Support Facility for Innovation & Knowledge exchange
EIP-AGRI

EU CAP Network cross-visit

Circular and organic soil management

Projects information

28-29 June 2023 – Basilicata, Italy

Funded by
the European Union

Host projects

Project title: "Optimization of inputs for sustainability of cereal crop systems in Basilicata" (CERESO)

Country, Region: Italy, Basilicata

Start and end date of the project: 06/06/2020 - 30/06/2022

Project objectives and activities:
The project tackles sustainability through a platform for precision soil management based on high-resolution on-the-go geo-electrical soil mapping and agronomic fertilization criteria. Different criteria for identifying agronomic soil uniform management zones were incorporated in the platform, from simple one-step soil-based clustering to an innovative two-step agronomic plus fuzzy clustering method.

Soil management practices that are covered in the project:
Minimum tillage, site-specific variable rate management, organic management, conservative agriculture.

Challenges tackled by the project:
Efficient and sustainable use of natural resources; Challenges related to climate change; Knowledge transfer, education and training.

Project results:
A diffused platform with hardware and resources for site-specific management based on agronomic criteria, sensor data and soil-vegetation relations; Diffusion of precision agriculture techniques; Data on fertilizer savings related to variable rate application; Criteria for identifying uniform management zones; traits for wheat variety selection based on soil-plant relations for resilience in changing climate. Strengthening of bonds between researchers and farmers towards the definition of new research objectives and projects.

Project related website(s), social media, videos, press articles, other communication materials:
https://www.alsia.it/opencms/opencms/Tag.html?cat=%20CERESO&catsearch=CERESO
https://www.alsia.it/opencms/opencms/Tag.html?cat=Cerealia&catsearch=Cerealia
https://www.alsia.it/opencms/opencms/agrifoglio/agrifoglio_online/dettaglio/articolo/Cerealicoltura-le-innovazioni-con-il-Progetto-LUCAN-CEREALS/?numagri=&Mese=

Participating representatives:

Name	Profession	Organisation	Type of organisation
Michele Perniola	Researcher	University of Basilicata	Research organisation
Roberta Rossi	Researcher	Consiglio per la ricerca in agricoltura e l'analisi	Research organiation

		dell'economia agrarian / Council for Agricultural Research and Agricultural Economics Analysis	
Rocco Antonio Mancusi	Farmer/farm manager or farm worker	Soc. Coop. Agricola La Generale	Farmers' organisation/ association

Project title: "Technological transfer of innovative agricultural practices within fruit and horticultural ecosystems (TINNOGEPRA)"

Country, Region: Italy, Basilicata

Start and end date of the project: 23/05/2018 - 31/10/2022

Project objectives and activities:
TINNOGEPRA aimed to transfer mature innovations to mitigate the carbon footprint and make farms more competitive. The improvement of soil quality linked to the management of agro-ecosystems and post-harvest processes were the keywords of the project to increase the resilience of agricultural systems and reduce the quantity of waste and increase the quality of production.

Soil management practices that are covered in the project:
The agricultural practices validated in the project had the aim of demonstrating how to improve soil fertility. The practices on which TINNOGEPRA focused concerned the non-tilling of the soil, the shredding of crop residues, the grassing, the addition of compost, manure and biochar, the efficiency of irrigation and nutrition.

Challenges tackled by the project:
Efficient and sustainable use of natural resources; Challenges related to climate change; Socio-economic sustainability

Project results:
The project demonstrated how the proposed innovations can improve the economic and environmental efficiency of fruit and vegetable production. The carbon footprint was calculated on various crops and it was verified how the suggested management

practices, if repeated over the years, cause an increase in carbon in the soil with a consequent increase in soil fertility, creating systems more resilient to biotic and abiotic stresses.

New products and solutions developed by this operational group: TINNOGEPRA, being a transfer project, did not produce new products or services but wanted to demonstrate how the sustainable management of agricultural systems has a positive impact both in economic and environmental terms.

Project related website(s), social media, videos, press articles, other communication materials:
https://www.alsia.it/opencms/opencms/Temi/attivita/TINNOGEPRA-00001/
https://www.facebook.com/profile.php?id=100064151915464

Participating representatives:

Name	Profession	Organisation	Type of organisation
Giuseppe Carlucci	CEO	Agreement srl	Advisor on technical, economic, environmental and/ or social dimensions for farmers/ forester
Egidio Lardo	Agronomist	Dimitra societa agricola	Researcher
Alba Minini	Researcher	University of Basilicata	Researcher
Bartolomeo Dichio	Professor	University of Basilicata	Researcher

Participating projects

Project title: “Finalized FRUIT Growing Organic Carbon Footprint - FRUTTI_FICO”

Country, Region: Italy, Emilia Romagna region

Start and end date of the project: 01/04/2017 - 20/02/2021

Project objectives and activities:
The goal of the Operational Group was to monitor the carbon footprint of the fruit sector also with reference to the soil's function to stock organic carbon identifying the cultivation techniques capable of mitigating GHG emissions in the cultivation of some fruit species in integrated, organic and biodynamic management. In the selected fruit plots of the involved farms specific samplings and analyses on the microbial biomass, the metabolic quotient (qCO2), the microbial quotient (qMic), the mineralization quotient (qM), the biological fertility index (IFB) and quality of organic matter were evaluated.

Soil management practices are covered in the project:
inter-row grass cover; green manure inter-rows

Challenges tackled by the project:
Efficient and sustainable use of natural resources; Challenges related to climate change; soil carbon sequestration

Project results:
The studies and research carried out have shown that the orchard managed with grassed or green manure inter-rows represents an excellent example of sustainable management, keeping organic carbon in the soil. The results quantified the organic substance content present in the first 30 cm of soil and demonstrated that the biofertility index is an excellent indicator for knowing the quality of the organic matter and its "stability" in remaining in the soil and therefore favoring storage of Carbon over time.

New products and solutions developed by this project include the definition of guidelines aimed to improve soil management for maintaining the organic matter and carbon sequestration in orchards.

Project related website(s), social media, videos, press articles, other communication materials:
https://progetti.crpv.it/Home/ProjectDetail/27

Participating representatives:

Name	Profession	Organisation	Type of actor
Maria Grazia Tommasini	Head of research on Integrated and Organic agriculture	RI.NOVA soc. Coop	Advisor on technical, economic, environmental and/or social dimensions for farmers/ foresters; Innovation support agent and/ or innovation broker

Project title: "Application of circular economy principles to 2 pilot cultivations using Ecolabel soil improvers (SoilCircle)"

Country, Region: Greece, Central Macedonia

Start and end date of the project: 14/12/2022 – 13/12/2025

Project objectives and activities:
Due to the negative effects on crop growth & the environment from the use of synthetic fertilizers, it is recommended to apply soil amendment to the soil to improve its structure, maintain & enhance its fertility & enrichment. The goal of the project is the procedures to be followed by all the procedures for the certification of compost of agri-food origin in order to create an environmentally friendly business model aimed at converting agri-food waste into a value-added product, through analysis of the qualitative composition of the compost produced, soil quality analyses, crop selection, et In this project, in order to improve soil structure and maintain its fertility and enrichment, certain amounts of compost will be applied, depending on crop needs.

Soil management practices are covered in the project:
In this project, in order to improve soil structure and maintain its fertility and enrichment, certain amounts of compost will be applied, depending on crop needs.

Challenges tackled by the project:
Efficient and sustainable use of natural resources; Socio-economic sustainability; Pollution to the soil and the natural environment

Project results:
Through the application of certified compost on crops, the reduction of management costs for the disposal of agri-food waste, the production of animal feed with a reduced

environmental footprint compared to the use of synthetic fertilizers (avoiding 6-7kg CO2/kg of synthetic fertilizer) is achieved. Finally, it is expected to increase crop efficiency by 25%, protect the natural environment & water resources, maintain sustainability through the recovery of agricultural waste &its conversion into useful agricultural by-products, & finally, obtain an Ecolabel eco-label for the soil conditioner produced. These are the expected results.

New products/solutions being developed by this operational group: It is an opportunity to obtain Ecolabel certification for the compost produced from agri-food waste, and to increase the number potential users. In particular, the agri-food sector in Greece is characterised by a large volume of waste, which is expected to be used for the production of Ecolabel certified soil improver, which is an indication of environmental responsibility.

Project related website(s), social media, videos, press articles, other communication materials:
www.soilcircle.gr

Participating representatives:

Name	Profession	Organisation	Type of actor
Michail Genitsargiotis	Agronomist – Project Manager	Ergo Planning	Advisor on technical, economic, environmental and/ or social dimensions for farmers/ forester
Stelios Tamvakidis	Biosystems engineer, Farm Advisor	N/A	Civil servant

Project title "Talamh Beo (Soil Biodiversity Literacy and Enhancement EIP) Operational Group"

Country, Region: Ireland, Sligo

Start and end date of the project: 01/06/2021 - 28/02/2023

Project objectives and activities:
A FARMER LED PEER TO PEER SOIL BIODIVERSITY LITERACY AND ENHANCEMENT PROGRAM

'Putting our feet back on healthy ground by growing the biodiversity in our soils'.

A group of farmers who have a demonstrated history of applied learning came together to learn about soil biodiversity and how to go about improving and enhancing it on their farms. The project was recorded in real time and made available to interested farmers and citizens to follow and learn alongside. Farm walks complemented knowledge transfer through peer to peer learning.

Soil management practices covered in the project:
Physical innovations (soil biological activators, johnsons-su reactors, mineral amendments, biochar, green manure, bio-complete compost, compost teas, inoculants) were trialled within differing land management practices (organic, no till, min till, biological farming, permaculture, conventional best practice, EOV certified farm (Environment outcomes verification under Savory Institute's regenerative farming) on different soil types and under different land use practices (dairy, beef, hill sheep, horticulture, mixed farming).

Challenges tackled by the project:
Challenges related to climate change; Knowledge transfer, education and training; Pollution to the soil and the natural environment.

Project results:
Farmers are able to learn and teach each other land management practices as well as becoming certified to laboratory test their soils for biological activity.

Project related website(s), social media, videos, press articles, other communication materials:
Talamh Beo Soil Biodiversity EIP https://talamhbeo.ie/eip-project/
Video of the Soil Biodiversity EIP https://youtu.be/mTL94dDCvqs

Participating representatives:

Name	Profession	Organisation	Type of actor
John Paul Brennan	Farmer/farm manager or farm worker; Advisor on technical, economic, environmental and/or social dimensions for farmers/ foresters	National Organic Training Skillsnet	Advisory organisation (on technical, economic, environmental and/or social dimensions for farmers/ foresters)

Project title: "Transfer and adaptation of organic conservation agriculture to the Marche farming systems" (AGRIBIOCONS)

Country, Region: Italy, Marche region

Start and end date of the project: 01/02/2019 - 01/02/2023

Project objectives and activities:
The AGRIBIOCONS project aims to mitigate the degradation of Marche soils, through the transfer and adaptation of conservation organic agriculture techniques and technologies in the cultivation systems of the region, especially on the most common arable crops. More specifically, the project aims to improve physicochemical and microbiological properties of soils through agroecological practices such as minimum tillage, cover crops and intercropping. In order to measure the effects of these practices, the research partners have developed a technological prototype able to measure soil erosion.

Soil management practices covered in the project:
The project has tested the following soil management practices:

- minimum tillage
- cover crops,
- intercropping,
- crop rotation.

These agronomic practices have been applied only in ORGANIC farms. In particular, the project has been implemented through 7 demonstration fields in the Marche region (central Italy) for a total area of 26 hectares. The farms have well represented the geo-morphological diversification of the regional territory, as they were located in valley floor, irrigated and non-irrigated, medium-low and medium-high hill areas.

Challenges tackled by the project:
Efficient and sustainable use of natural resources; Challenges related to climate change; Knowledge transfer, education and training.

Project results:

- Comparable crop yields between organic and organic conservative agriculture
- Slightly higher average costs in organic conservative agriculture due to the cultivation of cover crops.
- Less amount of water corralled in organic conservative farming compared to traditional organic management
- Approx. +150 kg/ha/year of organic nitrogen in the organic conservative farming system
- Erosion of soils managed with organic conservation techniques 10 times lower than ploughed fields in traditional organic farming (5 ton of sediment eroded in organic farming vs 0.5 ton in organic CA)

Project related website(s), social media, videos, press articles, other communication materials:
www.arca.bio/en/agribiocons

Participating representatives:

Name	Profession	Organisation	Type of actor
Simone Tiberi	Advisor on technical, economic, environmental and/or social dimensions for farmers/ foresters	ARCA	Advisory organisation (on technical, economic, environmental and/or social dimensions for farmers/ foresters)
Dominique Serrani	Researcher	UNIVERSITA' POLITECNICA DELLE MARCHE / MARCHE POLYTECHNIC UNIVERSITY	Research organisation
Francesca Carbonari	Press media collaborator	ARCA	Advisory organisation (on technical, economic, environmental and/or social dimensions for farmers/ foresters)

Project title: "Circular bioeconomy of proximity: organic fertilisation in organic and conventional vineyards"

Country, Region: Spain, Catalunya

Start and end date of the project: 21/06/2022 – 30/09/2024

Project objectives and activities:

The main objective is to promote the circular bioeconomy in Catalonia by using livestock manure and other organic amendments, to improve soil quality and vineyard productivity. First, high quality fertilisers are produced from the livestock manure transformation. Then, such fertilisers are ground tested in commercial vineyards (organic and conventional). Soil, plant and winemaking are evaluated. Technical, economic, and environmental feasibility will be done through life-cycle assessment. Finally, a pilot technical advisory on vineyard organic fertilisation will be created.

Soil management practices are covered in the project:
Organic fertilisation, Tillage reduction

Challenges tackled by the project:

Challenges related to climate change; Socio-economic sustainability; Knowledge transfer, education and training

Project results:
Expected project results include:

- Five different organic fertilisers are already applied in the field (3 for conventional, 2 for organic agriculture)
- Soil physic-chemical characterisation is done, and soil quality analyses are still in progress
- Fertilisers' physic-chemical characterisation is still in progress
- A solar biodrier for the solid fraction of the pig slurry is already set in the farm

New products and solutions developed by this project include a pilot solar biodrier for the solid fraction from pig slurry was designed and implemented in one farm.

Project related website(s), social media, videos, press articles, other communication materials:
https://www.innovi.cat/bioeconomia-circular/?lang=en
https://betatechcenter.com/projects/bioeconomia/

https://ruralcat.gencat.cat/documents/20181/10648953/EN+INICIAL+pilot+2021_087_juve_y_camps_BioecoCircular+%281%29_CA_EN.pdf/52284af1-e6bf-47c4-9d8c-9619f00b83a1

Participating representatives:

Name	Profession	Organisation	Type of actor
Diana Elisa Jimenez de Santiago	Researcher	Universitat de Vic	Researcher
Ricard Carreras Ubach	Head of transfer, business and territory	Beta Technological Center (UVic-UCC)	Researcher

Project title: "Optimizing the economic and technical performance of agricultural inputs by applying activated biochar to vegetable crops in the Nicosia region" (OLIVER Nicosia Vegs)

Country, Region: Cyprus, Nicosia

Start and end date of the project: 13/04/2021 - 15/04/2024

Project objectives and activities:
The objective of the OLIVER Nicosia Vegs project is the development of a new cultivation practice as well as the development of a new process with the application of activated biochar produced in Cyprus, to agricultural soils as a soil conditioner, with the aim of strengthening the existing common cultivation practices in Cypriot agriculture as well as the processes that take place in the soil-climatic environment of agricultural areas. The development of a new environmentally friendly agricultural practice of reduced inputs based on the use of activated biochar can serve several of FAO SDGs.

Soil management practices covered in the project:
OLIVER Nicosia Vegs project aims to demonstrate, through the implementation of soil friendly practices, the potential reduction of the necessary amounts of irrigation water, the reduction of energy consumption for cultivation operations, the reduction of the use of chemical fertilizers and pesticides to promote plant health and productivity, earliness and production increase. At the same time it intends to demonstrate the positive

contribution of the use of activated biochar in environmental processes and specifically in the soil-climatic environment of the agricultural areas of interest.

Challenges tackled by the project:
Efficient and sustainable use of natural resources; Challenges related to climate change; Pollution to the soil and the natural environment.

Project results:
Intermediate results of the project include acquisition of soil field data as well as crop production and quality indices that fortify the projects target regarding the beneficial use of the activated carbon in horticulture crops. Clear differences regarding quality and quantity parameters have been recorded, between pilot fields with and without the use of activated biochar, even for subsequent crops that were seeded in the same pilot filed.

Project related website(s), social media, videos, press articles, other communication materials:
https://oliver.cy/

Participating representatives:

Name	Profession	Organisation	Type of actor
Nicolaos Larkos	Innovation support agent and/ or innovation broker; Researcher	Agrotech Innovations Ltd	Innovation Support Service
Andreas Irakleous	Farmer/farm manager or farm worker		
Spyros Loungrou	Farmer/farm manager or farm worker		