verification and adaptation of agricultural cropping systems to climate change	L. M. MANICI CREA-AA	Emilia-Romagna Administrative Region		
SPRING Preparatory Action for EU Pollinator Monitoring Scheme and Indicators	Preparatory Action for an EU Pollinator Monitoring Scheme and Indicators.	M. QUARANTA CREA-AA	European Commission		- Assegni di ricerca - n. - Borse di studio - n.1
SUREVEG Strip-cropping and recycling of waste for biodiverse and resource-efficient intensive vegetable production	Building diversified biological horticultural models (by catch or associated crops), managed through the use of conservative crop termination for agro-ecological service, in order to promote the efficiency of the use of nutrients and rhizospheric interactions (mycorrhization, rhizobial nodulation of legumes). The effects related to different fertilization strategies will also be considered, comparing the agronomic and	A. TRINCHERA CREA-AA CREA-OF	MUR - Italian Ministry of University and Research		- Borse di studio - n.1

	nutritional performances of organic animal-based fertilizers usually applied to highly stabilized plant-based soil improvers. The project will provide also an adequate know-how to organic farmers, to encourage innovation in the sector				
SUSCAP Developing resilience and tolerance of crop resource use efficiency to climate change and air pollution	<p>Identification and involvement of stakeholders</p> <p>Dialogue and definition of interventions.</p> <p>Crop and pedoclimatic data (point scale)</p> <p>new OTC trials</p> <p>Exploration and homogenization of databases already available</p> <p>Integration of databases with remotely sensed information.</p> <p>Climatic data and atmospheric composition (European scale)</p> <p>Spatialization of current weather data</p> <p>Spatialization of atmospheric pollution data (i.e. ozone and aerosol)</p> <p>Creation of future climate and atmospheric composition scenarios.</p> <p>Development and application of crop models</p> <p>Model development</p> <p>Calibration and validation of point-scale models</p> <p>Spatially distributed application of calibrated models in the identified study areas (European scale)</p> <p>Preliminary evaluation of the results on a regional scale</p> <p>Quantification of the impacts of pollutants on production and efficiency of use of resources</p> <p>Identification of site-specific adaptation strategies</p>	G.A. CAPPELLI CREA-AA	MUR - Italian Ministry of University and Research - European Commission		
SYSTEMIC_951 An integrated approach to the challenge of sustainable food systems: adaptive and mitigatory strategies to address climate change and malnutrition	Explore transversal solutions, identify knowledge gaps and develop pathways for a food system transformation resilient and capable of addressing societal challenges in the context of climate change	D. VENTRELLA CREA-AA	MiPAAF - Ministry of Agricultural, Food and Forestry Policies		- Borse di studio - n.1
TRAS.IRRI.MA. Transfer of wise irrigation management technologies and protocols for irrigation optimization	<p>Increased adoption of sustainable practices and innovative technologies for irrigation management. Creation of an information network on irrigation issues to be supported even after the project. Reduction of water withdrawal, environmental risk mitigation.</p> <p>Hydrogeological risk mitigation, increase resilience of rural areas.</p> <p>Mitigation/adaptation to climate change</p>	M. MASTRORILLI CREA-AA	European Commission		

UNIHEMP Use of industrial hemp biomass for energy production and new biochemicals	<p>Increase the efficiency and improve the environmental and economic sustainability of the agro-industrial hemp chain through the enhancement of by-products as raw materials of other production processes. Enhance the by-products deriving from the waste of the hemp supply chain so as to create complementary business areas but able to increase the economic profitability of all the players in the supply chain. Optimize the economic, social and environmental impact the development of the hemp supply chain will have on the local, regional and national context.</p> <p>Increase the efficiency and improve the environmental and economic sustainability of the biomass transformation process coming from hemp processing waste to produce energy and biochemicals</p> <p>Improve the economic balance of the cultivation of hemp through the diffusion of means of sustainable production and the reduction of plant and cultivation costs</p>	<p>L. D'ANDREA CREA-AA CREA-CI CREA-DC</p>	<p>MUR - Italian Ministry of University and Research</p>	<p>- Poster Fulvio Flavia; Paris Roberta; Montanari Massimo; Citti Cinzia; Bassolino Laura; Moschella Anna; Cannazza Giuseppe; Pecchioni Nicola; Mandolino Giuseppe (2021). Lights and shades in the way for cannabinoids biosynthesis: a focus on the variability of THCA-like genes and their possible involvement in the chemical phenotype of Cannabis sativa L.</p> <p>- Publication Pieracci Ylenia; Ascrizzi Roberta; Terreni Valentina; Pistelli Luisa; Flamini Guido; Bassolino Laura; Fulvio Flavia; Montanari Massimo; Paris Roberta (2021). Essential Oil of Cannabis sativa L: Comparison of Yield and Chemical Composition of 11 Hemp Genotypes. Molecules, 26, 13. DOI: https://doi.org/10.3390/molecules26134080.</p> <p>- Publication Linciano Pasquale; Russo Fabiana Russo; Citti Cinzia; Tolomeo Francesco; Paris Roberta; Fulvio Flavia; Pecchioni Nicola; Vandelli Maria Angela; Laganà Aldo; Capriotti Anna Laura; Biagini Giuseppe; Carbone Luigi; Gilgi Giuseppe; Cannazza Giuseppe (2021). The novel heptyl phorolic acid cannabinoids content in different Cannabis sativa L. accessions. Talanta, 235. DOI: 10.1016/j.talanta.2021.122704.</p> <p>- Publication Cerrato Andrea; Citti Cinzia; Cannazza Giuseppe; Capriotti Anna Laura; Cavaliere Chiara; Grassi Gianpaolo; Marini Federico; Montone Carmela Maria; Paris Roberta; Piovesana Susy; Laganà Aldo (2021). Phytocannabinomics: Untargeted metabolomics as a tool for cannabis chemovar differentiation. Talanta, 230. DOI: 10.1016/j.talanta.2021.122313.</p> <p>- Publication Fulvio Flavia; Paris Roberta; Montanari Massimo; Citti Cinzia; Cilento Vincenzo; Bassolino Laura; Moschella Anna; Alberti Ilaria; Pecchioni Nicola; Cannazza Giuseppe; Mandolino Giuseppe (2021). Analysis of Sequence Variability and Transcriptional Profile of Cannabinoid synthase Genes in Cannabis sativa L. Chemotypes with a Focus on Cannabichromenic acid synthase. Plants, 10, 9. DOI: 10.3390/plants10091857.</p> <p>- Congress abstract Fulvio Flavia; Pieracci Ylenia; Ascrizzi Roberta; Pistelli Luisa; Flamini Guido; Bassolino Laura; Montanari Massimo; Paris Roberta (2021). Characterization and comparison of essential oils composition from 11 Cannabis sativa genotypes from two cultivation seasons. Book of Proceedings, 32.</p> <p>- Congress abstract Paris Roberta; Fulvio Flavia; Montanari Massimo; Bassolino Laura; Citti Cinzia; Pastore Chiara; Mandolino Giuseppe (2021). By-products from industrial hemp inflorescences. Book of Proceedings, 25.</p>	<p>- Research grant: 1</p>
VA.DI Evaluation of the risk assessment related to the use of digestate on soil, plant, and plant-soil-microorganism relationships	<p>Establishing the risk assessment related to the use of digestate on soil, plant, and plant-soil-microorganism relationships</p>	<p>L. CANFORA CREA-AA</p>	<p>Acqua Sole Ltd.</p>		
Water4AgriFood - ARS01_00825 Improvement of Mediterranean agri-food production in conditions of lack of water resources	<p>The project deals with the Agrifood area, which refers to technological solutions for the production, storage, traceability, safety and quality of food. It includes a variety of sectors related to agriculture and related activities, forests and wood industries, food and beverage processing industry, mechanical-food industry and precision agriculture, packaging and materials for packaging, nutraceuticals, nutrigenomics and functional foods</p>	<p>M. MASTRORILLI CREA-AA CREA-GB CREA-PB</p>	<p>MUR - Italian Ministry of University and Research</p>	<p>- Publication Foti Paola; Romeo Flora Valeria; Russo Nunziatina; Pino Alessandra; Vaccalluzzo Amanda; Caggia Cinzia; Randazzo Cinzia Lucia (2021).Olive Mill Wastewater as Renewable Raw Materials to Generate High Added-Value Ingredients for Agro-Food Industries.Applied Science, 11, 16, 1-19.DOI: 10.3390/app11167511.</p>	<p>- La compagnia del suolo. Contro la desertificazione dei suoli serve un'altra agricoltura. 13/10/2021 Bari - Research grant: 1</p>

Services

Collections

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Wild bees	Collection of about 50 entomological display cases, bearing a male and a female specimen of each of the approximately 1000 Italian species of "wild bees" (Hymenoptera Apoidea). Italy is home of about half of all European bee species. The collection is constantly being implemented, with material from donations, field collections as part of projects and loans from European museums. Currently, the collection houses about 60% of the species with at least one of the two sexes, for a total of about 1200 specimens out of the 2000 expected when completed. The activity is not currently funded by a specific dedicated project, but proceeds thanks to projects to which it provides support. For the period 2020-2023 the collection offers support to the BeeNet project.	M. Quaranta	CREA-AA
Silkworm	Germplasm silkworm collection and mulberry varietal collection: about 200 silkworm breeds and a mulberry grove of 2.5 ha with 60 varieties of mulberry.	S. Cappellozza	CREA-AA
Hymenoptera	National Reference Collection of Apoid Hymenoptera (Hymenoptera Apoidea).		CREA-AA
Soil fertility	"S. Anna" Farm, about 11 ha. Experimental devices have been installed for studies on no-food crops and recovery of the fertility of soils subjected to intensive cultivation - Monteroni di Lecce (LE).	C. Fina	CREA-AA
Almond tree germplasm	"La Piantata" Farm, about 6 ha. Preservation of almond tree germplasm and dry almond cultural systems - Bitetto (BA).	L. Gaeta	CREA-AA
Agricultural rotations	"Fagna" Experimental center, about 42 ha. Five-year and long-term (over 40 years) rotation tests are carried out - Scarperia and San Piero (FI).	G. Moretti	CREA-AA
Water-agricultural systems relationships	"M. Elisa Venezian Scarascia" Farm, about 25 ha, irrigated. Oriented to studies on the relations between water and cultivation systems and no-food crops. Present a collection of almond germplasm - Rutigliano (BA).	N. Sanitate	CREA-AA
Mediterranean extensive cultural systems	"Podere 124" Farm, about 20 ha. Studies are carried out on extensive and intensive Mediterranean cultivation systems. Techniques at the basis of organic, conservation, and precision agriculture are studied (Foggia).	A.V. Vonella	CREA-AA
Sustainable cultural systems	"Campo 7" Farm, about 7 ha. Long-term studies and experiments are developed on the management of crop systems, both arboreal and herbaceous, with particular regard to the efficient use of agri-environmental resources, the planning of environmentally friendly production systems and techniques, integrated and organic cultivation methods - Metaponto, Bernalda (MT).	A. Fiore	CREA-AA

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Library and Museum Collection of Meteorology and Agrometeorology Cultural heritage of the former Research Unit for Climatology and Meteorology Applied to Agriculture (CMA), based at the Roman College and in the premises of CREA-AN. It is specialized in meteorology, climatology, historical agrometeorology and seismic-volcanology	The Library and Museum Collection of Meteorology and Agrometeorology of CREA-AA, through its ancient, rare, and valuable books, its ancient measuring instruments, more unique than rare, and its original cards and documents of meteorology and seismology, is the main historical memory of the Italian meteorological and geophysical tradition, from the second half of the 16th century to today. The Library, identified with the international code IT-RM0783, is based in the Collegio Romano (Rome) and is considered the "first Italian meteorological library" (DM 9/10/1998). Its original nucleus comes from the Earth Sciences Fund of the Society of Jesus and dates back to the 16th century. It boasts a consistency of over 50,000 volumes, including monographs, magazines, original manuscripts and a precious collection of seismology, volcanology, meteorology, hydrobiology, natural sciences (from 1554 to 1830). Connected to the Library is the great variety of ancient instruments of meteorology, seismology and hydrobiology: more than 200 types that are characterized by their originality and their significant historical-cultural and didactic value. It represents a unicum, even at an international level, especially for its nineteenth-century section, as it is full of prototypes which, in most cases, are unique pieces. Attached to the Museum Collection is the Historical Meteorological Archive, one of the most important in the world: it preserves about 900 series of climatic data collected in national observatories and thermo-pluviometric stations and of the former Italian colonies (Eastern Africa, Croatia, Slovenia, Albania and Greece). It also consists of other original scientific documents: phenological and storm postcards, seismic postcards, correspondence from observers.	L. Iafrate	CREA-AA (Roma)
Historical Library of Soil Scientists and Plant Nutrition "Corrado Nigro"	Its origins date back to 1872, when it was born and developed as a specialized collection of the Royal Agricultural Experimental Station of Rome. Its original seat was at the Royal Roman Technical Institute. In 1874 the original nucleus of the Library was, together with the Agricultural Station, transferred to the former Roman Convent of Santa Maria della Vittoria (Largo di Santa Susanna). Fifteen years after its establishment, the Library already possessed monographs, encyclopedias and periodicals on	L. Iafrate	CREA-AA (Roma)

Historical collections of the former Research Center for the Study of Relationships between Plant and Soil (former RPS). It is the largest national bibliographic collection on plant nutrition and soil chemistry and physics.	<p>agricultural chemistry, analytical chemistry, inorganic chemistry, plant physiology, geopedology, microbiology and agronomy, both national and international, in such a quantity as to guarantee the Agricultural Station of keep up with the times.</p> <p>The last transfer of the Library dates back to the end of 1922 and the rooms that housed it, together with the rest of the station, including its laboratories, were located inside Villa Celimontana, where, from 1934, they had their final layout.</p> <p>Continuously improved over the years, the library collection of the former Agricultural Station (last name: Research Center for the Study of Relationships between Plants and Soil) has, since then, grown considerably in consistency, up to over 30,000 volumes, including monographs, encyclopedias and periodicals, with the latter being numerically preponderant. Thus, among books and pamphlets, even rare and valuable, specialized periodicals, various academic acts and reports, it offers a vast bibliographic panorama of significant historical-scientific interest that covers the period from 1515 to today.</p>		
Library of the former National Institute of Beekeeping and Sericulture (CRA-API) of Bologna	<p>The Library was formally established in 1933. Over the years, it has acquired its assets mainly through the channels of purchase and bequest by private individuals. The main areas of specialization of the Library are beekeeping and apidology.</p> <p>Since 2008 it maintains the "Bibliographic Fund of Apidology" of the lawyer Oddo Marinelli, a passionate and cultured beekeeping scholar who, in the last century, had collected more than 800 volumes, including magazines, reports and interesting books on epoch.</p>	A. Roveri	CREA-AA (Bologna)
Former ABP Soil Conservation Library, Florence	<p>The Library is located in the CREA-AA headquarters in Cascine del Riccio. It preserves a series of volumes, sorted alphabetically, whose fundamental disciplinary areas are related to: soil, soil degradation, soil chemistry, soil physics, soil genesis and cartography, erosive processes, soil pollution, soil quality and products, general biology, agricultural and forestry entomology, beekeeping.</p> <p>The Library also contains volumes belonging to old collections (about three hundred) and printed magazines relating to the interdisciplinary field of environmental sciences.</p> <p>Following the establishment of the new Defense and Certification Research Center (DC), the bibliographic material of the former ABP Soil Conservation of Florence has been in the Library of the DC Headquarters in Florence for about five years.</p>	A.M. Chiodo, L. Tirinnanzi	CREA-AA (Firenze)
Library of the former Agricultural Experimental Institute of Bari	<p>The Library of the former Experimental Agronomic Institute (ISA) of Bari, later Research Unit for the Cultivation Systems of Hot-Arid Environments (CRA-SCA), has about 25,000 volumes, some of which are of high historical-scientific and cultural value. It covers all areas of agronomy.</p> <p>Attached to the Library was a large international Journal library, which consisted of well over 20,000 issues of periodicals, many of which highly specialized. The entire newspaper library was donated, about a decade ago, to the "South-East" Section of the Georgofili Academy (Bari).</p> <p>The original nucleus of the Library is historically traced back to the Book Fund of the School of Oil Mill and Olive Growing in Bari (founded in 1881), subsequently integrated with the collections of the local Experimental Agricultural Station, established in 1918 to address the various economic problems of the South. of Italy connected with the productivity of the cultivation systems of the semi-arid and hot-arid environments of the Mediterranean area.</p>	V. Cazzato (già referente)	CREA-AA (Bari)
Historical Library of the former Bacological Station of Padua	<p>Library of particular historical, scientific and cultural interest, it consists of over 4,500 volumes, published from the end of the 1700s to the present day. It is configured as a precious tool for the historical study of the birth and evolution of the silkworm culture in Italy.</p> <p>One of its rather large sections concerns sericulture, mulberry growing and entomology in general. It also includes general agricultural monographs, annals, magazines, and bulletins of various agricultural research institutions active in the last two centuries, including the Bulletin and Annals of the Experimental Sericulture Station of Padua, founded by Vittorio Emanuele II in 1871.</p> <p>The Historical Library, together with the collection of ancient scientific instruments, constitutes the original nucleus of the current Esapolis: the largest living museum of insects, silkworms and bees in Italy.</p>	S. Cappellozza	CREA-AA (Padova)

3.CREA RESEARCH LINES BY CROSS CUTTING ISSUES

3.4. TECHNOLOGICAL INNOVATIONS, DIGITAL TRANSITION AND ADVANCED SENSORISTICS.

In a historical moment in which problems related to the environment, the depletion of natural resources and the need to activate energy saving strategies are increasingly pressing, it is strategic to address research topics on green and smart technologies. These technologies must also be oriented towards supporting companies and typical productions, even on a small and organic scale, by developing innovations and experimenting ad hoc applications, both for field activities and for post-harvest and early transformations.

The hereafter described research activities concern the application of mechanical and engineering technologies, including digital ones, from agricultural production to agri-food processing. The operational approach is part of the European Green Deal which aims at climate neutrality for EU countries, to be achieved by 2050. In this perspective and in the light of the deterioration of conditions and environmental factors in agriculture (salinization of the land, water scarcity, rise in temperatures, alteration of seasonal cycles, etc.) induced by climate change, the objective focuses on the study of remote-driven approaches for the application of agro-ecological farming and irrigation practices. One of the focal points of the European Green Deal concerns the "farm to fork" strategy which aims to ensure quality, safe and sustainable food production. Traditional methods will have to be transformed into more innovative ones starting from traditional mechanics/mechanization with mechatronic developments that increasingly integrate digital (sensors, ICT, etc.) and aerospace (Sentinel, Galileo) technologies to guarantee, even in the changed climatic scenarios, the safety and quality of primary productions, adequate economic profitability and improving environmental protection through the reduction and efficiency of external inputs (e.g., pesticides, fertilizers).

Increasing quality production and sustainability of the agricultural sector through innovations is one of the main challenges of the coming years. In this scenario, precision and digital agriculture (agriculture 4.0) play a decisive role managing the variability of production factors, especially in the field, and therefore make production more efficient by increasing yield and decreasing consumption (agrochemicals, water, driving form, work, etc.). Generally, the innovations for primary "field" activities mainly concern the study and experimentation of new machines or components, of innovative processes of mechanization, automation (including robotics) and technological systems, especially digital. These innovations can be extended to the entire agri-food sector, giving rise to precision transformations and targeted logistics, for example, to make production activity more efficient and simultaneously more sustainable (environmentally, economically, and socially) through the conscious use (consequential or predictive) of all the production factors.

Digital technologies are very quickly changing the world: the next decade, in fact, will be characterized by an accentuated and pervasive application of new technologies in all sectors and, particularly, in agriculture. This transition is important for the agri-food sector, as it is still characterized by great fragmentation and poor integration between supply chains and operators, especially the smaller and less organized ones. The actual research activities provide increasingly advanced, integrated, effective and economical solutions. The main technological innovations to be evaluated and tested in the multiplicity and variability of agricultural applications and agri-food transformations (smart agrifood), are related to: advanced sensors, new communication protocols, big/thick data, cloud computing, digital security, advanced photonics, artificial intelligence, digital twin.

Regarding to decision support system, digital integration can be of great support, making process data available from individual activities to entire systems, to develop coherent information, especially predictive, guiding directions and actions for producers and the entire supply chain/system with retroactive mechanisms of dynamic adaptive development capable of acting on multifactorial productivity as a lever for sustainable growth. The circular economy can be improved by using these innovative technologies to be extended to the agri-food system which, thanks to these strategies, is acquiring an increasingly important role in the recovery of waste. In fact, in addition to the supply of raw materials for the bioeconomy, it is important to intensify studies on mining of secondary materials and waste for the development of biomaterials and bioproducts, for agricultural production (e.g., competitively priced bioplastics for crop protection, environmentally friendly packaging, etc.), in a virtuous productive and economic circle where the actors play both roles of supplier and user.

In general, the set of technological and process innovations, including the digital transition and advanced sensors, in the agri-food processing sector, including cereals, fruit and vegetables and olive groves, can significantly contribute to raising the quality level of products, working synergistically on various aspects, including typicality, guarantee and safety, to improve production, environmental, economic and social sustainability.



3.4.1. Research and research products- Technological innovations, Digital transition and Advanced Sensoristics

ACROMYN AND RESEARCH TITLE	AIMS	PERSON IN CHARGE	FINANCING BODY	INTERNATIONAL PARTNERSHIP	PUBLICATION	OTHER RESEARCH PRODUCTS
AsFRUM Arsenic and mycotoxins in the durum wheat supply chain in Lazio: on-line optospectral control and use of innovative process technologies to contain the concentration in processed products	Develop in a synergic way innovative technologies of preventive selection, to control the not transformed raw material based on durum wheat, and of process, for the containment of the concentration of total arsenic and mycotoxins in the semi-integral type of raw material transformed. The expected results will concern the possibility of discriminating contaminated matrices using an on-line system and an innovative process technology to produce semi-whole durum wheat flours containing bran fractions / sub-fractions with a low concentration in arsenic and mycotoxins	P. MENESATTI CREA-IT	Regione Lazio - Lazio Innova spa		-Articolo in rivista Cammerata, Alessandro, Marabottini, Rosita, Allevato, Enrica, Aureli, Gabriella, & Stazi, Silvia Rita, 2021. Content of minerals and deoxynivalenol in the air-classified fractions of durum wheat. Cereal Chemistry. 2021;00: 1–11. https://doi.org/10.1002/cche.10458 . -Articolo in rivista Cammerata, Alessandro; Sestili, Francesco; Laddomada, Barbara; Aureli, Gabriella., 2021. Bran-Enriched Milled Durum Wheat Fractions Obtained Using Innovative Micronization and Air-Classification Pilot Plants. Foods 2021, 10, 1796. https://doi.org/10.3390/foods10081796 . -Articolo in rivista Cammerata, Alessandro; Laddomada, Barbara; Milano, Francesco; Camerlengo, Francesco; Bonarrigo, Marco; Masci, Stefania; Sestili, Francesco., 2021. Qualitative Characterization of Unrefined Durum Wheat Air-Classified Fractions. Foods 2021, 10, 2817. https://doi.org/10.3390/foods10112817 . -Articolo in rivista Cattaneo, Tiziana M.P.; Cutini, Maurizio; Cammerata, Alessandro; Stellari Annamaria; Marinoni, Laura; Bisaglia, Carlo and Brambilla Massimo, 2021. Near infrared spectroscopy and aquaphotomics evaluation of the efficiency of solar dehydration processes in pineapple slices. Journal of Near Infrared Spectroscopy 2021, Vol. 0(0) 1-7, https://doi.org/10.1177/09670335211054303 .	- Progetto AsFRUM: Arsenico e micotossine nella filiera del frumento duro del Lazio: controllo optospettrale on-line e uso di tecnologie innovative del processo per il contenuto della concentrazione nel (16/04/2021)
CoS.Mo Cooperation for the development of the Monococco supply chain in Sicily	Organization and development of the monococco wheat supply chain in Sicily, to identify new transformation products of this cereal. In addition to the agronomic aspects concerning the cultivation of monococco wheat, the knowledge acquired in terms of research will be transferred to the companies, in	L. GAZZA CREA-IT	Regione Siciliana - Assessorato Regionale dell'Agricoltura, dello Sviluppo Rurale e della Pesca Mediterranea - Dipartimento		- Articolo in rivista Nocente Francesca; Natale Chiara; Galassi Elena; Taddei Federica; Gazza Laura (2021). Using einkorn and tritordeum brewers' spent grain to increase the nutritional potential of durum wheat pasta. Foods, N.volume 10, N.fascicolo 3, pp. 1-9. DOI: 10.3390/foods10030502.	

ACROMYN AND RESEARCH TITLE	AIMS	PERSON IN CHARGE	FINANCING BODY	INTERNATIONAL PARTNERSHIP	PUBLICATION	OTHER RESEARCH PRODUCTS	
	relation to aspects of milling, with reference to the production of semolina for couscous, and the technological and nutritional profile of the flours will be evaluated. Thanks to the involvement of a farm that produces craft beer, the production technique of einkorn wheat malt and related beer will be optimized and transferred		Regionale dell'Agricoltura				
FILIGRANO Innovations in the Campania cereal supply chain: from high quality sustainable production to differentiated storage.	Strengthening the Campania cereal supply chain, through the experimentation and promotion of technological and organizational solutions aimed at improving cultivation techniques, the use of digital technologies and the management of storage for homogeneous batches. The intervention could prove to be crucial in contrasting the structural decline in durum wheat prices, guaranteeing an adequate level of regional supply and the profitability of the crop, reducing the impact on the environment, and protecting the characteristics of the agri-food products that characterize Made in Italy brand	Laura Gazza CREA-IT CREA-CI	Regione Campania - Direzione Generale delle Politiche Agricole Alimentari e Forestali			- Borse di	studio
INNOVALAT Innovative technologies for feeding dairy cattle to guarantee animal welfare and production quality.	Evaluate the effect of the use of innovative technologies in an IoT context, (specifically Nb-IoT - Narrowband - Internet of Things), aimed at optimizing the (precision) feeding of the dairy cow at high production to improve animal welfare and the dairy characteristics of the milk produced. In this regard, experimental tests will be set up in farms of Frisona dairy cows. Four companies will be identified in a limited area of central Italy. The farms will be selected as representative of the production area in terms of the production system adopted (intensive), average milk yield per cow and the design and management of the stables (without grazing time, unfeed and feeding practices based on silage of corn). All farms will be free housing. The management conditions will be kept constant within the company (operators, batches of similar feeds, milking	F. PALLOTTINO CREA-IT	Università degli Studi della TUSCIA - Dipartimento di Scienze e Tecnologie per l'Agricoltura, le Foreste, la Natura e l'Energia (DAFNE)				

ACROMYN AND RESEARCH TITLE	AIMS	PERSON IN CHARGE	FINANCING BODY	INTERNATIONAL PARTNERSHIP	PUBLICATION	OTHER RESEARCH PRODUCTS
	frequency and work routines) during the experimental period. The study will last for 2 years. The checks, the measurements and the withdrawals will be carried out avoiding the hot season. Milk production will be measured and will be collected individual milk, blood and faeces samples from 10 cows per farm. The cows will be selected on the lactation stage and the calving number so that the groups of 10 animals identified each time are balanced for the number of lactations, milk production, body condition score and days of lactation					
Panacea A thematic network to design the penetration Path of Non-Food Agricultural Crops into European Agriculture.	Create a network of relationships and exchanges between research, industry and the agricultural world aimed at the dissemination of knowledge and experience in the field of cultivation and use of non-food crops (NFC) already subject of study and research activities in many areas of Europe (rapeseed, sunflower, willow, miscanthus, thistle, common reed) in order to increase their diffusion and encourage the development of sustainable supply chains of bioproducts and materials for the "EU's Circular Economy	Luigi Pari CREA-IT	Commissione Europea	<ul style="list-style-type: none"> - Arkema France - Center Renewable Energy Source and Energy Saving - Iniciativas Innovadoras SAL - Stichting Wageningen Research (WR) - Institute Alterra and Institute Food Biobased Research - AgroTransilvania Cluster ATC - Association de Coordination Technique Agricole (ACTA) - 3B BioWarmia Bioenergy Bioresources - Agricultural University Of Athens - Dept. of Natural Resources Agricultural Engineering - Instituto Navarro de Tecnologias e Infraestructuras Agroalimentarias SA - Upyte' Experim.Station Lithuanian Research Centre Agric.Forestry - Cooperativas Agro-Alimentarias de Espana - BIOS AGROSYSTEMS S.A. - Imperial College London (ICL)/ Centre for Environmental Policy - Universidade Nova de Lisboa - Faculdade de Ciencias e Tecnologia - FCT-UNL Grupo de Disciplinas de Ecologia da Hidrosfera GDEH 		

ACROMYN AND RESEARCH TITLE	AIMS	PERSON IN CHARGE	FINANCING BODY	INTERNATIONAL PARTNERSHIP	PUBLICATION	OTHER RESEARCH PRODUCTS
AGROENER Energy from agriculture: sustainable innovations for bioeconomy.	<p>The general objective of the project refers to the ever increasing need to reduce dependence on fossil sources, to contribute to the mitigation of the effect of climate-changing gases, to encourage the use of renewable raw materials and to transfer the most important skills to the agricultural world. This need is sanctioned at European level by Directive 2009/28 / EC, and requires the identification of innovative, efficient and environmentally sustainable product and process solutions.</p> <p>The research priorities must therefore concern the type of raw material, the improvement of technologies and the optimization of transformation processes (biogas, thermal energy, electricity), the efficiency in the use of energy both by machines (also through the use of self-produced alternative fuels from renewable sources and / or precision technologies) and structures (especially energy-intensive ones, eg protected crops).</p> <p>The research activities will be supported and enhanced through the construction of experimental plants and demonstration and dissemination actions to give the project a specific value of technology and information transfer which is useful and important in the current agricultural landscape of the sector.</p>	P. MENESATTI CREA-IT CREA-OF CREA-CI CREA-OFA CREA-FL CREA-ZA CREA-AA	Ministero delle Politiche Agricole, Alimentari e Forestali - DIQPAI - Dipartimento delle politiche competitive della qualita' agroalimentare ippiche e della pesca - Direzione generale per la promozione della qualità agroalimentare e dell'ippica		<p>- Poster Sperandio Giulio; Pagano Mauro; Tomasone Roberto; Civitarese Vincenzo; Acampora Andrea; Cedrola Carla; Antonioli Giuseppe; Antonioli Giulio (2018). Risparmio energetico e sistemi di irrigazione di precisione in agricoltura.</p> <p>- Poster Vasmara Ciro; Marchetti Rosa; Cianchetta Stefano; Galletti Stefania; Ceotto Enrico (2021). THERMO-KOH PRE-TREATMENT AND CO-DIGESTION WITH PIG SLURRY IMPROVE METHANE YIELD AND DIGESTATE QUALITY FROM GIANT REED (Arundo Donax L.).</p> <p>- Articolo in rivista Sperandio Giulio; Suardi Alessandro; Acampora Andrea; Civitarese Vincenzo (2021). Carbon Footprint of Thermal Energy Production from Poplar Short-Rotation Coppice Plantations. Environmental Sciences Proceedings, N.volume 3, DOI: 10.3390/IECF2020-07908.</p> <p>- Articolo in rivista Fanigliulo Roberto; Pochi, Daniele; Servadio Pieranna (2021). Conventional and Conservation Seedbed Preparation Systems for Wheat Planting in Silty-Clay Soil. Sustainability, N.volume 13, N.fascicolo 11, DOI: 10.3390/su13116506.</p> <p>- Articolo in rivista Acampora Andrea; Civitarese Vincenzo; Sperandio Giulio; Reazei Negar (2021). Qualitative Characterization of the Pellet Obtained from Hazelnut and Olive Tree Pruning. . Energies, N.volume 14, N.fascicolo 14, pp. 1-16. DOI: 10.3390/en14144083.</p> <p>- Articolo in rivista Rossi Gabriella; Neri Ulderico; Felici Barbara; Benedetti Anna (2020). Effects of different zootechnical digestates on fertilization and nitrogen leaching. Agrochimica, N.volume LXIV, N.fascicolo 3, pp. 239-251. DOI: 10.12871/00021857201917.</p> <p>- Articolo in rivista Enrico Ceotto; Ciro Vasmara; Rosa Marchetti; Stefano Cianchetta; Stefania Galletti (2021). Biomass and methane yield of giant reed (Arundo donax L.) as affected by single and double annual harvest. Global Change Biology Bioenergy, N.volume 3, N.fascicolo 3, pp. 393-407. DOI: 10.1111/gcbb.12790.</p> <p>- Articolo in rivista Parenti Andrea; Cappelli Giovanni; Zegada-</p>	<p>- Assegni di ricerca - n.6</p> <p>- Borse di studio - n.1</p>

ACROMYN AND RESEARCH TITLE	AIMS	PERSON IN CHARGE	FINANCING BODY	INTERNATIONAL PARTNERSHIP	PUBLICATION	OTHER RESEARCH PRODUCTS
					<p>Lizarazu Walter; Sastre Carlos Martín; Christou Myrsini; Monti Andrea; Ginaldi Fabrizio (2021). SunnGro: A new crop model for the simulation of sunn hemp (<i>Crotalaria juncea</i> L.) grown under alternative management practices. Biomass and Bioenergy, N.volume 146, pp. 1-16. DOI: https://doi.org/10.1016/j.biombioe.2021.105975.</p> <p>- Articolo in rivista Manici L.M.; Caputo F.; Cappelli G.A.; Ceotto E. (2021). Can repeated soil amendment with biogas digestates increase soil suppressiveness toward non-specific soilborne pathogens in agricultural lands? . Renewable Agriculture and Food Systems , N.volume 36, N.fascicolo 4, pp. 353-364. DOI: 10.1017/S1742170520000393.</p> <p>- Articolo in rivista Manici Luisa Maria; Caputo Francesco; Ceotto Enrico (2021). Dai digestati un contributo alla sanità del suolo. ECOSCIENZA, N.volume 12, N.fascicolo 5, pp. 46-47.</p> <p>- Articolo in rivista Sperandio Giulio; Acampora Andrea; Civitarese Vincenzo; Bajocco Sofia; Bascietto Marco (2021). Transport Cost Estimation Model of the Agroforestry Biomass in a Small-Scale Energy Chain. Forests, N.volume 12, N.fascicolo 2, DOI: 10.3390/f12020158.</p> <p>- Articolo in rivista Brambilla Massimo; Romano Elio; Toscano Pietro; Cutini Maurizio; Biocca Marcello; Ferré Chiara; Comolli Roberto; Bisaglia Carlo (2021). From Conventional to Precision Fertilization: A Case Study on the Transition for a Small-Medium Farm. AgriEngineering, N.volume 3, N.fascicolo 2, pp. 438-446. DOI: 10.3390/agriengineering3020029.</p> <p>- Articolo in rivista Soppelsa Sebastian; Manici Luisa, Maria; Caputo Francesco; Zago Massimo; Kelderer Markus (2021). Locally available organic waste for counteracting strawberry decline in a mountain specialized cropping area. Sustainability (Switzerland), N.volume 13, N.fascicolo 7, DOI: 10.3390/su13073964.</p> <p>- Articolo in rivista Giulio Sperandio; Andrea Acampora; Angelo Del Giudice; Vincenzo Civitarese (2021). Models for the Evaluation of Productivity and Costs of Mechanized Felling on Poplar Short rotation Coppice in Italy. Forests, N.volume 12, N.fascicolo 7, DOI: 10.3390/f12070954.</p>	

ACROMYN AND RESEARCH TITLE	AIMS	PERSON IN CHARGE	FINANCING BODY	INTERNATIONAL PARTNERSHIP	PUBLICATION	OTHER RESEARCH PRODUCTS
					<p>- Articolo in rivista Assirelli Alberto; Caracciolo Giuseppina; Stagno Fiorella; Rocuzzo Giancarlo (2021). Diradamento meccanico frutti: buoni risultati su albicocco. L'Informatore Agrario, N.volume 76, N.fascicolo 11, pp. 48-50.</p> <p>- Articolo in rivista Biocca Marcello; Gallo Pietro; Sperandio Giulio (2021). Technical and economic analysis of Stone pine (Pinus pinea L.) maintenance in urban areas. Trees, Forests and People, N.volume 6, DOI: 10.1016/j.tfp.2021.100162.</p> <p>- Articolo in rivista Civitarese Vincenzo; Acampora Andrea; Sperandio Giulio; Gallo Pietro; Biocca Marcello; Gallucci Francesco; Vincenti Beatrice (2021). I prodotti della gestione del verde urbano. Cantieristica e potenziali impieghi delle biomasse. Sherwood foreste ed alberi oggi, N.volume 254, pp. 19-23.</p> <p>- Articolo in rivista Assirelli Alberto; Carbone Katya; Ciccoritti Roberto (2020). Mechanical Hop-Picking Solutions in Italian Cultivated Areas. Sustainability, N.volume 12, N.fascicolo 12, DOI: 10.3390/su12125006.</p> <p>- Articolo in rivista Raffaele Spinelli; Natascia Magagnotti; Alberto Assirelli; Joao Pedro Martins; Matheuz Mihelcic (2021). A Long-Term Follow-Up Study of Slash Bundling in Fast-Growing Eucalypt Plantations. Forests, N.volume 12, N.fascicolo 11, DOI: 10.3390/f12111548.</p> <p>- Articolo in rivista Vasmara Ciro; Cianchetta Stefano; Marchetti Rosa; Ceotto Enrico; Galletti Stefania (2021). Potassium Hydroxide Pre-Treatment Enhances Methane Yield from Giant Reed (Arundo donax L.). Energies, N.volume 14, N.fascicolo 3, DOI: 10.3390/en14030630.</p> <p>- Articolo in rivista Cappelli, Giovanni Alessandro; Ginaldi Fabrizio; Fanchini Davide; Corinzia Sebastiano Andrea; Cosentino Salvatore Luciano; Ceotto Enrico (2021). Model-Based Assessment of Giant Reed (Arundo donax L.) Energy Yield in the Form of Diverse Biofuels in Marginal Areas of Italy. Land, N.volume 10, N.fascicolo 6, pp. 1-24. DOI: 10.3390/land10060548.</p> <p>- Articolo in rivista Sperandio Giulio; Tomasone Roberto; Pagano Mauro; Cedrola Carla; Acampora Andrea; Assirelli</p>	

ACROMYN AND RESEARCH TITLE	AIMS	PERSON IN CHARGE	FINANCING BODY	INTERNATIONAL PARTNERSHIP	PUBLICATION	OTHER RESEARCH PRODUCTS
					<p>Alberto; Santelli Piero (2020). Ali gocciolanti: stimare il reale vantaggio economico. L'Informatore Agrario, N.fascicolo 30, pp. 46-49.</p> <p>- Articolo in rivista</p> <p>Andrea Acampora; Vincenzo Civitarese; Giulio Sperandio (2021). Produzione di pellet da residui di potatura di nocciolo e olivo. Sherwood, N.volume 250, pp. 23-27.</p> <p>- Articolo in rivista</p> <p>Torresi Biagio; Allegra Maria; Amenta Margherita; Gentil Fausto; Rapisarda Paolo; Fabroni Simona; Ferlito Filippo (2021). Physico-chemical and multielemental traits of anaerobic digestate from Mediterranean agro-industrial wastes and assessment as fertiliser for citrus nurseries . Waste Management, N.volume 131, pp. 201-213. DOI: 10.1016/j.wasman.2021.06.007.</p> <p>- Articolo in rivista</p> <p>Sperandio Giulio; Acampora Andrea; Del Giudice Angelo; Civitarese Vincenzo (2021). Abbattimento meccanizzato pioppeti invecchiati: conviene?. L'Informatore Agrario, N.fascicolo 33, pp. 31-34.</p> <p>- Articolo in rivista</p> <p>Giulio Sperandio; Alessandro Suardi; Andrea Acampora; Vincenzo Civitarese (2021). Environmental Sustainability of Heat Produced by Poplar Short Rotation Coppice (SRC) Woody Biomass. Forests, N.volume 12, DOI: 10.3390/f12070878.</p> <p>- Articolo in rivista</p> <p>Assirelli Alberto; Caracciolo Giuseppina; Rocuzzo Giancarlo; Stagno Fiorella (2021). New Tools for Mechanical Thinning of Apricot Fruitlets. Agriculture, N.volume 11, pp. 1-11. DOI: 10.3390/agriculture11111138.</p> <p>- Abstract in atti di convegno</p> <p>Orlandini Alessandro; Cacini Sonia; Brambilla Massimo; Burchi Gianluca; Cutini Maurizio; Fedrizzi Marco; Massa Daniele; Ceccarelli Angela Valentina; Cardarelli Maria Teresa (2021). Assessment of a Trichoderma-based biostimulant on two bedding plant growth in different growing media and within a basal heating system . Acta Italus Hortus 26, N.volume 26, pp. 213-.</p> <p>- Abstract in atti di convegno</p> <p>Assirelli, A.; Brambilla, M.; Santangelo, E.; Rocuzzo, G.; Bisaglia, C. (2018). Sustainability Issues Related to Woody Biomass Supply From Fruit Tree Plantation Removal. AgEng2018 Book of Abstracts, pp. 205-205.</p>	

ACROMYN AND RESEARCH TITLE	AIMS	PERSON IN CHARGE	FINANCING BODY	INTERNATIONAL PARTNERSHIP	PUBLICATION	OTHER RESEARCH PRODUCTS
					<ul style="list-style-type: none"> - Abstract in atti di convegno Cacini Sonia; Orlandini Alessandro; Brambilla Massimo; Burchi Gianluca; Cutini Maurizio; Fedrizzi Marco; Massa Daniele; Ceccarelli Valentina; Cardarelli Mariateresa (2021). A Trichoderma-based biostimulant enhances Impatiens walleriana growth and flowering in different growing media . 2nd International Symposium on Growing Media, Soilless Cultivation, and Compost Utilization in Horticulture, pp. 82-. - Abstract in atti di convegno Cianchetta Stefano; Polidori Nakia; Vasmara Ciro; Marchetti Rosa; Ceotto Enrico; Galletti Stefania (2021). GIANT REED HYDROLYSATE FOR SINGLE CELL OIL PRODUCTION BY OLEAGINOUS YEASTS LIPOMYCES STARKEYI AND RHODOSPORIDILOBOLUS AZORICUS . - Abstract in atti di convegno Pignatti Giuseppe; Verani Stefano; Sperandio Giulio (2018). Produzione di legna da ardere da cedui di eucalipto a turno breve: produttività e costi. IV Congresso Nazionale di Selvicoltura (IV National Congress of Silviculture). Abstract Book, pp. 270-272. - Contributo in atti di convegno Brambilla Massimo; Romano Elio; Cutini Maurizio; Fedrizzi Marco; Pagano Mauro; Burchi Gianluca; Cacini Sonia; Massa Daniele; Terrosi Chiara; Bisaglia Carlo (2018). Effect of Bench Heating on Growing Medium Temperature and Heat Loss From a Greenhouse in Wintertime. Proceedings of the European Conference on Agricultural Engineering AgEng2018, pp. 877-883. - Contributo in atti di convegno Civitarese Vincenzo; Acampora Andrea; Sperandio Giulio; Assirelli Alberto; Scarfone Antonio (2021). Potential use of biomasses from urban green management for the pellet production. pp. 673-675. - Contributo in atti di convegno Cappelli, Giovanni Alessandro; Ginaldi Fabrizio; Corinzia Sebastiano Andrea; Cosentino Salvatore Luciano; Fanchini Davide; Ceotto Enrico (2020). Assessment of giant reed biomass potential (Arundo donax L.) in marginal areas of Italy via the application of Arungro simulation model. Proceedings of the 28th European Biomass Conference and Exhibition EUBCE , pp. 15-21. - Contributo in atti di convegno 	

ACROMYN AND RESEARCH TITLE	AIMS	PERSON IN CHARGE	FINANCING BODY	INTERNATIONAL PARTNERSHIP	PUBLICATION	OTHER RESEARCH PRODUCTS
					<p>Cutini Maurizio; Brambilla Massimo; Bisaglia Carlo; Pochi Daniele; Fanigliulo Roberto (2021). A Simplified Algorithm for the Optimal Setting of the Factors Affecting Agricultural Tractor Fuel Consumption During Heavy Drawbar Tasks. Proceedings of the European Conference on Agricultural Engineering AgEng2021, pp. 239-246.</p> <p>- Contributo in atti di convegno Giulio Sperandio; Andrea Acampora; Vincenzo Civitarese; Bajocco Sofia; Marco Bascietto (2021). Transport Cost Estimation Model of the Agroforestry Biomass in a Small-Scale Energy Chain. Environmental Sciences Proceedings, N.volume 3, DOI: 10.3390/IECF2020-07891.</p> <p>- Contributo in atti di convegno Tomasone Roberto; Cedrola Carla; Mingozi Marco (2021). Innovative mechanization schemes for leafy greens integrating flame treatments, minimum tillage and residue removal to improve sustainability. Proceedings Acta Horticulturae 1319, N.volume 1319, pp. 131-138. DOI: 10.17660/ActaHortic.2021.1319.15.</p> <p>- Contributo in atti di convegno Civitarese Vincenzo; Acampora Andrea; Sperandio Giulio; Tomasone Roberto; Caracciolo Giuseppina; Gallucci Francesco; Carnevale Monica; Assirelli Alberto (2019). Poplar Wood from SRF for Pellet Production. Characterization of the Raw Materials Derived from 3 and 6 Years Old Trees. pp. 299-302. DOI: 10.5071/27thEUBCE2019-1DV.3.13.</p> <p>- Contributo in atti di convegno Alberto Assirelli; Giancarlo Roccuzzo; Massimo Brambilla; Fiorella Stagno; Vincenzo Civitarese; Andrea Paoletti; Carlo Bisaglia. (2021). Potential use of briquetting techniques for cereal chaff. European Biomass Conference and Exhibition Proceedings 2021, pp. 178-181.</p> <p>- Contributo in atti di convegno Caracciolo Giuseppina; Cacchi Mattia; Sirri Sandro; Quacquarelli Irene; Assirelli Alberto; Giovannini Daniela (2021). A new mechanical thinner to reduce hand labor in peach. N.volume 1304, pp. 243-247. DOI: 10.17660/ActaHortic.2021.1304.34.</p> <p>- Contributo in atti di convegno Alberto Assirelli; Salvatore Faugno; Fiorella Stagno; Maura Sannino; Enrico Santangelo; Andrea Paoletti; Stefano Amaducci. (2021). HEMP CULTIVATION TECHNIQUES EVALUATION FOR SOWING SEED PRODUCTION. European Biomass</p>	

ACROMYN AND RESEARCH TITLE	AIMS	PERSON IN CHARGE	FINANCING BODY	INTERNATIONAL PARTNERSHIP	PUBLICATION	OTHER RESEARCH PRODUCTS
					Conference and Exhibition Proceedings 2021, pp. 279-283. - Contributo in atti di convegno Cutini Maurizio; Brambilla Massimo; Assirelli Alberto; Romano Elio; Bisaglia Carlo (2021). Encouraging the Adoption of Precision Fertilization Technologies: steps from Theory to Practice. Proceedings of the European Conference on Agricultural Engineering AgEng2021, pp. 450-457.	
AUTOFEED Feeding automation for cattle farms in Lombardy	Improve the dairy and beef cattle's welfare that result in an improved quality and sustainability of their production thanks to the adoption of mechanized and automatic devices for feeding administering.	C. BISAGLIA CREA-IT	Regione Lombardia - Direzione Generale Agricoltura		- Articolo in rivista Brambilla Massimo; Rossi Paolo; Cutini Maurizio; Bisaglia Carlo. 2021. Alimentazione dei Bovini; i livelli di automazione. Informatore Zootecnico 7/2021: pagg. 29-32 - Articolo in rivista Bisaglia Carlo; Lazzari Andrea; Giovinnazzo Simone; Brambilla Massimo. 2021. Automazione unifeed a livelli sempre più alti. Informatore Zootecnico 20/2021: pagg 56-61 - Articolo in rivista Rossi Paolo; Brambilla Massimo; Giovinnazzo Simone; Lazzari Andrea; Bisaglia Carlo. 2021. Inserire in stalla i sistemi automatici di alimentazione. Informatore Zootecnico 13/2021: pagg. 39-45	- L'automazione dell'alimentazione per le bovine da latte: Perché sì ... perché no? (26/11/2021) Cremona
FOOD-WAT-HEV Improving understanding of autochthonous Hepatitis E transmission routes: a focus on foodborne and waterborne pathways	Deepen the understanding of the transmission routes of the hepatitis E virus to arrive at the preparation of effective prevention strategies	M. BRAMBILLA CREA-IT	ISTITUTO SUPERIORE SANITA'			
Agridigit_AgroFiliere Integrated digital technologies for the sustainable strengthening of agri-food production and processing.	Experimentation and research on proximal and remote mapping of soils, the use and applications of multi-scale and multi-sensor systems mainly imaging-based (ground, proximal, on-site, on-the-go, robot terrestrial) and the development of simulation tools for precision agriculture applications. Provide for the development of mechatronic systems and digital interface on machines for advanced management in the AdP. Provide for the application of precision and digital systems for the advanced management of the horticultural and	P. MENESATTI CREA-IT CREA-OF CREA-CI CRA-OFA CREA-AA	Ministero delle Politiche Agricole, Alimentari e Forestali - Dipartimento delle politiche europee ed internazionali e dello sviluppo rurale - Direzione generale dello sviluppo rurale - DISR 4 - Ricerca e sperimentazione		- Contributo in volume (Capitolo o Saggio) Pallottino F; Figorilli S; Cecchini Cristina; Costa Corrado (2021). Light drones for basic in-field phenotyping and precision farming applications: RGB tools based on image analysis. Crop breeding. Methods in Molecular Biology, pp. 269-278. DOI: 10.1007/978-1-0716-1201-9_18. - Poster Traversari Silvia; Battista Piero; Massa Daniele; Nesi Beatrice; Pane Catello; Rapi Bernardo; Romani Maurizio; Sabatini Francesco; Cacini Sonia (2021). Models on Micrometeorological Parameters for Fungal Pathogen Spread Prediction. - Articolo in rivista	- Agricoltura del futuro: entrano in campo i droni - Innovazione, ricerca sviluppo, sicurezza al servizio dell'agricoltura e delle foreste (14/12/2021) - L'innovazione tecnica dei mezzi pesanti da trasporto per trattoristica e la logistica agroalimentare (10/03/2021) - L'innovazione digitale nella trasformazione agroalimentare (27/10/2021) - Tecnologie digitali applicate alle agrofiliere di qualità: il caso rucola e altre baby-leaf in Piana del Sele (18/06/2021) - La trasformazione digitale nelle produzioni agricole

ACROMYN AND RESEARCH TITLE	AIMS	PERSON IN CHARGE	FINANCING BODY	INTERNATIONAL PARTNERSHIP	PUBLICATION	OTHER RESEARCH PRODUCTS
	horticultural supply chain, as well as for the control and traceability of quality and safety throughout the entire cereal chain. Provide for the implementation of advanced and innovative sensors with a high degree of digital and information integration for the development of advanced systems for global quality in the supply chain paths from production, to transformation and consumption, as well as the potential use of a logistics platform for the built-in traceability and blockchain for maintaining the quality of fresh-cut vegetable-based products. Furthermore, a traceability plan will be created through the application of blockchain technology to protect the quality of the citrus fruit supply chain				<p>Bascietto Marco; Santangelo Enrico; Beni Claudio (2021). Spatial Variations of Vegetation Index from Remote Sensing Linked to Soil Colloidal Status. Land, N.volume 10, N.fascicolo 1, DOI: 10.3390/land10010080.</p> <p>- Articolo in rivista Romano Elio; Bisaglia Carlo; Calcante Aldo; Oberti Roberto; Zani Alessio; Vinnikov Dennis; Marconi Andrea; Vitale Ermanno; Bracci Massimo; Rapisarda Venerando (2020). Assessment of comfort variation among different types of driving agricultural tractors: Traditional, satellite-assisted and semi-automatic. International Journal of Environmental Research and Public Health, N.volume 17, N.fascicolo 23, pp. 1-17. DOI: 10.3390/ijerph17238836.</p> <p>- Articolo in rivista Traversari Silvia; Cacini Sonia; Galieni Angelica; Nesi Beatrice; Nicastro Nicola; Pane Catello (2021). Precision Agriculture Digital Technologies for Sustainable Fungal Disease Management of Ornamental Plants . Sustainability, N.volume 13, N.fascicolo 7, pp. 22-. DOI: 10.3390/su13073707.</p> <p>- Articolo in rivista Figorilli Simone; Pallottino Federico; Colle Giacomo; Spada Daniele; Beni Claudio; Tocci Francesco; Vasta Simone; Antonucci Francesca; Pagano Mauro; Fedrizzi Marco; Costa Corrado (2021). An open source low-cost device coupled with an adaptative time-lag time series linear forecasting modelling for apple Trentino (Italy) precision irrigation. SENSORS, N.volume 21, N.fascicolo 8, DOI: 10.3390/s21082656.</p> <p>- Articolo in rivista Romano Elio; Bergonzoli Simone; Pecorella Ivano; Bisaglia Carlo; De Vita, Pasquale (2021). Methodology for the Definition of Durum Wheat Yield Homogeneous Zones by Using Satellite Spectral Indices. Remote Sensing, N.volume 13, N.fascicolo 11, DOI: 10.3390/rs13112036.</p> <p>- Articolo in rivista Manganiello Gelsomina; Nicastro Nicola; Caputo Michele; Zaccardelli Massimo; Cardi Teodoro; Pane Catello (2021). Functional Hyperspectral Imaging by High-Related Vegetation Indices to Track the Wide-Spectrum Trichoderma Biocontrol Activity Against Soil-Borne Diseases of Baby-Leaf Vegetables. Frontiers in Plant Science, N.volume 12, pp. 1-21. DOI: 10.3389/fpls.2021.630059.</p>	<p>(26/10/2021)</p> <p>- SimAGRI: un simulatore per sperimentare virtualmente l'agricoltura di precisione</p> <p>(21/04/2021)</p> <p>- Filiera frumento duro-pasta: autenticità, tracciabilità e coltivazione sostenibile</p> <p>(20/05/2021)</p> <p>- Assegni di ricerca - n.7</p>

ACROMYN AND RESEARCH TITLE	AIMS	PERSON IN CHARGE	FINANCING BODY	INTERNATIONAL PARTNERSHIP	PUBLICATION	OTHER RESEARCH PRODUCTS
					<p>- Articolo in rivista Brambilla Massimo; Romano Elio; Toscano Pietro; Cutini Maurizio; Biocca Marcello; Ferré Chiara; Comolli Roberto; Bisaglia Carlo (2021). From Conventional to Precision Fertilization: A Case Study on the Transition for a Small-Medium Farm. AgriEngineering, N.volume 3, N.fascicolo 2, pp. 438-446. DOI: 10.3390/agriengineering3020029.</p> <p>- Articolo in rivista Catello Pane; Gelsomina Manganiello; Nicola Nicastro; Luciano Ortenzi; Federico Pallottino; Teodoro Cardi; Corrado Costa (2021). Machine learning applied to canopy hyperspectral image data to support biological control of soil-borne fungal diseases in baby leaf vegetables. Biological Control, N.volume 164, pp. 1-9. DOI: 10.1016/j.biocontrol.2021.104784.</p> <p>- Articolo in rivista Ortenzi Luciano; Violino Simona; Pallottino Federico; Figorilli Simone; Vasta Simone; Tocci Francesco; Antonucci Francesca; Imperi Giancarlo; Costa Corrado (2021). Early estimation of olive production from light drone orthophoto, through canopy radius. DRONES, N.volume 4, N.fascicolo 4, DOI: 10.3390/drones5040118.</p> <p>- Articolo in rivista Pane Catello; Manganiello Gelsomina; Nicastro Nicola; Cardi Teodoro; Carotenuto Francesco (2021). Powdery Mildew Caused by Erysiphe cruciferarum on Wild Rocket (Diplotaxis tenuifolia): Hyperspectral Imaging and Machine Learning Modeling for Non-Destructive Disease Detection. Agriculture, N.volume 11, N.fascicolo 4, DOI: 10.3390/agriculture11040337.</p> <p>- Articolo in rivista Assirelli Alberto; Romano Elio; Bisaglia Carlo; Lodolini Enrico Maria; Neri Davide; Brambilla Massimo (2021). Canopy index evaluation for precision management in an intensive olive orchard. Sustainability, N.volume 13, N.fascicolo 15, DOI: 10.3390/su13158266.</p> <p>- Articolo in rivista Assirelli Alberto; Caracciolo Giuseppina; Rocuzzo Giancarlo; Stagno Fiorella (2021). New Tools for Mechanical Thinning of Apricot Fruitlets. Agriculture, N.volume 11, pp. 1-11. DOI: 10.3390/agriculture11111138.</p> <p>- Articolo in rivista</p>	

ACROMYN AND RESEARCH TITLE	AIMS	PERSON IN CHARGE	FINANCING BODY	INTERNATIONAL PARTNERSHIP	PUBLICATION	OTHER RESEARCH PRODUCTS
					<p>Pane Catello; Angelica Galieni; Carmela Riefolo; Nicola Nicastro; Annamaria Castrignanò (2021). Hyperspectral Reflectance Response of Wild Rocket (<i>Diplotaxis tenuifolia</i>) Baby-Leaf to Bio-Based Disease Resistance Inducers Using a Linear Mixed Effect Model. <i>Plants</i>, N.volume 10, N.fascicolo 12, pp. 1-17. DOI: 10.3390/plants10122575.</p> <p>- Articolo in rivista Romano E.; Pirozzi M.; Ferri M.; Calcante A.; Oberti R.; Vitale E.; Rapisarda V. (2020). The use of pressure mapping to assess the comfort of agricultural machinery seats. <i>International Journal of Industrial Ergonomics</i>, N.volume 77, DOI: 10.1016/j.ergon.2019.102835.</p> <p>- Software Ortenzi Luciano; Violino Simona; Pallottino Federico; Figorilli Simone; Vasta Simone; Tocci Francesco; Antonucci Francesca; Costa Corrado (2021). Software per l'estrazione del canopy radius.</p> <p>- Abstract in atti di convegno Traversari Silvia; Battista Piero; Massa Daniele; Nesi Beatrice; Pane Catello; Rapi Bernardo; Romani Maurizio; Sabatini Francesco; Cacini Sonia (2021). Models on micrometeorological parameters for fungal pathogen spread prediction. pp. 115-.</p> <p>- Abstract in atti di convegno Traversari Silvia; Nicastro Nicola; Nesi Beatrice; Nin Stefania; Ortenzi Luciano; Pallottino Federico; Pane Catello; Cacini Sonia (2021). Digital tools for the early detection of grey mould symptoms on rose plants. <i>Acta Italus Hortus</i> 26, N.volume 26, pp. 215-.</p> <p>- Abstract in atti di convegno Traversari Silvia; Battista Piero; Massa Daniele; Nesi Beatrice; Pane Catello; Rapi Bernardo; Romani Maurizio; Sabatini Francesco; Cacini Sonia (2021). Setting up of alert systems for the early detection of fungal diseases on <i>Rosa</i> spp.. <i>Acta Italus Hortus</i> 26, N.volume 26, pp. 223-.</p> <p>- Contributo in atti di convegno Cutini Maurizio; Brambilla Massimo; Assirelli Alberto; Romano Elio; Bisaglia Carlo (2021). Encouraging the Adoption of Precision Fertilization Technologies: steps from Theory to Practice. <i>Proceedings of the European Conference on Agricultural Engineering AgEng2021</i>, pp. 450-457.</p>	

ACROMYN AND RESEARCH TITLE	AIMS	PERSON IN CHARGE	FINANCING BODY	INTERNATIONAL PARTNERSHIP	PUBLICATION	OTHER RESEARCH PRODUCTS
					<p>- Contributo in atti di convegno Romano Elio; Bergonzoli Simone; El Khair Davide; Comolli Roberto; Ferré Chiara; Bisaglia Carlo (2021). Monitoring the uniformity of soil permeability for orchard precision irrigation. Acta Horticulturae, N.volume 1314, pp. 98-108. DOI: 10.17660/ActaHortic.2021.1314.14.</p> <p>- Contributo in atti di convegno Maura Sannino; Salvatore Faugno; Rossella Piscopo; Alessio Vincenzo Tallarita; Francesco Serrapica; Alberto Assirelli; Gianluca Caruso (2021). EFFECT OF IRRIGATION, FERTILIZATION AND MECHANICAL HARVESTING ON YIELD PERFORMANCE OF PEANUT (ARACHIS HYPOGAEA L.) GROWN IN SOUTHERN ITALY. European Biomass Conference and Exhibition Proceedings 2021, pp. 352-357.</p>	
ESPERA Circular Economy and sustainability of the “PGI Mantovana” pear supply chain	Determination of a non-destructive ripening index at harvest, as a selection tool to improve fruit conservation; Improvement of fruit management during storage with the identification of fruit intended for fresh consumption and fruit intended for processing into dried slices; Production of dried pear slices from fruits with physiopathies, originally not intended for fresh consumption; Recovery of waste from the production of washers for the extraction of nutritional compounds with high-quality technological functionality and high added value; Creation of a prototype for non-destructive optical measurements of the degree of ripeness adaptable to the fruit selection lines; Reconfiguration of the Mantuan PGI pear supply chain based on the principles of sustainability and circularity, through the analysis and implementation of innovative technological, process and organizational solutions, for the prevention of waste and the circular management of food surpluses	M. VANOLI CREA-IT	Regione Lombardia - Direzione Generale Agricoltura, Alimentazione e Sistemi Verdi		<p>- Poster Vanoli Maristella, Cortellino Giovanna, Buccheri Marina, Grassi Maurizio, Lovati Fabio, Caramanico Rosita, Levoni Pietro, Spinelli Lorenzo, Torricelli Alessandro (2021). Economia circolare e sostenibilità della filiera della pera IGP del Mantovano: recupero di frutti con fisiopatie per la produzione di chips di pera. XIII Giornate Scientifiche SOI. Catania, 22-23 giugno 2021, Acta Italus Hortus 26: 216.</p> <p>- Poster Buccheri Marina, Grassi Maurizio, Cortellino Giovanna, Caramanico Rosita, Lovati Fabio, Vanoli Maristella (2021). Ethylene, α-farnesene and conjugated trienols in 'Abate Fetel' pears in relation to storage, 1-MCP treatment and superficial scald development. XIII Giornate Scientifiche SOI. Catania, 22-23 giugno 2021, Acta Italus Hortus 26: 117.</p>	- Assegni di ricerca - n.1
KIRIS The death of the kiwi - In-depth study of the etiology and prevention	Insights on physiological aspects involved in the onset of kiwifruit early decline syndrome because of environmental, agronomical and phytopathological	L. BARDI CREA-IT	Regione Piemonte - Direzione Sviluppo dell'Agricoltura		- Articolo in rivista Bardi Laura (2021) Moria del kiwi: possibili soluzioni agronomiche. Informatore Agrario, 21:44-45.	

ACROMYN AND RESEARCH TITLE	AIMS	PERSON IN CHARGE	FINANCING BODY	INTERNATIONAL PARTNERSHIP	PUBLICATION	OTHER RESEARCH PRODUCTS
and defense tools	factors, in order to prevent the onset of this disorder in new plantations and to propose possible remedies for existing orchards				- Articolo in rivista Nari L., Berra L., Bardi Laura, Morone C., Spadaro D. (2021) Moria del kiwi in Piemonte: situazione attuale e sperimentazioni in corso. Frutticoltura (7) 34-37.	
KIRIS THIRD YEAR The death of the kiwi - In-depth study of the etiology and prevention and defense tools	Insights on physiological aspects involved in the onset of kiwifruit early decline syndrome because of environmental, agronomical and phytopathological factors, in order to prevent the onset of this disorder in new plantations and to propose possible remedies for existing orchards	L. BARDI CREA-IT	Regione Piemonte - Direzione Sviluppo dell'Agricoltura		- Articolo in rivista Bardi Laura (2021) Moria del kiwi: possibili soluzioni agronomiche. Informatore Agrario, 21:44-45. - Articolo in rivista Nari L., Berra L., Bardi Laura, Morone C., Spadaro D. (2021) Moria del kiwi in Piemonte: situazione attuale e sperimentazioni in corso. Frutticoltura (7) 34-37.	
QUALITYKIWI Innovations for the improvement of qualitative standards of Kiwi in Lazio	Direct involvement of producers and networking with innovation stakeholders: the classic top down directive approach (OP-> producers) will be replaced with a bottom up approach, thanks to which the GO will carry out an accurate analysis of the problems raised by the producers themselves. The resolution of these problems will be discussed, implemented, and verified thanks to a close collaboration of all the actors of the partnership. Improvement of integration in the supply chain: the information deriving from the implementation of the DSS-kiwi, combined with that obtained after harvesting, will make it possible to refine and enhance the traceability system of the batches, already in place to the leader, making information on each one more available production. Furthermore, the widespread diffusion of the system among producers, through meetings and practical demonstrations, will allow the entire supply chain to share qualitatively and quantitatively more complete information, to the greater benefit of consumers and to guarantee excellence. Reduction of production costs: the development of the DSS-kiwi will make it possible to redefine the irrigation and nutritional inputs necessary for the production of kiwifruit, with a view to optimize the resources used. In fact, the ability to obtain accurate and timely	A. Suardi CREA-IT CREA-OFA CREA-DC	Regione Lazio			

ACROMYN AND RESEARCH TITLE	AIMS	PERSON IN CHARGE	FINANCING BODY	INTERNATIONAL PARTNERSHIP	PUBLICATION	OTHER RESEARCH PRODUCTS
	<p>information (thanks to the development of an interface between the DSS output and the devices used) will allow manufacturers to rationalize the resources used in a timely manner in each area used, leading to economic savings. In addition, the project idea will encourage the modernization of company irrigation systems and machinery as well as push towards full adhesion to the organic production system.</p> <p>At the same time, the improvement of the agronomic techniques used will allow to reduce production waste, reducing the costs of disposal of the same.</p> <p>Product quality improvement: the implementation of the DSS-kiwi will allow the development of a new production protocol, with particular regard to the yellow kiwi varieties recently introduced in the production areas, more tolerant to phytopathy but for which it is necessary to refine the technical lines used. The kiwifruit produced in this way can be enhanced to a greater extent primarily by virtue of its intrinsic characteristics (size and dry matter), as well as intangible ones (reduced environmental impact, geographical derivation).</p> <p>Improvement of perceived product quality: the development of the DSS-kiwi will make it possible to refine the agronomic techniques used in production, in compliance with the requirements for organic and PGI production. Similarly, the implementation of these systems will further improve the traceability of the product, with the possibility of increasing the range of information obtainable on each lot. The information recorded, integrated with other information obtained after collection, will be the basis of communication activities to consumers, who will clearly recognize a product with higher added value as it is traceable, organic and IGP</p>					
Simodrofila Innovative monitoring systems for the	Provide an innovative monitoring strategy that allows an early identification of infestation outbreaks on	M. BIOCCA CREA-IT CREA-OFA	Regione Lazio			

ACROMYN AND RESEARCH TITLE	AIMS	PERSON IN CHARGE	FINANCING BODY	INTERNATIONAL PARTNERSHIP	PUBLICATION	OTHER RESEARCH PRODUCTS
sustainable control of <i>Drosophila suzukii</i> and other pests relevant to Lazio fruit growing	which to intervene promptly by following the criteria of Precision Agriculture and using sustainable active ingredients					
DEAOLIVA Quality, sustainability and operational safety improvement in table olives debittering through innovative pilot scale processes	Introduction of the research results on the de-amarization of the "table olives" product towards more sustainable and healthily compatible processes	B. LANZA CREA-IT CREA-AN CREA-OFA	Ministero delle politiche agricole alimentari e forestali - DG PQAI 2 - Sviluppo imprese e cooperazione		<p>- Articolo in rivista Ortenzi Luciano; Figorilli Simone; Costa Corrado; Pallottino Federico; Violino Simona; Pagano Mauro; Imperi Giancarlo; Manganiello Rossella; Lanza Barbara; Antonucci Francesca (2021). A machine vision rapid method to determine the ripeness degree of olive lots. SENSORS, N.volume 21, N.fascicolo 9, DOI: 10.3390/s21092940.</p> <p>- Articolo in rivista Lanza Barbara; Zago Miriam; Di Marco Sara; Di Loreto Giuseppina; Cellini Martina; Tidona Flavio; Bonvini Barbara; Bacceli Martina; Simone Nicola (2020). Single and Multiple Inoculum of Lactiplantibacillus plantarum Strains in Table Olive Lab-Scale Fermentations. Fermentation, N.volume 6, N.fascicolo 4, DOI: 10.3390/fermentation6040126.</p> <p>- Articolo in rivista Lanza Barbara; Cellini Martina; Di Marco Sara; D'Amico Emira; Simone Nicola; Giansante Lucia; Pompilio Arianna; Di Loreto Giuseppina; Bacceli Martina; Del Re Paolo; Di Bonaventura Giovanni; Di Giacinto Luciana; Aceto Gitana Maria (2020). Olive Pâté by Multi-Phase Decanter as Potential Source of Bioactive Compounds of Both Nutraceutical and Anticancer Effects. Molecules, N.volume 25, N.fascicolo 24, DOI: 10.3390/molecules25245967.</p> <p>- Articolo in rivista Lanza Barbara; Di Marco Sara; Bacceli Martina; Di Serio Maria Gabriella; Di Loreto Giuseppina; Cellini Martina; Simone Nicola (2021). Lactiplantibacillus plantarum Used as Single, Multiple, and Mixed Starter Combined with Candida boidinii for Table Olive Fermentations: Chemical, Textural, and Sensorial Characterization of Final Products. Fermentation, N.volume 7, N.fascicolo 4, pp. 1-16. DOI: 10.3390/fermentation7040239.</p> <p>- Articolo in rivista Manganiello Rossella; Pagano Mauro; Nucciarelli Davide; Ciccioritti Roberto; Tomasone Roberto; Di Serio Maria Gabriella; Giansante Lucia; Del Re Paolo, Servili Maurizio; Veneziani Gianluca (2021). Effects of Ultrasound Technology on the</p>	<p>- Assegni di ricerca - n.4</p> <p>- Borse di studio - n.3</p>

ACROMYN AND RESEARCH TITLE	AIMS	PERSON IN CHARGE	FINANCING BODY	INTERNATIONAL PARTNERSHIP	PUBLICATION	OTHER RESEARCH PRODUCTS
					<p>Qualitative Properties of Italian Extra Virgin Olive Oil. FOODS, N.volume 10, N.fascicolo 11, pp. 1-20. DOI: 10.3390/foods10112884.</p> <p>- Articolo in rivista Ortenzi Luciano; Violino Simona; Pallottino Federico; Figorilli Simone; Vasta Simone; Tocci Francesco; Antonucci Francesca; Imperi Giancarlo; Costa Corrado (2021). Early estimation of olive production from light drone orthophoto, through canopy radius. DRONES, N.volume 4, N.fascicolo 4, DOI: 10.3390/drones5040118.</p> <p>- Software Ortenzi Luciano; Violino Simona; Pallottino Federico; Figorilli Simone; Vasta Simone; Tocci Francesco; Antonucci Francesca; Costa Corrado (2021). Software per l'estrazione del canopy radius.</p> <p>- Abstract in atti di convegno Bacceli Martina; Simone Nicola; Lanza Barbara (2020). Social communication: brief investigation about social media use by some typical food industries in Abruzzo region (Italy).</p> <p>- Abstract in atti di convegno Lanza Barbara; Bacceli Martina; Simone Nicola (2020). Rheological and sensory approaches to characterize table olive texture.</p> <p>- Abstract in atti di convegno Simone Nicola; Bacceli Martina; Lanza Barbara (2020). Factors that affect Italian consumers' table olive consumption behaviour .</p>	
INFOLIVA Information traceability and process and product innovations in the oil and table olive supply chain	The project is developed within the National Olive Growing Plan aimed at enhancing the peculiarities of Italian olive growing and the potential that the sector can express on the production and quality profile of high-quality products. The strengths of the Italian system are represented by the rich variety panorama, and by areas with high cultivation vocation, such as to provide products of high value and typicality, certifiable and usable as added value in the current growth scenarios	C. COSTA CREA-IT CREA-OFA	Ministero delle politiche agricole alimentari e forestali - Dip. Politiche competitive, della qualità agroalimentare, ippiche e della pesca		<p>- Articolo in rivista Lanza Barbara; Di Marco Sara; Bacceli Martina; Di Serio Maria Gabriella; Di Loreto Giuseppina; Cellini Martina; Simone Nicola (2021). Lactiplantibacillus plantarum Used as Single, Multiple, and Mixed Starter Combined with Candida boidinii for Table Olive Fermentations: Chemical, Textural, and Sensorial Characterization of Final Products. Fermentation, N.volume 7, N.fascicolo 4, pp. 1-16. DOI: 10.3390/fermentation7040239.</p> <p>- Articolo in rivista Veneziani Gianluca; Nucciarelli Davide; Taticchi Agnese; Esposto Sonia; Selvaggini Roberto; Tomasone Roberto; Pagano Mauro; Servili Maurizio (2021). Application of Low Temperature during the Malaxation Phase of Virgin Olive Oil Mechanical Extraction Processes of Three Different Italian Cultivars. Foods 2021, N.volume</p>	extravergine d'oliva: il progetto INFOLIVA (01/04/2020) - Tracciabilità dell'olio extravergine di oliva, una prospettiva internazionale (04/03/2021) - Extra Virgin Olive Oil traceability, an international perspective (04/03/2021) - Progetto Infoliva "Tracciabilità informativa e innovazioni di processo e di prodotto nella filiera di olive da olio e da mensa" - I risultati della ricerca (06/10/2021)

ACROMYN AND RESEARCH TITLE	AIMS	PERSON IN CHARGE	FINANCING BODY	INTERNATIONAL PARTNERSHIP	PUBLICATION	OTHER RESEARCH PRODUCTS
					<p>10, N.fascicolo 7, pp. 1-11. DOI: https://doi.org/10.3390/foods10071578.</p> <p>- Articolo in rivista Manganiello Rossella; Pagano Mauro; Nucciarelli Davide; Ciccoritti Roberto; Tomasone Roberto; Di Serio Maria Gabriella; Giansante Lucia; Del Re Paolo, Servili Maurizio; Veneziani Gianluca (2021). Effects of Ultrasound Technology on the Qualitative Properties of Italian Extra Virgin Olive Oil. FOODS, N.volume 10, N.fascicolo 11, pp. 1-20. DOI: 10.3390/foods10112884.</p> <p>- Articolo in rivista Romeo Flora Valeria; Granuzzo Gina; Foti Paola; Ballistreri Gabriele; Caggia Cinzia; Rapisarda Paolo (2021). Microbial Application to Improve Olive Mill Wastewater Phenolic Extracts. Molecules, N.volume 26, N.fascicolo 7, pp. 1-11. DOI: 10.3390/molecules26071944.</p> <p>- Articolo in rivista Lanza Barbara; Zago Miriam; Di Marco Sara; Di Loreto Giuseppina; Cellini Martina; Tidona Flavio; Bonvini Barbara; Bacchi Martina; Simone Nicola (2020). Single and Multiple Inoculum of Lactiplantibacillus plantarum Strains in Table Olive Lab-Scale Fermentations. Fermentation, N.volume 6, N.fascicolo 4, DOI: 10.3390/fermentation6040126.</p> <p>- Articolo in rivista Sperandio Giulio; Pallottino Federico; Violino Simona; Figorilli Simone; Costa Corrado (2021). Sostenibilità economica dei sistemi di tracciabilità. OLIO E OLIVO, N.volume 24, N.fascicolo 4, pp. 49-53.</p> <p>- Articolo in rivista Pallottino Federico; Violino Simona; Figorilli Simone; Costa Corrado (2021). Preferenze del consumatore, quanto costa l'origine?. OLIO E OLIVO, N.volume 24, N.fascicolo 2, pp. 57-61.</p> <p>- Articolo in rivista Pallottino Federico; Violino Simona; Figorilli Simone; Imperi Giancarlo; Costa Corrado (2021). Tracciabilità dell'olio di oliva: vantaggi dal campo allo scaffale. L'INFORMATORE AGRARIO, N.volume 24, pp. 36-38.</p> <p>- Articolo in rivista Violino Simona; Benincasa Cinzia; Taiti Cosimo; Orteni Luciano; Pallottino Federico; Marone Elettra; Mancuso Stefano; Costa Corrado (2021). AI-based hyperspectral and VOCs assessment approach to identify adulterated extra virgin</p>	

ACROMYN AND RESEARCH TITLE	AIMS	PERSON IN CHARGE	FINANCING BODY	INTERNATIONAL PARTNERSHIP	PUBLICATION	OTHER RESEARCH PRODUCTS
					<p>olive oil. EUROPEAN FOOD RESEARCH AND TECHNOLOGY, N.volume 247, N.fascicolo 4, pp. 1013-1022. DOI: 10.1007/s00217-021-03683-4.</p> <p>- Articolo in rivista Ortenzi Luciano; Violino Simona; Pallottino Federico; Figorilli Simone; Vasta Simone; Tocci Francesco; Antonucci Francesca; Imperi Giancarlo; Costa Corrado (2021). Early estimation of olive production from light drone orthophoto, through canopy radius. DRONES, N.volume 4, N.fascicolo 4, DOI: 10.3390/drones5040118.</p> <p>- Software Ortenzi Luciano; Violino Simona; Pallottino Federico; Figorilli Simone; Vasta Simone; Tocci Francesco; Antonucci Francesca; Costa Corrado (2021). Software per l'estrazione del canopy radius.</p> <p>- Abstract in atti di convegno Carbone Fabrizio; Salimonti Amelia; Regina Teresa Maria Rosaria; Zelasco Samanta (2019). Development and evaluation of polymorphic genomic-SSR markers in olive (<i>Olea europaea</i> L.). . Proceedings of the LXIII SIGA Annual Congress. ,</p>	
Mon.Oli.Tech Hi-Tech monitoring for the sustainable management of the Lazio olive grove ecosystem	Constitution of the Operating Group; animation and dissemination actions regarding technological innovations in olive growing; design.	M. BIOCCA CREA-IT CREA-DC CREA-AA	Regione Lazio - DIREZIONE REGIONALE FORMAZIONE, RICERCA E INNOVAZIONE, SCUOLA E UNIVERSITA', DIRITTO ALLO STUDIO			
4CE-MED .	The project's primary objective is to systematize existing knowledge on best practices and the latest research conducted on agricultural economics	L. PARI CREA-IT	PRIMA IS	<p>- ARVALIS, International Centre for Arvalis Institut du Végétal</p> <p>- Camelina Company Espana</p> <p>- Centre for Renewable Energy Sources and Saving</p> <p>- Iniciativas Innovadoras SAL</p> <p>- INRAA (Institut National de la Recherche Agronomique d'Algérie)</p> <p>- BIOS AGROSYSTEMS S.A.</p> <p>- INSTITUT NATIONAL DE LA RECHERCHE AGRONOMIQUE DE TUNISIE</p> <p>- International Center for</p>	<p>- Articolo in rivista Stefanoni Walter, Latterini Francesco, Prieto Ruiz Javier, Bergonzoli Simone, Palmieri Nadia and Pari Luigi (2021). Assessing the camelina (<i>Camelina sativa</i> (L.) Crantz) seed harvesting using a combine harvester: A case-study on the assessment of work performance and seed loss. Sustainability, 13(1), 195.</p>	

ACROMYN AND RESEARCH TITLE	AIMS	PERSON IN CHARGE	FINANCING BODY	INTERNATIONAL PARTNERSHIP	PUBLICATION	OTHER RESEARCH PRODUCTS
				Agricultural Research in the Dry Areas - ICARDA - Cooperativas Agro-Alimentarias de Espana		
MediOpuntia Introducing cactus plantations (Opuntia spp.) and smart water management systems in marginal lands of Egypt and Morocco to drive rural renaissance in the Mediterranean Region	Develop a cultural system suitable for the Cactus in desert areas and marginal lands to increase the economic income and the well-being of small farmers in these areas. MediOpuntia research aims to answer the following main questions: <ul style="list-style-type: none"> • What are the suitable areas for cactus plantations in the marginal lands of the Mediterranean countries? • What is the potential role of the cactus as a soil remedy especially in severely degraded soils, subject to desertification? • What is the impact of applying new proven techniques such as groundwater retention technique and low-cost irrigation system for large scale cactus planting? • Is it possible to start up micro and small projects to produce functional foods based on the components of the cactus? 	L. PARI CREA-IT	Ministero dell'Università e della Ricerca (MIUR) - Dipartimento per l'università, l'afam e per la ricerca - Direzione generale per il coordinamento e lo sviluppo della ricerca - Commissione europea	- Mubarak City for Scientific Research and Technology Applications MCSAT - Universite Cadi Ayaad	- Articolo in rivista Palmieri Nadia, Suardi Alessandro, Stefanoni Walter, Pari Luigi (2021). Opuntia ficus-indica as an Ingredient in New Functional Pasta: Consumer Preferences in Italy. Foods, 10(4), 803 - Contributo in atti di convegno Pari Luigi, Stefanoni Walter, Latterini Francesco, Suardi Alessandro, Palmieri Nadia, Alfano Vincenzo, Bergonzoli Simone, Lazar Sandu, Fernando Ana Luisa, Rashad Mohamed, Outzourhit Abdelkader (2021). A Subsurface Water Retention System to Collect Rain Water and Fight the Desertification. Proceedings of the 29 th European Biomass Conference and Exhibition (e-EUBCE Virtual), 26-29 April 2021, pp.89-93. - Contributo in atti di convegno Rodrigues, C., Rheinboldt, A.A.A., Souza Victor Gomes Lauriano, Coelho Isabel, Rashad, M., Pari Luigi, Outzourhit Abdelkader, Fernando Ana Luisa (2021). Process Optimization of Pectin Extraction from Opuntia Spp. and Characterization. Proceedings of the 29 th European Biomass Conference and Exhibition (e-EUBCE Virtual), 26-29 April 2021, pp. 194-198. - Articolo in rivista Palmieri Nadia, Stefanoni Walter, Latterini Francesco and Pari Luigi (2021). An Italian Explorative Study of Willingness to Pay for a New Functional Pasta Featuring Opuntia ficus indica. Agriculture, 11(8), 701.	
COMPONET EVALUATION OF THE EFFECT OF COMPOST ON PLANT NECTAR PRODUCTION AND POLLINATION ACTIVITY (COMPO-NET)	The CIC / CREA-IT collaboration project concerns the arrangement of plots in the open field, organized according to an experimental scheme in randomized blocks. The plots will allow to study the interactions between the soil, the nectar and the plants, therefore, the three (3) treatments identified will be based on different levels / types of soil fertilization.	S. BERGONZOLI CREA-IT	CIC - Comitato Italiano Compostatori			
A-B-Compost Organic substance of value in Organic	The Rural Development Program (PSR) of the Lombardy Region identifies among the general strategic objectives "Favoring	S. BERGONZOLI CREA-IT	Regione Lombardia - Direzione Generale		- Articolo in rivista Confalonieri Alberto, Bergonzoli Simone (2021). Il compost tra qualità e tecniche di distribuzione,	

ACROMYN AND RESEARCH TITLE	AIMS	PERSON IN CHARGE	FINANCING BODY	INTERNATIONAL PARTNERSHIP	PUBLICATION	OTHER RESEARCH PRODUCTS
Agriculture	<p>competitiveness of agricultural, food and forestry systems and the recovery of added value for the agricultural system through the dissemination of knowledge, innovations, integration and networks ". Measure 1 of the Rural Development Program is dedicated to promoting the human potential of the workers in the sector agriculture and improve the skills needed to promote economic growth and development of rural areas and to improve the sustainability, competitiveness, efficient use of resources and the environmental performance of companies agricultural. Furthermore, the measure contributes to strengthening the links between agriculture and research.</p> <p>Operation 1.2.01 promotes the transfer of knowledge and innovation in the agricultural sector through the implementation of information projects (dissemination events, conferences, seminars, innovative communication methods etc.) and demonstration initiatives in the field, guided tours, non-periodic thematic and / or specialist publications, disseminated through print or electronic media etc.</p> <p>The projects participate in the achievement of results for three of the priorities identified by the RDP through the relative "Focus Area".</p> <p>Priority 2: enhance the profitability of farms and the competitiveness of agriculture in all its forms e promoting innovative technologies for farms;</p> <p>Priority 4: preserve, restore and enhance ecosystems related to agriculture;</p> <p>Priority 5: Encourage the efficient use of resources for a low carbon and climate resilient economy in the agri-food sector. The projects financed with these implementing provisions, "Focus Area" of Priority 4 (Focus Area 4 A and 4B), compete in addition to the achievement of the objectives of the Life Gestire 2020 project (www.naturachevale.it) for the conservation of biodiversity referred to</p>		Agricoltura, Alimentazione e Sistemi Verdi		Divulgazione e confronto, Rivista Acer, giugno, 2021, pp 91-91	

ACROMYN AND RESEARCH TITLE	AIMS	PERSON IN CHARGE	FINANCING BODY	INTERNATIONAL PARTNERSHIP	PUBLICATION	OTHER RESEARCH PRODUCTS
	the Habitats and Birds Directives, based on the contents of the Prioritized Action Framework (PAF) regional, for the improvement of the management capacity of the Natura 2000 network					
AGRI4.0 A NEW INTEGRATED APPROACH FOR THE OPTIMIZATION OF RESOURCES IN AGRICULTURE AND THE PRESERVATION OF THE ENVIRONMENT	Creation of a new Web-GIS / mobile-GIS tool for the optimization of water and energy resources in agriculture. Through the involvement of the project partner irrigation consortia and individual consortium members, it is intended to create (in accordance with the technologies already available) a user-friendly tool capable of allowing sustainable management of land parcels 1) optimizing the use of natural resources; 2) achieving energy efficiency of electromechanical equipment and 3) effectively monitoring the use of pesticides	C. COSTA CREA-IT	PROVINCIA AUTONOMA DI TRENTO		- Articolo in rivista Figorilli Simone; Pallottino Federico; Colle Giacomo; Spada Daniele; Beni Claudio; Tocci Francesco; Vasta Simone; Antonucci Francesca; Pagano Mauro; Fedrizzi Marco; Costa Corrado (2021). An open source low-cost device coupled with an adaptative time-lag time series linear forecasting modelling for apple Trentino (Italy) precision irrigation. SENSORS, N.volume 21, N.fascicolo 8, DOI: 10.3390/s21082656.	
AB Mauri Italy Spa - CREA-IT agreement SOSP-Studio Optimization for the use of Potassium Salts as fertilizer	Characterization of potassium salts; Pelletizing; Laboratory analysis.	F. GALLUCCI CREA-IT	AB Mauri Italy S.p.A			
LIFE FOLIAGE Forest planning and earth observation for a well-grounded governance	Support forestry policy at regional level in Lazio and Umbria based on a complete and dynamically and periodically updated cognitive framework, given by the census of forestry operations and by sustainable management indicators based on remote sensing	M. BASCIETTO CREA-IT CREA-FL	European Union			- Presentazione del LIFE Foliage ai portatori di interessi (16/03/2021) - LIFE FOLIAGE: Aspettative e utilità dall'introduzione del sistema digitale forestale (14/01/2022) - Dati statistici forestali verso uno standard unico nazionale. Contributi alla governance forestale regionale e nazionale (18/06/2021) - Assegni di ricerca - n.2
AgMech Agricultural machinery subjected to test cycles on the track and on specially made benches	Define experimental methodologies focused on the study of the operating dynamics of agricultural driving and operating machinery (including large self-propelled agricultural machinery - GMOS), under controlled conditions and to perform the related tests on vehicles characterized by innovative elements	C. BISAGLIA CREA-IT	SAME DEUTZ- FAHR ITALIA S.P.A			
ASSITOL 2 USE OF RAW AND	Identification of alternative uses of olive pomace oil to food, in crisis of demand.	Daniele POCHI CREA-IT	Innovhub Stazioni sperimentali per			

ACROMYN AND RESEARCH TITLE	AIMS	PERSON IN CHARGE	FINANCING BODY	INTERNATIONAL PARTNERSHIP	PUBLICATION	OTHER RESEARCH PRODUCTS
REFINED SANSO OIL, AS A TECHNICAL FLUID TO BE USED FOR AGRICULTURAL MACHINES	Study of employment opportunities such as: - biodegradable technical fluid on agricultural machinery - agglomerant to produce pellets from coffee grounds		l'industria-Azienda speciale della CCIAA di Milano			
Becool Brazil-EU Cooperation for Development of Advanced Lignocellulosic Biofuels	Promote sustainable development in terms of resource efficiency and cost-effectiveness of the cultivation of energy crops both in Europe and in Brazil to produce biofuels	L. PARI CREA-IT	Commissione Europea	- Deutsches Biomasseforschungszentrum gemeinnuetzige GmbH (DBFZ) - Internationales institut fuer angewandte systemanalyse - Stichting Wageningen Research (WR) - Institute Alterra and Institute Food Biobased Reserach - Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas (CIEMAT) - Energy research centre of the Netherlands - Technical Research Centre of Finland Ltd (VTT) - BTG Biomass Technology Group - Center Renewable Energy Source and Energy Saviing		- Assegni di ricerca - n.1
BTT- Bio Termo Test Research, experimentation and certification of boilers, burners and motor systems for the production of green thermal and / or electrical energy Combustion efficiency of biomass boiler and study of the gaseous effluents in the chimney	Combustion efficiency of biomass boiler and study of the gaseous effluents in the chimney	F. GALLUCCI CREA-IT	Ministero delle politiche agricole alimentari e forestali - DG PQAI 2 - Sviluppo imprese e cooperazione		- Articolo in rivista Andrea Rosario Proto, Adriano Palma, Enrico Paris, Salvatore Francesco Papandrea, Beatrice Vincenti, Monica Carnevale, Ettore Guerriero, Roberto Bonofiglio, Francesco Gallucci, 2021, Assessment of wood chip combustion and emission behavior of different agricultural biomasses, Fuel, DOI: 10.1016/j.fuel.2020.119758; - Articolo in rivista Adriano Palma, Andrea Colantoni, Beatrice Vincenti, Leonardo Bianchini, Monica Carnevale, Enrico Paris, Francesco Gallucci, 2021, Comparison between coffee and common lignocellulosic biomass for energetic potential prediction, Environmental Engineering and Management Journal, DOI: 10.30638/eemj.2021.150; - Articolo in rivista Monica Carnevale, Leonardo Longo, Francesco	- Assegni di ricerca - n.1

ACROMYN AND RESEARCH TITLE	AIMS	PERSON IN CHARGE	FINANCING BODY	INTERNATIONAL PARTNERSHIP	PUBLICATION	OTHER RESEARCH PRODUCTS
					<p>Gallucci, Enrico Santangelo, 2021, Influence of the harvest time and the airflow rate on the characteristics of the Arundo biochar produced in a pilot updraft reactor, Biomass Conversion and Biorefinery, DOI: 10.1007/s13399-020-01241-8.</p> <p>- Contributo in atti di convegno</p> <p>Enrico Paris, Francesco Gallucci, Valeria Ancona, Giorgia Aimola, G., Adriano Palma, Beatrice Vincenti, Monica Carnevale, Andrea De Silvestri, A., Luigi Iannitti, Michele Vincenzo Migliarese Caputi, Domenico Borello, 2021, Pruning of Biomass from Plant-Assisted BioRemediation (PABR): Use in a Gasification Plant and Monitoring of Syngas Quality, 29th European Biomass Conference and Exhibition, DOI: 10.5071/29thEUBCE2021-2AV.4.11;</p> <p>- Contributo in atti di convegno</p> <p>Beatrice Vincenti, Enrico Paris, Adriano Palma, Monica Carnevale, Rossella Manganiello, Mariangela Salerno, Domenico Borello, Ettore Guerriero, Andrea Colantoni, Attilio Tonolo, Costanza Drigo, Andrea Rosario Proto, Francesco Gallucci, 2021, Characterization of Biomass Burning Tracers in PM2.5 Aerosols, 29th European Biomass Conference and Exhibition, DOI: 10.5071/29thEUBCE2021-4AV.3.13;</p> <p>- Contributo in atti di convegno</p> <p>Monica Carnevale, Enrico Paris, Adriano Palma, Beatrice Vincenti, Mariangela Salerno, Rossella Manganiello, Ettore Guerriero, Mattia Perilli, Andrea Colantoni, Andrea Rosario Proto, Francesco Gallucci, 2021, Characterization of Emissions from Combustion of Olive Wood Chips, 29th European Biomass Conference and Exhibition, DOI: 10.5071/29thEUBCE2021-2BV.6.8;</p> <p>- Contributo in atti di convegno</p> <p>Adriano Palma, Beatrice Vincenti, Monica Carnevale, Enrico Paris, Domenico Borello, Mariangela Salerno, Rossella Manganiello, Leonardo Bianchini, Andrea Colantoni, Andrea Rosario Proto, Francesco Gallucci, 2021, Evaluation of Trace Elements Fate in Contaminated Biomass Fractions for Clean Biofuel Production, 29th European Biomass Conference and Exhibition, DOI: 10.5071/29thEUBCE2021-1BO.13.4;</p> <p>- Contributo in atti di convegno</p> <p>Francesco Gallucci, Enrico Paris, Monica</p>	

ACROMYN AND RESEARCH TITLE	AIMS	PERSON IN CHARGE	FINANCING BODY	INTERNATIONAL PARTNERSHIP	PUBLICATION	OTHER RESEARCH PRODUCTS
					<p>Carnevale, Adriano Palma, Beatrice Vincenti, Mariangela Salerno, Rossella Manganiello, Attilio Tonolo, Valerio Paolini, Domenico Borello, Andrea Rosario Proto, Andrea Colantoni, 2021, Comparison between 'Open Burning' and Boiler Combustion: Characterization of the Metals Present in the PM10, 2.5 and Intermediate Fractions, 29th European Biomass Conference and Exhibition, DOI: 10.5071/29thEUBCE2021-4AV.3.11;</p> <p>- Contributo in atti di convegno Francesco Gallucci, Adriano Palma, Antonio Scarfone, Enrico Paris, Beatrice Vincenti, Monica Carnevale, Angelo Del Giudice, Andrea Colantoni, 2021, Coffee Pellet Vs. Conventional Pellet: a Statistical Evaluation Based on Quality Parameters, 29th European Biomass Conference and Exhibition, DOI: 10.5071/29thEUBCE2021-1CV.6.7;</p> <p>- Poster Francesco Gallucci, Enrico Paris, Monica Carnevale, Adriano Palma, Beatrice Vincenti, Attilio Tonolo, Andrea Colantoni, Leonardo Bianchini, Andrea Rosario Proto, Ettore Guerriero, 2021, Tecnologie analitiche per il monitoraggio degli inquinanti da combustione di biomassa agroforestale, ECOMONDO 2021 Rimini;</p> <p>- Poster Francesco Gallucci, Raffaele Mancini, Marco Calcopietro, Enrico Paris, Monica Carnevale, Adriano Palma, Beatrice Vincenti, Ettore Guerriero, 2021, Valutazione delle emissioni generate dalla combustione di compost e biomasse lignocellulosiche, ECOMONDO 2021 Rimini.</p>	
Car.Ve. Characterization of the vertical dynamics of a vehicle	Characterize the vertical dynamics of a vehicle and reproduce the stresses acquired on a test course	M. CUTINI CREA-IT	Commissione Europea, Joint Research Centre			
COMPOSTEAM Reuse and enhancement of organic waste in agro-food companies to be used for heat production	Develop innovative technologies related to the Green Economy	F. GALLUCCI CREA-IT	Regione Lazio - Lazio Innova spa		<p>- Poster Francesco Gallucci, Raffaele Mancini, Marco Calcopietro, Enrico Paris, Monica Carnevale, Adriano Palma, Beatrice Vincenti, Ettore Guerriero, 2021, Valutazione delle emissioni generate dalla combustione di compost e biomasse lignocellulosiche, ECOMONDO 2021 Rimini.</p>	

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EfiTrA Evaluation of the influence of some performance parameters of agricultural tires on the efficiency and comfort of the tractor	Evaluate the influence of some performance parameters on the efficiency of the agricultural tractor.	M. CUTINI CREA-IT	Trelleborg Wheel Systems Italia S.p.A.			
ENVRI-FAIR ENVironmental Research Infrastructures building Fair services Accessible for Society, Innovation and Research ENVRI-FAIR	Development of common and shared standards and policies for the life cycle of data, for their "curation" and the provision of services in the cluster of environmental research infrastructures, inspired by the principles of FAIR (Findable, Accessible, Interoperable, Reusable) and interoperability. Development and implementation in each research infrastructure of the tools necessary for the life cycle of the data, their care and provision of services, based on the reference model developed by ENVRI. Development and maintenance of the skills necessary for the data life cycle, care, and provision of data at Research Infrastructures through extensive training and personnel exchange programs	M. DONATELLI CREA-IT CREA-AA	European Union	<ul style="list-style-type: none"> - UNIVERSITE DE VERSAILLES SAINT-QUENTIN-EN-YVELINES - IFREMER - NSTITUT FRANCAIS DE RECHERCHE POUR L'EXPLOITATION DE LA MER - E-Science European Infrastructure for Biodiversity and Ecosystem Research (LifeWatch ERIC) - CETAF - CONSORTIUM OF EUROPEAN TAXONOMIC FACILITIES - NILU - NORSK INSTITUTT FOR LUFTFORSKNING STIFTELSE - MARIS - MARIENE INFORMATIE SERVICE MARIS BV - LUNDS UNIVERSITET - INRA - INSTITUT NATIONAL DE LA RECHERCHE AGRONOMIQUE - UiB - UNIVERSITETET I BERGEN - SURFSARA BV - EISCAT - SCIENTIFIC ASSOCIATION - BRGM - BUREAU DE RECHERCHES GEOLOGIQUES ET MINIERES - CSIC - AGENCIA ESTATAL CONSEJO SUPERIOR DEINVESTIGACIONES CIENTIFICAS - INSB - INSTITUTUL NATIONAL DE CERCETARE DEZVOLTARE PENTRU STIINTA BIOLOGICE - SIOS Svalbard AS - INTEGRATED CARBON 		

ACROMYN AND RESEARCH TITLE	AIMS	PERSON IN CHARGE	FINANCING BODY	INTERNATIONAL PARTNERSHIP	PUBLICATION	OTHER RESEARCH PRODUCTS
				OBSERVATION SYSTEM EUROPEAN RESEARCH INFRASTRUCTURE CONSORTIUM - GEOECOMAR-INSTITUTUL NATIONAL DE CERCETARE- DEZVOLTARE PENTRU GEOLOGIE SI GEOECOLOGIE - FMI - ILMATIETEEEN LAITOS - BIOSENSE- INSTITUTE - RESEARCH AND DEVELOPMENT INSTITUTE FOR INFORMATION TECH - UHEL - HELSINGIN YLIOPISTO - RBINS - INSTITUT ROYAL DES SCIENCES NATURELLES DE BELGIQUE - NERC-NATURAL ENVIRONMENT RESEARCH COUNCIL - UvA - UNIVERSITEIT VAN AMSTERDAM - EURO-ARGO ERIC - TIB - TECHNISCHE INFORMATIONSBIBLIOTHEK - CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE CNRS - EAA - UMWELTBUNDESAMT GESELLSCHAFT MIT BESCHRANKTER HAFTUNG (UBA GMBH) - KNMI - KONINKLIJK NEDERLANDS METEOROLOGISCH INSTITUUT - USTIR - THE UNIVERSITY OF STIRLING - NATURALIS - STICHTING NATURALIS BIODIVERSITY CENTER		
FRUFUN LOW ENVIRONMENTAL IMPACT PRODUCTION OF INNOVATIVE FUNCTIONAL FOOD WITH FRUIT PRODUCED BY AGRICULTURAL	Eco-sustainable quality food processing for the problem of fruit surpluses	T.M. CATTANEO CREA-IT	Regione Lazio			

ACROMYN AND RESEARCH TITLE	AIMS	PERSON IN CHARGE	FINANCING BODY	INTERNATIONAL PARTNERSHIP	PUBLICATION	OTHER RESEARCH PRODUCTS
ENTERPRISES IN THE SABINO AREA						
GOMM HaMMurabi Monococco Marche: from the field to the table	Identify the correct and most suitable milling, pasta making or other processing of the monococcum wheat; ensure the least loss, in the processing stages, of the qualitative characteristics of the raw material; improve the organoleptic characteristics of the finished product	L. GAZZA CREA-IT	Regione Marche - Servizio Ambiente e Agricoltura		- Articolo in rivista Nocente Francesca; Natale Chiara; Galassi Elena; Taddei Federica; Gazza Laura (2021). Using einkorn and tritordeum brewers' spent grain to increase the nutritional potential of durum wheat pasta. Foods, N.volume 10, N.fascicolo 3, pp. 1-9. DOI: 10.3390/foods10030502.	
Hermes Use of HERMETia illucens for the bioconversion of residual biomass from agro-industry and use of the residue in agriculture	Develop a sustainable and environmentally friendly technology for the bioconversion of residual organic biomass using the scavenging activity of the dipteran <i>Hermetia illucens</i> (soldier fly). <i>Hermetia</i> can degrade organic matrices producing a residue that can be used as a soil improver and an "entomic biomass" (larvae) source of biomolecules. Specific objectives of the project are: <ul style="list-style-type: none"> the identification of the most suitable operating conditions for the <i>Hermetia</i> business and the best combinations of a series of agri-food waste; the use of the residual substrate of the <i>Hermetia</i> activity as a soil improver. the design of a prototype for the automation of the breeding and production process, suitable for the subsequent scale-up; the identification of a pool of Lazio companies interested in enhancing the results, with reference to both the recovery of waste and the use of substrates as soil improvers; the dissemination of innovation through dissemination and dissemination activities 	A. ASSIRELLI CREA-IT	Regione Lazio - Lazio Innova spa			
LEG-GER NEW SUSTAINABLE FOODS WITH HIGH NUTRITIONAL VALUE BASED LEGUMES FROM LAZIO	Through this notice, the Lazio Region aims to strengthen the capacity of the research system and promote the competitiveness of the Lazio production system by granting non-repayable grants on the costs incurred by research and dissemination organizations and ODR knowledge for the realization of CSR projects. CSR projects must fall into one of the	F. PALLOTTINO CREA-IT	Regione Lazio - Lazio Innova spa			- Assegni di ricerca - n.1

ACROMYN AND RESEARCH TITLE	AIMS	PERSON IN CHARGE	FINANCING BODY	INTERNATIONAL PARTNERSHIP	PUBLICATION	OTHER RESEARCH PRODUCTS
	areas of specialization (ADS): Aerospace, Life Sciences., Cultural heritage and technology of culture, Agrifood, Digital creative industries, Green Economy and Security of the Regional Smart Specialization Strategy (S3), be consistent with the objectives of the national and European programs for research and innovation and must be aimed at producing results of interest to the companies of Lazio					
Magic Marginal lands for Growing Industrial Crops: Turning a burden into an opportunity	Promote sustainable development in terms of resource efficiency and cost-effectiveness of the cultivation of industrial crops on land with low (marginal) productivity in order to favor, in the long term, the development of a bio-economy, contributing to the achievement of energy and environmental objectives	L. PARI CREA-IT	Commissione Europea	<ul style="list-style-type: none"> - Center Renewable Energy Source and Energy Saviing - Universitaet Hohenheim - Stichting Dienst Landbouwkundig Onderzoek DLO - SAS NOVABIOM - 3B BioWarmia Bioenergy Bioresources - Nova-Institut Germany - Agricultural University Of Athens - Department of Agricultural Economics Rural Development - Cooperativas Agro-Alimentarias de Espana - Institute fuer Energie and Umweltforschung - IFEU - BTG Biomass Technology Group - Institute of Bioenergy Crops and Sugar Beet NAAS (IBC SB) - Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas (CIEMAT) - Internationales institut fuer angewandte systemanalyse - Latvijas Valsts Mezzinatnes Instituts Silava - Imperial College London (ICL)/ Centre for Environmental Policy - INRA - Institut National de la Recherche Agronomique - BIOS AGROSYSTEMS S.A. - Instytut Wlókien 	<ul style="list-style-type: none"> - Contributo in atti di convegno Stefanoni Walter, Suardi Alessandro, Palmieri Nadia, Bergonzoli Simone, Alfano Vincenzo, Lazar Sandu, Pari Luigi (2021). Castor Bean Cultivation in Romania: a Case of Study. Proceedings of the 29th European Biomass Conference and Exhibition (e-EUBCE Virtual), 26-29 April 2021, pp. 366-369. - Contributo in atti di convegno Stefanoni Walter, Bergonzoli Simone, Latterini Francesco, Alfano Vincenzo, Suardi Alessandro, Palmieri Nadia, Lazar Sandu, Pari Luigi (2021). Camelina Seeds Harvesting: Evaluation of Work Performance of a Combine Harvester in Two Experimental Fields in Italy and Spain. Proceedings of the 29th European Biomass Conference and Exhibition (e-EUBCE Virtual), 26-29 April 2021, pp. 77-80. - Contributo in atti di convegno Suardi Alessandro, Stefanoni Walter, Latterini Francesco, Pari Luigi, Lazar Sandu, Fernando Ana Luisa, Palmieri Nadia (2021). The Economic and Environmental Assessment of Castor Oil Supply Chain. Proceedings of the 29th European Biomass Conference and Exhibition (e-EUBCE Virtual), 26-29 April 2021, pp. 1184-1188. 	

ACROMYN AND RESEARCH TITLE	AIMS	PERSON IN CHARGE	FINANCING BODY	INTERNATIONAL PARTNERSHIP	PUBLICATION	OTHER RESEARCH PRODUCTS
				Naturalnych I Roslin Zielarskich - Wageningen University - VANDINTER SEMO BV - Universidade Nova de Lisboa - Faculdade de Ciencias e Tecnologia - FCT-UNL Grupo de Disciplinas de Ecologia da Hidrosfera GDEH - Arkema France		
MOBI.RU.D Rural Mobility for Disabled People	Facilitate the mobility of disabled people with reduced mobility in rural environments simultaneously giving the opportunity to carry out agricultural work	M. PAGANO CREA-IT	INAIL - Dipartimento di Igiene del Lavoro			
Multi-Canapa Multi-purpose applications to relaunch the hemp supply chain	Create the technical, economic and market conditions to support the development of a supply chain for the production of multipurpose hemp in Emilia Romagna	A. ASSIRELLI CREA-IT	Regione Emilia Romagna			
REACH Resilient Environment and Agricultural Caribbean Habitats	Consolidation of data acquisition protocols Support to CIMH, CIMA FOUNDATION, UNIFI and FAO for the development and validation of innovative forecasting models for the control of plant diseases Support to CIMH, CIMA FOUNDATION, UNIFI and FAO for the development and validation of forecast models for the management of irrigation water Production of manuals and reports to support the activity	F. PALLOTTINO CREA-IT	FONDAZIONE CIMA			
SoFa Experimental analysis of the fatigue resistance of an agricultural tractor equipped with innovative cab suspension	Verify the fatigue resistance of an agricultural tractor equipped with innovative cab suspensions	M. CUTINI CREA-IT	SAME DEUTZ-FAHR ITALIA S.P.A.			
SUSCACE Scientific support for agricultural conversion to energy crops	Provide technical and scientific support to the actors of the various supply chains by finding solutions to the problems indicated by the users of the research; making key technological innovations available to farmers for the outcome of the supply chains; inform agro-energy entrepreneurs to	L. PARI CREA-IT CREA-CI CREA-FL	Ministero delle Politiche Agricole, Alimentari e Forestali - Dipartimento delle politiche competitive del mondo rurale e		- Articolo in rivista Matteo R.; D'Avino L.; Ramirez-Cando L. J.; Pagnotta E.; Angelini L. G.; Spugnoli P.; Tavarini S.; Ugolini L.; Foschi L.; Lazzeri L. (2020). Camelina (Camelina sativa L. Crantz) under low-input management systems in northern Italy: yields, chemical characterization and environmental balance. Italian Journal of Agronomy, N.volume	

ACROMYN AND RESEARCH TITLE	AIMS	PERSON IN CHARGE	FINANCING BODY	INTERNATIONAL PARTNERSHIP	PUBLICATION	OTHER RESEARCH PRODUCTS
	<p>direct choices towards those species, varieties and cultivation techniques that have proven to be able to give better results in the specific environment; monitor the changes and possible problems that the conversion of areas previously cultivated with beet to energy crops can generate; this in order to foresee the possible problems that could be generated in the supply basin when the plant is fully operational and then formulate any systems and methods of guidance to avoid them.</p> <p>Contain the environmental impact on the territory while maintaining the situation of the national agricultural sector in terms of income and employment, present before the conversion of the sugar beet sector</p>		<p>della qualità - Direzione generale dello sviluppo agroalimentare, e della qualità - SAQ VI Agroenergie e filiere minori</p>		<p>15, N.fascicolo 2, pp. 132-143. DOI: 10.4081/ija.2020.1519.</p> <p>- Contributo in atti di convegno Picchio Rodolfo, Stefanoni Walter, Pari Luigi, Lazar Sandu, Venanzi R., Tocci D., Latterini Francesco (2021). Felling Operation in Artificial Coniferous Stands: Work Productivity Analysis. Proceedings of the 29th European Biomass Conference and Exhibition (e-EUBCE Virtual), 26-29 April 2021, pp. 263-264.</p> <p>- Contributo in atti di convegno Latterini Francesco, Stefanoni Walter, Pari Luigi, Lazar Sandu, Venanzi R., Tocci D., Picchio Rodolfo (2021). Forest Operation in High Slope: Preliminary Considerations on the Possibility of Substituting Cable Yarder with Helicopter for Timber Extraction. Proceedings of the 29th European Biomass Conference and Exhibition (e-EUBCE Virtual), 26-29 April 2021, pp. 304-305.</p> <p>- Contributo in atti di convegno Latterini Francesco, Stefanoni Walter, Pari Luigi, Lazar Sandu, Venanzi R., Di Marzio N, Tocci D., Picchio Rodolfo (2021). Heavy Gravity Cable Yarding in Italian Alps, Operation Planning and Logistic. Proceedings of the 29th European Biomass Conference and Exhibition (e-EUBCE Virtual), 26-29 April 2021, pp. 298-300.</p> <p>- Contributo in atti di convegno Latterini Francesco, Stefanoni Walter, Pari Luigi, Lazar Sandu, Venanzi R, Tocci D., Picchio Rodolfo (2021). Precision Forest Harvesting: Wood Extraction Planning and Validation of Gis Models. Proceedings of the 29th European Biomass Conference and Exhibition (e-EUBCE Virtual), 26-29 April 2021, pp. 32-35.</p> <p>- Contributo in atti di convegno Latterini Francesco, Stefanoni Walter, Pari Luigi, Lazar Sandu, Venanzi R., Tocci D., Di Marzio N., Picchio Rodolfo (2021). Work Productivity Analysis in Thinning Intervention of Chestnut Coppice in Central Italy. Proceedings of the 29th European Biomass Conference and Exhibition (e-EUBCE Virtual), 26-29 April 2021, pp. 301-303.</p> <p>- Contributo in atti di convegno Picchio Rodolfo, Stefanoni Walter, Pari Luigi, Lazar Sandu, Venanzi R., Tocci D., Latterini Francesco (2021). Work Productivity Evaluation of Different Harvesting Systems in Oak Coppice Stands. Proceedings of the 29th European Biomass Conference and Exhibition (e-EUBCE</p>	

ACROMYN AND RESEARCH TITLE	AIMS	PERSON IN CHARGE	FINANCING BODY	INTERNATIONAL PARTNERSHIP	PUBLICATION	OTHER RESEARCH PRODUCTS
					Virtual), 26-29 April 2021, pp. 260-262.	
TestControl21 Testing of agricultural driving and operating machinery under controlled test conditions	Define experimental methodologies on the operating dynamics of agricultural driving and operating machinery in controlled environmental conditions and perform the related tests on vehicles characterized by innovative elements	C. BISAGLIA CREA-IT	SAME DEUTZ- FAHR ITALIA S.P.A			
Track&Lab Experimental activities on agricultural machinery on the track and in dedicated laboratories	Learn about the performance of newly developed agricultural machinery under controlled and repeatable test conditions	C. BISAGLIA CREA-IT	SAME DEUTZ- FAHR ITALIA S.P.A			
TRACKMEC2020 Trials on the track in controlled conditions of innovative tractors and agricultural machinery	Carry out objective assessments on: i) the control electronics, ii) the braking capacity, iii) the traction capacity and iv) the general performance (e.g. comfort, noise, stability, visibility, instrumental checks aimed at homologation , etc.)	C. BISAGLIA CREA-IT	SAME DEUTZ- FAHR ITALIA S.P.A			
Traction23 Tractors in traction test cycles on the track and in the field and performance checks on specific benches	Define test methodologies and carry out experimental tests	C. BISAGLIA CREA-IT	SAME DEUTZ- FAHR ITALIA S.P.A			
TractorTrials Tractors under test	Define experimental methodologies focused on the study of the operating dynamics of agricultural driving and operating machinery	C. BISAGLIA CREA-IT	SAME DEUTZ- FAHR ITALIA S.P.A			
VISTA Experimental analysis of the vibrational dynamics of an agricultural tractor in operating conditions	Characterize the vibrational dynamics of agricultural tractors in operating conditions	M. CUTINI CREA-IT	SAME DEUTZ- FAHR ITALIA S.P.A			
SOUL Innovation in the SOrgo supply chain for food use in Lazio: sustainability, cultivation, processing and guidelines for the disposal of processing	Set up an operational group for the establishment of the short sorghum chain and participate in the subsequent sub-measure relating to the RDP. The operational group that will be formed into a Temporary Purpose Association will strive to introduce and integrate	F. TADDEI CREA-IT CREA-OFA	Regione Lazio		- Articolo in rivista Federica Taddei; Laura Gazza; Francesca Nocente; Fabrizio Quaranta; Roberto Ciccoritti (2021). Lazio, Innovazione e sostenibilità nella filiera del sorgo ad uso alimentare: il progetto SOUL. Pianeta PSR, N.volume 99,	- 3°evento telematico di animazione e coinvolgimento del progetto SOUL "Innovazione nella filiera del SOrgo ad Uso alimentare nel Lazio sostenibilità, coltivazione, trasformazione e recupero funzionale (26/11/2020) - 2°evento telematico di animazione e coinvolgimento del progetto SOUL "Innovazione nella filiera del SOrgo ad Uso alimentare nel Lazio sostenibilità, coltivazione, trasformazione e recupero funzionale

ACROMYN AND RESEARCH TITLE	AIMS	PERSON IN CHARGE	FINANCING BODY	INTERNATIONAL PARTNERSHIP	PUBLICATION	OTHER RESEARCH PRODUCTS
waste	"food grade" sorghum in the current rural landscape of Lazio. The goal is to make this cereal known to the regional and national reality through the development of a sustainable agri-food chain, which contributes to the enhancement of the functional properties of this cereal, suitable for the recovery of marginal rural areas and the production of functional foods suitable for consumption. also, by patients suffering from food-related diseases and by individuals from different parts of the planet who are now an integral part of the national social fabric. It is also to indicate guidelines for the correct use of production waste deriving from processing					(20/10/2020)
Convenzione Resilco Srl - CREA-IT Analysis of materials obtained from CO2 mineralization tests with innovative methods	Development and application of CO2 mineralization research methodology	F. GALLUCCI CREA-IT	Resilco srl			

3.4.2. Patents and Services

Patents PATENTS (INDUSTRIAL PATENTS)

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
OECD Tractors standard Codes	The OECD Standard Codes for the Official Testing of Agricultural and Forestry Tractors allow participating countries to perform tractor tests according to harmonized procedures, and to obtain OECD official approvals	M. Cutini	CREA-IT Treviglio
ENAMA and ENTAM certification of the functional and safety characteristics of agricultural machinery and equipment	The Agricultural Machinery test laboratory, accredited by ACRRED from 2010 to 2014, carries out certification of the machines by ENAMA. The Certificates are recognized in Europe by the ENTAM (European network for testing of agricultural machinery)	D. Pochi	CREA-IT Monterotondo

Services

Collection

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Collection of micro-organisms of olive-oil interest	Collection of lactic bacteria and yeasts to be used in the guided debittering processes of table olives	B. Lanza	CREA-IT Pescara

Historical library

PRODUCTS /MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Recent progress in hormone research	dal 1949 (posseduto: 1949-1951;1962)	A. Belocchi	CREA-IT Roma
Symposia of the Society for Experimental Biology	dal 1947 (posseduto: 1947-1948;1951-1953;1957-1963;1965;1967)	A. Belocchi	CREA-IT Roma
Advances in genetics	dal 1947 (posseduto: 1947-1948;1950-1951;1953-1956;1961-1962;1964-1965;1968;1970-1971;1973;1976;1979;1982;1985;1989;1991-1992;1994;	A. Belocchi	CREA-IT Roma
Progress in biophysics and biophysical chemistry	dal 1950 (posseduto: 1950-1962)	A. Belocchi	CREA-IT Roma
Hereditas	dal 1920 (posseduto: 1920-1988)	A. Belocchi	CREA-IT Roma
Agronomy journal	dal 1949 (posseduto: 1949-1988;1990-2003)	A. Belocchi	CREA-IT Roma
Journal of agricultural science	dal 1950 (posseduto: 1950-1988;1991-1993;1995-2002)	A. Belocchi	CREA-IT Roma
Plant breeding abstracts	dal 1936 (posseduto 1936-1992;1994)	A. Belocchi	CREA-IT Roma
Journal of heredity	dal 1917 (posseduto: 1917-1929;1931-1935;1937-1938;1941-1948;1950-1954;1956-1957;1959-1965;1967;1969-1987)	A. Belocchi	CREA-IT Roma
Euphytica: Netherlands journal of plant breeding	dal 1953 (posseduto: 1953-1962)	A. Belocchi	CREA-IT Roma
Fortschritte der Chemie Organischer Naturstoffe	dal 1945 (posseduto: 1945-1970)	A. Belocchi	CREA-IT Roma
Advances in agronomy	dal 1949 (posseduto: 1949-1975;1986-2004)	A. Belocchi	CREA-IT Roma
Molini d'Italia	dal 1950 (posseduto: 1950-1962;1964-1969;1971-1974;1978-1982;1984-1988)	A. Belocchi	CREA-IT Roma
Annual review of plant physiology	dal 1950 (posseduto: 1950-1987)	A. Belocchi	CREA-IT Roma
Advances in protein chemistry	dal 1944 (posseduto: 1944-1945;1947-1949;1951-1954;1956-1968;1970-1974;1976)	A. Belocchi	CREA-IT Roma
Annali della Reale Accademia d'Agricoltura di Torino	1886	A. Belocchi	CREA-IT Roma

PRODUCTS /MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Cereal chemistry	dal 1924 (posseduto: 1924-1992;1996)	A. Belocchi	CREA-IT Roma
Yearbook of the United States Department of Agriculture	dal 1899 (posseduto: 1899-1904;1906-1920;1922-1924;1936-1937)	A. Belocchi	CREA-IT Roma
The Japanese journal of genetics	dal 1926 (posseduto: 1926-1969;1971-1986;1988-1993)	A. Belocchi	CREA-IT Roma
Collane di Olivicoltura ed Elaiotecnica	La Rivista Italiana delle Sostanze Grasse	A. Petrucci	CREA-IT Pescara
Collane di Olivicoltura ed Elaiotecnica	Grasas y Aceites	A. Petrucci	CREA-IT Pescara
Collane di Olivicoltura ed Elaiotecnica	American Journal of Botany	A. Petrucci	CREA-IT Pescara
Collane di argomento generale	Enciclopedia della scienza e della tecnica	A. Petrucci	CREA-IT Pescara
Collane di argomento generale	Enciclopedia Internazionale di chimica	A. Petrucci	CREA-IT Pescara
Collane di argomento generale	Enciclopedia Italiana	A. Petrucci	CREA-IT Pescara
Libri di Olivicoltura ed Elaiotecnica	Libri storici circa 1.000	A. Petrucci	CREA-IT Pescara

Other scientific and technological infrastructures

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Technologic innovations: Platform for cereal transformation: pilot plants for grinding, pasta making and bread making	Platform is equipped with grain cleaning plants, durum and bread wheat mill, ultra-fine grinder, flour air-classificator, debranner, pasta-making plant, pasta dryer at low and high temperature, leavening chamber, oven	P. Manesatti	CREA-IT Rome
Agromechanical innovations: Four Poster test bench	The test bench reproduces the vibrations acting on an agricultural vehicle. Four hydraulic actuators provide solicitations to the vibrating table, which is suspended on a 408-t seismic mass. Both machine control and data acquisition are fully computerized.	M. Cutini	CREA-IT Treviglio
Agromechanical innovations: Test Tracks	One track, 333 meters long and 4 meters wide, has the external ring in cement and the inner part of grassy soil. The second track is 1040 meters long and 13 meters wide. It has the paving of the inner ring made of asphalt while the external ring is made of cement	M. Cutini	CREA-IT Treviglio
Agromechanical innovations: Agriculture engineering laboratory	Research facility made of: - engine test bench or the performance testing of agricultural tractors and engines according to OECD and ISO standards; - hydraulic bench to measure the hydraulic power of agricultural tractors.	M. Cutini	CREA-IT Treviglio
Agromechanical innovations: Test rig for driver's cabs	Equipment for the testing of tractor safety cabins and safety frames according to ROPS (Roll Over Protective Structures) and FOPS (Fall Over Protective Structures), international	M. Cutini	CREA-IT Treviglio

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
	regulations		
Agromechanical innovations: Agricultural machinery simulator for precision agriculture (SimAgri)	"Driver in the loop" simulator developed by CREA in which the operator interacts with the virtual environment he is immersed in through commands like those present in a real advanced tractor.	M. Cutini	CREA-IT Treviglio
Technologic innovations Input containment: "Milano" experimental farm	The farm (15 ha) is devoted to precision agriculture. It has a fleet of machines equipped with automatic and satellite assisted guidance systems for the variable rate distribution of agricultural inputs. It's been implemented with advanced sensor systems for on-the-go analysis and drones, and there is also a wireless network to cover the farm area (LoRA).	E. Romano	CREA-IT Treviglio
Innovative transformations: Solar dryer for agro-food products powered with solar panels	Solar dryer for agro-food products where hot air is circulated continuously in the drying chamber through a small fan electrically powered with a fotovoltaic panel	T.M.P. Cattaneo	CREA-IT Milano
Innovative transformations: Multifunctional miniaturized line for preserve production	Compact and multifunctional production line of preserves and mini-boiler for dairy production. The system consists of a washing and chopping station, an element for cooking /concentrating also under vacuum, a manually and mechanically controlled dosing unit, a mini-autoclave and a pasteurization station. The system is equipped with thermal solar panels (for water heating) and an exercise bike that charges a service battery for the operation of the control panel.	R. Lo Scalzo	CREA-IT Milano
Innovative transformations: System for the packaging of agro-food products	The system consists of a bell-shaped packaging machine with sealing bar, also suitable for large products. The system allows for vacuum packaging or modified atmosphere packaging, as it can be connected to a high precision digitally controlled gas mixing (max 3) system.	G. Cortellino	CREA-IT Milano
Technologic innovations: System for fruit storage in controlled atmosphere	12 experimental cabinets for very low oxygen storage and a cell for real-time monitoring of the respiratory quotient of fruits. The system is equipped with sensors for measuring the chlorophyll fluorescence and the DA [®] ripening index which allow the physiological state and quality of the fruit to be monitored in real time.	M. Vanoli	CREA-IT Milano
Technologic innovations: Electron Paramagnetic Resonance Spectrometer	System for the direct measurement of radical species. The EPR spectrometer allows to measure the ability of an extract (or a natural molecule) to react with radical species in the liquid phase and significantly reduce their concentration, to attribute an in vitro antioxidant potential value to the extract (or molecule) analyzed.	R. Lo Scalzo	CREA-IT Milano
Technologic innovations: Biomass power plant and laboratory for energy cogeneration	The plant, 1.2 MPa steam generator, with a mobile grid furnace with a power of 350 kWth, is equipped with a double auger biomass feeding system (DUPLO [®]) which allows the introduction into the furnace of different types of biomass (wood chips, pruning etc.). All combustion and flow rate parameters are controlled by a SCADA system which allows adjustment in the combustion chamber both to optimize the boiler efficiency and to control the gaseous emissions into the atmosphere.	F. Gallucci	CREA-IT Monterotondo
Agromechanical innovations: Agricultural machinery test center	This center has: dynamometric brake for tractor engine performance through PTO for analysis of alternative fuels, biolubricants and transmissions; test bench used in the evaluation of tractors' hydraulic lifts and in tires crushing tests, with load and position control; mobile test bench simulating the action of operating machines both pulled by the tractor and operated by the PTO for the study of the tractor-implement system; mobile test bench (patented) for the study of tires performances on various surfaces, used in tests on traction, rolling resistance, soil compaction, noise and tire vibrations.	D. Pochi	CREA-IT Monterotondo
Agromechanical innovations: Test plant for tractors, alternative fuels and biolubricants	Equipped with a dynamometric brake, connected to an electric motor, for detecting the characteristic curves of tractors with power up to 260 kW, the power absorption of the engine functions (transmission, gearbox, hydraulic system, air conditioning) and the performance of alternative fuels. The plant also houses a test bench for hydraulic fluids, transmission lubricants and multifunction fluids (eg UTTO - Universal Tractor Transmission Oil).	D. Pochi	CREA-IT Monterotondo
Agromechanical innovations: Plant for static tests of lifts and agricultural tires	It allows the detection of the lifting capacity of the hydraulic lifts of the tractors and the detection of the behavior of the tires in vertical (crushing) and transverse (lateral) loading conditions. It consists of a hydraulic system capable of imparting the requested stresses and related measurement systems (force, oil pressure, ground clearance).	D. Pochi	CREA-IT Monterotondo

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Transformation and qualitative characterization of cereals and derivatives	Qualitative analysis and characterization of cereals and derived products, according to official methods. First and second transformation processes through the technological platform supplied to the Center	C. Cecchini	CREA-IT Roma
Contract/third party analysis to verify the authenticity of vegetable oils and fats	Qualitative and authenticity analysis of vegetable oils and fats, according to the official methods set out in Reg. no. 2568/91/EEC and amended and in the Trade Standard of the Madrid International Olive Oil Council (IOC)	L. Di Giacinto	CREA-IT Pescara
Chemical-physical analysis and characterization of agroforestry biomass. Monitoring and control of atmospheric emissions generated by biomass energy conversion systems.	Characterization of lignocellulosic and food matrices. The laboratory is equipped with various thermochemical plants for the energy conversion of biomasses such as biomass boilers, gasifiers, pyrolyzers which, thanks to the LASER-B field instrumentation, allow to carry out analyzes and monitoring on the gaseous effluents produced by the energy conversion systems of the biomass	F. Gallucci	CREA-IT Monterotondo
Testing activities for third parties aimed at research and experimentation on innovative agricultural machines and tires	The Agricultural Machinery test laboratory, accredited by ACRRED from 2010 to 2014, has facilities, equipment and instruments for the study and evaluation of the performance of agricultural machinery and tires.	D. Pochi	CREA-IT Monterotondo
Quality control service of recovery products transformed by solar energy	Collaboration in the development of issues concerning the "Quality of recovered products and / or processed food surplus by solar energy".	T. Cattaneo	CREA-IT Milano
Analysis for third parties for the evaluation of the quality of processed products	Analysis of the volatile compounds profile of basil raw materials and semi-finished products	G. Bianchi	CREA-IT Milano
CLOCARD - Chlorophyll and carotenoid determination in different plant species	Leaf chlorophyll and carotenoid extraction and quantification through spectrophotometric determination	V. Picchi	CREA-IT Milano
Third party analysis for the evaluation of the product quality of organic and conventional fruits and vegetables (fresh and processed) available on the market	Contract for the execution of physico-chemical and nutritional quality measurements on fruit and vegetable products	V. Picchi	CREA-IT Milano

Working tables / working groups / institutional partnerships / Centre journals / Editorial Board of Journals

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Wheat Initiative-Expert Working Group (EWG) on "Durum wheat genomics and breeding"	The Wheat Initiative provides EWGs with a platform for discussion, information sharing and interaction to identify and address specific research and organizational challenges	F. Nocente F. Taddei	CREA-IT Roma
Wheat Initiative-Expert Working Group (EWG) on "Improving wheat quality for processing and health"	The Wheat Initiative provides EWGs with a platform for discussion, information sharing and interaction to identify and address specific research and organizational challenges	L. Gazza F. Taddei	CREA-IT Roma
Italian Referent	International network for Kernel quality assessment by NIT/NIR instruments and calibration	Laura Gazza	CREA-IT Roma
Member of Ministerial Group	Discussion about scientific and economics aspects of cereal supply chain	Laura Gazza	CREA-IT Roma
GTQ (technical group of quality)	National System of Certification of Integrated Production (SQNPI)	R. Lo Scalzo	CREA-IT Milano
IOC Organoleptic Expert Group	Verification of the method "SENSORY ANALYSIS OF OLIVE OIL - METHOD FOR THE ORGANOLEPTIC EVALUATION OF VIRGIN OLIVE OIL" referred to in IOC/T.20/Doc. no.15/	L. Di Giacinto	CREA-IT Pescara
IOC ChemicalExpert Group	Verification of the methods and parameters present in the "Commercial standard of the IOC applied to olive oils and olive-pomace oils" referred to in IOC/T.15/NC No 3/	L. Di Giacinto	CREA-IT Pescara
Commission referred to in art. 10 of Ministerial Decree no. 07/10/2021. Departmental Decree no. 180552 of 21 April 2022	Procedure for the revocation of tasting committees for virgin olive oils recognized by MiPAAF	L. Di Giacinto	CREA-IT Pescara
Management Committee of the National Register of Experts in Honey Sensory Analysis as per Ministerial Decree no. 21547 of 28 May 1999 as amended, renewal of Prot. no. 28737 of 7/07/2017	Management Committee of the National Register of Experts in Honey Sensory Analysis	L. Di Giacinto	CREA-IT Pescara
Ministerial Group on oil quality strategy	Formulation of guidelines for the improvement of virgin olive oil quality	L. Di Giacinto	CREA-IT Pescara
CODEX Alimentarius Ministerial Group - Vegetable oils	Verification of CODEX Alimentarius methods and parameters - Vegetable oils	L. Di Giacinto	CREA-IT Pescara
IOC Commission for the management of the Mario Solinas International Competition on the quality of virgin olive oils	Management of the Mario Solinas International Competition on the quality of virgin olive oils	L. Di Giacinto	CREA-IT Pescara
Commission for the management of the Ercole Olivario National Competition on the quality of virgin olive oils	Management of the Ercole Olivario National Competition on the quality of virgin olive oils	L. Di Giacinto	CREA-IT Pescara
IOC Table Olive Organoleptic Expert Group	Verification of the methods and parameters present in the "Method for the sensory analysis of table olives" referred to COI/OT/MO No 1	B. Lanza	CREA-IT Pescara
IOC Table Olive Standard Expert Group	Verification of the methods and parameters present in the "Trade standard applying to table olives" referred to COI/OT/NC No 1 and CODEX ALIMENTARIUS CODEX STAN 66-1981	B. Lanza	CREA-IT Pescara
OECD Tractor Standard Codes	CREA-IT is accredited as a test station in regulatory and technological harmonization activities with the OECD, preparing or acquiring technical-scientific documents which are then shared, through ad hoc technical working groups, with other institutions.	M. Cutini	CREA-IT Treviso
National Phytosanitary Committee	Working group "Kiwifruit early decline syndrome"	L. Bardi	CREA-IT Torino
European Food Safety authority (EFSA)	Contact person (referent) for CREA for the following topics: 4.5 Food contact materials, enzymes and/or processing; 4.8 Biological hazards; 4.10 Human nutrition, dietetic products, allergens and/or novel foods	L. Bardi	CREA-IT Torino

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Italian User Forum for the Copernicus Programme	Collection of the requirements of end and intermediate users for an agreed and harmonized national position towards the European Copernicus Committee, consistent with the institutional needs, of the enterprise and of the country's industrial space policy.	M. Bascietto	CREA-IT Monterotondo
SPRING (Sustainable Processes and Resources for Innovation and National Growth)	Construction of shared supply chains and projects for the development and implementation of bio-based projects and processes for the creation of final products with high added value	D. Pochi	CREA-IT Monterotondo
Member of the Technical-Scientific Group (TSO) of the CREA integrated defence group	Activation of the national quality system of integrated production	D. Rongai	CREA-IT Pescara
MIPAAF - G.U. Serie generale n. 234 del 05/10/2004	Verification of the compliance of the Test Centers with the principles of good practices for carrying out field tests aimed at registering plant protection products	D. Rongai	CREA-IT Pescara

4.CREA RESEARCH LINES -Food Nutrition and Food waste

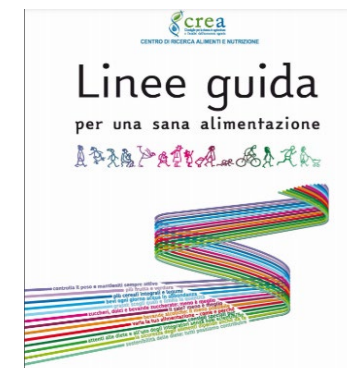
According to the Agenda 2030 priorities, CREA develops research, activities, expertise and initiatives aimed at safeguarding human health, within the development of models of healthy, nutritious and sustainable diets innovation in food quality and safety, introducing also tools and methodologies of waste bio-refinery, and food waste reduction. This latter area of research is aimed at lowering the environmental footprint of biomass waste derived from the main food chain agricultural production systems. Food and human nutrition security in long term call for a deep transition from the present unsustainable production systems towards the unique goal of the "One Health" paradigm, which includes human nutrition and health, food security and sustainability.

The research activity on food quality aims at evaluating and improving the nutritional and organoleptic quality of food, as well as its safety. All steps of the food supply chain are analyzed in a farm-to-fork approach. Traditional food and foodstuff with quality labels (e.g., PDO, PGI, TSG, etc.) are characterized to valorize and promote the excellence of the national agro-food production, with a special focus on the organic farming system. Quality markers for the identification of farming system, breeding, processing and storage are investigated. Food chain by-products and food waste are also studied as source of functional molecules and bioactive compounds.

RESEARCH TARGETS:

- Bringing new knowledge to nutritional and organoleptic quality (molecular and sensory), safety and health-promoting aspects of food, so as to provide consumers with tools enabling informed choices in line with nutritional recommendations;
- Providing stakeholders and SMEs in the optimization of production processes and in the choice of processing and preservation technologies for improvement of food products and process sustainability, also through the recovery and use of by-products and food wastes.
- Contributing to the development of new agro-food systems to safeguard crop biodiversity and to the promotion of food and diet sustainability.
- Development of innovative production systems for value chains;
- Supporting policy makers and stakeholders in the development and valorization of national food production systems.

Research on human nutrition analyzes the interaction between lifestyle, physical activity and human health, in order to understand the complex association between dietary patterns and non-communicable disease risk. Special attention is paid to the physiological aspects and the molecular mechanisms related to prevention of non-communicable diseases and to the maintenance of the health status. Population and intervention studies are targeted to all age: children, adults, elderly people. Studies on animal and cellular models are also performed, with experimental methodologies that combine biochemical, microbiological, metagenomics and molecular techniques. Population studies include national food consumption surveys aimed at collecting data about the adequacy of the diet in terms of energy and nutrient intake, exposure to chemical substances and environmental footprint. These studies allow to focus on aspects of food consumption which may also explain consumers' food choices. Population-based data are used as a reference for formulating food policy guidelines for healthier lifestyles, and the setup of consensus documents, e.g. dietary guidelines, also in the frame of chronic disease prevention.



RESEARCH TARGETS:

- Understanding the relationship between nutrition, nutritional status and health.
- Identifying molecular biomarkers (metabolic, molecular, microbiological, metagenomics, genomic, genetic, epigenetic and clinical) associated with diet, health status and lifestyle.
- Identifying the physiological, biochemical, metabolic and molecular mechanisms by which the different components of the diet act at level of cells, tissue and organism;
- Evaluating population-based food consumption data, with a focus on children, adolescents, pregnant women, etc., so that the nutritional risk assessment can produce accurate and reliable results, as well as food consumption impact and food waste.
- Investigating the drivers for consumers' food choices also through the development of new methodologies for the analysis of sensory perceptions.
- Developing food education campaigns targeted specifically at children, adults and elderly people.
- Management of national food databanks (Food Composition Database have been regularly updated since 1939; Food Consumption Surveys; Observatory for Food Waste);
- Preventing the increase of physio-pathological conditions associated with wrong food choices and lifestyles, providing recommendations on the nutritional adequacy of the diet, in terms of energy and nutrient requirements, according to the goals of Agenda 2030.

4.1. Research and research products-Food Nutrition and Food Waste

ACRONYMS AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND RESEARCH CENTRES	PARTNERSHIP/ FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹
Veggie-MED-CHEESES Valorisation of thistle-curdled CHEESES in MEDiterranean marginal areas	Studying and optimizing the existing processing technologies in cheese making in order to: (i) valorise traditional and typical local cheeses by meeting the world-wide increase demand of cheeses made by non-animal rennet; (ii) assess the technological and socio-economic viability of the utilization and valorisation of the Mediterranean thistles as traditional alternatives to the animal rennet; (iii) build upon traditional knowledge and culinary heritage while establishing the conditions for sustainability, food safety and better control of the quality of these traditional cheeses; (iv) improve the traditional cheese-making value chain	P.MANZI CREA-AN	Consortium Agreement between the Italian parties (UNIVPM (Coordinator) and CREA AN) and the other Member States (Spain - UCAM; Greece - DEMETER; Tunisia ISA-CM) / PRIMA 2018 Program - Funding body: Ministry of University and Research (MUR)		i) web page of the project https://veggiedcheeses.com/ ; ii) "Valorisation of thistle-curdled CHEESES in MEDiterranean marginal areas" General meeting (04/11/2021)
METROFOOD-PP METROFOOD-RI Preparatory Phase Project	Develop the organisational, operational and strategic framework of METROFOOD-RI, which is a new distributed research infrastructure aimed at providing high-quality services in support to the agrifood sector with specific reference to food quality and safety.	M. MASCI CREA-AN CREA-CI CREA-GB CREA-IT	Belgium, Switzerland, Czech Republic, Germany, Spain, Finland, France, Greece, Hungary, Moldova, Macedonia, Holland, Norway, Portugal, Romania, Slovenia, Turkey / European Commission	Navigato T.; Masci M.; Caproni R. (2021) <i>Molecules</i> , 26, 16, DOI: 10.3390/molecules26165015	i) web page of the project: https://www.metrofood.eu/ ; ii) paper in repository: Navigato T.; Masci M.; Turrini A.; Zoani C.; Caproni R. (2021). DOI: 10.5281/zenodo.4425583

¹ prototypes; dissemination activities (conferences, seminars, reports, sites and videos, etc.); training activities (scholarships, research grants and PhD scholarships)

ACRONYMS AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND RESEARCH CENTRES	PARTNERSHIP/ FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹
EXCORNSEED - Separation, fractionation and isolation of biologically active natural substances from corn oil	Increase the value of industrial co-streams by developing eco-efficient processing solutions for enriching intermediate fractions with bioactive compounds and proteins. Develop technologies to recover proteins and bioactive components from industry side streams into ingredients for high value products.	G. DI LENA CREA-AN	Italia, Slovakia, Belgium, Germany, Spain, Holland, Romania/European Commission	Di Lena, G., Sanchez Del Pulgar, J.S., Lucarini, M., Durazzo, A., Ondrejčková, P., Oancea, F., Frinchi, R.-M., Aguzzi, A., Nicoli, S.F., Casini, I., Gabrielli, P., Caproni, R., Červeň, I., Lombardi-Boccia, G. 2021. Valorization potentials of rapeseed meal in biorefinery perspective: Focus on nutritional and bioactive components. <i>Molecules</i> , 26 (22), art. n. 6787. DOI: 10.3390/molecules26226787 Benedetti, B., Sanchez Del Pulgar, J., Di Lena, G., Lombardi-Boccia, G. 2021. Simultaneous analysis of 21 bioactive compounds in biorefinery oil: Multivariate optimization of a method based on liquid chromatography, atmospheric pressure chemical ionization and tandem mass spectrometry. <i>Microchemical Journal</i> , 170, art. n. 106761, DOI: 10.1016/j.microc.2021.106761	Project website: www.excornseed.eu Dissemination products: Newsletters, Video, Technical report deliverables available at project's website and at https://cordis.europa.eu/project/id/792054
DIPRIMAO - Productive diversification of aquaculture plants in association with holothurians	Productive diversification of mollusk culture plant Technical evaluation of an integrated multitrophic aquaculture system. Quality of products.	G. DI LENA CREA-AN	ITTIMAR, Università Tor Vergata, AGEI coop. soc./ FEAMP Regione Puglia		Conference, dissemination brochure of the Project Participation to 52 nd Conference SIDEA. Agricoltura e Società tra mercato, innovazione e ambiente: le nuove frontiere e analisi dell'impresa agro-alimentare. Bologna 17 settembre 2021 . Oral session 4 - Sustainability in the Italian agrifood sector: from production to reduction of waste. Oral presentation (G. DI LENA).

ACRONYMS AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND RESEARCH CENTRES	PARTNERSHIP/ FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹
ProOrg. Code of Practice for organic food processing	Develop a Code of Conduct directed to organic food processors and certification bodies with the aim of providing a set of strategies and tools that can help them make the best choices of accurate processing methods and formulations, free of additives, while ensuring compliance with organic principles, high product quality, low environmental impact and a high consumer acceptance.	F.PAOLETTI CREA-AN	Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria Università Politecnica delle Marche Associazione Nazionale delle Imprese di Trasformazione e Distribuzione di prodotti Biologici e naturali University of Copenhagen Wageningen University, Department Agrotechnology and Food Sciences Thuenen Institut FH Münster University of Applied Sciences Assoziation Ökologischer Lebensmittelhersteller Warsaw University of Life Sciences Forschungsinstitut für biologischen Landbau The French Network of Food Technology Institutes Institut National de recherche pour l'agriculture, l'alimentation et l'environnement Institut Technique de l'Agriculture Biologique Hungarian Research Institute of Organic Agriculture University of Kassel 4)	- IFOAM, Organics International (Ed.) (2021) Book of Abstracts: Organic World Congress 2021. Proceedings of Organic World Congress 2021, Rennes, France, September 8-10, 2021 - Beck, Alexander; Kretzschmar, Ursula; Paoletti Flavio and Vidal, Rodolphe (2021) Assessment Criteria for Processing Technologies Based on EU Regulation 2018/848. AöL e. V., CREA, FiBL, IT	CREA, Italy (Ed.) (2021) Oral presentations of ProOrg. Proceedings of SANA 2021 - 33rd international exhibition of organic and natural products, Bologna, Italy, 09-12 September 2021. Paoletti, Flavio (2021) CORE Organic Cofund Project: Code of Practice for organic food processing - ProOrg. Workshop at: BioFach 2021, Nurnberg, 18/02/2021 "Trasformazione dei prodotti bio. Le buone pratiche da conoscere. Contribution to Terra&Vita magazine. Published in April 2021. https://www.proorgproject.com/_files/ugd/88a346_51652d48af1b441ea6b48f441ea80339.pdf (F.Paoletti)

ACRONYMS AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND RESEARCH CENTRES	PARTNERSHIP/ FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹
LPS-MG Attività legante dell'argilla Mastersorb gold al lipopolisaccaride (LPS) in cellule intestinali	Investigate the binding activity to LPS of the clay and evaluate the possible protective and anti-inflammatory activity of this substance in an in vitro model of intestinal cells	M.ROSELLI CREA-AN	EW Nutrition GmbH		Proceedings of the Australian Poultry Science Symposium Volume 32 2021, p 24. Roselli M., Caballero M.C., Tran S.T. Guantario B., Finamore A. The mitigation of LPS-stimulated immune response in IPEC-J2 cells by an anti-mycotoxin product.
MICROFLUX Analisi dei flussi microbici implicati nell'interazione tra microbiomi ambientali e intestinali (Knowledge Platform (KP) on food, diet, intestinal microbiomics and human health HDHL INTIMIC, EoI 795)	Analysis of the impact of foodborne microbes on human gut microbiota	C.DEVIRGILIIS CREA-AN	- Ministero delle Politiche Agricole, Alimentari e Forestali - Dipartimento delle politiche europee ed internazionali e dello sviluppo rurale - Direzione generale dello sviluppo rurale - DISR 4 - Ricerca e sperimentazione - Commissione europea	Roselli Marianna; Natella Fausta; Zinno Paolo; Guantario Barbara; Canali Raffaella; Schifano Emily; De Angelis Maria; Nikoloudaki Olga; Gobetti Marco; Perozzi Giuditta; Devirgiliis Chiara (2021). Colonization Ability and Impact of Human Gut Microbiota of Foodborne Microbes From Traditional or Probiotic-Added Fermented Foods: A Systematic Review.. Frontiers in Nutrition, N.volume 8, DOI 10.3389/fnut.2021.689084.	- Abstracts Devirgiliis Chiara; Roselli Marianna; Natella Fausta; Zinno Paola; Guantario Barbara; Canali Raffaella; Schifano Emily; Perozzi Giuditta (2021). ANALYSIS OF THE IMPACT ON HUMAN GUT MICROBIOTA AND OF COLONIZATION ABILITY OF PROBIOTIC MICROBES FROM FERMENTED FOODS THROUGH A SYSTEMATIC APPROACH; 1 fellowship
Ham2016-01 Evaluation of Hamamelis extract bioavailability and its effects on gene expression	Valorization of a medicinal plant through the study of the bioavailability of the phenolic compounds and of the effects of metabolites on the molecular pathways involved in skin regeneration processes.	R.CANALI CREA-AN		Fausta Natella; Barbara Guantario; Robert Ambra; Giulia Ranaldi; Federica Intorre; Carolina Burki; Raffaella Canali (2021). Human Metabolites of Hamaforton™ (Hamamelis virginiana L. Extract) Modulates Fibroblast Extracellular Matrix Components in Response to UV-A Irradiation. Frontiers in Pharmacology, N.volume 12, DOI 10.3389/fphar.2021.747638.	

ACRONYMS AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND RESEARCH CENTRES	PARTNERSHIP/ FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹
NutriSUSFood-JPI-HDHL relativo a "Knowledge Hub" Europeo SYSTEMI	Nutritional characterization of new varieties of food sources resilient to climate change and the development of new balanced food consumption models both based on the coverage nutrient recommendation and low environmental impact in terms of greenhouse gas emissions (GHGE)	M.FERRARI CREA-AN	M. Ferrari, CREAAAN CREA-CI, CREAGB CREA-PB Funding MIPAAF	Rossi L, Ferrari M, Martone D, Benvenuti L, D Santis A. The Promotions of Sustainable Lunch Meals in School Feeding Programs: The Case of Italy. <i>Nutrients</i> . 2021 May 7;13(5):1571. doi: 10.3390/nu13051571; Losa A, Vorster J, Cominelli E, Sparvoli F, Paolo D, Sala T, Ferrari M, Carbonari M, Marconi S, Camilli E, Reboul E, Waswa B, Ekes B, Aragão F, Kunert, K Drought and heat affect common bean minerals and human diet—What we know and where to go. <i>Food Energy Security</i> . 2021.	Webinar "'Which diet can help to reduce climate change? an analysis of the Italian food consumption model'", NUTRIM 2021
Sapermanglare .mobi (website and facebook page)	Provide scientifically valid and up-to-date information (based on the Guidelines for healthy eating, available in text and video on the website) and practical tools for the self-management of proper nutrition.	L.GENNARO CREA-AN			On the website there are interactive services, able to provide answers to the most frequently asked questions, and personalized information based on food composition tables. Furthermore, a real tutor checks the weekly diary of food consumption entered by users, sending a comment and personalized advices via email. The Facebook page allows to organize events, to answer specific questions, to share interesting information.
COLTIVA 5. APPUNTAMENTO A CAMPO... 5 COLORI. ALLA DIFESA DI FRUTTA E VERDURA	It's an original game that can be transformed into an educational laboratory. Teams / farmers have to explore strategies and collaborations to cultivate, exchange and collect five different colored fruit and vegetable. Unexpected cards will hinder (or facilitate) the rounds seasons for players who are not sufficiently careful or lucky in obtaining adequate protection (for example greenhouse cards or methods of fighting parasites). Winners will not only be those who obtain the most crops, but also those who collaborate with others to protect everyone's field.	L. GENNARO CREA-AN CREA-OFA CREA-OF			The game mechanism, with its regulations, was deposited with the SIAE as an unpublished work, pursuant to Article 67 letter b of the SIAE regulations. The deposit, marked with number 2021/02465 in the repertoire, runs from 10/19/2021, expiring 10/19/2026
MYO-INOSITOLO Evaluation of the aromatase activity of D-chiro-Inositol and Myo-Inositol in different in vitro cell models.	Study of the effects of D-chiro-Inositol and Myo-Inositol on mRNA modulation and enzymatic activity of aromatase in different cell models	R. COMITATO CREA-AN	Lo.Li Pharma		

ACRONYMS AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND RESEARCH CENTRES	PARTNERSHIP/ FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹
FENNEL4MED Innovative sustainable organic sea fennel (Crithmum maritimum L.) - based cropping systems to boost agrobiodiversity, profitability, circularity, and resilience to climate changes in Mediterranean small farms	The main objective of SEA FENNEL4MED is the introduction of new sustainable organic sea fennel (Crithmum maritimum L.)-based cropping systems, able to cope with limited resources (fresh waters/fertile soils), environmental constraints (biodiversity loss, chemical pollution) and climate-related risks (soil salinization, water drought) for the enhancement of food production stability over time and increase of farmers' incomes	A.RAFFO CREA-AN	Università Politecnica delle Marche (Italy) UNIVERSITY OF SPLIT (Croatia) INSTITUTE FOR ADRIATIC CROPS AND KARST RECLAMATION (Croatia) UNIVERSITÉ DE BRETAGNE OCCIDENTALE (France) INSTITUT NATIONAL DE RECHERCHE EN GÉNIE RURAL ET FORÊTS (Tunisie) UNIVERSITY OF EGE (Turkey) MUR (PRIMA Foundation 2020 Call)		
PRO-FORNO Design cereal products with high nutritional and safety properties for the promotion of the Lazio's cereal supply chain	Design new bakery products naturally enriched in folate with a very low FOD- MAPS content and very low acrylamide levels ; promoting some particular cereal cultivar from Lazio Region; improving nutritional status of some population group	S.RUGGERI CREA-AN	Campus Biomedico University of Rome- Project Funded by Regione Lazio- Lazio Innovation (19/07/2020- GO8487)		
POMOFONDI Certified Quality of Mini San Marzano cultivars in relationship to environmental sustainability and nutritional quality	Improving sustainability of mini San Marzano cultivation reducing water and energy consumption and improving nutritional value of the products	S.RUGGERI CREA-AN	CREA IT (PAGANO M) - Funded by Lazio Region		kick-off meeting;; webinar: video on CREA canal youtube

ACRONYMS AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND RESEARCH CENTRES	PARTNERSHIP/ FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS ¹
EPI1000 Implementation of training course and communication about the importance of the first 1000 days of life"	Improving the awareness and the knowledge about the importance of healthy eating habits and good life style in the first 1000 days of life	S.RUGGERI CREA-AN	Ospedale pediatrico Bambino Gesù - Azienda Ospedaliera UNIVERSITÀ - funded by Ministry of Health	<p>publications: Montagnoli, C., Zancanato, G., Ruggeri, S., Cinelli, G., & Tozzi, A. E. (2021). Restructuring maternal services during the covid-19 pandemic: Early results of a scoping review for non-infected women. Midwifery, 94, DO 102916.10.1016/j.midw.2020.102916</p> <p>Montagnoli, C., Ruggeri, S., Cinelli, G., Tozzi, A. E., Bovo, C., Bortolus, R., & Zancanato, G. (2021). Anything new about paternal contribution to reproductive outcomes? A review of the evidence. World Journal of Men's Health, 39(4), 626. DOI: 10.5534/WJMH.200147</p> <p>Montagnoli, C., Zancanato, G., Cinelli, G., Tozzi, A. E., Bovo, C., Bortolus, R., & Ruggeri, S. (2020). Maternal mental health and reproductive outcomes: a scoping review of the current literature. Archives of gynecology and obstetrics, 302(4), 801-819. DOI: 10.1007/s00404-020-05685-1</p> <p>Buzzi T., Filippini F., Zancanato G., Ruggeri S., Parazzini F., Bortolus R. (2019). Maternal feeding and reproductive outcomes. Medico Bambino, 38(3), 170-176. ISSN 15913090</p>	Facebook and Youtube live (Three webinars) "The Wonders of Epigenetics. The first 1000 days: important days for our health". FAD COURSE for healthcare workers: "Promotion of health in the first 1000 days of life " (from 2019 to 2021)

4.2 Patents and Services - Food, Nutrition and Food Waste

Patents (Industrial Patents)

MAIN TOPICS	DENOMINATION/DESCRIPTION	AUTHORS/INVENTORS	CREA RESEARCH CENTER
Food composition	Method for measuring antioxidant capacity (IT).	E. Finotti, F.Nobili	CREA-AN

Services

Collections and Data Banks

MAIN TOPICS	DENOMINATION/DESCRIPTION	PERSONE IN CHARGE	CREA RESEARCH CENTER
<u>Data Banks</u>			
FOOD/QUALITY AND FUNCTIONALITY	Implementation of of Dietary Supplement Label Database in Italy	A.Durazzo	CREA-AN
FOOD/QUALITY AND FUNCTIONALITY	Compiler eBASIS (Bioactive Substances in Food Information Systems) Databases, EuroFIR AISBL: Value documentation and compilation of Input Forms for bioactive compounds (polyphenols, lignans, carotenoids) on a regular basis.	A.Durazzo	CREA-AN
FOOD/QUALITY AND FUNCTIONALITY	Database on Nutritional Composition of Meat-based Italian Traditional Recipes	M.Lucarini	CREA-AN
FOOD/QUALITY AND FUNCTIONALITY	Italian Deli meat Database	Lombardi-Boccia G., M.Lucarini	CREA-AN
FOOD/QUALITY AND FUNCTIONALITY	Folate Content Database of Italian Food		CREA-AN
CONSUMER, FOOD EDUCATION, CONSULTANCY	Databases system to estimate food consumption models. The information system includes individual food consumption and databases that can be used for nutritional quality- home portions and measurement units, photographic atlas, standard recipes, linkage with food composition data, linkage with contaminant occurrence data and other undesirable substances carried by foods, and with environmental indicators databases - the coding system and all processing procedures.	G. Catasta, F. Javier Comendador, L.D'Addezio, M. Ferrari, C. Le Donne, D. Martone, L. Mistura, R. Piccinelli, S. Sette	CREA-AN
CONSUMER, FOOD EDUCATION, CONSULTANCY	Database of environmental impact indicators such as carbon footprints and water footprints linked to the database on food consumption INRAN SCAI 2005-2008 (available after licensing the use of the "FOODCONS" software)	S. Marconi, E. Camilli	CREA-AN
CONSUMER, FOOD EDUCATION, CONSULTANCY	Database of Italian Food Composition: Development and management of a relational and structured database consists of 900 foods and 129 nutrients. Each food and nutrient value is accompanied by specific documentation of the method, the bibliographic reference, the descriptors of the data. In addition, for each recipe (≈ 55) the ingredients, the preparation protocol, the cooking method and the variation in weight have been stored	L.Rossi	CREA-AN
CONSUMER, FOOD EDUCATION, CONSULTANCY	Individual and aggregate databases, set from primary data collections carried out in projects on population studies from 1999 onwards, in different areas in Italy with validated and standardized methodologies, and related to anthropometric data (nutritional status and body composition); eating habits; adherence to the Mediterranean Diet, lifestyle, physical activity and sedentary, blood pressure, socio-economic aspects and the living environment, concerning adulthood (including fertile age and pregnancy) and childhood.	M.Ferrari	CREA-AN
CONSUMER, FOOD EDUCATION, CONSULTANCY	Creation of a database (national surveillance system) on food waste, eating habits, adherence to the Mediterranean diet of the Italian population	L.Censi , S. Ruggeri, R. Roccaldo, M. Galfo	CREA-AN
<u>Collections</u>			
Collection of arbuscular mycorrhizal fungi and raw inocula (Pre-commercial biostimulants)	The collection begins in 2019, partly self-financed by the referent, to reconstitute arbuscular mycorrhizal fungal strains, actually no longer available, as those that had been isolated between 1994-1999 that were part of the "COLMIA" collection at CREA Agriculture and Environment Center of Rome . The fungal strains of this type of collection are obligate symbionts and must necessarily be grown with their host plant. The current collection consists of several strains of diverse	M. Bragaloni, L. Riccioni	CREA AN, CREA-DC

MAIN TOPICS	DENOMINATION/DESCRIPTION	PERSONE IN CHARGE	CREA RESEARCH CENTER
	species and "pre-commercial" biostimulating raw inocula at the III and IV generation stage of multiplication and selection on clover and zucchini. The collection is a tool for study and applied research in organic farming and for obtaining sustainable food and products.		
Collection of fungal strains isolated in pure culture from mushrooms of agri-food interest	In 2021 a mycotheca was established with various fungal strains isolated from mushrooms of agri-food interest. The fungal strains of the mycotheca are kept in pure culture at the Food and Nutrition Research Center.	M. Bragaloni	CREA AN
cell collections	Eucariotic cell line: Caco-2 (intestinal epithelial cell line derived from human adenocarcinoma); T84 (intestinal epithelial cell derived from human colon luminal metastasis); RIN-38 (pancreatic beta cell line derived from rat insulinoma); HepaRG (hepatic cell line derived from human hepatoma); HepaRG (hepatic cell line derived from human hepatoma); HT29_MTX (goblet intestinal cell subcloned in Methotrexate from the parental human colon carcinoma HT29 cell line); HT29 18 C1 Clone (differentiated epithelial intestinal cells subcloned from the parental human adenocarcinoma HT29 cell line); HT29 18 N2 clone (goblet intestinal cell subcloned from the parental human colon carcinoma HT29 cell line); MDCK (epithelial kidney cell derived from dog); MDCK-TRE (MDCK cell stably transfected with TRE, tetracycline responsive element, plasmid); MDCK TET-OFF (MDCK cell stably transfected with tet-off plasmid); MDCK-ZnT4 (MDCK cell stably transfected with TET-OFF+ ZnT4 zinc transporter plasmid); IPEC-J2 (intestinal porcine epithelial cell line isolated from neonatal piglet mid-jejunum); 3T3-L1 (mouse fibroblast cell line of embryonic origin); K562 (human erythroleukemic cell line); FRTL-5 (rat thyroid cell line); Hep-G2 (human hepatocyte carcinoma); HUVEC (human umbilical vein endothelial cells); U937 (human pro-monocytic from myeloid leukaemia); HaCaT (human epidermal keratinocyte); HDF (human primary dermal fibroblast); HeLa (human epitheloid cervix carcinoma); MCF-7 (human breast cancer cell. Estrogen dependent); MDA-MD-231 (human breast cancer cell. Estrogen independent); LiSa-2 (human liposarcoma); SGBS (human preadipocyte cell strain); COV 434 (human ovarian granulosa tumour cell line); NHDF (Normal Human Dermal Fibroblasts) Lonza; IEC6 (Rat intestinal epithelial cell-6)	Ferruzza S., Ranaldi G., M. Roselli, A. Finamore, B. Guantario, R. Canali., R. Comitato	CREA AN
strain collections	Lactic acid bacteria strains isolated from vegetables and dairy fermented foods	C. Devirgiliis, P. Zinno	CREA AN

Other scientific and technological infrastructures

MAIN TOPICS	DENOMINATION/DESCRIPTION	PERSONE IN CHARGE	CREA RESEARCH CENTER
FOOD/QUALITY AND FUNCTIONALITY	Experimental Kitchen	S.Marconi , G. Lombardi, Boccia, M.Lucarini	CREA-AN
NUTRITION AND NUTRITIONAL SUSTAINABILITY	animal care unit: evaluation of the effects of food, modification of the intestinal microbiota, immunological studies, metabolomics, obesity, inflammatory diseases	A.Finamore	CREA-AN
NUTRITION AND NUTRITIONAL SUSTAINABILITY	Biosecurity laboratory for cell and microorganism manipulation (BL2, BL3)	A.Polito	CREA-AN
NUTRITION AND NUTRITIONAL SUSTAINABILITY	Biosafety Laboratory of Radioisotopes	A.Polito	CREA-AN
NUTRITION AND NUTRITIONAL SUSTAINABILITY	Energy Metabolism Laboratory for the study of the relationship between diet, metabolism, energy needs and impact on human health	S. Ferruzza	CREA-AN
NUTRITION AND NUTRITIONAL SUSTAINABILITY	Indirect Calorimetric Chamber for the study of energy metabolism with a high level of precision and accuracy	R.Ambra	CREA-AN
CONSUMER, FOOD EDUCATION, CONSULTANCY	Sensory laboratory compliant with ISO 8589 including 14 sensory cabins and kitchen	F.Sinesio	CREA-AN
CONSUMER, FOOD EDUCATION, CONSULTANCY	Multimedia laboratory for immersive tests	E.Moneta	CREA-AN

Collection

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA RESEARCH CENTRE
Collection of arbuscular mycorrhizal fungi and raw inocula (Pre-commercial biostimulants)	The collection begins in 2019, partly self-financed by the referent, to reconstitute arbuscular mycorrhizal fungal strains, actually no longer available, as those that had been isolated between 1994-1999 that were part of the "COLMIA" collection at CREA Agriculture and Environment Center of Rome. The fungal strains of this type of collection are obligate symbionts and must necessarily be grown with their host plant. The current collection consists of several strains of diverse species and "pre-commercial" biostimulating raw inocula at the III and IV generation stage of multiplication and selection on clover and zucchini. The collection is a tool for study and applied research in organic farming and for obtaining sustainable food and products.	M. Bragaloni, L. Riccioni	CREA-AN CREA-DC
Collection of fungal strains isolated in pure culture from mushrooms of agri-food interest	In 2021 a mycotheca was established with various fungal strains isolated from mushrooms of agri-food interest. The fungal strains of the mycotheca are kept in pure culture at the Food and Nutrition Research Center.	M. Bragaloni	CREA-AN
Cell collections	Eucariotic cell line: Caco-2 (intestinal epithelial cell line derived from human adenocarcinoma); T84 (intestinal epithelial cell derived from human colon lung metastasis); RIN-38 (pancreatic beta cell line derived from rat insulinoma); HepaRG (hepatic cell line derived from human hepatoma); HepaRG (hepatic cell line derived from human hepatoma); HT29_MTX (goblet intestinal cell subcloned in Methotrexate from the parental human colon carcinoma HT29 cell line); HT29-116 (goblet intestinal cell subcloned from the parental human colon carcinoma HT29 cell line); HT29 18 N2 clone (goblet intestinal cell subcloned from the parental human colon carcinoma HT29 cell line); MDCK (epithelial kidney cell derived from dog); MDCK-TRE (MDCK cell stably transfected with TRE, tetracycline responsive element, plasmid); MDCK TET-OFF (MDCK cell stably transfected with tet-off plasmid); MDCK-ZnT4 (MDCK cell stably transfected with TET-OFF+ ZnT4 zinc transporter plasmid); IPEC-J2 (intestinal porcine epithelial cell line isolated from neonatal piglet mid-jejunum); 3T3-L1 (mouse fibroblast cell line of embryonic origin); K562 (human erythroleukemic cell line); FRTL-5 (rat thyroid cell line); Hep-G2 (human hepatocyte carcinoma); HUVEC (human umbilical vein endothelial cells); U937 (human pro-monocytic from myeloid leukaemia); HaCaT (human epidermal keratinocyte); HDF (human primary dermal fibroblast); HeLa (human epitheloid cervix carcinoma); MCF-7 (human breast cancer cell. Estrogen dependent); MDA-MD-231 (human breast cancer cell. Estrogen independent); LiSa 2 (human liposarcoma); SGBS (human preadipocyte cell strain); COV 434 (human ovarian granulosa tumour cell line); NHDF (Normal Human Dermal Fibroblasts Lonza); IEC6 (Rat intestinal epithelial cell-6)	S. Ferruzza, G. Ranaldi, M. Roselli, A. Finamore, B. Guantario, R. Canali, R. Comitato	CREA-AN
Strain collections	Lactic acid bacteria strains isolated from vegetables and dairy fermented foods	C. Devirgiliis, P. Zinno	CREA-AN

Databanks

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA RESEARCH CENTRE
Food/Quality and Funtionality	Implementation of of Dietary Supplement Label Database in Italy	A. Durazzo	CREA-AN
Food/Quality and Funtionality	Compiler eBASIS (Bioactive Substances in Food Information Systems) Databases, EuroFIR AISBL: Value documentation and compilation of Input Forms for bioactive compounds (polyphenols, lignans, carotenoids) on a regular basis.	A. Durazzo	CREA-AN
Food/Quality and Funtionality	Database on Nutritional Composition of Meat-based Italian Traditional Recipes	G. Lombardi-Boccia, M. Lucarini	CREA-AN
Food/Quality and Funtionality	Italian Deli meat Database	M. Lucarini	CREA-AN
Food/Quality and Funtionality	Folate Content Database of Italian Food	S. Ruggeri	CREA-AN
Consumer, Food Education, Consultancy	Databases system to estimate food consumption models. The information system includes individual food consumption and databases that can be used for nutritional quality- home portions and measurement units, photographic atlas, standard recipes, linkage with food composition data, linkage with contaminant occurrence data and other undesirable substances carried by foods, and with environmental indicators databases - the coding system and all processing procedures.	G. Catasta, F. Javier Comendador, L. D'Addezio, M. Ferrari, C. Le Donne, D. Martone, L. Mistura, R. Piccinelli, S. Sette	CREA-AN
Consumer, Food Education, Consultancy	Database of environmental impact indicators such as carbon footprints and water footprints linked to the database on food consumption INRAN SCAI 2005-2006 (available after licensing the use of the "FOODCONS" software)	M. Ferrari	CREA-AN
Consumer, Food Education, Consultancy	Database of Italian Food Composition: Development and management of a relational and structured database consists of 900 foods and 129 nutrients. Each food and nutrient value is accompanied by specific documentation of the method, the bibliographic reference, the descriptors of the data. In addition, for each recipe (> 55) the ingredients, the preparation protocol, the cooking method and the variation in weight have been stored	E. Camilli, S. Marconi	CREA-AN
Consumer, Food Education, Consultancy	Individual and aggregate databases, set from primary data collections carried out in projects on population studies from 1999 onwards, in different areas in Italy with validated and standardized methodologies, and related to anthropometric data (nutritional status and body composition); eating habits; adherence to the Mediterranean Diet, lifestyle, physical activity and sedentary, blood pressure, socio-economic aspects and the living environment, concerning adulthood (including fertile age and pregnancy) and childhood.	L. Censi, S. Ruggeri, R. Roccaldo, M. Galfo	CREA-AN
Consumer, Food Education, Consultancy	Creation of a database (national surveillance system) on food waste, eating habits, adherence to the Mediterranean diet of the Italian population	L. Rossi	CREA-AN

Other science and technology infrastructure

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA RESEARCH CENTRE
Food/Quality and Functionality	Experimental Kitchen	S. Marconi, G. Lombardi-Boccia, M. Lucarini	CREA-AN
Nutrition and Sustainability	animal care unit evaluation of the effects of food, modification of the intestinal microbiota, immunological studies, metabolomics, obesity, inflammatory diseases	A. Finamore	CREA-AN
Nutrition and Sustainability	Biosecurity laboratory for cell and microorganism manipulation (BL2, BL3)	S. Ferruzza	CREA-AN
Nutrition and Sustainability	Biosafety Laboratory of Radioisotopes	R. Ambra	CREA-AN
Nutrition and Sustainability	Energy Metabolism Laboratory for the study of the relationship between diet, metabolism, energy needs and impact on human health	A. Polito	CREA-AN
Nutrition and Sustainability	Indirect Calorimetric Chamber for the study of energy metabolism with a high level of precision and accuracy	A. Polito	CREA-AN
Consumer, Food Education, Consultancy	Sensory laboratory compliant with ISO 8589 including 14 sensory cabins and kitchen	F. Sinesio	CREA-AN
Consumer, Food Education, Consultancy	Multimedia laboratory for immersive tests	E. Moneta	CREA-AN

Working tables / working groups / institutional partnerships / Centre journals / Editorial Board of Journals

Communication services

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA RESEARCH CENTRE
Food/Quality and Functionality	Event "ITALIAN FOOD DESIGN, Re-design italian food from a sustainability perspective"	S. Ruggeri, T. Amoriello, I. Baiamonte, C. Giannetti, N. Nardo, V. Narducci, M. Ritota, V. Turfani, M. Conterio	CREA-AN, CREA AC
Food/Quality and Functionality	FrascatiScienza – European Researchers' Night. Webinar "Let's give a new life to fruit and vegetable waste"	T. Amoriello, R. Ciccoritti, D. Ceccarelli	CREA-AN, CREA OFA
Food/Quality and Functionality	Webinar "Bioactive molecules, food and databases"	A. Durazzo	CREA-AN
Food/Quality and Functionality	Webinar on "Promotion of biodiversity and sustainability for the olive food chain in the Sonnino area"	A. Durazzo, M. Lucarini	CREA-AN
Food/Quality and Functionality	Webinar on "New inputs for the the promotion of biodiversity in the Valle del Sacco area"	A. Durazzo, M. Lucarini	CREA-AN
Food/Quality and Functionality	Webinar on "Valorisation of agri-food waste: challenges and opportunities"	M. Lucarini	CREA-AN
Food/Quality and Functionality	Webinar "Sustainable development, circular economy and new interconnections among value-chains"	G. Di Lena	CREA-AN
Nutrition and Sustainability	Event "BUONO: Italian Stories of agriculture, lands and sustainable food" - 3- 5 June Rome https://buono.makerfairerome.eu/session/buono-frigo-apriamo-a-sorpresa-il-frigorifero-di/	S. Ruggeri	CREA-AN
Nutrition and Sustainability	Event "Food and Innovation" in the International Years of Fruit & Vegetables " In International Food Journalism Festival 2021	S. Ruggeri	CREA-AN
Nutrition and Sustainability	Event "Mediterranean Sustainable Menu" - 7 december 2021- Reggia di Caserta	S. Ruggeri	CREA-AN
Consumer, Food Education, Consultancy	Citynews s.r.l. Agreement 2020-2021: Scientific technical support to the CAP promotion activities within the Agrikids projects, to design competitions for children and cartoons, with TV appearances and interviews with Gambero Rosso, as requested in European calls for communication companies.	L. Gennaro	CREA AN, CREA OFA, CREA OF
Consumer, Food Education, Consultancy	Webinar CREA AN "Sustainability and optimization: an analysis of the Italian consumption model",	M. Ferrari	CREA-AN
Consumer, Food Education, Consultancy	Webinar ""Which diet can help to reduce climate change? an analysis of the Italian food consumption model""	M. Ferrari	CREA-AN
Consumer, Food Education, Consultancy	Frascati scienza - "Optimized dietary pattern for the achievement of nutritional and environmental goals"	M. Ferrari, L. Rossi	CREA-AN
Consumer, Food Education, Consultancy	Live seminar on the Facebook page of SaperMangiare "Knowing legumes": an opportunity to receive answers on how much, why and how to include these precious seeds in our diet. The participants of the "sapermangiare community" have proposed photo-recipes that include legumes as ingredients, and which can be suggestive and tempting even for children. In the live broadcast, the researchers of the Center commented on the recipes most appreciated by the public. The event was also posted in https://worldpulsesday.org/events/	L. Gennaro	CREA-AN
Consumer, Food Education, Consultancy	Frascati Scienza: "I cook when I want" -Researchers into the Kitchen - Show Cooking	S. Ruggeri, L. Cattivelli, C. Giannetti	CREA AN, CREA GB
Consumer, Food Education, Consultancy	"Mediterranean Sustainable Menu-" At Reggia di Caserta	S. Ruggeri	CREA-AN
Consumer, Food Education, Consultancy	Facebook and Youtube live (Three webinars) "The Wonders of Epigenetics. The first 1000 days: important days for our health" in the frame of EPI1000 project funded by Italian Ministry of Health	S. Ruggeri	CREA-AN
Consumer, Food Education, Consultancy	Event (live streaming) entitled "P.C.T.O. for a healthy and sustainable diet" - 24 September, 2021 - carried out in occasion of the European Researchers' Night LEA (heal the pAnet's FUTURE) with teachers and their students from three different high schools in Rome: Scientific high school "S. Cannizzaro"; Classical - Linguistic Scientific high school "Lucio Anneo Seneca", "Giuseppe Garibaldi" Agricultural Technical Institute, respectively.	M. Mattera	CREA-AN

Consumer, Food Education, Consultancy	Live streaming event: 3rd edition of the Procida Sud Festival – 15 July 2021, in Procida (Borgo Marina Di Chiaiolella). Discussion entitled "sustainable recipe" on local agri-food products and chemical-nutritional evaluation of 3 dishes prepared by the chef (Slow Food)	M. Mattera	CREA-AN
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Services various

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA RESEARCH CENTRE
Consumer, Food Education, Consultancy	Licensing to use food data management software (FOODCONS). Use of the software for estimating food consumption for operators in the education, health prevention and environmental sustainability sectors (FOODCONS - Food Consumption Database) for schools, health companies and private citizens.	R. Piccinelli	CREA-AN
Consumer, Food Education, Consultancy	Processing on request of data on food consumption and methodological support. On request, specific processing of data on food consumption collected with the surveys carried out by CREA is carried out, with the aim of having estimates relating to categories of food products, analysis of the diet in energy and nutrients also for population subgroups, exposure analysis to harmful agents conveyed by the diet, analysis of the environmental impact of the diet, joint analysis of the reasons for food choices and behavior and analysis for other categories of in-depth analysis.	S. Sette	CREA-AN
Consumer, Food Education, Consultancy	Development of AlimentiNUTrizione Portal, Section: Food Composition Tables (https://www.alimentinutrizione.it/sezioni/tabelle-nutrizionali) Management and updating of the Food Composition Tables that can be freely consulted through an easy-to-use interface. Users access the composition data form using the search system by food, category, nutrient and alphabetical order. The form is divided into two areas: one descriptive of the characteristics of the food, the other shows the values of the analyzed nutrients expressed both per 100g of edible part and per portion, furthermore each data is provided with a descriptor and a bibliographic reference. The menus: introduction, presentation of data, symbols and abbreviations, complete the picture of the information that direct users to a correct and informed use of the data.	S. Marconi, E. Camilli	CREA-AN
Consumer, Food Education, Consultancy	Nutritional labeling Consultancy for the creation of nutritional labeling of processed products and food preparations (recipes) for operators in the agro-food sector	S. Marconi, E. Camilli	CREA-AN

Activities for school

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA RESEARCH CENTRE
Food/Quality and Functionality	School project "Polyphenols characterization of wines from Valle di Comino" addressed to Istituto di istruzione Superiore Tulliano	M. Lucarini	CREA-AN
Nutrition and Nutritional Sustainability	Event for five High School Institutes " Let's enjoy life together" on the occasion of World eating Disorder Day 2021	S. Ruggeri	CREA-AN
Nutrition and Nutritional Sustainability	Webinar for students of the classes: 5th A Human Sciences and 5th A Social Economic Institute of the "Carlo Baudi di Vesme" MAGISTRAL INSTITUTE. "The Mediterranean diet and sustainability" 25.05.2022	A. Polito	CREA-AN
Consumer, Food Education, Consultancy	Food and nutrition education for all school levels. Organization of single or articulated meetings, face-to-face or virtual, on issues related to nutrition, aimed at pupils, their families and teachers. Structuring of videolessons and production of materials. Creation of educational play workshops for the promotion of a healthy lifestyle	L. Gennaro	CREA-AN
Consumer, Food Education, Consultancy	Game-based educational laboratory "Good for you, good for the planet?" at the Frascati Scienza Festival (European Researcher's Night 2021). The main topic of the proposed activity was the positive impact of consumption of fruit and vegetables in both "human and planet health". The activity was part of the "CREA supports the 2021 FAO International Year of Fruit and Vegetables" agreement. In an interactive physical activity game, the students are questioned not only on their knowledge of plant products, but also on issues such as biodiversity, reduction of greenhouse gas emissions, fight against food waste, etc... by interrogating themselves about their own food groups' consumption levels, compared to those advised by the Italian Food-based Dietary Guidelines.	S. Berni Canani	CREA-AN
Consumer, Food Education, Consultancy	Game-based educational laboratory "Grow 5. Appointment at the field ... 5 colors. In defense of fruit and vegetables!" at the International Genoa Science Festival 2021. The enrolled classes challenging each other in a game about correct and sustainable nutrition. They use their virtual fields to grow seasonal products, as varied as possible, while defending them against the specific pests of those crops, with the help of antagonistic insects, preventive agronomic practices and even "trained detective dogs". They can exchange their crops with teams of neighboring fields, learning the advantages of cooperation, to increase the variety of their own cultivation. The game is set up on a virtual platform. The activity is included among those by which CREA supports the 2021 FAO International Year of Fruit and Vegetables, but it is also in line with the sustainable production objectives, themes of the 2020 International Year of Plant Health.	L. Gennaro	CREA-AN
Consumer, Food Education, Consultancy	Distance educational learning activity carried out from November to December 2021 (26-30 November and 02 December) for 5 classes of students and teachers of Classical - Linguistic - Scientific high school "Lucio Anneo Seneca" in Rome - Via F. Albergotti, 35 - organized by CREA Research Centre for Food and Nutrition into an event entitled "CREA orientation towards a Sustainable Food System".	M. Mattera	CREA-AN
Consumer, Food Education, Consultancy	Launch of the "on the job trainings for the high school" - P.C.T.O. project, also known in Italy as "Alternanza Scuola Lavoro"	M. Mattera	CREA-AN
Consumer, Food Education, Consultancy	P.C.T.O. project, entitled "Instruction manual to build a healthy and sustainable food model among students" was proposed by CREA Research Centre for Food and Nutrition to teachers and their students and targeted to the Scientific high school "S. Cannizzaro" in Rome during the school year 2020/2021. It was carried out from January to June 2021.	M. Mattera	CREA-AN
Consumer, Food Education, Consultancy	P.C.T.O. project, entitled "Instruction manual to build a healthy and sustainable food model among students" was proposed by CREA Research Centre for Food and Nutrition to teachers and their students and targeted to the Classical - Linguistic - Scientific high school "Lucio Anneo Seneca" in Rome during the school year 2020/2021. It was carried out from January to May 2021.	Mattera	CREA-AN
Consumer, Food Education, Consultancy	P.C.T.O. project, entitled "Instruction manual to build a healthy and sustainable food model among students" was proposed by CREA Research Centre for Food and Nutrition to teachers and their students and targeted to the Agricultural Technical Institute "G. Garibaldi" in Rome during the school year 2020/2021. It was carried out from February to May 2021.	M. Mattera	CREA-AN
Consumer, Food Education, Consultancy	3 PCTO projects entitled "Instruction manual to build a healthy and sustainable food model among students" were proposed by CREA Research Centre for Food and Nutrition to teachers and their students during the school year 2021/2022 and they will be carried out from January to June 2022 in two different high schools in Rome: Scientific high school "S. Cannizzaro" and Classical - Linguistic - Scientific high school "Lucio Anneo Seneca" and also, in Terracina (LT) Scientific - Classical Human Science - high school "Leonardo da Vinci". In progress	M. Mattera	CREA-AN

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA RESEARCH CENTRE
Nutrition and Nutritional Sustainability	Assessment of nutritional status and body composition. Higher Education Institute Rome	A. Polito, D. Ciarapica	CREA-AN
Food/Quality and Functionality	External Reviewer of Research Thesis "Valorisation of brewing-derived waste by reuse in enriched fruit juices" for the "Food Science and Technology" graduate program, Department for Innovation in Biological, agro-food and Forestry systems (DIBAF) of the University of Tuscia	T. Amoriello	CREA-AN
Food/Quality and Functionality	Appointed teacher at the Tor Vergata University of Rome. Bachelor: Dietistic Science. Course title: "Food chemistry"	E. Azzini	CREA-AN
Nutrition and Nutritional Sustainability	Tutor of the student Marangi G. for Masters Degree in Pharmacy- University Sapienza (Rome)	E. Azzini	CREA-AN
Nutrition and Nutritional Sustainability	Appointed teacher at Sapienza University of Rome, Faculty of Medicine and Dentistry. Bachelor: Dietistic Science. Course title: "Nutritional biochemistry". (from academic years 2016/17)	R. Canali	CREA-AN
Nutrition and Nutritional Sustainability	Appointed teacher at Roma Tre University, Dept. of Sciences, Bachelor: Scienze e Culture Enogastronomiche. Course title: Molecular methods for food microbiological safety	C. Devirgiliis	CREA-AN
Nutrition and Nutritional Sustainability	Appointed teacher at Accademia dei Meccanismi Molecolari, lesson title "Fermented foods and consumer's health" (November 2021)	C. Devirgiliis	CREA-AN
Nutrition and Nutritional Sustainability	Seminars on "Food microbiota and identification methods, within the course "Molecular microbiology and microbial genomics e Genomica microbica", Bachelor Genomic Biotechnologies at Sapienza University of Rome (reference teacher prof. Bianca Colonna)	C. Devirgiliis	CREA-AN
Nutrition and Nutritional Sustainability	Seminars on "Food microbiota" within the course "Sistemi Modello e Applicazioni Industriali" Bachelor Biology and Cell Technologies at Sapienza University of Rome (reference teacher prof. Daniela Uccelletti)	C. Devirgiliis	CREA-AN
Nutrition and Nutritional Sustainability	Seminars on "Table olives and fermented vegetal products" within the course "Fermentation biotechnology" Bachelor Scienze e Culture Enogastronomiche at Roma Tre University (reference teacher Livia Leoni)	C. Devirgiliis	CREA-AN
Nutrition and Nutritional Sustainability	Tutor of Dr. Alberto Rebecchi for the preparation of a thesis entitled: "Bifidobacterium adolescentis as a "psychobiotic" candidate in major depressive disorders", to get the degree of Molecular Consultant from Accademia dei Meccanismi Molecolari (November 2021)	C. Devirgiliis	CREA-AN
Nutrition and Nutritional Sustainability	Tutor of the student Sara Arzano for the preparation of a thesis entitled: "Table olive microbiota and potential applications" to get the degree in Scienze e Culture Enogastronomiche at Roma Tre University (March 2021)	C. Devirgiliis	CREA-AN
Food/Quality and Functionality	Seminar on "Bioactives, Foods and Databases", within Course of Quality Control of Medicines of Bioanalytical Sciences, Spring Semester (2nd Semester, 2020-2021) (Prof. Eliana B. Souto), Faculty of Pharmacy of University of Coimbra, Portugal.	C. Devirgiliis	CREA-AN
Food/Quality and Functionality	Seminar on "Bioactive molecules, food and databases" within the Course "Principi di Ingegneria Biochimica" (Prof. Roberto Lavecchia), Corso di Laurea Magistrale in Ingegneria Chimica, Università di Roma "Sapienza"	C. Devirgiliis	CREA-AN
Food/Quality and Functionality	Seminar on "Dietary Supplements: coding systems and harmonization procedures" within the Course "Principi di Ingegneria Biochimica" (Prof. Roberto Lavecchia), Corso di Laurea Magistrale in Ingegneria Chimica, Università di Roma "Sapienza".	C. Devirgiliis	CREA-AN
Food/Quality and Functionality	Seminar on topic " BIOACTIVE MOLECULES, FOOD AND DATABASE" within PhD Programme Agricultural Production Chains – From Fork to Farm (AgriChains http://www.agrichains.utad.pt/), organized by University of Trás-os-Montes e Alto Douro (UTAD) and by University del Minho (UMinho) with partnership of University of Wageningen (WUR) and University Politecnica di València (UPV).	C. Devirgiliis	CREA-AN
Food/Quality and Functionality	Seminar on "BIOACTIVE MOLECULES, FOOD AND DATABASE" within the Course "Chimica delle Sostanze Organiche Naturali" (Prof. Roberta Bernini), Corso di Laurea Magistrale in Biotecnologie per la Qualità e la Sicurezza Agroalimentare, Dipartimento di Scienze Agrarie e Forestali, Università degli Studi della Toscana.	C. Devirgiliis	CREA-AN
Food/Quality and Functionality	Seminar on "Natural products and their applications in agronomic and environmental fields" within the Course "Chimica Organica ed Elementi di Chimica Generale" (Prof. Roberta Bernini), Corsi di Laurea Triennale in "Scienze Agrarie e Ambientali" (L-25) and "Scienze delle Foreste e della Natura" (L-25), Dipartimento di Scienze Agrarie e Forestali (DAFNE), Università degli Studi della Toscana.	C. Devirgiliis	CREA-AN

Food/Quality and Functionality	Video lesson on "Bioactive molecules, food and database" within the Course "Chimica delle Sostanze Organiche Naturali" (Prof. Roberta Bernini), Corso di Laurea Magistrale in Biotecnologie per la Qualità e la Sicurezza Agroalimentare, Dipartimento di Scienze Agrarie e Forestali, Università degli Studi della Toscana.	C. Devirgiliis	CREA-AN
Food/Quality and Functionality	Participation to organization of a 4 lessons module entitled "Emerging Directions for Healthy Nutrition: Focus on Bioactive Components in Food, Dietary Supplements and Alternative Sources", Corso di Laurea Magistrale in Scienze dell'Alimentazione e della Nutrizione Umana, Università di Palermo and participation as relators for lessons: "Bioactive components in foods: focus on databases" and "Coding systems and harmonization procedures: application on food, recipes and dietary supplements".	C. Devirgiliis	CREA-AN
Food/Quality and Functionality	Co-supervisor thesis in the field of Food Chemistry "Recovery and reuse of antioxidants from waste of vegetable matrices, in particular Vitis Vinifera and Lycopersicon Esculentum". Candidate Francesco Orazzo. Supervisor Prof. Dr. Antonello Santini. CORSO DI LAUREA IN TECNOLOGIE ALIMENTARI. UNIVERSITÀ DEGLI STUDI DI NAPOLI "FEDERICO II" DIPARTIMENTO DI AGRARIA	C. Devirgiliis	CREA-AN
Food/Quality and Functionality	Co-supervisor thesis in the field of Food Chemistry "Cold-pressed vegetable oils: a snapshot of the current state of research and the food industry". Candidate Carmela Livigni. Supervisor Prof. Dr. Antonello Santini. CORSO DI LAUREA IN TECNOLOGIE ALIMENTARI. UNIVERSITÀ DEGLI STUDI DI NAPOLI "FEDERICO II" DIPARTIMENTO DI AGRARIA	C. Devirgiliis	CREA-AN
Food/Quality and Functionality	External Reviewer of Research Thesis "A GREEN CHEMISTRY APPROACH FOR THE VALORIZATION OF POLYPHENOLS BASED AGRO-INDUSTRIAL WASTE ACCORDING TO THE CIRCULAR ECONOMY STRATEGY" of PhD (XXXIII cycle) in "Plant and Animal Production Sciences", Department of Agricultural and Forestry Sciences (DAFNE) of the University of Tuscia (Candidate: Dr. Mariangela CLEMENTE; Supervisor: Prof Roberta BERNINI, Co-Supervisor: Prof. Annalisa ROMANI, Prof. Luca SANTI)	C. Devirgiliis	CREA-AN
Nutrition and Nutritional Sustainability	Food microbiology and human health as part of the teaching of "Nutrigenomics" - Master's Degree Course in Biology for Molecular, Cellular and Pathophysiological Research Roma Tre University (April 2021)	A. Finamore	CREA-AN
Nutrition and Nutritional Sustainability	Seminar on "Proteomic in Food Safety" Bachelor Scienze e Culture Enogastronomiche at Roma Tre University; Course title: Molecular methods for food microbiological safety	B. Guantario	CREA-AN
Nutrition and Nutritional Sustainability	"Nutritional epidemiology" Specialization School in Food Science "La Sapienza" University of Rome	C. Leclercq	CREA-AN
Food/Quality and Functionality	Lesson on topic "VALORIZATION OF AGRI-FOOD WASTE PRODUCTION AND MANAGEMENT: CHALLENGES AND OPPORTUNITIES OF THE GREEN ECONOMY" within PhD Programme Agricultural Production Chains – From Fork to Farm (AgriChains http://www.agrichains.utad.pt/), organized by University of Trás-os-Montes e Alto Douro (UTAD) and by University of Minho (UMinho) with the partnership of University of Wageningen (WUR) and University of Politecnica València (UPV).	M. Lucarini	CREA-AN
Food/Quality and Functionality	Lesson on topic "Valorization of agri-food waste production and management: challenges and opportunities of the green economy", within the Course Quality Control of Medicines of Bioanalytical Sciences, Spring Semester (2nd Semester, 2020- 2021), Faculty of Pharmacy of University of Coimbra, Portugal.	M. Lucarini	CREA-AN
Food/Quality and Functionality	Lesson on topic "Valorization of agri-food waste production and management: challenges and opportunities of the green economy" within the Course Principi di Ingegneria Biochimica, Corso di Laurea Magistrale in Ingegneria Chimica, Università di Roma "Sapienza"	M. Lucarini	CREA-AN
Food/Quality and Functionality	Lesson on topic "Structure and functions of lipids" within the Course Principi di Ingegneria Biochimica, Corso di Laurea Magistrale in Ingegneria Chimica, Università di Roma "Sapienza"	M. Lucarini	CREA-AN
Food/Quality and Functionality	Lesson on topic: "Valorization of agri-food waste production and management: challenges and opportunities of the green economy" within the Course Chimica e Tecnologie Alimentari, Modulo Scienze Merceologiche, Corso di Laurea triennale in Dietistica- Scuola di Medicina, Università degli Studi di Firenze	M. Lucarini	CREA-AN
Food/Quality and Functionality	Lesson on topic: "BIOACTIVE MOLECULES, FOOD AND DATABASE" within the Course Chimica e Tecnologie Alimentari, Modulo Scienze Merceologiche, Corso di Laurea triennale in Dietistica- Scuola di Medicina, Università degli Studi di Firenze	M. Lucarini	CREA-AN
Food/Quality and Functionality	Lesson on topic "Valorization of agri-food waste production and management: challenges and opportunities of the green economy" within the Course Chimica delle Sostanze Organiche Naturali, Corso di Laurea Magistrale in Biotecnologie per la Qualità e la Sicurezza Agroalimentare, Dipartimento di Scienze Agrarie e Forestali, Università degli Studi della Toscana.	M. Lucarini	CREA-AN
Food/Quality and Functionality	Video lesson on topic "Valorization of agri-food waste production and management: challenges and opportunities of the green economy" within the Course Chimica delle Sostanze Organiche Naturali, Corso di Laurea Magistrale in Biotecnologie per la Qualità e la Sicurezza Agroalimentare, Dipartimento di Scienze Agrarie e Forestali, Università degli Studi della Toscana	M. Lucarini	CREA-AN

Food/Quality and Functionality	Participation to organization of module of 4 lessons entitled "Emerging Directions for Healthy Nutrition: Focus on Bioactive Components in Food, Dietar Supplements and Alternative Sources", Corso di Laurea Magistrale in Scienze dell'Alimentazione e della Nutrizione Umana, Università di Palermo and participation a relators for lessons: "Valorization of agri-food waste" and "Structure and functions of lipids" .	M. Lucarini	CREA-AN
Food/Quality and Functionality	Seminar on topic "Sustainability and Bioeconomy from chmical point of view" within th CoursesLaurea in "Scienze Agrarie e Ambientali" (L25) e "Scienze delle Foreste e della Natura" (L25), 10/12/2021. Università della Tuscia.	M. Lucarini	CREA-AN
Consumer, Food Education, Consultancy	Seminar on "Diet sustainability model to achieve nutritional and environmental goals", Siena University	M. Ferrari	CREA-AN
Consumer, Food Education, Consultancy	Tutoring for student of degree course in Food Human Nutrition Sciences (University of Perugia) entitled "The climate on your plate: design of a healthy diet with low enviromental impact through the optimization of food consumption observed in a sample of italian teenagers"	M. Ferrari	CREA-AN
Consumer, Food Education, Consultancy	Seminar on "Development of a sustainable diet through our food choices. Sustainability in collective food catering " Tor Vergata University, Human Nutrition	M. Ferrari	CREA-AN
Food/Quality and Functionality	"Composition and structural and "functional" properties of foods. Food items, food categories, servings" Specialization School in Food Science "La Sapienza University of Rome	P. Manzi	CREA-AN
Food/Quality and Functionality	Appointed teacher at Roma Tre University, Dept. of Sciences. Bachelor: Scienze e Culture Enogastronomiche. Course title: Sensory analysis of food, academic year 2021/2022	E. Moneta	CREA-AN
Food/Quality and Functionality	Tutoring for student of degree course in Scienze e Culture Enogastronomiche, Roma Tre University. (Sig.ra Alice Carreca)	E. Moneta	CREA-AN
Food/Quality and Functionality	Tutor of the student Alice Carreca for the preparation of a thesis entitled: "Officinalis plants: olfactory sensory characteristics and volatile compounds" to get the degree in Scienze e Culture Enogastronomiche at Roma Tre University (July 2021)	E. Moneta	CREA-AN
Food/Quality and Functionality	Appointed teacher at Sapienza University of Rome, Faculty of Medicine and Dentistry. Bachelor: Dietistic Science. Course title: "Food science and tecnologia" (from academic years 2018/19)	F. Natella	CREA-AN
Food/Quality and Functionality	Lecture: Chemical and sensory characterization of food quality. Degree course: Food Science and Technology. University of Tuscia - University Sapienza (Rome) academic year 2020/2021.	A. Raffo	CREA-AN
Food/Quality and Functionality	Lecture: Chemical and sensory characterization of food quality. Degree course: Food Science and Technology. University of Tuscia - University Sapienza (Rome) academic year 2021/2022.	A. Raffo	CREA-AN
Food/Quality and Functionality	Tutoring for student of degree course in Food Science and Technology (University of Tuscia - University Sapienza (Rome) (Sig. Gabriele Lombardi)	A. Raffo	CREA-AN
Food/Quality and Functionality	Tutoring for student of degree course in Food Science and Technology (University of Tuscia - University Sapienza (Rome) (Sig. Mattia Adduci)	A. Raffo	CREA-AN
Food/Quality and Functionality	Tutoring for student of degree course in Food Science and Technology (University of Tuscia - University Sapienza (Rome) (Sig.ra Sofia Allegra)	A. Raffo	CREA-AN
Food/Quality and Functionality	Tutoring for student of degree course in Pharmacy (University Sapienza (Rome) (Sig.ra Martina Pera)	A. Raffo	CREA-AN
Food/Quality and Functionality	Tutoring for student of degree course in Enogastronomic sciences and cultures (Roma Tre University) (Sig.ra Alice Carreca)	A. Raffo	CREA-AN
Food/Quality and Functionality	Workshop entitled "Aroma compounds in foods" within the degree course in Enogastronomic sciences and cultures (Roma Tre University), academic year 2020/2021	A. Raffo	CREA-AN
Development of analytical methods for the dairy sector	Tutoring for student of degree course in Food control and safety (University of Modena and Reggio Emilia) entitled "Development of an analytical method for the determination of amino acids in dairy products"	M. Ritota	CREA-AN
Consumer, Food Education, Consultancy	Adjunct Professor Teaching of "Nutritional sciences" of the Degree Course in Enogastronomic Sciences and Cultures at the Faculty of Science of the Roma Tre University SSD: MED / 49 CFU: 8	L. Rossi	CREA-AN
Consumer, Food Education, Consultancy	Tutor for carrying out internships related to the Interuniversity Master in Food Law (MIDAL)	L. Rossi	CREA-AN
Consumer, Food Education, Consultancy	Seminar lesson "Food waste" as part of the educational activities chosen by the Master's Degree Course in Human Nutrition Sciences - University of Rome Tor Vergata		CREA-AN

Consumer, Food Education, Consultancy	Adjunct Professor Teaching of principles of dietetics and food hygiene (15 hours renewal), at the Department of History, Cultural Heritage, Education and Society.	L. Rossi	CREA-AN
Consumer, Food Education, Consultancy	Lesson (2 hours) at the Teaching of Health Promotion and Protection - Science of Wellbeing (6 CFU) Master's Degree Course in "Management of gastronomic science for wellbeing (Course program)	L. Rossi	CREA-AN
Food/Quality and Functionality	Course of "Food Science & Technology " (AGRI 15- SCFU-40ore) as Adjunct Professor in Master's Degree in Human Nutrition - Faculty of Medicine - University of Rome Tor Vergata, from Academic Year 2014-15	S. Ruggeri	CREA-AN
Food/Quality and Functionality	Course of "Healthy Food Design" (AGRI 15- 2CFU-12 ore) as Adjunct Professor in Master's Degree in Human Nutrition Science - Faculty of Medicine - University of Rome Tor Vergata from Academic Year 2018-19	S. Ruggeri	CREA-AN
Food/Quality and Functionality	Tutor of the student R. Augello for the preparation of thesis " Qualitative nutritional aspects of local sicilian durum wheat cultvars" in: "Master's Degree in Human Nutrition Science - Academic Year 2020-21	S. Ruggeri	CREA-AN
Food/Quality and Functionality	Course: " Diet for preconceptional period and pregancy" in Master " Personalized Nutrition: molecular and genetic basis " - Faculty of Medicine University of Rome	S. Ruggeri	CREA-AN
Food/Quality and Functionality	Course: "Comunication in Nutrition" in Master " Nutrition & Cosmesis" - Faculty of Medicine University of Rome	S. Ruggeri	CREA-AN
Food/Quality and Functionality	Tutor of the student M. Berardo for the preparation of thesis " Evaluation of eating behaviuors of a cohort of Italian Adolscents during the Covid 19 pandemia " in Master's Degree in Human Nutrition Science	S. Ruggeri	CREA-AN
Food/Quality and Functionality	Tutor of the student M. Milazzo for the preparation of thesis "Evaluation of supplement use by pregnant Italiana Women" in Master's Degree in Human Nutrition Science	S. Ruggeri	CREA-AN
Nutrition and Nutritional Sustainability	Course of "Comunication in Nutrition" as Adjunct Professor at the Master Degree Course of Human Nutrition - Faculty of Medicine University of Rome Tor Vergata from A.A. 2014-15	S. Ruggeri	CREA-AN
Food/Quality and Functionality	Course: " Gender Nutrition" in Master " Nutrition & Cosmesis" - Faculty of Medicine University of Rome	S. Ruggeri	CREA-AN
Nutrition and Nutritional Sustainability	Seminars on "Microbiology of fermented meat products" within the course "Fermentation biotechnology" Bachelor Scienze e Culture Enogastronomiche at Roma Tre University (reference teacher Livia Leoni)	P. Zinno	CREA-AN
Nutrition and Nutritional Sustainability	Subject-matter expert at Roma Tre University, Dept. of Sciences, Bachelor: Scienze e Culture Enogastronomiche. Course title: Molecular methods for food microbiological safety	P. Zinno	CREA-AN

Working tables

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA RESEARCH CENTRE
Food/Quality and Functionality	Participation in the Working group 5 "Economic Observatory and Statistical Data" of the technical committee on Botanicals (DG PQAI - PQAI 02, Prot. n. 73436 del 19/10/2018)	T. Amoriello, P. Borsotto	CREA-AN, CREA PB
Food/Quality and Functionality	Participation in the Working group 3 "Research and experiments" of the Table of Chain on hop (<i>Humulus lupulus</i> L.) (DG PQAI - PQAI 02, Prot. n. 34580 del 15/05/2019)	T. Amoriello, A. Assirelli, G. Bianchi, F. Bonello, K. Carbone, M. C. Cravero, M. Pagano, M. Savino	CREA-AN, CREA CI, CREA-DC, CREA-IT, CREA-OFA, CREA-PB, CREA-VE
Food/Quality and Functionality	Participation in the Working group 4 "Economic and statistical Observatory" of the Table of Chain on hop (<i>Humulus lupulus</i> L.) (DG PQAI - PQAI 02, Prot. n. 34580 del 15/05/2019)	T. Amoriello, K. Carbone	CREA-AN, CREA OFA
Food/Quality and Functionality	Reference person of CREA expert working group for topic "4.12 Nanotechnology", EFSA, European Food Safety Authority, (ex art. 36, EC Regulation n. 178/2002)	A. Durazzo	CREA-AN
Food/Quality and Functionality	Reference person of CREA expert working group for topic "4.6 Products or substances used in animal feed" EFSA, European Food Safety Authority, (ex art. 36, EC Regulation n. 178/2002).	M. Lucarini	
Food/Quality and Functionality	CREA expert working group for topic "4.10 Human nutrition, dietetic products, allergens and/or novel foods" EFSA, European Food Safety Authority, (ex art. 36, EC Regulation n. 178/2002).	M. Lucarini	CREA-AN
Food/Quality and Functionality	CREA expert working group for topic "4.12 Nanotechnology", EFSA, European Food Safety Authority, (ex art. 36, EC Regulation n. 178/2002)	M. Lucarini	CREA-AN
Food/Quality and Functionality	Executive Board EuroFIR AISBL	A. Durazzo	CREA-AN
Food/Quality and Functionality	CREA expert working group for topic "4.6 Products or substances used in animal feed" EFSA, European Food Safety Authority, (ex art. 36, EC Regulation n. 178/2002).	A. Durazzo	CREA-AN
Food/Quality and Functionality	CREA expert working group for topic "4.10 Human nutrition, dietetic products, allergens and/or novel foods" EFSA, European Food Safety Authority, (ex art. 36, EC Regulation n. 178/2002).	A. Durazzo	CREA-AN
Food/Quality and Functionality	Working Group with Office of Dietary Supplements, National Institutes of Health and Agricultural Research Service, US Department of Agriculture(USDA) on Dietary Supplement Databases	A. Durazzo	CREA-AN
Food/Quality and Functionality	Member of the working group "Research and innovation (control tools, mechanization, genetic improvement and seed production)" in the context of the Technical Committee for the Hemp Supply Chain. Prot. 0091771 of 24/02/2021 (Italian Ministry of Agricultural, Food and Forestry Policies)	M. Masci	CREA-AN, CREA CI, CREA-IT
Food/Quality and Functionality	Membership between CREA and EuroFIR AISBL	A. Durazzo	CREA-AN
Food/Quality and Functionality	Participation as proxy at 12th General Assembly EuroFIR AISBL on behalf of CREA	A. Durazzo	CREA-AN
Food/Quality and Functionality	EuroFIR Working group: Documentation	A. Durazzo, E. Camilli	CREA-AN
Food/Quality and Functionality	EuroFIR Working group: Data Aggregation	A. Durazzo, E. Camilli, S. Marconi, D' L. Addezio	CREA-AN
Food/Quality and Functionality	EuroFIR Working group: Recipe Calculation	A. Durazzo, E. Camilli, S. Marconi, S. Sette, R. Piccinelli, C. Le Donne	CREA-AN
Food/Quality and Functionality	EuroFIR Working group: FoodCASE	A. Durazzo, E. Camilli	CREA-AN

Food/Quality and Functionality	EuroFIR Working group: Branded foods	S. Marconi, A. Durazzo A. C. Le Donne, S. Sette, R. Piccinelli	CREA-AN
Food/Quality and Functionality	EuroFIR Working group: Laboratory Analysis	S. Marconi	CREA-AN
Food/Quality and Functionality	CREA expert working group for the topic "4.4 food additives, flavourings and smoke flavourings and covers their safety" EFSA, European Food Safety Authority, (ex art. 36, Regulation CE n. 178/2002)	L. Mistura (Reference person); L. D'Addezio, C. Le Donne	CREA-AN
Nutrition and Nutritional Sustainability	EFSA - European Food Safety Authority - (Organismi Art.36 Regolamento (CE) n. 178/2002) 4.10 Human nutrition, dietetic products, allergens and/or novel foods	A. Polito	CREA-AN
Nutrition and Nutritional Sustainability	Project Mediterranean multi stakeholder platform on sustainable food system FAO-UNEP Sustainable Food Systems of the Programme 10YFP Sustainable Food Systems Programme - Referente	A. Polito	CREA-AN
Nutrition and Nutritional Sustainability	Member of the Review Working Group of LARN (Energy requirements)	A. Polito	CREA-AN
Nutrition and Nutritional Sustainability	Working group of the Italian Society of Human Nutrition "Nutrition in Oncology"	A. Polito (Reference person), E. Azzini, L. Barnaba, D. Ciarapica	CREA-AN
Nutrition and Nutritional Sustainability	EFSA - European Food Safety Authority - (Organismi Art.36 Regolamento (CE) n. 178/2002) 4.10 Human nutrition, dietetic products, allergens and/or novel foods	E. Azzini	CREA-AN
Nutrition and Nutritional Sustainability	Agreement between the Integrated Center for Breast Care, Department of Women's Health, Childhood and Public Health Sciences - Agostino Gemelli University Polyclinic Foundation and CREA - Food and Nutrition Research Center	A. Polito (Reference person), E. Azzini, L. Barnaba, D. Ciarapica	CREA-AN
Nutrition and Nutritional Sustainability	IMPLEMENTATION AGREEMENT between the Department of Medical, Surgical and Neuroscience Sciences of the University of Siena and the CREA-Center for Research on Food and Nutrition	A. Polito (Reference person), E. Azzini, L. Barnaba, D. Ciarapica	CREA-AN
Nutrition and Nutritional Sustainability	Advisory Board Member for the project "SWITCHtoHEALTHY" (Call: PRIMA 2021, Thematic Area 3-Agri-foodvaluechain 2021, TOPIC: 1.3.1-2021 (IA)	E. Azzini	CREA-AN
Consumer, Food Education, Consultancy	Member of the Technical Committee of "OKkio alla SALUTE", the national surveillance system, coordinated by the Istituto Superiore di Sanità, for overweight, obesity and related risk factors in primary school children (6-10 years). It is included in the list of national surveillance systems and registers identified by the Prime Minister's Decree of 3 March 2017	L. Censi	CREA-AN
Consumer, Food Education, Consultancy	NCD Risk Factor Collaboration (NCD-RisC) is a network of health scientists around the world that provides rigorous and timely data on major risk factors for non-communicable diseases for all of the world's countries. Publications of 2021: https://ncdrisc.org/publications.html#2021	L. Censi, M. Ferrari, M. Galfo, R. Roccaldo	CREA-AN
Consumer, Food Education, Consultancy	Technical-scientific support activities as an expert for the topic "human nutrition, dietetic products" for which EFSA makes use of CREA pursuant to art. 36 of Regulation (EC) no 178/2002.	L. Censi	CREA-AN
Consumer, Food Education, Consultancy	Working group for the Revision of LARN - Revision of energy needs.	L. Censi	CREA-AN
Consumer, Food Education, Consultancy	Technical-scientific support to EFSA on topic 4.9 "Chemical contaminants in the food chain" pursuant to Article 36 of EFSA's founding regulation 178/2002 on Competent Organizations in Member States	M. Masci	CREA-AN
Consumer, Food Education, Consultancy	Technical-scientific support to EFSA on topic 4.11 "Environmental risk assessment (ERA)" pursuant to Article 36 of EFSA's founding regulation 178/2002 on Competent Organizations in Member States	M. Masci	CREA-AN
Consumer, Food Education, Consultancy	Technical-scientific support to EFSA on topic 4.9 "Chemical contaminants in the food chain" pursuant to Article 36 of EFSA's founding regulation 178/2002 on Competent Organizations in Member States	T. Navigato	CREA-AN
Consumer, Food Education, Consultancy	Technical-scientific support to EFSA on topic 4.11 "Environmental risk assessment (ERA)" pursuant to Article 36 of EFSA's founding regulation 178/2002 on Competent Organizations in Member States	T. Navigato	CREA-AN

Consumer, Food Education, Consultancy	European SENSory Network. A powerful international network of leading research institutions and industrial partners at the cutting edge of sensory and consumer sciences.	F. Sinesio	CREA-AN
Consumer, Food Education, Consultancy	Update of food sources for the new LARN 2022 edition	S. Sette, M.Ferrari, E. Camilli	CREA-AN
Consumer, Food Education, Consultancy	Italian Network for Data Collection. Coordinated Italian table of the Italian Focal Point of EFSA (Ministry of Health)	L. D'Addezio, C. Le Donne	CREA-AN
Consumer, Food Education, Consultancy	Network on Food Consumption Data. Forum for exchange of views between experts on methodologies for the collection of food consumption data, in particular to act as a contact point between the European Food Safety Authority (EFSA) and the Member States in order to coordinate the collection of and accessibility to high quality, up-to-date and harmonised food consumption information	L. D'Addezio, C. Le Donne	CREA-AN
Consumer, Food Education, Consultancy	Members of the SCAR "Standing Committee on Agricultural Research"	M. Ferrari, L. Rossi	CREA-AN
Consumer, Food Education, Consultancy	Update of the "Proteins" chapter for the new LARN 2022 edition.	S. Marconi	CREA-AN
Consumer, Food Education, Consultancy	Member of the Review Working Group of LARN (Hydro-soluble Vitamins requirements)	S. Ruggeri	CREA-AN
Consumer, Food Education, Consultancy	Member of National Network EcoFood Fertility	S. Ruggeri	CREA-AN
Consumer, Food Education, Consultancy	Member of Steering Committee of PhD Course of " Food Quality and Human Nutrition" - University of Foggia	S. Ruggeri	CREA-AN
Consumer, Food Education, Consultancy	Member of Steering Committee of Interdepartmental Degree: Human Nutrition Sciences - University of Foggia	S. Ruggeri	CREA-AN
Consumer, Food Education, Consultancy	Componente gruppo di lavoro per revisione del capitolo "Vitamine Idrosolubili " della nuova edizione dei LARN	S. Ruggeri	CREA-AN
Consumer, Food Education, Consultancy	Member of the control room inside the Capitoline Administration of the Scientific Technical Committees and of the Development Councils for the Strategic Urban Economic Development Plan on Agri-food and Smart Business verticalizations.	L. Rossi	CREA-AN
Consumer, Food Education, Consultancy	Appointment with the mandate of the Director of the CREA Food and Nutrition Center for the drafting of a document similar to an institutional relationship, which represents the Centre's activity - also considering the development of previous activities such as INN and INRAN - within the scope of the topic " Rural development and food security ", as regards the competences and mission of the Center for the Italian Agency for Development Cooperation, Ministry of Foreign Affairs and International Cooperation	L. Rossi, M. Ferrari	CREA-AN
Consumer, Food Education, Consultancy	EFSA - European Food Safety Authority - (Organismi Art.36 Regolamento (CE) n. 178/2002) 4.10 Human nutrition, dietetic products, allergens and/or novel foods	L. Rossi	CREA-AN
Consumer, Food Education, Consultancy	Assignment for the development of a reference practice for environmental product labeling.	L. Rossi	CREA-AN
Consumer, Food Education, Consultancy	Member of the coordination committee of the 5th revision of the Recommended Energy and Nutrient Intake Levels (LARN and coordination of the "Energy" Chapter and the "Proteins" Chapter and member of the "Micronutrients" group	L. Rossi	CREA-AN
Consumer, Food Education, Consultancy	Member of the Working Group for the planning and implementation of activities related to the creation of the Italian Agriculture Yearbook 2019 - Volume LXXIII.	L. Rossi	CREA-AN
Consumer, Food Education, Consultancy	Coordination, planning and implementation of a visit to the CREA Food and Nutrition for Erasmus-Plus Students of the IIS Papareschi Institute in Rome. Students from Spain, Romania, Germany, France attended lectures on Food Waste, Mediterranean Diet and adherence to nutritional recommendations	L. Rossi	CREA-AN
Consumer, Food Education, Consultancy	Technical and scientific committee "School and food", Ministry of Education. The Committee coordinates and expresses opinions on the food education initiatives, as facilitating agent of the Guidelines for food education.	L. Gennaro	CREA-AN

Technology transfer and know how

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA RESEARCH CENTRE
Food/Quality and Functionality	Methods for elimination of sulfites interference in the evaluation of polyphenolic antioxidant content in white wine	M. Nardini	CREA-AN
Food/Quality and Functionality	Methods for synthesis, determination and evaluation of antioxidant properties of phenolic acids metabolites identified in human plasma	M. Nardini	CREA-AN
Food/Quality and Functionality	Optimization of composite flours for "Pinsa romana" production	T. Amoriello	CREA-AN
Food/Quality and Functionality	Sustainable recovery of bioactive compounds from Brewing-Derived By-Products	T. Amoriello	CREA-AN
Food/Quality and Functionality	Antioxidants as index of traceability in the dairy supply chain	P. Manzi	CREA-AN

Editorial activities

PRODUCTS/MAIN TOPICS	DESCRIPTION	PERSON IN CHARGE	CREA RESEARCH CENTRE
Food/Quality and Functionality	Editorial Board member for the international journal "Molecules" for "Food Quality" section	M. Nardini	CREA-AN
Food/Quality and Functionality	Guest Editor for the Special Issue "Phenolic compounds in food: characterization and health benefits" for the international journal "Molecules"		CREA-AN
Food/Quality and Functionality	Guest Editor for Special Issue "Sustainability: Recovery and Reuse of Brewing-Derived By-Products" in "Sustainability"	T. Amoriello	CREA-AN
Food/Quality and Functionality	Topical Advisory Panel Member of "Sustainability"	T. Amoriello	CREA-AN
Food quality and Functionality/Analytical methods in the dairy sector	Guest Editor for Special Issue "Analytical Methods in Milk and Dairy Products: Focus on Functional Compounds" in Molecules MPDI	P. Manzi, M. Ritota	CREA-AN
Food quality and Functionality/Analytical methods in the dairy sector	Guest Editor per lo Special Issue Chemical "Properties, Nutritional Quality, and Bioactive Components of Horticulture Food" in Horticulturae, MDPI	A. Durazzo, M. Lucarini	CREA-AN
Food quality and Functionality/Analytical methods in the dairy sector	Guest Editor for the Special Issue "Traceability – from food to consumers: new insights and outcomes" in Measurement: Food, Elsevier	A. Durazzo, M. Lucarini	CREA-AN
Food quality and Functionality/Analytical methods in the dairy sector	Guest Editor for the Special Issue "Food Composition and Dedicated Databases: Key Tools for Human Health and Public Nutrition", in Nutrients MDPI	A. Durazzo, M. Lucarini	CREA-AN
Food quality and Functionality/Analytical methods in the dairy sector	Guest Editor for the Special Issue "Effect of Dietary Antioxidants on Metabolic Diseases" in International Journal of Molecular Science, MDPI	A. Durazzo, M. Lucarini, Lombardi, G. Boccia	CREA-AN
Food quality and Functionality/Analytical methods in the dairy sector	Doctoral Thesis of the course Environmental and Evolutionary Biology at Sapienza University of Rome: "Study of the transfer mechanisms and factors involved in the absorption of toxic, or potentially toxic, elements from the soil to the plant: the case study of durum wheat and olive tree". External Reviewer.	M. Masci	CREA-AN
Nutrition and Nutritional Sustainability	Academic Editor dell' Editorial Board della rivista Oxidative Medicine and Cellular Longevity, Hindawi Publishing Corporation	E. Azzini	CREA-AN
Nutrition and Nutritional Sustainability	Member of Editorial Board della rivista International Journal of Molecular Sciences	E. Azzini	CREA-AN
Nutrition and Nutritional Sustainability	Member of Editorial Board della rivista International Journal of Molecular Sciences	A. Polito	CREA-AN
Nutrition and Nutritional Sustainability	Guest Editors Special Issue "Functional Mechanism of B-Vitamins and Their Metabolites 2.0" in IJMS	E. Azzini, A. Polito, Peluso	CREA-AN
Nutrition and Nutritional Sustainability	Guest editor for the Special Issue "Natural Products and Human Health: Current Understanding and Application" Nutrients	R. Canali, F. Natella	CREA-AN
Nutrition and Nutritional Sustainability	Editorial Board member as Review Editor for Frontiers in Nutrition, section Nutrition and Microbes	C. Devirgiliis	CREA-AN
Nutrition and Nutritional Sustainability	Guest Editor for "Salivary Biomarkers and Their Application to Diagnosis and Monitoring Human Diseases 2.0", Diagnostics	A. Finamore	CREA-AN
Nutrition and Nutritional Sustainability	Member of Editorial Board as Review Editor for Frontiers in Nutrition, section Immunology	A. Finamore	CREA-AN
Nutrition and Nutritional Sustainability	Member of Editorial Board as Review Editor for Review for Frontiers in immunology, section Nutritional Immunology	A. Finamore	CREA-AN
Nutrition and Nutritional Sustainability	Associated Editor for Frontiers Nutrition	A. Finamore	CREA-AN
Nutrition and Nutritional Sustainability	Associated Editor for Journal of Nutrition	A. Finamore	CREA-AN
Nutrition and Nutritional Sustainability	Member of Editorial Board of International Journal of Clinical Nutrition and Dietetics	S. Ruggeri	CREA-AN
Consumer, Food Education, Consultancy	Guest Editor Special Issue "Adolescent Nutrition and Health" incluso nella section "Adolescents" hosted by MDPI International Journal of Environmental Research and Public Health ((IF 3.39/Q2).	L. Censi, S. Ruggeri	CREA-AN

Consumer, Food Education, Consultancy	Guest Editor Special Issue "Dietary and Nutritional Status Assessment in Children and Adolescents in European Countries" included in Section "Nutritional Epidemiology" hosted by MDPI Journal Nutrients (IF 5.719/Q1).	L. D'Addezio, L. Censi	CREA-AN
Consumer, Food Education, Consultancy	Guest Editor Special Issue "The Role of the Diet in Achieving Global Security and an Adequate, Safe, and Sustainable Food System " included in the section "Nutrition and Public Health", Nutrients (IF 5.719/Q1).	M. Ferrari	CREA-AN
Consumer, Food Education, Consultancy	Guest Editor Special Issue "Public Health and Sustainability of food consumption habits " included in the section "Sustainability (IF3.251/Q1).	L. Mistura, M. Ferrari, A. Turrini	CREA-AN

Publications various FOOD/QUALITY AND FUNCTIONALITY

- Ambra, R; Pastore, G; Lucchetti, S The Role of Bioactive Phenolic Compounds on the Impact of Beer on Health MOLECULES 2021, 26 2
- Amoriello, T; Ciccoritti, R Sustainability: Recovery and Reuse of Brewing-Derived By-Products SUSTAINABILITY 2021,134
- Amoriello, T; Mellara, F; Amoriello, M; Ceccarelli, D; Ciccoritti, R Powdered seaweeds as a valuable ingredient for functional breads EUROPEAN FOOD RESEARCH AND TECHNOLOGY 2021, 247 10 2431-2443
- Amoriello T; Mellara F; Bartoli L; Galli V; Amoriello M Innovation in Pinsa romana production: a Response Surface Methodology approach. Chemical Engineering Transactions 2021, 87614-624
- Amoriello T; Bartoli L; Mellara F; Galli V; Amoriello M La lievitazione nella Pinsa romana: come scegliere i parametri di processo Industrie Alimentari, 2021, 6199 15
- Amoriello T; Amoriello M L'alga Chlorella vulgaris come nuovo ingrediente nella panificazione: effetti sulla reologia dell'impasto e sulle proprietà del pane Industrie Alimentari 2021 621, 3-9
- Benedetti, B; del Pulgar, JS; Di Lena, G; Lombardi-Boccia, G Simultaneous analysis of 21 bioactive compounds in biorefinery oil: Multivariate optimization of a method based on liquid chromatography, atmospheric pressure chemical ionization and tandem mass spectrometry MICROCHEMICAL JOURNAL 2021 1170
- Carcea, M Value of Wholegrain Rice in a Healthy Human Nutrition AGRICULTURE-BASEL 2021 11 8
- Ciccoritti, R; Ciorba, R; Mitrano, F; Cutuli, M; Amoriello, T; Ciaccia, C; Testani, E; Ceccarelli, D Diversification and Soil Management Effects on the Quality of Organic Apricots AGRONOMY-BASEL 2021, 11,9
- de Moraes Lima G.; da Silva Brito A.K.; de Farias L.M.; Lopes Rodrigues L.A.R.; de Carvalho Pereira C.F.; Rodrigues Lima S.K.; de Macedo Gonçalves Frota K.; dos Santos Rizzo M.; Moreira Nunes P.H.; Lucarini M.; Durazzo A.; Rufino Arcanjo D.D.; do Carmo de Carvalho e Martins M Effects of "Bacuri" Seed Butter (Platonia insignis Mart.) on Metabolic Parameters in Hamsters with Diet-Induced Hypercholesterolemia. EVIDENCE-BASED COMPLEMENTARY AND ALTERNATIVE MEDICINE, 2021, 55, 84, 965
- Di Lena, G; del Pulgar, JS; Lucarini, M; Durazzo, A; Ondrejickova, P; Oancea, F; Frincu, RM; Aguzzi, A; Nicoli, SF; Casini, I; Gabrielli, P; Caproni, R; Cerven, I; Lombardi-Boccia, G Valorization Potentials of Rapeseed Meal in a Biorefinery Perspective: Focus on Nutritional and Bioactive Components MOLECULES 2021, 26 22
- Di Stefano, V; Bongiorno, D; Buzzanca, C; Indelicato, S; Santini, A; Lucarini, M; Fabbriozzi, A; Mauro, M; Vazzana, M; Arizza, V; Durazzo, A Fatty Acids and Triacylglycerols Profiles from Sicilian (Cold Pressed vs. Soxhlet) Grape Seed Oils SUSTAINABILITY 2021 1132
- Durazzo, A; Lucarini, M Food Composition and Dedicated Databases: Key Tools for Human Health and Public Nutrition NUTRIENTS 2021 1311
- Durazzo, A; Lucarini, M New Traits of Agriculture/Food Quality Interface 2.0 AGRICULTURE-BASEL 2021 11, 12
- Durazzo, A; Lucarini, M Environmental, Ecological and Food Resources in the Biodiversity Overview: Health Benefits. LIFE-BASEL 2021 1111
- Durazzo, A; Lucarini, M; Plutino, M; Lucini, A; Aromolo, R; Martinelli, E; Souto, EB; Santini, A; Pignatti, G Bee Products: A Representation of Biodiversity, Sustainability, and Health. LIFE-BASEL, 2021, 11,9
- Durazzo, A; Lucarini, M; Plutino, M; Pignatti, G; Karabagias, IK; Martinelli, E; Souto, EB; Santini, A; Lucini, L Antioxidant Properties of Bee Products Derived from Medicinal Plants as Beekeeping Sources AGRICULTURE-BASEL 2021, 1111
- Durazzo, A; Lucarini, M; Santini, A Plants and Diabetes: Description, Role, Comprehension and Exploitation. INTERNATIONAL JOURNAL OF MOLECULAR SCIENCES, 2021 228
- Durazzo, A; Nazhand, A; Lucarini, M; Delgado, AM; De Wit, M; Nyam, KL; Santini, A; Ramadan, MF Occurrence of Tocols in Foods: An Updated Shot of Current Databases. JOURNAL OF FOOD QUALITY 2021
- Durazzo, A; Nazhand, A; Lucarini, M; Silva, AM; Souto, SB; Guerra, F; Severino, P; Zaccardelli, M; Souto, EB; Santini, A Astragalus (Astragalus membranaceus Bunge): botanical, geographical, and historical aspects to pharmaceutical components and beneficial role RENDICONTI LINCEI-SCIENZE FISICHE E NATURALI 2021 323625642
- Durazzo, A., Lombardi-Boccia, G., Santini, A., & Lucarini, M. Dietary Antioxidants and Metabolic Diseases. INTERNATIONAL JOURNAL OF MOLECULAR SCIENCES 2021 222212558
- Durazzo, A; Souto, EB; Lombardi-Boccia, G; Santini, A; Lucarini, M Metrology, Agriculture and Food: Literature Quantitative Analysis. AGRICULTURE-BASEL 2021 11 9
- Dwyer, J; Saldanha, L; Bailen, R; Durazzo, A; Le Donne C; Piccinelli R; Andrews, K; Pehrsson, P; Gusev, P; Calvillo, A; Connor, E; Goshorn, J; Sette, S; Lucarini M, D'addezio L; Camilli E; Marletta L; Turrini A. Commentary: An impossible dream? Integrating dietary supplement label databases: needs, challenges, next steps. JOURNAL OF FOOD COMPOSITION AND ANALYSIS 2021, 102, 103882.
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- Lucarini, M; Durazzo, A; Bernini, R; Campo, M; Vita, C; Souto, EB; Lombardi-Boccia, G; Ramadan, MF; Santini, A; Romani, A Fruit Wastes as a Valuable Source of Value-Added Compounds: A Collaborative Perspective. MOLECULES 2021 2621
- Lucarini, M; Durazzo, A; Lombardi-Boccia, G; Souto, EB; Cecchini, F; Santini, A Wine Polyphenols and Health: Quantitative Research Literature Analysis. APPLIED SCIENCES-BASEL 2021 1111
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- Lupotto, E.; Tamborini, L.; Narducci, V. Breve storia della coltura del riso in Italia. In: Il riso – un cereale che viene da lontano, a cura di Lupotto, E.; Narducci, V.; Sarcina, P., Ed. CREA 2021, ISBN 9788833851426, pp. 13.26.
- Luziatelli, F; Melini, F; Bonini, P; Melini, V; Cirino, V; Ruzzi, M Production of Indole Auxins by Enterobacter sp. Strain P-36 under Submerged Conditions. FERMENTATION 2021 7 3138
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5.CREA RESEARCH LINES - Agricultural policies and Bioeconomy

The Politics and Bioeconomy Research Center develops research based on five objectives:

a) the analysis of the economic, social and environmental dynamics of the agri-food system through methodological tools development and database implementation; b) Impact assessment of the national and European agricultural policy on both Italian agri-food and local systems to improve the effectiveness of policy tools; c) Analysis and tools for ecological transitions in the agricultural and forestry sectors; d) Analysis of the Italian agri-food system competitiveness; e) Economic and social needs and impact assessment of innovations.

With these general lines of research, CREA contributes to the reflection and design of policy instruments linked to rural development, elaborates impact studies on the sectors, territories and companies involved in investment programs, analyzes the short-term and medium/long-term phenomena affecting the agri-food system to provide an interpretative key to society and institutions.

2021 activities include: preparatory and functional studies for the drafting of the CAP Strategic Plan 2021-2027; analysis of the impact of the current reform of agricultural policies on the national agri-food system; analysis of sustainability with particular attention to indicators and certification; the ecological transition and digital technology applied to agriculture; The analysis of needs within the new National Recovery and Resilience Plan within the Next Generation EU, with particular regard to renewable energy issues affecting the agricultural sector. Some studies address issues that become increasingly relevant to respond to the challenges launched mainly by the Green Deal and Farm to Fork: the environmental ones (water, agricultural and natural biodiversity, climate and emissions, soil, landscape, sustainable forest management); those related to social inclusion (work, migrants, social agriculture, vitality of rural areas); those related to ecological transition (bioeconomy, circular economy, sustainable use of inputs, animal welfare and antibiotic resistance, food waste, organic farming).

Researchers are mainly involved in supporting the Italian Ministry of Agriculture Food and Forestry Policies and the Regions with activities related to the common agricultural and rural development policies. CREA is indeed “the core” of the **Rural National Network**, the operational tool to improve the implementing and management of Rural Development Plans – RDP. The Center also manages the **Agricultural Accounting Information Network (FADN)**, as a liaison body between Italy and the EU. Finally, the Research Centre for Policy and Bioeconomy (CREA-PB) hosts the **Statistical Office (UDS)**, which has the task of coordinating all the statistical activities carried out in the CREA centers, as well as ensuring relations with the SISTAN and other statistical public bodies and institutions.



5.1. Research and research products - Agricultural policies and Bioeconomy

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS
ACCORDO D'ACCORDO Collaboration agreement for technical-scientific activities with reference to the management of water resources between CREA PB and the Southern Apennine District Basin Authority	Promote the coordination of water policies between the environment and agriculture as part of the updating of the Water Management Plan of the Southern Apennine District Basin Authority <ul style="list-style-type: none"> Promote the involvement of local authorities and institutions of the District, holders of information useful for the activities and purposes of the Agreement, in order to coordinate them and their validation Develop methodologies, shared with local authorities and institutions of the District, for processing the information collected 	R. ZUCARO CREA PB	Autorità di Bacino Distrettuale dell'Appennino Meridionale		
ACOPOA Collaboration agreement between Mipaaf and CREA	<ul style="list-style-type: none"> Support the planning of irrigation investments towards innovative types of intervention, to favor the mitigation capacity and the adaptation of the agro-forestry system to the reduction of the environmental impact on soil and water resources and to identify and promote actions for the saving and efficient use of water resources favoring the implementation of policies for knowledge and innovation also in the field of water resources and in relation to the Community agricultural policy. 	R. ZUCARO CREA PB	MIPAAF	<ul style="list-style-type: none"> - Articolo in rivista Carmelo Picone; Roberto Henke; Myriam Ruberto; Emilio Calligaris; Raffaella Zucaro (2021).A Synthetic Indicator for Sustainability Standards of Water Resources in Agriculture.Sustainability, 13, 15,DOI: 10.3390/su13158221 - Abstract in atti di convegno Ruberto Myriam; Branca Giacomo; Troiano Stefania; Zucaro Raffaella (2021).THE ECONOMIC VALUE OF ECOSYSTEM SERVICES OF IRRIGATION : A CHOICE EXPERIMENT FOR THE MONETARY EVALUATION OF IRRIGATION CANALS AND FONTANILI IN THE LOMBARDY REGION - Abstract in atti di convegno Picone Carmelo; Henke Roberto; Ruberto Myriam; Calligaris Emilio; Zucaro Raffaella (2021).A Synthetic Indicator for Sustainability Standards of Water Resources in Agriculture 	- Scholarship - n.10
ADA ADaptation to climate change in Agriculture	Implement a public-private partnership to increase the resilience of the agricultural sector through the development of knowledge and planning tools that individual farmers and producer organizations can use to adapt to climate change.	S. DE LEO CREA PB	European Commission		
AGROBRIDGES Connecting consumers and producers in innovative agri-food supply chains	Developing tailor-made and practical support to set up innovative supply chains creating win-win for producers and consumers, including through a collection of examples of good practice illustrating mutually beneficial cooperation and fair share for primary producers. Integrating the needs of primary producers and consumers in a hands-on approach in particular by minimising margins taken by intermediaries. Improved sharing of experience between contracting authorities on tendering healthy and fresh food, with a view to connecting consumers with producers in a mutually beneficial way for the longer term.	F. GIARE CREA PB CREA AN	Unimos Foundation Q-PLAN INTERNATIONAL ADVISORY PC Food Bio Cluster Denmark Hub Madrid SL Institute of Technology, Tralee Sabri Ulker Foundation Fundación Corporación Tecnológica de Andalucía EuCOFEL - Fruit and Vegetables production and trade WAGENINGEN UNIVERSITY TEAGASC - AGRICULTURE AND FOOD DEVELOPMENT AUTHORITY (TEAGASC) VEGEPOLYS VALLEY Sustainable Innovations Europe SL		- Research grant - n.2

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			Rezos Brands Agrifood Company , European Commission		
AKIS FISHING AND AQUACULTURE CAMPANIA Implementation of a knowledge system according to an AKIS model of the fisheries and aquaculture sector.	The project aims to support small fisheries, fish farming and shellfish farming enterprises, which form the basis of the sector, through the structuring of knowledge networks, according to the AKIS model, in order to develop shared knowledge among the various actors and also start activities of Innovation brokers through the dissemination of innovations.	C.MENNA CREA PB	ISTITUTO ZOOPROFILATTICO SPER DEL MEZZOGIORNO		- Scholarship - n.2
ANaRG National register of biodiversity of agricultural and food interest	The aim of the project is the preparation of a cooperating and interoperable database that functions as a "registry for local genetic resources of food and agricultural interest of plant, animal or microbial origin, subject to risk of extinction or genetic erosion".	A.TRISORIO CREA PB	MiPAAF		

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AT 2017/2023 PSRN Cooperazione agreement between Mipaaf and CRE for the National Rural Development Plan 2014-2020 (NRDP)	Support the achievement of the objectives set by the National Rural Development Plan (NRDP), in particular in relation to the management of water resources and irrigation investments (sub-measure 4.3) and the development of cooperation to preserve biodiversity in the livestock sector (sub-measures 10.2 and 16.2). In relation to the irrigation resource, the technical scientific support is accompanied by analysis activities on issues related to water resource policies and their impact on the agricultural environment; conditionality for water resources under EAFRD; integration and synergy between agriculture and environment policies (in particular Water Framework Directive and Floods) and other national and regional policies (state aids) analysis of the irrigation context and phenomena of water scarcity, also through the quantification of appropriate indicators; irrigation reuse of purified wastewater; support for the new CAP 2021-2027; identification and promotion of actions for the saving and efficient use of water resources for irrigation, also in the international scientific context.	R. ZUCARO CREA PB	MiPAAF	<ul style="list-style-type: none"> - Traduzione di libro di Zucaro Raffaella; Angelini Simona; Blasi Giuseppe (2021). Hydraulic reclamation works, irrigation systems and networks: 150 years in the history of Italy - Articolo in rivista di Raffaella Zucaro; Veronica Manganiello; Romina Lorenzetti; Marianna Ferrigno (2021). Application of Multi-Criteria Analysis selecting the most effective Climate change adaptation measures and investments in the Italian context. BAE - Bio-based and Applied Economics, 10, 2, 109-122. DOI: 10.36253/bae-9545. 	<ul style="list-style-type: none"> - Incontro di approfondimento sui dati del settore agricolo Autorità di Bacino Distrettuale della Sicilia 18/05/2021 - Presentazione dei primi risultati del progetto LEO "Livestock Environment Opendedata Piattaforma Opendedata per Zootechnia" 15/12/2021 - Incontro di approfondimento sui dati del settore agricolo Autorità di Bacino Distrettuale delle Alpi Orientali 19/05/2021 - Incontro di approfondimento sui dati del settore agricolo Autorità di Bacino Distrettuale dell'Appennino Centrale Appennino Settentrionale 25/05/2021 - Presentazione delle Linee Guida "Strumenti per la stima dei prelievi e dei consumi idrici per la zootechnia" 06/04/2021 - Incontro di approfondimento sui dati del settore agricolo Autorità di Bacino Distrettuale della Sardegna 18/05/2021

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BIOPLAT-EU PROMOTING SUSTAINABLE USE OF UNDERUTILIZED LANDS FOR BIOENERGY PRODUCTION THROUGH A WEB-BASED PLATFORM FOR EUROPE	BIOPLAT-EU project will promote and support the uptake of sustainable bioenergy projects on marginal, underutilized and contaminated lands (MUC lands). These lands cannot be used for food production or for recreational and conservation purposes, but in some cases, they still retain the potential to produce biomass for non-food and non-feed purposes. Moreover, such use of these lands is not known to stakeholders, therefore the project will promote and inform about such opportunities through a web-based platform which will include a public user-friendly tool using global information system that will assess the environmental, social and techno-economic sustainability aspects of defined value chains for bioenergy production on MUC lands and through stakeholder engagement activities.	G.BONATI CREA PB	Commissione Europea	- Articolo in rivista Pirelli Tiziana; Chiumenti Alessandro; Morese Maria Michela; Bonati Guido; Fabiani Stefano; Pulighe Giuseppe (2021).Environmental sustainability of the bioenergy pathway in Italy through the methodology of the Global Bioenergy Partnership.Journal of Cleaner Production, 318, 1-13.DOI: 10.1016/j.jclepro.2021.128483. - Articolo in rivista Tiziana Pirelli; Giuseppina Costantini; Teresa Lettieri; Giuseppina Crispino (2021).Filiere bioenergetiche sostenibili su aree marginali, sottoutilizzate e contaminate: il Progetto BIOPLAT-EU lungo il cammino verso la neutralità climatica.Pianeta PSR, 10(2), 1-10. - Articolo in rivista Khawaja Cosette; Janssen Rainer; Mergner Rita; Rutz Dominik; Colangeli Marco Traverso Lorenzo; Morese Maria Michela; Hirschmugl Manuela; Sobe Carina; Calera Alfonso; Cifuentes David; Fabiani Stefano; Pulighe Giuseppe; Pirelli Tiziana; Bonati Guido; Tryboi Oleksandra; Haidai Olha; Köhler Raul; Knoche Dirk; Schlepphorst Rainer; Gyuris Peter(2021).Viability and Sustainability Assessment of Bioenergy Value Chains on Underutilised Lands in the EU and Ukraine.Energies, 14(6),DOI: 10.3390/en14061566.	- Il Sud Ovest che partecipa Incontro di approfondimento 22/06/2021 - European Biomass Conference and Exhibition. GBEP side event Biomass for landscape restoration: how can the bioeconomy contribute to the UN Decade on ecosystem restoration? 29/04/2021
BIOTECH_SBEVAL BIOTECH Subproject: SBEVAL Assessment of the economic, political and social impact of so biotechnologies in Italian agriculture	1. Assessment of the economic and social impact of the introduction of new genetic traits in typical Italian agri-food crops 2. Identification of economic, regulatory and legal obstacles to the application of research results	A. ZEZZA CREA PB	MiPAAF		
CAMP_SAT_PIE_2021_2022	Survey using the FADN methodology of a satellite sample of Piedmontese farms (accounting year 2021 and 2022)	S.TRIONE CREA PB	Piemonte Region		
CAMP_SAT_VDA_2018_2019_2020	Survey using the FADN methodology of a satellite sample of Aosta Valley farms (accounting year 2018, 2019 and 2020)	S.TRIONE CREA PB	Valle D'Aosta Region	- Altra Borsotto Patrizia; Cagliari Roberto; Pisan Cristina; Trione Stefano (2021).L'agricoltura biologica in Valle d'Aosta. - Altra Borsotto Patrizia ; Cagliari Roberto; Borri Ilaria; Trione Stefano (2021).L'COMPENSAZIONI PER LE ZONE SVANTAGGIATE ATTRAVERSO LA LETTURA DEI DATI DELLE RELAZIONI ANNUALI DI ATTUAZIONE PSR VALLE D'AOSTA 2014-2020	
CO.PE.AGRI.SAR Experimental mode of intervention for work and the active inclusion of people in penal execution – Colonie Agricole SARDEGNA	Collaboration agreement aimed at deepening the internal organization of the agricultural penitentiary colonies of Sardinia	F. MUSCAS CREA PB	Sardegna Region		
CO.PE.AGRI.TO Experimental mode of intervention for work and the active inclusion of people in criminal execution – REGIONE TOSCANA	Collaboration agreement aimed at deepening the internal organization of the agricultural penitentiary colonies of Toscana	G. DARA GUCCIONE CREA PB	Toscana Region		- Scholarship - n.3

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COLONIE PUGLIA Experimental models of intervention for work and the active inclusion of people in criminal execution – Colonie Agricole PUGLIA	Analyze the development potential of the agricultural and social activities of the penitentiary agricultural colonies involved in the project	F. GIARE' CREA PB	Puglia Region		- Scholarship - n.1
CONTRATTO COMIFO Contract for the award of the business line development service with reference to the management and protection of water resources	Development of lines of activity with reference to the management and protection of water resources by the end users of the resource, or the farmers of the cooperatives of land improvement consortia.	R. ZUCARO CREA PB	Federazione Provinciale dei Consorzi Irrigui e di Miglioramento Fondiario di Trento (COMIFO)		- Investment opportunities for the sustainable use of water and use of databases DANIA and SIGRIAN 24/05/2021
ANALISI ECONOMICA PO	Performance of technical and scientific activities necessary for the economic analysis for the update of the Po River Basin District Management Plan and support for the Water Balance Plan of the River Basin District through: supporting the socio-economic analysis of irrigated agriculture and livestock use - non-irrigated agriculture; supporting the validation phase of the analysis of pressures and significant impacts; supporting the determination of the program of measures and related costs; supporting the assessment of ecosystem services; supporting the identification of levers for cost recovery coverage and internalization.	R. ZUCARO CREA PB	Autorità di Bacino Distrettuale del Fiume Po	- Articolo in rivista Manganiello Veronica; Banterle Alessandro; Canali Gabriele; Gios Geremia; Brandi Gaetano; Galeotti Sofia; De Filippis Fabrizio; Zucaro Raffaella (2021).Economic characterization of irrigated and livestock farms in The Po River Basin District.Economia agro-alimentare / Food Economy, 23, 3, 1-24.DOI:10.3280/ecag3-0a12773.	- Scholarship - n.1
FAS Cipro Nord Technical Assistance for the implementation of Farm Advisory Services	The overall objective of this project is to support the economic development of the Turkish Cypriot community and prepare them for the implementation of the acquis upon lifting of its suspension, by contributing inter alia to the social and economic development including restructuring, in particular concerning rural development, human resources development and regional development.	S.CRISTIANO CREA PB	Commissione Europea		
FAST Study for the development of a common framework for the quantitative advice of crop nutrient requirements and greenhouse gas emissions and removal assessment at farm level	The overall aim of the study is to provide a sound and comprehensive description of the methodological frameworks including appropriate parameters, variables and formulae necessary to provide quantitative advice for the use of fertilizers and assessment of GHG emissions and removals at field and farm/holding scales.	S.FABIANI CREA PB CREA AA	Commissione Europea		
FEAMP AQUACULTURE	Improving the design and management capacity of lucanian fish companies.	M. A. D'ORONZIO CREA PB	Regione Basilicata		- Scholarship - n.1

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FEASR BASILICATA	Cognitive analysis and monitoring of the 2014-2020 Basilicata RDP	C. DEVIVO CREA PB	Regione Basilicata		
FORMIPAAF Cooperation agreement "Program of basic activities, to organize the permanent structures in order to implement the provisions of art. 15 of the legislative decree 3 April 2018 n. 34. "	a) implementation of all the purposes referred to in Article 14 of the Consolidated Law on Finance Forests b) implementation of the set of purposes referred to in Article 15 of the Consolidated Law on Finance Forests	R.ROMANO CREA PB CREA FL	MiPAAF		
FOR-PU Reordering and updating of regional legislation regarding forests and forestry chains and drafting of the regional forest plan proposal	The aim of this project is to bring the regional administration to adopt, in a short time, a regional forest plan and a modern and effective regional law on the protection and enhancement of the regional forest heritage.	R.ROMANO CREA PB	Puglia Region		
FRUTTIJOB On-the-job training for fruit growers in Cuneo.	The project intends to support the growth of human capital within the Cuneo fruit companies with specific training actions in order to increase their competitiveness and provide them with adequate knowledge on innovative tools to obtain quality production in compliance with more sustainable and green techniques.	P. BORSOTTO CREA PB	Fondazione Cassa di Risparmio di Cuneo		

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I2CONNECT Connecting advisers to boost interactive innovation in agriculture and forestry	The project aims to fuel the competencies of advisers who will support and facilitate interactive innovation processes responding to multiple challenges in European agriculture and forestry. In particular, i2connect project's main objectives are: 1) To strengthen the skills, competencies and attitudes of advisers to support interactive innovation, by identifying and sharing best practices, developing tools and methods, training, and organizing peer to peer learning & networking; 2) To enhance and profile the role of advisers in interactive innovation processes, at different scales: by a better understanding of the Agriculture and Forestry Knowledge and Innovation System (AFKIS) at country level, by identifying providers of advisory services across Europe, by creating an enabling environment within advisory services, by better connecting and embedding advisory services within the AFKIS and by appropriate public policies; 3) To create a social support network and a networking culture among advisers facilitating innovative innovation processes.	P.PROIETTI CREA PB	¹ Commissione Europea		
JRC/SVQ/2019/MVP/2614	Study on drivers and constraints of intergenerational change in EU agriculture and on the role of farmers' participation in food supply chains.	F. CARILLO CREA PB	Università degli Studi della TUSCIA		
LEADER BTD evaluation	Evaluation of the impact of LEADER on territorial development.	F.MANTINO CREA PB	University of Gloucestershire		
LENSES Learning and action alliance for Nexus Environments	Topic 1.4.1 (IA) Demonstrating benefits of the Water-Ecosystem-Food Nexus approach in delivering optimal economic development achieving high level of environmental protection and ensuring fair access to natural resources.	S.FABIANI CREA PB CREA AA	ECO_ADAPTA Agrisat Iberia sl Hellenic Agricultural Organization HAO "DEMETER" TUC National Agricultural Research Center DRAXIS ENVIRONMENTAL S.A. UTAEM EA-TEK MIGAL PRIMA IS		- Progetto LENSES - First Stakeholder meeting Tarquinia (Italy) 30/11/2021 Tarquinia - Progetto LENSES - First progress meeting 13/12/2021

¹ • Széchenyi István University (SZE) • Latvian Rural Advisory and Training Centre Ltd (LLKC) • ILVO - EIGEN VERMOGEN VH INSTITUUT VOOR LANDBOUW-EN VISSERIJONDERZOEK • Association de Coordination Technique Agricole (ACTA) • PI Lithuanian Agricultural Advisory Service (LAAS) • SEASN - South Eastern Europe Advisory Service Network • TEAGASC AGRICULTURE AND FOOD DEVELOPMENT AUTHORITY - Irlanda • Agricultural University Of Athens - Department of Agricultural Economy and Development, Informatics Laboratory • AGRIDEA • Magyar Agrár-, Élelmiszergazdasági és Vidékfejlesztési Kamara (NAK) • ZLTO - Zuidelijke Land en Tuinbouw Organisatie • Ministerio de Agricultura, Pesca y Alimentación (MAPA) • Centrum Doradztwa Rolniczego w Brwinowie (CDR Brwinów) • EUFRAS - European Forum for Agricultural and Rural Advisory Services • ProAgria • FiBL - Research Institute of Organic Agriculture • NAAS - National Agricultural Advisory service • IALB - Internationale Akademie für ländliche Beratung • The CIRCA Group Europe Limited (CIRCA) • Hohenheim University • STICHTING WAGENINGEN RESEARCH (WR)

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LIAP Policies to support the competitiveness of Apulia agricultural enterprises and the labor production factor: efficiency and synergistic effect of support and regulation tools	Provide the Puglia Region with a methodological tool (flexible, updatable and with a clear and understandable structure) for a correct assessment of the labor needs in Apulia agricultural enterprises also in relation to sustainability, both in the ethical dimension of priority collective interest and of a competitive nature, to private interest priori	P. PALLARA CREA PB	Puglia Region		
LIFE SPA Saproxyl Habitat Network: planning and management for European forests	The project will preserve the value of the wood products that forests can sustainably deliver maintaining a high productivity, while ensuring biodiversity protection. It will demonstrate management criteria that can be applied in different contexts to combine planning, production and biodiversity conservation significantly improving the conservation status of forest species and habitats	U. DI SALVATORE CREA PB CREA FL	Università di Würzburg EFI European Forest Institute Unione Europea		- Progetto LIFE SPAN (LIFE1 NAT/IT/000104) Saproxyl Habitat Network: planning and management for European forests Conferenza iniziale 21/06/2021 - Assegni di ricerca - n.1
MEPLASUS MEdicinal PLAnts in SUSTainable Supply chain. Experience of land-use practices	The Basilicata Region promotes interregional and / or transnational actions through the creation of partnerships between partners operating in the Basilicata Region and partners operating in other Italian regions and / or in other countries, of which at least one partner operating in another Member State of the European Union	M. A. D'ORONZIO CREA PB	UNIVERSITA' DI BELGRADO HELLINIKOS GEORGIKOS ORGANISMOS - DIMITRA / HELLENIC AGRICULTURAL ORGANIZATION (HAO) – DEMETER Basilicata Region		
MONITORAGGIO FEAMP Monitoring activities of the regional EMFF OP 2014-2020	Verify, through the analysis of the data and information of the financial resources of the EMFF Basilicata OP, the progress of the regional fisheries and aquaculture policy	M. A. D'ORONZIO CREA PB	Basilicata Region		
NIVA New IACS vision in action	The proposal supports the further development of the IACS, promoting extensive data and information flows between Member States, the European Commission and various other stakeholders. The simulation tool is included in wider Use Case: "Seamless Claim, Traffic light and Payment Entitlements simulation tools"	F. PIERANGELI CREA PB	Commissione Europea		- Research grant - n.1
OLIVEMAP Mapping of investment needs and monitoring of Italian olive growing	"Investments in olive growing" (CREA Research Centre for Agricultural Policies and Bioeconomy)	M. R. PUPO D'ANDREA CREA PB CREA FL	MiPAAF - Ministero delle politiche agricole alimentari e forestali	- Monografia o trattato scientifico Petriccione Gaetana; Pupo D'Andrea Maria Rosaria; Solazzo Robert (2021). L'analisi economico-finanziaria delle OP attraverso i dati di bilancio: un confronto tra le OP olivicolo-olearie e le OP ortofrutticole. L'analisi economico-finanziaria delle OP attraverso i dati di bilancio: un confronto tra le OP olivicolo-olearie e le OP ortofrutticole. - Monografia o trattato scientifico Pupo D'Andrea Maria Rosaria; Petriccione Gaetana; Solazzo Robert (2021). L'analisi economico-finanziaria delle OP olivicolo-olearie attraverso i dati di bilancio. L'analisi economico-finanziaria delle OP olivicolo-olearie attraverso i dati di bilancio. - Monografia o trattato scientifico Reda Emilia; Pupo D'Andrea Maria Rosaria (2021). PSR 2014-2020 e misure	

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				<p>interesse delle OP.PSR 2014-2020 e misure di interesse delle OP</p> <p>- Articolo in rivist</p> <p>Pupo D'Andrea Maria Rosaria; Cardillo Concetta (2020).Aziende associate a Ol</p> <p>l'identikit strutturale.Olivo e Olio, 23, 6, IV-V</p> <p>- Articolo in rivist</p> <p>Pupo D'Andrea Maria Rosaria; Reda Emilia (2020).Le politiche per il settore e</p> <p>ruolo delle OP.Olivo e Olio, 23, 6, V-V</p> <p>- Articolo in rivist</p> <p>Pupo D'Andrea Maria Rosaria; Cardillo Concetta (2020).Aziende associate a Ol</p> <p>l'identikit strutturale.Terra e Vita, 37/2020, 63-63.</p>	
PORTALBIO National portal of biodiversity of agricultural and food interest	Preparation of the National Biodiversity Portal of agricultural and food interest, or a platform in a web environment that interconnects the existing databases of genetic resources of local food and agricultural interest, and which allows the dissemination of information on genetic resources of agricultural and food interest. The Portal will integrate the National Registry and will allow it to be consulted	M. MAMBELLA CREA PB	MiPAAF		
PROSURI Soil and water resource protection	Protection of biodiversity, saving of irrigation resources and land use	R. PERGAMO CREA PB CREA CCI	Campania Region		
RAMONESPL Rural Advisory Monitoring and Evaluation System linked to Precision Learning	Knowledge Alliances. This Key Action is expected to result in the development, transfer and/or implementation of innovative practices at organizational, local, regional, national and European levels.	S. CRISTIANO CREA PB	SLOVENSKA POLNOHOSPODARSKA UNIVERZITA V NITRE Gazda Kontroll Kft. LATVIJAS LAUKU KONSULTACIJU UN IZGLITIBAS CENTRS FONDACIJA AGRO CENTAR ZA EDUKACIJA FACE Srednja skola "Arboretum Opeka Commissione Europea		
RCH 2016-2018 Public spending on agriculture 2016-2018	The organization of the information flow and the analysis of the results of public spending for agriculture they represent the objectives of the project aimed at providing support to the spending decisions of the area, representing the level of achievement of the performance of the primary sector.	P. PIATTO CREA PB	Campania Region		
RESERVAQUA Determination of the environmental cost and the cost of the water resource for carrying out the activities referred to in the optimization of the use of water resources in the agricultural sector	Quantification of environmental costs and resource costs related to the use of water resources for agricultural irrigation use in Valle d'Aosta, and determination, together with the costs, also of the environmental benefits associated with the irrigation practice (positive externalities)	P. BORSOTTO CREA PB	Fondazione Institut Agricole Régional	<p>- Articolo in rivist</p> <p>Moino Francesca; Borsotto Patrizia (2021). La gestione sostenibile dell'acqu</p> <p>irrigua e la quantificazione del suo costo ambientale: il progetto</p> <p>Reservaqua.Pianeta PSR, 10</p> <p>-Altro</p> <p>Borsotto Patrizia; Altobelli Filiberto; Trione Stefano; Pisan Cristina; Cagliari</p> <p>Roberto; Moino Francesca (2021). Il progetto Reservaqua: relazione (2019-2021)</p> <p>Aggiornamento marzo 2021.</p>	- Scholarship - n.1

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FADN 2021 Farm Accountancy Data Network (FADN) - Accounting year 2021	Approval of the 2021 FADN Financial Plan	A.SCARDERA CREA PB	MiPAAF	- Altr Giampaolo Antonio; Arzeni Arzeni; Borsotto Patrizia; Cesaro Luca; Marongiu Sonia; Martino Matteo; Scardera Alfonso; Zilli Greta (2021). GRANO DURO: costi di produzione, prezzi, margini e aiuti RICA Italiana - 2016-2020.	
NRN2020 National Rural Network (NRN) 2014-2020	Improving the capacity building of the administrations involved. Carrying out information and promotion activities for enhancing an informed participation of stakeholders on PAC strategic themes. Developing communication tools addressed to civil society and networking paths for promoting the debate among relevant stakeholders both at territorial and sectorial level.	A. MONTELEONE CREA PB CREA FL CREA AA	MiPAAF	See NRN publicatio	See NRN events
RS-ACT Rural social ACT	The project intends to promote the role of social agriculture as a sustainable, inclusive and quality territorial development	M. C. MACRI CREA PB	Ministry of Labor and Social Policies		
SAMoCA Support for the monitoring of company accounting keeping by the beneficiaries of the 2007/2013 Lazio Rural Development Program.	Support the activity of monitoring the keeping of company accounts, according to the FAD methodology, by the beneficiaries of Measure 112 (Establishment of young farmers) and 121 (Modernization of farms) of the PSR Lazio 2007/2013, of the companies benefiting from the aid of the Measure 121 financed by the CM sugar and by the beneficiary companies that have obtained a concession provision under measure 411.121 of the LAG's PSL.	C. LIBERATI CREA PB	Lazio Region		
SIMDAZ Simulation of the economic and environmental dynamics of the F.V. Giulia.	Simulation of micro-economic dynamics based on the use of econometric models to support rural development policies	F. CISILINO CREA PB	ERSA - Agenzia regionale per lo sviluppo rurale del Friuli-Venezia Giulia		
SOIL4LIFE	Promoting sustainable use of Mediterranean soil resources	F.ALTOBELLI CREA PB CREA AA	CCIVS Udruga Zelena Istra - Green Istria GI/ Commissione Europea		- Webinar-Serie DIVERFARMING: Sistemi colturali diversificati per un'agricoltura sostenibile 25/06/2021

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STRENGTH2FOOD	Strengthening European Food Chain Sustainability by Quality and Procurement Policies	L. CESARO CREA PB	¹ Commissione Europea		
SU AFAl Start Up Azienda Foresta Alta Irpinia	Cooperation to support the competitiveness of forestry chains through the experimentation of active management of the forest heritage in Alta Irpinia; Technical studies and analysis of the environmental and socio-economic context of the Inner Area of Alta Irpinia, also through mapping, of the eco-systemic functions present or to be increased in the territory in order to implement a strategic plan for the enhancement of the forest heritage	R.ROMANO CREA PB	Regione Campania	- Rivista a stampa "Comunità Montagna" – numero speciale Giugno 2021	- On line meeting Risorsa Acqua Disseto Idrogeologico nell'Area Interna Alta Irpinia 14/01/2021 - On line meeting Gestione forestale sostenibile e Servizi Ecosistemici nell'Area Interna Alta Irpinia 22.01.2021 - On line meeting Valorizzazione socioculturale e turistica ricreativa dei boschi dell'Alta Irpinia 03.02.2021
TRADE4SD Fostering the positive linkages between trade and sustainable development	The main objective of this project is to identify new opportunities to foster positive sustainability impacts of trade supported by improved trade policy at national, EU and global level, including WTO modernization, and increased coherence across agricultural, energy, climate, environmental and nutritional policies.	A. ZEZZA CREA PB	² Unione Europea		
TWINALGERIA	Ensure institutional support to the Ministry of Agriculture, Water Resources and Fisheries to strengthen its capacities for the development and implementation of inclusive, participatory, and long-term agricultural and rural policies.	C. ZUMPANO CREA PB	MiPAAF - Ministero delle politiche agricole alimentari e forestali		
UNISECO	Understanding and Improving the Sustainability of Agro-ecological Farming Systems in the EU.	A.POVELLATO CREA PB	Commissione Europea		
VALUE-SHELL Economy, environmental externalities and	The project pursues the following objectives: to provide an updated knowledge framework of the	L. TUDINI CREA PB	MiPAAF		- SEALOGY, il salone europeo della blue economy

¹ MINISTARSTVO PROSVETE, NAUKE I TEHNOLOSKOG RAZVOJA - Ministero della Pubblica Istruzione, la Scienza e lo sviluppo tecnologico UNIVERSITY OF NEWCASTLE UPON TYNE FILIPOVIC MALADA IVANA Top Class Center for Foreign Languages • INRA - Institut National de la Recherche Agronomique • Food Nation (FOODNAT) • MUNICIPALITY OF ARIJE (Opština Arilje) • THE UNIVERSITY OF EDINBURGH • ECOZEPT GBR (ECOZEPT) • RHEINISCHE FRIEDRICH-WILHELMS-UNIVERSITÄT BONN (Università di Bonn) • EKONOMSKI FAKULTET, UNIVERZITET U BEOGRADU (Facoltà di Economia - Università di Belgrado) • HOGSKOLEN I OSLO OG AKERSHUS (Oslo and Akershus University College of Applied Sciences) • ARISTOTELIO PANEPISTIMIO THESSALONIKIS (Aristotle University of Thessaloniki) • IMPACT MEASUREMENT LIMITED (ImpMent) LTD • BALKAN SECURITY NETWORK • SVEUCILISTE U ZAGREBU EKONOMSKI FAKULTET (ZAG) - Faculty of Economics and Business, University of Zagreb • Wageningen UR (University Research centre) • ECO-SENSUS KUTATO, OKTATO ES KOMMUNIKACIOS NON PROFIT KORLATOLT FELELOSSEGU TARSASAG (Eco-Sensus) • EUROPEAN FOOD INFORMATION COUNCIL (EUFIC) AISBL • KASETSART UNIVERSITY • CENTRE DE RECERCA EN ECONOMIA I DESENVOLUPAMENT AGROALIMENTARI-UPC-IRTA (CREDA) - The Center for Agro-food Economy and Development (CREDA-UPC-IRTA) • KONZUM, TRGOVINA NA VELIKO I MALO DD (KONZUM) • TRUONG DAI HOC KINH TE THANH PHO HO CHI MINH (UEH) - University of Economics, Ho Chi Minh • Szkoła Główna Gospodarstwa Wiejskiego - Warsaw University of Life Sciences (SGGW) • Główny Inspektorat Jakości Handlowej Artykułów Rolno - Spożywczych (GIJHARS) - Agricultural and Food Quality Inspection •

² • Johann Heinrich von Thünen-Institut - Federal Research Institute for Rural Areas, Forestry and Fisheries (BFH) Germania • Institute of Statistical, Social Economic Research (ISSER), University of Ghana • University of Economics Ho Chi Minh City • LUKE Natural Resources Institute Finland • University of Sussex • Johann Heinrich von Thünen-Institut - Federal Research Institute for Rural Areas, Forestry and Fisheries (BFH) Germania • INRAE • University of Kent • CASE - Center for Social and Economic Research

ACRONYM AND RESEARCH TITLE	AIMS	PERSON IN CHARGE AND CREA CENTRES	INTERNATIONAL PARTNERSHIP/FINANCING BODY	PUBLICATIONS	OTHER RESEARCH PRODUCTS
policies of the shellfish sector in Italy	shellfish production chain in the national and community context; to assess the environmental impacts associated with farms; to identify the main policies directly and/or indirectly supporting the sector; to identify future intervention strategies with stakeholders and sector operators.	CREA ZA			18/11/2021 Ferrara - Research grant - n.3
VENABIO Vesuvio: Biodiversità Natura	Enhancement of typical products and protection of biodiversity and decrease in land consumption	R. PERGAMO CREA PB CREA CCI	Campania Region		

5.2. Services

INSTITUTIONAL ACTIVITIES	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Italian Agriculture Yearbook 2020, Volume LXXIV	The Yearbook, that has reached its 74rd year, analyzes the structural features of the agricultural sector, its trend and relations with the economy as a whole, offering a medium-long term view. Relationships between agriculture, environment and civil society and the impacts of the Covid 19 pandemic on the Italian agri-food system are also analyzed.	R. Sardone	CREA PB
Italian Agriculture in Figures	Since 1988, "Italian Agriculture in Figures" has been an agile information tool on the progress of the Italian agri-food system available for Public Administration, public opinion and for all those who need the data and trends that, year after year, characterize the Italian agriculture. The focus is extended to the entire agri-food sector and to all interrelations with the territory, the environment and the needs of society and the country. The booklet is available in Italian, English and Chinese version.	M. F. Marras	CREA PB
Regional Agriculture in figures	The regional information report is a publication that is easy to read and interpret on the progress of the regional agricultural system, born in 2008 to follow the same aim of the "Italian agriculture in figures". The aim is to offer a concise and at the same time critical reading of the changes in the agricultural scenario, available to all those who work in it: farmers, representatives of OO.PP.AA., technicians and professionals, administrators and, finally, consumers and citizens.	C.Liberati, R. Ugati, A. Sturla, S. Trione, I. Borri R. Solazzo	CREA PB
Italian foreign trade in agri-food products 2020	The Report, that has reached its 29th edition, analyzes the Italian agri-food trade. Import and export performance is analyzed by areas and main partner countries, by sectors and products, with a focus on Made in Italy.	R. Solazzo	CREA PB
Public spending on agriculture	Analysis of the evolution and consistency of expenditure in agriculture: quantification and qualification of the items that make up, directly or indirectly, public support to the sector	L. Briamonte	CREA PB
Survey on foreign workers in agriculture	The Report disseminates the results of the Survey on Foreign Employees in Agriculture. The Report consists of a first part that collects the analyzes at national level based on the statistical and administrative data available, as well as the information contained in the database of the accounting network of agricultural companies (FADN); in the second part, the information collected through the direct survey intends to investigate the characterizing aspects of the presence of foreign workers in specific regional agricultural realities.	M.C. Macri	CREA PB
Survey on the Land Market	The Survey provides a detailed synthesis of the land market's general trend through the elaboration of land average prices and regional indices.	A Povellato, D. Longhitano	CREA PB
Italian Review of Agricultural Economics (REA)	The Italian Review of Agricultural Economics (REA) is an international open access and peer-reviewed journal	A. Povellato	CREA PB

Advisory and technical assistance services	Description	Person in charge	CREA Centre
Support and consulting for the implementation of the National Rural Network	Drafting of execution reports, coordination of network activities, portal management and coordinated image	S. Angeli	CREA PB
Support and consulting for dissemination activities on the value of rural development policy	Magazine publication, Collection of rural excellence	M. Verrascina, B. Zanetti	CREA PB
Support to the Managing Authority of the NRN Program for coordination and implementation of EAFRD communication and implementation of information and knowledge exchange activities	Coordination of the communication table, pilot project with schools and universities	P. Lionetti	CREA PB
Support and consulting for the strategic monitoring of the CAP	Information collection and analysis for PAC results analysis	F. Pierangeli, S. Tarangio	CREA PB
Support and consulting for the Programming of the CAP 2021-23 and the PNRR	Coordination of the technical table, preparation of analyses, methodological documents and guidelines	A. Monteleone, F. Pierangeli, S. Tarangio	CREA PB
Support and consulting for the implementation of the evaluation system of the rural development policy	Coordination of technical table Mipaaf, IGRUE, Regions, paying agencies	M. Bolli, A. Amato	CREA PB
Support and consulting for the implementation of the national monitoring system of rural development policy	Coordination of the Regions-Evaluators technical table, participation on the European experts group, methodological and guiding documents	S. Cristiano	CREA PB
Support and consulting for the implementation of environmental measures of the rural development policy	Analysis of interventions implementation, drafting of documentation, animation of discussion with stakeholders (MATTM, OOPP, environmental organizations)	D. Marandola	CREA PB
Support and consulting for the drafting of the National Plan for the sustainable use of plant protection products	Participation in the Scientific Committee, drafting of documentation, animation of discussions with stakeholders	D. Marandola	CREA PB
Support and consulting for the implementation of the organic farming measure of the rural development policy	Analysis of interventions implementation, drafting of documentation, animation of discussion with stakeholders ("Organic" world organization)	L. Viganò	CREA PB
Support and consulting for the definition of the new classification of less favored areas	Definition of methodology, classification and discussion with Regions	D. Storti, L. Frascchetti	CREA PB
Support and consulting for the animation of territorial development strategies	Territorial support to define strategies based on territorial reading of data and information	D. Storti	CREA PB
Support and consulting for the implementation of the National Strategy for Internal Areas	Territorial support for defining pilot areas strategies and integration with EAFRD funds	F. Mantino	CREA PB
Support and consulting for the implementation of the territorial measures of the rural development policy	Support to regions for overcoming problems related to financing infrastructure interventions in the EAFRD	C. Zumpano	CREA PB
Support and consulting for the implementation of LEADERS	Animation of the LAG network, support to LAGs and regions on implementation issues	R. Di Napoli	CREA PB
Support and consulting for the implementation of measures on supply chain cooperation within the CAP	Support to the regions on problems related to the implementation of cooperation measures	S. Tarangio	CREA PB
Support and consulting for the implementation of Social Agriculture measures within the rural development policy	National Observatory activities support, stakeholders animation, interventions implementation analysis	P. Borsotto, F. Giarè	CREA PB
Support and consulting for the implementation of the National Forest Strategy	Support to Mipaaf and Regions on the commitments undertaken in the context of the national forest law	R. Romano, L. Cesaro	CREA PB
Support and consulting for the implementation of animal welfare measures within the rural development policy	Participation in the ACCREDIA table for certification, stakeholders' animation, interventions implementation analysis	M. C. Macri, M. Scornaienghi	CREA PB
Support and consulting for the implementation of AKIS within the rural development policy	Network animation of GO PEI, support to GOs and Regions on implementation problems	A. Vagnozzi	CREA PB
Support and consulting for the implementation of the national strategy for ultrabroadband	Support to Mipaaf and the Regions in the implementation of the BUL	G. Bonati, N. D'Alicand	CREA PB

Regional network stations	Support to Regions on implementation issues related to RDPs	P.Piatto	CREA PB
Accounting survey of 400 farms in Piedmont (financial year 2017)	Piedmont Region supports the accounting survey; data is useful to monitoring and evaluation of agriculture and rural development policies at the regional and national levels	S. Trione, G. Peiretti	CREA PB
Accounting survey of 80 farms in Aosta Valley (financial year 2018)	Autonomous Region of the Aosta Valley supports the accounting survey; data is useful to monitoring and evaluation of agriculture and rural development policies at the regional and national levels	S. Trione, C. Pilan	CREA PB
Regional network stations	Support to Regions on implementation issues related to RDPs	R. Cagliero, F. Varia	CREA PB
Farm Advisory Services - FAS Cyprus -Technical assistance for the implementation of local agricultural advisory services in Northern Cyprus	The overall objective of the project is to support the economic development of the Turkish Cypriot community and to prepare it for the implementation of the acquis, helping among other things, to establish agricultural advisory services, strengthen the technical skills of local consultants and define intervention measures in favour of the advisory system in Cyprus. CREA is contributing through the definition and implementation of training plans for local consultants on subjects such as: beekeeping, farm management and animal welfare, global business management and supply chain integration, plant production, pest management, production protection and quality, viticulture.	S.Cristiano	CREA - PB, AA, I, ZA, OFA, DC,
WORKING TABLES/ WORKING GROUPS/ INSTITUTIONAL PARTNERSHIP	DESCRIPTION	PERSON IN CHARGE	CREA CENTRES
Participation in working group within the National Fruit and Vegetable Table	Support to Mipaaf for definition of OP programs and sustainability	C. dell'Aquila	CREA-PB
Cooperation agreement	Initiate sustainable and supportive territorial development paths and social innovation practices, through the tool of social agriculture and system	G. Gaudio	CREA-PB
Cooperation agreement	Launch support actions to facilitate young people's access to the primary sector and to combat the abandonment and consumption of agricultural land (L.R. n. 31 of 5/7/2017)	G. Gaudio	CREA-PB
Cooperation agreement	Elaboration and implementation of research and development programs, aimed at intercepting the social and economic needs of the territory and proposing solutions	G. Gaudio	CREA-PB
Cooperation agreement	Develop and regulate collaborative relationships on topics of common interest aimed both at the mutual exchange of skills in training and teaching, on the design and management of European funds for rural development and in institutional events for the promotion of scientific-technological culture	G. Gaudio	CREA-PB
FADN Community Committee	Body responsible for verifying the compliance of the selection plans drawn up by each Member State, monitoring, evaluating and analysing the accounting data in relation to other statistical sources and the Economic Accounts	A. Scardera	CREA-PB
FADN National Committee	Body in charge at national level of approving the selection plan for each accounting year; approving the criteria for distributing companies by type and size class; approving the methods for selecting farms.	A. Scardera	CREA-PB
Table on the theme of equal access to land promoted by the Inequalities and Diversity Forum (letter from the Director of CREA PB prot. No. 00551613 of 11/27/2019)	On suggestion of the Inequalities and Diversity Forum, collaboration on a proposal for the improvement of working conditions in agriculture and for a more equitable access to land	L. Briamonte, M. C. Macri, G. Valentino	CREA-PB
XVIII Technical Discussion Table/Round table discussion on Primary Sector, organized by Veneto Lavoro (Regione Veneto) - 2 October 2020	Presentation of the activities carried out by CREA PB as part of the intervention on "L'occupazione femminile in agricoltura: Progetto BRIGHT Programma Rights, Equality and Citizenship 2014-2020" (the whole presentation was shared with other project partners)	M. C. Macri, G. Valentino	CREA-PB
Table on hop sector	Participation in the sector table to provide opinions and addresses - Coordination 2 WG	S. Tarangoli, R. Sardone, F. Licciardo	CREA-PB
Table on fruit and vegetables sector	Participation in the logistic working group table	G. Petriccione, S. Tarangoli	CREA-PB
National bioeconomy steering group	National table for implementation of bioeconomy national strategy	A. Zezza	CREA-PB
GBEP- Global Partnership for Sustainable Biofuel	Multilateral working table at FAO for the sustainability of bioenergy	A. Zezza	CREA-PB
OCSE	Agriculture and Trade Committee PB	A. Zezza	CREA-PB
SCAR BSW	Strategic Working group on bioeconomy- European Commission, SCAR Committee	A. Zezza	CREA-PB
OCSE	APM- Committee for Agricultural Policies and Markets	A. Zezza	CREA-PB
AGMEMOD	European econometric model working group for agriculture Outlook	A. Zezza	CREA-PB
Agricultural expert c/o national representative of United Nations	technical support to ONU ROMA on agricultural topics	F. Altobelli	CREA-PB
Discussion table on the theme of equal access to land - Inequality and Diversity forum	Technical-scientific support to the activities of the Table	L. Briamonte	CREA-PB
Working group "Territorial needs and value chains"	Technical-scientific support to the activities of the Undersecretary for Agricultural Policies concerning the political and programmatic lines to be implemented also in accordance with the planning of resources under the Recovery Plan	L. Briamonte	CREA-PB
Institutional tables of hemp, hazelnut and other nuts	Technical-scientific support for the activities of the Table	L. Briamonte	CREA-PB
Technical committee of the National Contact Point of the OECD guidelines on social responsibility at the MISE	Participates in the work of the NCP representing MIPAAF	L. Briamonte	CREA-PB
Interministerial Committee for Human Rights (CIDU) at the Ministry of Foreign Affairs	Participates in the work of the Committee	L. Briamonte	CREA-PB

Working Group 3 - Indicators under the Agreement entered into with the Italian Alliance for Sustainable Development (ASViS)	Technical-scientific support for the revision of the indicators used for ASVIS activities	Referenti postazioni regionali RRN(membri/uditori/stakeholder)	CREA-PB
Monitoring Committee for the 2014-2020 Rural Development Program	Participation to Monitoring Committee for the 2014-2020 Rural Development Program	R.Zucaro	CREA-PB
Partnership istituzionale. Study visit Turkey	In collaboration with the Central Apennine District Authority, to which the European Commission had made an explicit request in the framework of the TAIEX Project, CREA PB hosted a delegation of the Turkish Ministry of Agriculture. In addition to the description of CREA and its activities, the study visit included a specific presentation of the activities carried out by CREA and CREA PB, in particular on issues related to the sustainable use of water. On this occasion, the SIGRIAN and DANIA databases were illustrated	R.Zucaro	CREA-PB
Table. Coordination table of the PRIMA initiative (Partnership for Research and Innovation in the Mediterranean Area)	Support to the PRIMA (Partnership for Research and Innovation in the Mediterranean Area) Program, the Euro-Mediterranean action ex Article 185 of the TFEU, approved by the European Parliament and the Council by Decision (EU) 2017/1324 of July 4, 2017, with the aim of consolidating a long-term structured partnership in research and innovation in the Mediterranean area, in accordance with the principles of co-ownership, mutual interest and benefit sharing.	R.Zucaro	CREA-PB
Institutional Partnership/Working Group. Focal point for the FAO Global Framework on Water Scarcity (WASAG).	In April 2017, the international platform WASAG - The Global Framework on Water Scarcity in Agriculture (http://www.fao.org/land-water/overview/wasag/en/) was launched promoted by FAO and composed of government agencies, ministries, international organizations, research institutes, advocacy groups and membership organizations. To date it consists of about 50 partners who are committed to working together with the common goal of identifying priority actions to be taken to combat global water scarcity and promote adaptation of the agricultural sector to climate change, including in compliance with the 2030 European Agenda and the United Nations Sustainable Development Goals. Within WASAG, CREA-PB has been identified as the Focal Point for Italy in support of MiPAAF (part of the Steering Committee). In this context, an Italian coordination group has been established in order to create synergies, cooperate and raise the level of political commitment towards more sustainable practices in the management of water resources for different uses, promoting a conscious and rational use. To date, the working group has started the drafting of the Technical Guidelines for the appropriate "Design and Management of pressurized irrigation distribution system", a support tool useful in providing a methodology for planning and design of investments in the irrigation field to increase the productivity of water resources for irrigation purposes, especially in arid areas, also through the involvement of the private sector.	R. Henke, C. Abitabile, R. Zucaro, C. Zumpano, A. Trisorio, S. Fabiani, G. Bonati, R. Sardone, F. Giarè, L. Viganò, F. Mantino, M. Verrascina, N. Mardariam, L. Briamonte, S. Luzzi Cont S. Baralla, G. Crisponi.	CREA-PB
Working Group. Adherent ASVIS - Italian Alliance for Sustainable Development	CREA PB, in coherence with its general scientific competences in the field of agriculture, agribusiness, agroindustry, fisheries, forestry, human nutrition of food, rural development and agricultural economics, carries out relevant activities aimed at promoting the sustainable and efficient use of natural resources, with particular regard to water and soil, with a view to the overall sustainability of the production system in the light of environmental, economic and social constraints. With particular reference to water resources in agriculture and their sustainable management, ensuring sustainable and resilient agriculture will enable the achievement of the goals stated in the 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals (SDGs) adopted by the United Nations in 2015. Based on these considerations, CREA's membership in ASVIS was initiated during 2019 and then made official in 2020. The membership provides that the Research Centre for Agricultural Policies and Bioeconomy supports the various activities conducted by the Alliance, including those carried out by the Thematic and Transversal Working Groups, as well as the organization of the ASVIS Festival of Sustainability and the drafting of the ASVIS Report "Italy and the Sustainable Development Goals" and the report "The Budget Law and Sustainable Development" drafted annually.	S. Fabiani, R. Romano	CREA-PB
CLUSTER SPRING Italian Cluster on Green Chemistry Working table "Biomass" and Working table "Law"	Development of strategies for the enhancement of biomasses of agricultural and forestry origin with a particular focus on marginal, disadvantaged, abandoned industrial areas. Activities aimed at creating value chains based on the enhancement of agricultural biomass. Analysis and regulatory planning activities aimed at the development of the bioeconomy and integration with other sectoral policies.	S. Fabiani	CREA-PB
ENRD Thematic Group - Bioeconomy and Climate Action in Rural Areas	Thematic group within the European Network for Rural Development. ENRD serves as a hub for exchange of information on how Rural Development policy, programmes, projects and other initiatives are working in practice and how they can be improved to achieve more	R. Zucaro	CREA-PB
Table. Permanent Table as per art. 3 of the Ministerial Decree MIPAAF of 31 July 2015	CREA PB, within this table, supported the drafting of the MIPAAF Guidelines of MD 31/07/2015. These guidelines define the minimum cases in which the regions and autonomous provinces must establish obligations to measure the volumes of water used in agriculture, with regard to withdrawals, returns and uses, both for collective and autonomous irrigation, indicate the elements to be monitored (withdrawals, uses, returns), the subjects responsible for the acquisition and transmission of monitoring data (irrigation agencies or regions), the methods of quantification (measurement or estimation) and the timing of monitoring and data transmission to SIGRIAN. In fact, they identify SIGRIAN as the reference database for the collection of data for the quantification of irrigation volumes. With their own measures, all regions and autonomous provinces have subsequently implemented and adopted the MIPAAF guidelines.	R. Zucaro	CREA-PB
Table. Technical Committee for the Coordination of the Observatories	CREA participates in the Technical Committee for the Coordination of the Observatories, whose purpose is to define - minimum and common contents of the Bulletins of the Observatories (a basic information tool where the current, historical and statistical values of the magnitudes of cause and effect of water crises are reported, so that the members of the Observatory have a suitable cognitive basis for the identification of the most appropriate actions to be taken to contrast the critical situation); - national guidelines for water availability and water severity to be adopted at the level of the individual District Observatory.	R. Zucaro	CREA-PB
Table. Permanent observatory on the water uses in the seven Hydrographic Districts	CREA is a member of the Permanent Observatories for Water Uses, established in July 2016 by MATTM for each of the seven Hydrographic Districts and in which participate a subjects, in addition to the District Authorities, the Ministry of Agriculture, Food and Forestry (MiPAAF) and the Ministry of Infrastructure and Transport (MIT), the DPC, ISPRA, ISTAT, the National Research Council (CNR), the Regions, ANBI, lake regulation consortia, energy and environmental water companies and electricity companies. The activation of the Observatories is a specific measure of the District Water Management Plans.	R. Zucaro	CREA-PB
Table. Technical Coordination Committee for the "Design of the Operational Plans of the Permanent Observatories on Water Uses set up in the various Italian Districts".	CREA's activity includes participation in the Technical Coordination Committee and in particular in the working group aimed at: - preparation of a technical manual for Water Availability and Water Severity Indicators; - to the WEI+ working group to coordinate at national level the calculation and evaluation methods of the indicator; - to the Ecological Runoffs Working Group.	R. Zucaro	CREA-PB
Working Group. Evaluation Steering Group of the NRDP 2014-2020.	The activity of CREA has provided support in the evaluation activities of the National Rural Development Program 2014-2020, with particular reference to the proposals for updating the Evaluation Plan, the identification of evaluation needs throughout the programming period 2014-2020 and the verification of the functionality of the links between the monitoring system and the evaluation process. The Evaluation Steering Group was also responsible for liaising with the Independent Evaluator and providing him with data and information relevant to the evaluation activities.	R. Zucaro	CREA-PB

Working Group. Participation in the Terrevalute 2022 Project promoted by the National ANBI	CREA provides support within the project Terrevalute 2022 promoted by ANBI. In particular, the purpose of the project is to outline the operational and institutional guidelines that will inspire the action of the Consorzi di bonifica in the coming years, in an era now strongly affected by climate change. To this end, four Technical Tables have been set up corresponding to four distinct thematic areas, each of which will focus on the analysis of some of the Goals for Sustainable Development of the 2030 Agenda, goals that are particularly linked to the activities and responsibilities of the Land Reclamation Consortia: A. Goals 8-9-12 (8. Decent work and economic growth; 9. Goals 3-6 (3. Health; 6. Clean Water - Water Quality) D. Goal 15 (15. Life on Earth - Biodiversity). In particular, CREA is providing support to Table C. Goals 3-6, focused on the analysis of Health, Clean Water and Water Quality among the Goals for Sustainable Development of the 2030 Agenda particularly related to the activities and prevailing responsibilities of the Reclamation Consortia.	R. Zucaro	CREA-PB
Agreement between CREA PB and the University for Foreigners of Perugia, Department of Human and Social Sciences, WARREDOC Center	The agreement between CREA PB and Warredoc foresees the joint collaboration of the two institutes in order to carry out technical-scientific activities necessary: 1. to the implementation and development of policies and programs for the sustainable use of water to address water scarcity in agriculture and to adapt agricultural systems to these limiting conditions and climate change; 2. to the study and development of technologies for the sustainable use of water in agriculture; 3. to promote the conscious and rational use of water resources, through an active participation in WASAG; 4. to promote technology transfer activities and best practices for the sustainable use of water resources also through research and experimental communication projects that actively involve citizens and students with a focus on the exploitation of the potential offered by new technologies for observation, modeling and monitoring through remote sensors and mobile devices (e.g. open data, big data, citizen science).	Direttore di Centro	CREA-PB
Memorandum of Understanding	Memorandum of Understanding with Campania Region, Department of Agriculture, on agriculture and rural development	M. A. D'Oronzio, G. Costantini	CREA-PB
Lucanian Bioeconomy Cluster	The Cluster aims at 1) promoting the bioeconomy in the regional territory, 2) promoting the development and competitiveness of enterprises on the regional strategic lines of the bioeconomy; 3) encouraging specialist training.	C. De Vivo	CREA-PB
Partnership agreement between CREA PB and Basilicata University	Agreement aimed to: 1) Collaboration in the definition of research and training projects for young graduates and undergraduates, 2) Definition, development, participation and implementation of scientific projects in sectors of common interest; 3) Development of improvement situations to enhance the results of the changes and their transfers; 4) Sharing of instrumental and human resources aimed at the realization of programs and projects	M. A. D'Oronzio, M. C. Suanno	CREA-PB
Institutional Tables of FEAMP 2014-2020 OP, Monitoring Committees, State-Region Conference linked to the fishing sector under the EMFF OP, National Network of FLAGS.	To favor the planning, control and management of the EMFF 2014-2020 National Operative Program	L. Tudini	CREA-PB
Regional Conference of Research and Innovation (Tuscany)	Permanent body of the Tuscany Region with consultative functions, made up of representatives of universities, research centers, science and technology parks, companies and trade unions.	L. Tudini	CREA-PB
Management body for transparent goby fishing in GSA 9 (Ministry of Agricultural, Food and Forestry Policies)	Management and socio-economic monitoring of the National management plan for derogation to Regulation (EC) n. 1967/2006, regarding the use of boat seines for transparent goby fishing in GSA 9	L. Tudini	CREA-PB
Working Group CREA-NISEA (Fisheries and Aquaculture Economic Research)	Analysis of the Covid-19 emergency effects on the Italian fisheries and aquaculture sectors (results published on the CREA website)	P. Proietti	CREA-PB
Steering Committee of the International Farming System Association (IFSA)	Scientific exchange on issues concerning farming systems, organization of biennial European conferences, convenors' activities and organization of thematic sessions within the conferences	P. Proietti	CREA-PB
International Scientific Steering Committee of the European Seminar on Extension Education (ESEE)	Scientific exchange on issues concerning education and extension in agriculture, organization of biennial European conferences, convenors' activities and organization of thematic sessions within the conferences	P. Proietti	CREA-PB
Editorial board of The International Journal of Agricultural Extension (ISSN: 2311-8547, 2311-6110) https://esciencepress.net/journals/IJAE/about/editorialTeam	Editorial activity	P. Proietti	CREA-PB
Cultural Association Laboratorio di Studi Rurali Sismondi	Scientific exchange on issues concerning rural development, organization of conferences and seminars	M. Lai	CREA-PB
Monitoring Committee of the RDP EAFRD 2014-2020 of the Tuscany Region	Stakeholder	F. Pierangeli	CREA-PB
Italian ESAD platform	The project is funded (€ 33,000) by IEEP (Institute for European Environmental Policy). The goal is the creation of a national platform of research stakeholders who discuss the agro-food research needs to be promoted through Horizon Europe. These contributions feed a European ESAD platform, in constant contact with the EC and with a group of relevant stakeholders for the agro-food sector.	M. C. Macrì	CREA-PB
CAP National Strategic Plan (2023-2027)	National contact point with the services of the European Commission regarding the National Strategic Plan of the Common Agricultural Policy from 2023 to 2027	S. Baiocco, F. Pierangeli, M. Bascietto	CREA-PB
Analysis of the impact of the COVID 19 emergency measures on foreign labor in agriculture	Carrying out a qualitative survey on shortages of foreign seasonal labor during the lockdown	F. Pierangeli	CREA-PB
National User Forum for Space Economy (Copernicus)	The Space Economy consists of a national program parallel to the EU program relating to Copernicus and aims to develop downstream services of the space supply chain in the context of the country for the use and application of technologies enabled by satellite earth observation	P. Lionetti	CREA-PB
Agriculture table for the Space Economy	The group aims at identifying the needs of the agricultural world and defining the technical requirements indispensable for the application of remote monitoring through the use of Earth Observation satellite data.	P. Lionetti	CREA-PB

Rete Comunicatori Fondi Sie	Participation in the sector table to provide opinions and addresses	M. Bolli, S. Cristiano, V. Carta, P. Proietti, P. Lionetti, F. Varia, A. Trisorio, F. Licciardo	CREA-PB
Comitato Comunicazione della RRN	Participation in the sector table RRN	R. Cagliero, B. Camaioni S. Cristiano	CREA-PB
Steering group for the implementation of the Evaluation Plan of the 2014/2020 Rural Development Program of Lazio, Sardinia, Tuscany, Emilia Romagna Sicily, RDN	Coordination of methodologies and use of evaluation results	R. Di Napoli	CREA-PB
GREXE	Panel experts on CAP evaluation by DG AGRI	A. Trisorio	CREA-PB
Leader sub-committee	Panel experts on LEADER in the framework of European Rural Network	F. Altobelli	CREA-PB
European Innovation Partnership (EIP-AGRI) Focus Group on High Nature Value (HNV) - Farming profitability	Network EU experts HNV	D.Marandola	CREA-PB
Rappresentanza Permanente d'Italia presso le Organizzazioni delle Nazioni Unite in Roma Scientific Attaché	Supporting activities on agriculture and rural development representation	A. Trisorio	CREA-PB
Comitato scientifico del Piano di azione nazionale sull'uso sostenibile dei prodotti fitosanitari (PAN)	Expert panel on PAN address and production	F. Pierangeli	CREA-PB
Gruppo di Lavoro UNESCO	UNESCO site expert panel at Mipaaf	F. Mantino, D. Storti	CREA-PB
GeoHUB Italia su PAC 2021-27	Coordination group development PSN 2021-27 and connection with CE	G.Bonati, S.Cristiano, F. Giarè, D.Storti, R. Di Napoli, D. Marandola, S Tarangioli	CREA-PB
Comitato Tecnico Aree interne (CTAI)	Coordination table SNAI implementation	Serena Tarangioli	CREA-PB
Gruppi tecnici Accordo di Partenariato 2021-2027	Strategic issues discussed Partnership Agreement under preparation	F. Giarè	CREA-PB
Gruppo tecnico Attuazione Accordo di Partenariato 2014-2020	Periodic comparison on AP monitoring	R. Pergamo	CREA-PB
Osservatorio Nazionale Agricoltura Sociale	Technical table at Mipaaf with Regions and OOPP on implementation of AS law	R. Romano	CREA-PB
Scientific Advisory Board	Journal of Food Economy	M. Scornaienghi	CREA-PB
Strategia Forestale Nazionale	Mipaaf technical table including Regions participation on national forest law implementation	A. Vagnozzi	CREA-PB
Tavolo Tecnico ACCREDIA per certificazione benessere animale filiera suinicola	Definition path for national "standard" on animal welfare certification	A. Scardera, R. Sardone	CREA-PB
Rete dei Servizi e della Ricerca in Agricoltura	Regional coordination table on AKIS issues	G. Bonati	CREA-PB
Tavolo tecnico certificazione sostenibile filiera vitivinicola	Coordination table with Mipaaf/regions/other certification bodies	D. Storti	CREA-PB
Tavolo tecnico BUL	Coordination table with Mise/Infratel/regions on BUL implementation	D.Storti	CREA-PB
OCSE, Working Party on Rural Policy	Rural development policies working group	F. Cisilino, G. Zanuttig	CREA-PB
Acron group 5 Eusalp - EU Strategy for the Alpin Region	Rural development policies working group for alpine regions	S. Cristiano	CREA-PB

6. CREA ORGANIZATION

Il CREA - Council for agricultural research and economics- is the leading Italian research organization with scientific competences in the fields of agriculture, agri-food supply chains, food-science and nutrition, fishery, silviculture, and socio-economics issues.

Having inherited a hundred-year history of experimental institutes, CREA was profoundly reformed in 2015, with an organization based on a Directorate-General, 12 research centres, 6 of them focused on supply chains and 6 on transversal fields.

CREA carries out research and develops technological solutions to enhance the protection and conservation of natural resources and of agricultural, forestry and fisheries ecosystems biodiversity, as well as the profitability and competitiveness of agriculture, agri-food and forestry activities, in a context of sustainability and health of production; it promotes the objectives of competition between agro-food and industrial systems for "Made in Italy" products; it promotes and develops relations with public research institutes, private, national and international; it promotes the debate on scientific topics of interest to Italian and European agriculture; it carries out certification, testing and accreditation activities in the relevant fields;

CREA is a legal entity under public law, supervised by the Ministry of Agricultural, Food, Forestry Policies (Mipaaf). Its organization chart is made up of::

- **The President**, Prof. Carlo GAUDIO, appointed by Decree of the President of the Italian Republic, upon the appointment of the Minister of Agricultural, Food and Forestry Policies, after consultation with the Parliamentary Committees on Agriculture.
- **The Board of Directors**, which, in addition to the Chairman, is composed of 4 members: two members upon appointment by the Minister, one member upon appointment by the Regions-State Conference and one member elected by the staff of CREA; the new Board of Directors, appointed on February 15th, 2021, in addition to President GAUDIO , is composed as follows: Prof. Alberto BASSET; Prof.ssa Stefania DE PASCALE, Dr. Enrica ONORATI e Dr. Domenico PERRONE.
- **The Scientific Council**, composed as follows: Prof. Gino BELLA; Prof. Giorgio CALABRESE; Prof.ssa Hellas CENA; Prof. Enrico GARACI; Prof.ssa Manuela GIOVANNETTI; Prof. Giulio MALORGIO; Prof.ssa Ilaria PERTOT; Prof. Michele PISANTE; Dr.Guido BONATI; Dott. Stefano FABIANI; Dott. Giuseppe MAZZA; Dott. Catello PANE.
- **The Board of Auditors**, composed as follows: Dr. Laura BELMONTE – President; Dr. Luca FAZIO; Dr. Carlo REGOLIOSI.

THE BOARD OF DIRECTORS

President, Prof. Carlo GAUDIO



**Vice President, Member
Prof.ssa Stefania De PASCALE**



**Member
Prof. Alberto BASSET**



**Member
Dr.ssa Enrica ONORATI**



**Member
Dr. Domenico PERRONE**



The Director-General, responsible for the overall management of CREA, oversees the activities of all offices and takes care of the organization and management, ensuring both the operational coordination of all the departments and the operational and administrative units present on the whole territory. Since November 2020, the CREA DG is Dr. Stefano VACCARI. Control over the financial management of the institution is also ensured by a Magistrate of the Italian Court of Audit, who attends the meetings of the Board of Directors and the Board of Auditors. Currently, the delegated Magistrate is Cons. Donato LUCIANO.

CREA has scientific, statutory, organizational, administrative and financial autonomy, in order to enable the Institution to achieve its aims as defined within the objectives and guidelines laid down by the Minister of Agriculture, Food and Forestry Policies.

CREA's budget revenue is largely secured by the Ministry of Agricultural, Food and Forestry Policies, through a specific annual allocation, but they are complemented by the hundreds of projects financed by other State Administrations, Regions and European Union in which CREA participates.

CREA staff is mostly employed by permanent contracts, enjoying therefore a significant proportion of stability in contracts. As of December 31, 2021, 2,283 staff units worked for CREA, 81% of whom in research and technical roles. The rate of women employed is 51.%. About 7% of the staff works in the Central Administration. CREA staff is located in 74 operative branches.

The Central Administration supports the research centres in technical and administrative activities and provides the common institutional services.

The following table provides a summary of the different Offices and their Heads of the Central Administration:

CENTRAL ADMINISTRATION (31 DECEMBER 2021)	EXECUTIVE
Programming and Management control (UDG1)	Speranza De Chiara
UDG2 - Transparency and anti-corruption	Fiorella Pitocchi
UDG3 – Project management	Laura Proietti
UDG4 - Institutional Affairs and International relations	Paola Fiore
UDG5 - Technology Transfer	Corrado Lamoglie
UDG6 - Support to agricultural business	Luca Buttazoni
UDG7 - General and Legal Affairs	Ginevra Albano
UDG8 - Information Systems	Alessandro Piscicelli
USC1 - Recruitment, training and labour	Silvia Incoronato
USC2 - Financial resources	Carla Berti
USC3 - Human Resource Management	Mara Peronti
USC4 – Property and real estate valorisation	Fidalma D'Andrea
USC5 – Contracts Office	Emilia Troccoli
Press Office	Cristina Giannetti

CREA, as said, is structured in 12 research centers (6 interdisciplinary and 6 focused on supply chain) distributed all over the national territory and collaborating with a central administration, local and regional institutions, companies and various commercial and industrial sectors and associations. From a structural point of view, CREA can boast many structures.

In the publication "I Centri di ricerca del CREA", available at <https://www.crea.gov.it/-/presentation-del-volume-centri-di-ricerca-del-crea> further details and insights on the single CREA Research Centers are available.

RESEARCH CENTRES	STRUCTURES	REAL ESTATE	MAIN LABORATORIES	HECTARES
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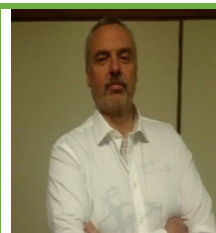
Agriculture and Environment (CREA-AA)	4	34	6	123
Food and Nutrition (CREA-AN)	1	1	1	
Cereals and Industrial Crops (CREA-CI)	6	80	3	931
Plant Protection and Certification (CREA-DC)	10	31	4	278
Forestry and Wood (CREA-FL)	5	19	2	385
Genomics and Bioinformatics (CREA-GB)	4	12	2	34
Engineering and Agro-Food Processing CREA-IT	6	75	4	286
Olive Fruit and Citrus Crops (CREA-OFA)	4	27	5	33
Vegetables and Ornamental Crops (CREA-OF)	6	38	4	235
Agricultural Policies and Bioeconomy (CREA-PB)	18	-	-	-
Viticulture and Enology (CREA-VE)	7	22	5	67
Animal Production and Aquaculture (CREA-ZA)	6	257	5	2.620
Central Administration (CREA-AC)	4	4	-	-
TOTAL	-81	600	41	4.992

STAFF WORKING AT CREA (SITUATION AT 31 DECEMBER 2021)

POSITION PROFILE	Agriculture and Environment (CREA-AA)	Food and Nutritic (CREA-AN)	Cereals and Industrial Crops (CREA-CI)	Plant Protection and Certification (CREA-DC)	Forestry and Wood (CREA-FL)	Genomics and Bioinformatics (CREA-GB)	Engineering and Agro-Food Processing CREA-IT	Olive Fruit and Citrus Crops (CREA-OFA)	Vegetables and Ornamental Crop (CREA-OF)	Agricultural Policies and Bioeconomy	Viticulture and Enology (CREA-VE)	Animal Production and Aquaculture (CREA-ZA)	Central Administration (CREA-AC)	TOTAL
Research Director													1	1

Research Manager 1st grade													12	12
Research Manager 2nd grade	7	2	2	5	2	3	3	5	3	6	-	8	-	46
Technical Manager	1	2	-	-	-	1	3	-	-	4	2	-	-	13
Chief Researchers	6	9	11	7	1	1	6	3	6	17	5	10	-	82
Chief Technicians	2	-	2	7	-	-	2	1	1	10	1	1	-	27
Researchers	55	50	31	45	27	35	47	31	41	52	38	37	-	489
Technicians	14	4	7	21	7	-	3	2	3	104	19	11	27	222
Administrative Officers	1	4	2	2	3	-	-	2	2	1	2	1	16	36
Technical collaborators	43	32	27	95	24	5	31	17	35	70	26	18	24	447
Administrative collaborators	15	15	8	22	4	2	8	5	21	46	10	12	55	223
Administrative operators	15	6	6	21	9	4	11	12	19	6	13	14	11	147
Technical operators	28	5	39	67	14	11	27	26	24	4	21	50	3	319
Other		1		1										2
PhD Students	1	3	9	1	-	-	7	9	20	-	11	15	-	76
Research grant holders	-	1	1	5	-	3	2	-	7	11	8	4	-	42
Agricultural Operators				9				3				17		29
Total	188	134	145	308	91	65	150	116	182	331	156	198	149	2.213

THE CREA RESEARCH CENTRES AND THEIR DIRECTORS



Agriculture and Environment (CREA-AA)
Structures in: Bologna Saliceto Bar
Bologna Firenze, Roma
Director: Giuseppe CORTI
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Director i.t. until 31 December 2021:
Marcello MASTRORILLI



Director until 31 June 2021: Marcello DONATELLI



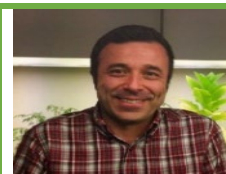
Plant Protection and Certification (CREA-DC)
Structures in Milano Palermo Lonigo (VI)
Bagheria (PA), Battipaglia (SA) Firenze
Roma Tavazzano (LO)Vercelli Bologna
Director: Pio Federico ROVERSI
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Food and Nutrition (CREA – AN)
Structure in ROME
Director: Emanuele MARCONI
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Director until 31 December 2021:
Elisabetta LUPOTTO



Cereals and Industrials Crops (CREA-CI)
Structure in : Rovigo Bergamo Bologna Foggia Vercelli
Acireale Caserta
Director: Nicola PECCHIONI
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Forests and Wood (CREA-FL)
Structures in: Rende (CS), Roma, Arezzo
Casale Monferrato, Trento
Direttore: Piermaria CORONA
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Director i.t. until 31 December 2021
Giuseppe NERVO



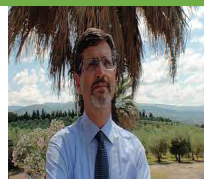
Genomics and Bioinformatics (CREA-GB)
Structures in: Fiorenzuola d'Arda (PC) Montanaso
Lombardo (LO) Roma
Director: Luigi CATTIVELLI
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Engineering and Agro-Food Processing (CREA- IT)

Structures in: Roma Forlì Pescara Torino
Milano Monterotondo (RM) Treviglio
(BG)

Director: Paolo MENESATTI
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Olive Fruit and Citrus Crop (CREA- OFA)

Structures in: Rende (CS) Spoleto (PG)
Acireale (CT) Caserta Forlì, Roma Ciampino

Director: Enzo PERRI
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Vegetable and Ornamental Crops (CREA-OF)

Structures in: Monsampolo del Tronto (AP) Pescia (PT)
Pontecagnano (SA) Sanremo

Director: Daniele MASSA
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<https://www.researchgate.net>



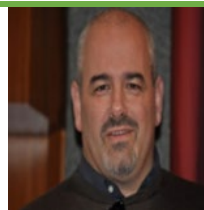
Director until 31 December 2021: Teodoro CARDI



Agricultural Policies and Bioeconomy (CREA-PB)

Structures in Roma Bari Bologna Cagliari
Campobasso Firenze Genova Legnano
Milano Osimo Palermo Potenza Reggio
Calabria Rende Torino Udine Napoli
Pescara Perugia

Director: Alessandra PESCE
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Viticulture and Enology (CREA- VE)

Structures in: Conegliano (TV) Asti Arezzo
Velletri (RM) Gorizia Turi (BA)

Director: Riccardo VELASCO
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Structures: Monterotondo (RM), Lodi, Modena, Belluno
Muro (PZ)

Director: Salvatore CLAPS
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Director until 31 December 2021
Roberto HENKE



Director until 31 December 2021: Luca BUTTAZZONI



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