EU CAP Network cross-visit ‘Climate adaptation on the ground – innovative solutions to build farm resilience’

Thessaloniki, Greece
26-27 June 2024

Table of contents

Sustainable soil management and precision agriculture techniques to ensure the viability of arable crops

Myrto Kosti
PreConAgri

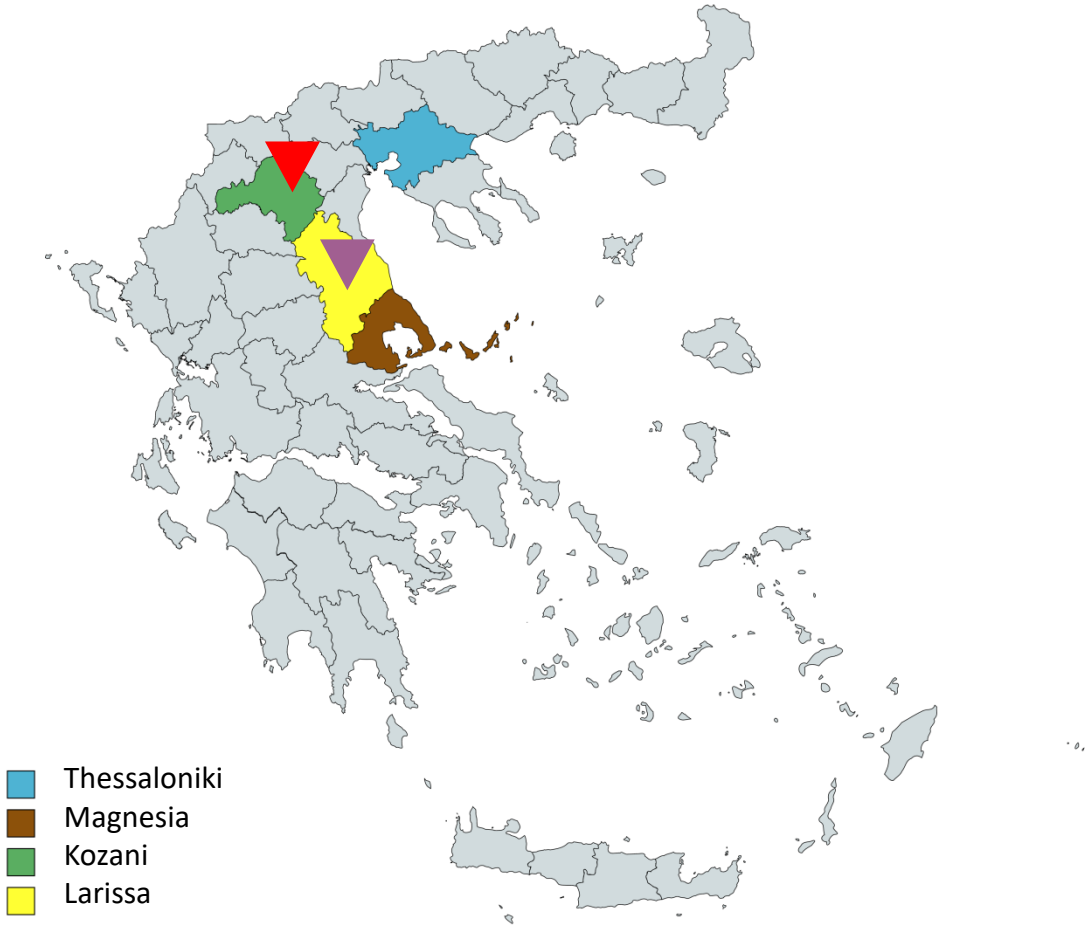
EU CAP Network cross-visit 'Climate adaptation on the ground – innovative solutions to build farm resilience' | Thessaloniki, Greece| 26-27 June 2024

Funded by the European Union

EU CAP NETWORK

preconagri
precision conservation agriculture

- The Operational Group consists of 6 members and is located in Greece



- The Operational Group consists of 6 members and is located in Greece

1. CERTH/ IBO – Volos Magnesia
2. Special Account of Research Funds University of Thessaly – Volos Magnesia
3. Hellenic Association for Promotion of Conservation Agriculture - Thessaloniki
4. Agromet – Thessaloniki
5. Producer - Charisios Lampropoulos – Kozani
6. Agricultural Cooperative Nikaia Larissa "Prometheus“ - Larissa

- 2 trial areas

1. Krokos, Kozani, Western Macedonia region
2. Nikaia, Larissa, Thessaly region

Pilot fields

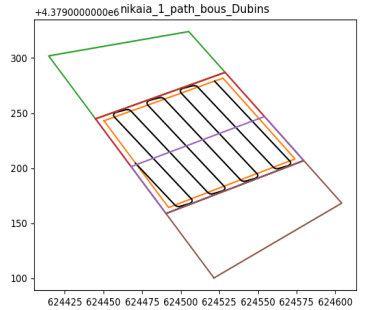
1. **Krokos, Kozani, Western Macedonia region**

2. **Nikaia, Larissa, Thessaly region**

Project info – state of play

What challenges are addressed by your OG?

1. **High soil degradation** due to the sloping terrain in a large extent of agricultural land and the intensive mechanical processing traditionally applied to these areas
2. **Soil compression and destruction of soil structure** due to intensive tillage and frequent disorderly machine passage
3. **Irrational use of nitrogen fertilizers**, which beyond increasing production costs leads to non-utilization of nitrogen fertilizers, pollution of surface and underground waters with nitrates
4. **Increased fuel consumption** and the corresponding **greenhouse gas emissions**



What innovative solutions are developed / tested by your OG?

- **Conservation Agriculture** including minimum or no-tillage and permanent soil cover with vegetation and residues (mulching)
- **Smart Agriculture** including Variable Rate Nutrient Application (VRNA) based on real-time sensoring and actuation (AUGMENTA technology) and map-based actuation in plots always using Machine Guidance (TRIMBLE technology) with parallel assessment of optimal pathways within and out of the farm parcels.

Further project development

What other challenges came up during the implementation of the project?

- There was an **incompatibility** between Machine Guidance (TRIMBLE technology) and the Augmenta Field Analyzer
- It was not possible in the context of the current funding scheme for the experimental procedure to be tested for more than 3 growing seasons for more robust results
- The OG will consider the possibility of alternate funding after the conclusion of the current Programme in Q3 2025

What other solutions (that are not currently tested by the OG) would need to be tested or developed?

- Testing of the combined system in more areas / plots with **various soil characteristics**

Future project idea

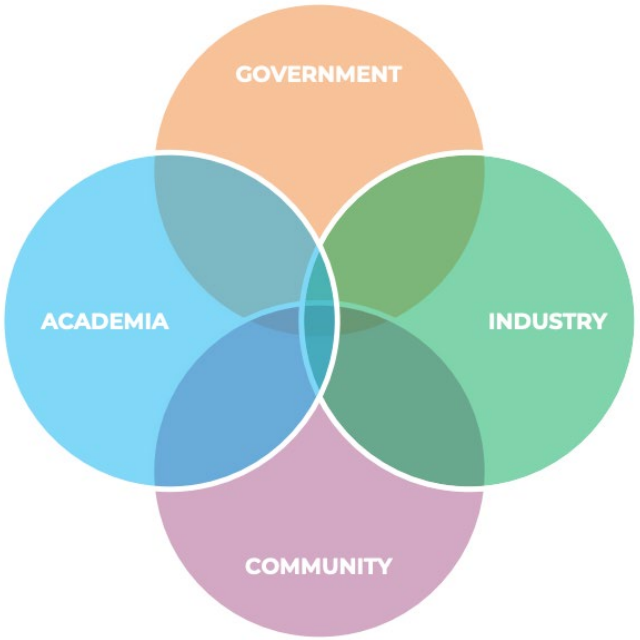
What project ideas you would like to develop in the future?

- Emphasize on solutions to deal with the issue of soil degradation
- Long period CA experimentation in many degraded land areas of Greece
- Combination of several smart farming solutions with CA (e.g. optimum weeding at nozzle control level to minimize the use of glyphosate or similar herbicides)

Future collaboration (needs and offer)

Do you have any **needs** for further collaboration?

- Get valuable feedback by different stakeholders (covering the quadruple helix) that may or may not be aware of the proposed cultivation scheme
- Learning about applicable and innovative ways to tackle the issue of agricultural land degradation in order to create a transnational OG



What can you **offer** to your future partners?

- Experience of the combined concept (CA and SA) implemented and evaluated in the context of PreConAgri to tackle agricultural land degradation
- Experience on LCA and LCC of different agricultural systems

Thank you for your attention!

precision conservation agriculture

https://www.preconagri.gr/en/

m.kosti@certh.gr

C. Lampropoulos
Producer

Innovative post harvesting technologies to restore soil sustainability

Lina Šarūnaitė
InoTechSoil

Funded by the European Union

EU CAP Network cross-visit 'Climate adaptation on the ground – innovative solutions to build farm resilience' | Thessaloniki, Greece| 26-27 June 2024

Project info – state of play

What challenges are addressed by your OG?

The project manifests itself in the attention to comprehensively solving the completeness of plant growing technologies for restoring soil productivity: mobilize and store nutrience, organic matter, stabilize physical properties, optimize moisture, and reduce fluctuations in plant productivity due to climate change.

What innovative solution(s) are developed / tested by your OG?

The technological prototype to show how to correctly (without losses) use the green mass of catch crops for fertilision.

their insertion

Further project development

What other challenges came up during the implementation of the project?

Soil moisture and yield reduction during short-term droughts.

What other solutions (that are not currently tested by the OG) would need to be tested or developed?

Optimizing soil moisture during the cultivation of catch crops and in the spring after heir insertion.

Future project idea

What project ideas you would like to develop in the future?

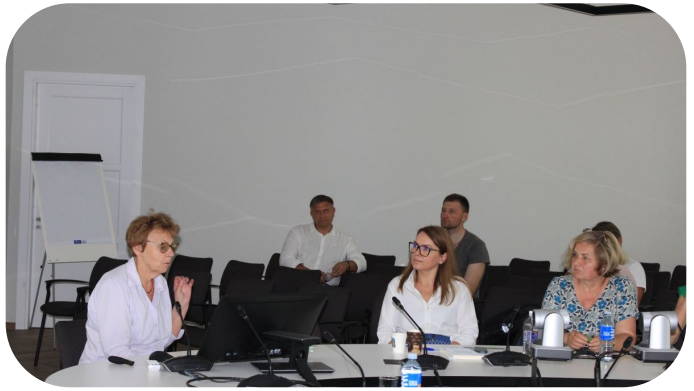
Modeling of cacth crop growing technologies for soil moisture conservation during short-term droughts.

Future collaboration (needs and offer)

Do you have any **needs** for further collaboration?

The lack of initiative and activity from farmers.

What can you **offer** to your future partners?



Find a common solution, since each farmer has a different farming practice: specific farm-specific land-specific technology.

An innovative plant production management system with emphasis on optimization of machine operation, fertilization and protection of soil biodiversity.

Andrzej Słomczewski
SFC - FTF

Funded by the European Union

EU CAP Network cross-visit 'Climate adaptation on the ground – innovative solutions to build farm resilience' | Thessaloniki, Greece| 26-27 June 2024

Project info – state of play

What challenges are addressed by your OG?

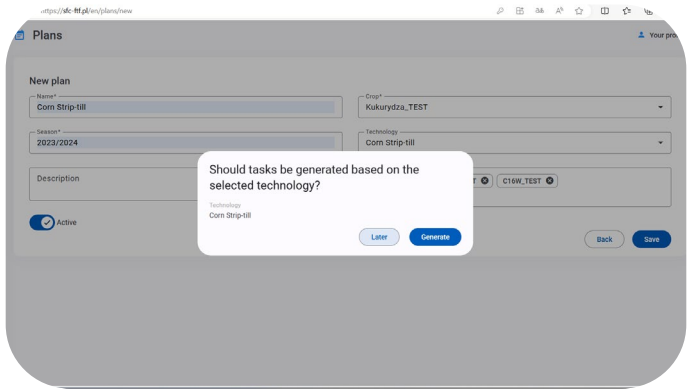
Farm data management & data optimal use.

- Large amount and variability of data, number of layers;
- Different sources and different databases;
- Incorrrect and incomplete data.

What innovative solution(s) are developed / tested by your OG?

Innovative Farm Management Information System (FMIS).

- Collecting data in one database by IoT;
- Repair, extrapolation and interpolation incomplete data;
- Data analysis by AI (*including biological data*);
- User-friendly service.



Further project development

What other challenges came up during the implementation of the project?

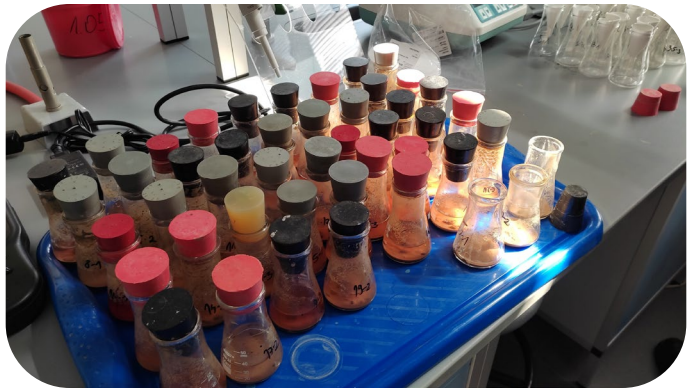
Hardware, software & …time.

- Devices and software ;
- Integration FMIS with solutions from various manufacturers;
- Short project implementation time.

What other solutions (that are not currently tested by the OG) would need to be tested or developed?

Expanding the scope of analyzed data.

- Consideration of crop varieties;
- Including the cultivation of catch and cover crops;
- Extension the research to other crops.



Future project idea

What project ideas you would like to develop in the future?

Water managment.

Improving quality of sowing in different soil conditions.

Further improvement and development of FMIS.

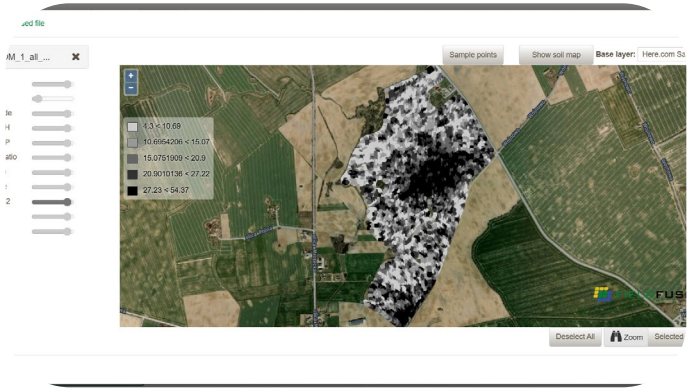
Future collaboration (needs and offer)

Do you have any **needs** for further collaboration?

Openness & complementary knowledge.

- Partners open to co-creating solutions;
- Knowledge that allows us to jointly create solutions that meet our needs.

What can you **offer** to your future partners?



Openness, Data & experience.

- Full openness to new ideas and collaboration;
- Practical knowledge, experience and database;
- Many different possibilities.

Thank you for your attention.

Diversification of cover crops and use of multifunctional properties to increase soil sustainability and carbon sequestration potential and reduce fertilizer requirements

Edita Karbauskienė

EU CAP Network cross-visit 'Climate adaptation on the ground – innovative solutions to build farm resilience' | Thessaloniki, Greece| 26-27 June 2024

Funded by the European Union

Project info – state of play

To develop and improve technologies for the cultivation of different species of cover crops and their mixtures

- To apply them for more efficient carbon sequestration and plant nutrient use
- To maintain and increase farm profitability and sustainable farming
- To reduce impact on climate change
- To reduce soil degradation and GHG emissions in different crop rotations, and soils and farming systems

The aim of the project - to introduce innovative technologies for the diversification of cover crops and the use of their multifunctional properties in farms, increasing soil sustainability and carbon sequestration potential, and reducing greenhouse gas (GHG) emissions and the need for fertilizers.

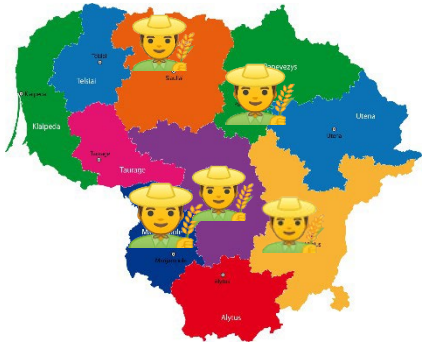
EU CAP NETWORK

Operational Group

LEŪA
Lietuvos ekologinių ūkių asociacija
LIETUVOS EKOLOGINIŲ ŪKIŲ ASOCIACIJA
LITHUANIAN ASSOCIATION OF ORGANIC FARMS

LIETUVOS ŪKININKŲ SĄJUNGA

- representatives of farmers' organizations
- problem identification
- installation of experimental fields
- technical service



VYTAUTAS MAGNUS UNIVERSITY AGRICULTURE ACADEMY

- scientific justification
- introduction of innovation
- analysis and monitoring
- preparation of conclusions and recommendations
- preparation of methodical material

THE CHAMBER OF AGRICULTURE OF THE REPUBLIC OF LITHUANIA

- project coordination
- consulting
- education
- dissemination

Project info – state of play

Problems that are solving

- The diversity potential of cover crop species is not used;
- Plants with a short time carbon sequestration are selected;
- Plowing of cover crops in autumn accelerates and promotes the mineralization of organic matter, the release and leaching of nutrients, gas emissions, does not protect the soil from water and wind erosion, the environmental goal of nutrient immobilization is not achieved;
- Insufficient supply of engineering solutions for methods of inserting cover crops (mulching, rolling, etc.);
- Many species of intercrops have not been evaluated for their impact on the reduced use of mineral fertilizers and plant protection products, the amount of sequestered carbon and nutrients, soil biodiversity, physical properties, and the yield and quality of crop rotation;
- There is a lack of recommendations on the selection of cover crops plant species for economic entities applying traditional, minimal and zero tillage technologies.

Innovations in the diversification of cover crops based on scientific research and the wider use of their multifunctional properties, which would be implemented in farms during the implementation of the project, can help solve the problems.

Further project development

What other challenges came up during the implementation of the project?

- Different soil conditions
- Different climatic conditions
- Different farming systems
- Different methods of tillage
- Different variety of plant species

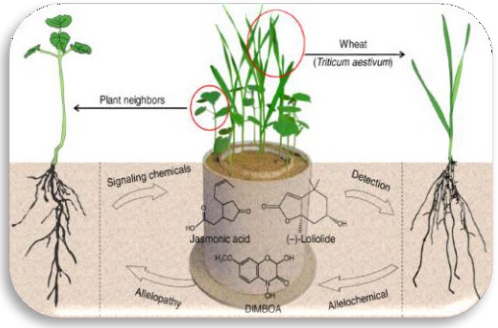
Data from farms in different farming systems and regions varies greatly and it is difficult to generalize the results

What other solutions (that are not currently tested by the OG) would need to be tested or developed?

- To identificate ghg emissions from the soil around year (carbon dioxide, methane)
- To investigate the effect of cover crops on the less frequently cultivated species and mix farming systeme
- To study and methodically evaluate the distribution of accumulated carbon in the upper and deeper soil layer under different agricultural systems and tillage technologies
- To determine the influence of different rates and forms of fertilizers on the potential of sequestered carbon
- To investigate the influence of multicomponent cover crops on soil biota and allopathic relationships

Future project idea

- Modulation of carbon sequestration potential
  - To crebate modular systems for obtaining carbon credits
- Nitrogen mineralization management
- Increasing the utilization potential of soil phosphorus resources and searching for alternative sources of phosphorus
- Modeling and use of research data for technology improvement
- Modeling of nutrient balance for plants using fertilization with integrated compositions of plants grown for green manure



Future collaboration (needs and offer)

NEEDS

Do you have any needs for further collaboration?

- To adapt and apply the project results achieved by EIP-AGRI in the agriculture practice
  - national
  - international
- Foster sustainable development and efficient management of natural resources such as water, soil and air
- Contribute to climate change mitigation and adaptation

OFFER

What can you offer to your future partners?

- Developing better connections between researchers, teachers, advisors, farmers:
  - to encourage innovations „from bottom to top“
  - EIP-AGRI OG network support
  - dissemination quality improvement
  - to speak and understand in the „same language“

Chamber of Agriculture of the Republic of Lithuania
Address: K. Donelaičio g. 2, 44213 Kaunas
Tel. + 370 37 400351, +370 614 08793
- zur@zur.lt
- https://www.zur.lt
- https://www.facebook.com/zemesukiorumai/

SoilCircle – Application of circular economy principles in 2 pilot crops using Ecolabel soil conditioner

Anastasios Mitsopoulos, QLAB
SoilCircle

Funded by the European Union

EU CAP NETWORK

SOIL CIRCLE

EU regulations FPR and ABPR

Component Material Category (CMC) 3

- The Commission Delegated Regulation (EU) 2023/1605 has recently been published, outlining new guidelines for the end points in the manufacturing chain of certain organic fertilisers and soil improvers. This regulation aims to provide clarity and harmonization within the European market, ensuring the safe and sustainable use of these products.

End Point for Compost and Digestate

- The regulation determines the end point in the manufacturing chain for compost and digestate, beyond which they are no longer subject to the Animal By-Products Regulation (ABPR). This allows these materials to be used as component materials in EU fertilising products in accordance with the EU Fertilising Products Regulation (FPR).

EU regulations FPR and ABPR

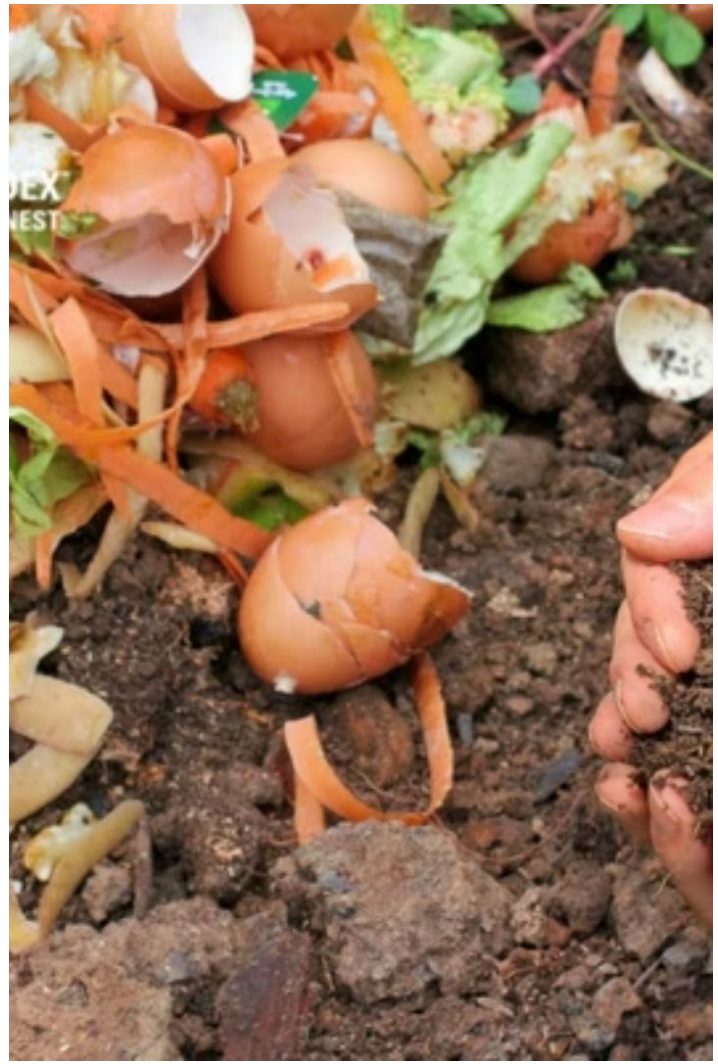
Component Material Category (CMC) 3

Standard Transformation Parameters

The regulation refers to the standard transformation parameters for processing animal by-products in composting and biogas plants, as laid down in Annex V to Regulation (EU) No 142/2011. This includes a requirement for treatment at 70°C for at least 1 hour with a maximum particle size of 12 mm.

No Derogations Allowed

Unlike the FPR, the ABPR previously allowed operators to use alternative transformation parameters that were validated by the competent authority. However, the new regulation does not allow any derogations from the standard transformation parameters.



EU regulations FPR and ABPR

Component Material Category (CMC) 3

Compost: A Sustainable Solution

Compost is a valuable organic fertilizer that can be produced from a variety of biodegradable materials. The European Union has established strict guidelines to ensure the safety and quality of compost used in fertilizing products. This section outlines the key requirements for compost to be included in EU fertilizing products.

EU regulations FPR and ABPR

Approved Compost Inputs

1 Bio-waste

Compost may contain bio-waste from separate collection, as defined in the Waste Framework Directive.

2 Unprocessed Organic Materials

Compost can be made from living or dead organisms that are unprocessed or minimally processed.

3 Composting Additives

Small amounts of additives may be used to improve the composting process, as long as they meet certain requirements.

4 Pre-Composted Materials

Compost can also contain materials that have been previously composted or digested, as long as they meet purity standards.

EU CAP NETWORK

SOIL CIRCLE

EU regulations FPR and ABPR

Composting Process Requirements

Separation

Composting production lines must be clearly separated from those processing other avoid contamination.

1

Thermophilic Conditions

2

The composting process must maintain specific time profiles to ensure proper sanitation and

Quality Control

The final compost must meet strict limits for contaminants such as plastics, glass, and aromatic hydrocarbons.

3

EU regulations FPR and ABPR

Compost Stability Criteria

Oxygen Uptake Rate

An indicator of the extent to which biodegradable organic matter is being broken down, with a maximum limit of 25 mmol O2/kg organic matter/h.

Self-Heating Factor

The maximum temperature reached by a compost in standardized conditions, with a minimum Rottegrad III as the criterion.

Stability Importance

Compost must meet at least one of these stability criteria to ensure it has been properly decomposed and is ready for use as a fertilizer.

Project info – state of play

What challenges are addressed by your OG?

- Analysis of the current situation
- Investigation of soil improver production in Greece
- Implementation of all procedures for the certification of agricultural compost
- Establishment of two organic farms to produce organic animal feed
- Development of an environmentally friendly business model to transform agricultural waste into a value-added product

What innovative solution(s) are developed/tested by your OG?

- Production of a certified soil improver
- Implementation in livestock crops
- Compilation of a compost production manual

Further project development

What other challenges came up during the implementation of the project?

- Analysis of basic parameters for the crop's composition and location (e.g., the slope of the land, the location and proximity to the sea, lakes and rivers, water catchments, as well as the wind potential)
- Quality analysis of produced compost (e.g., pH, conductivity, salinity, nutrients, and trace elements)

What other solutions (that are not currently tested by the OG) would need to be tested or developed?

- Use of **precision agriculture technologies** to enhance resource efficiency and crop yields.
- **Developing IoT-based** soil health monitoring systems, **coupled with** regular laboratory analyses of compost for pH, conductivity, and nutrient content, would aid in real-time decision-making.

EU CAP NETWORK

SOIL CIRCLE

Results

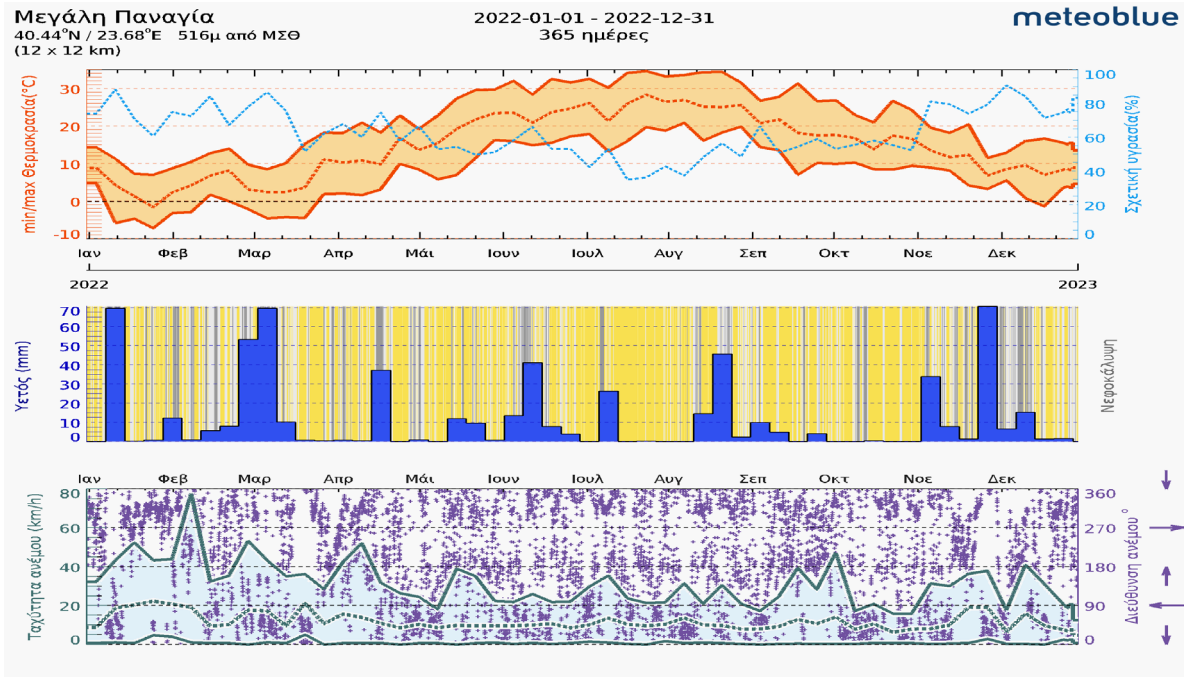
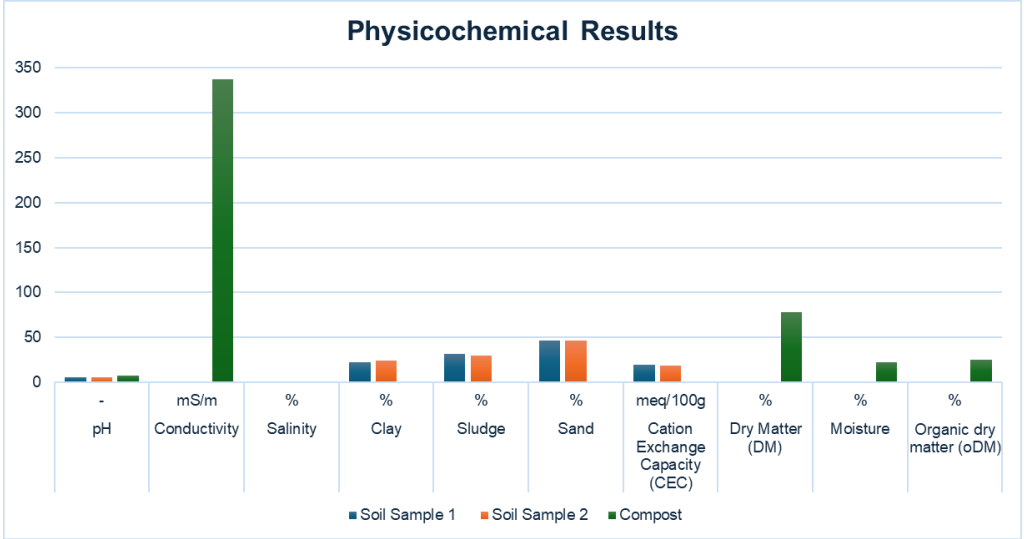
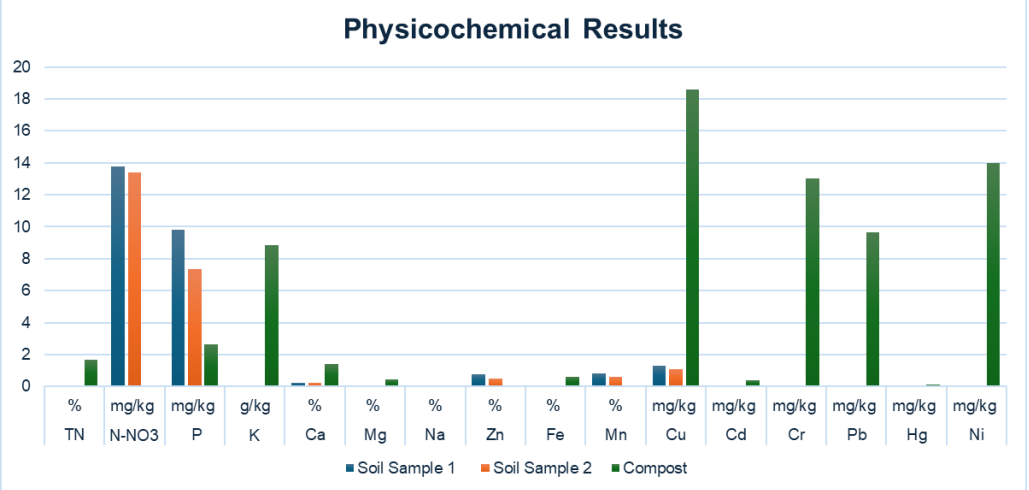


Fig 1. Meteorological data for a year



Diag 1. Physicochemical analysis of soil samples and compost



Diag 2. Physicochemical analysis of soil samples and compost

Compost application

SOIL CIRCLE

Dissemination Activities

- Creation of printed material and targeted dissemination through agricultural press
- Website in Greek and English: www.soilcircle.gr
- Dissemination in social media (Facebook, LinkedIn, Twitter)
- Participation at workshops: "N-Recovery – Workshop on Nitrogen Recovery" and "SOFIE2 – Organic and organo-mineral Fertilisers Industries in Europe Summit"
- Presentation of important parameters and agricultural practices for compost evaluation
- Collaboration with the Research Team for the utilization of results

EU CAP NETWORK

SOIL CIRCLE

Future project idea

What project ideas you would like to develop in the future?

- Decomposable packaging for compost vendors
- New recipes of compost production specific to crop cultivation
- Managing microbiome during compost production
- Industrial symbiosis for the production of compost

Future collaboration (needs and offer)

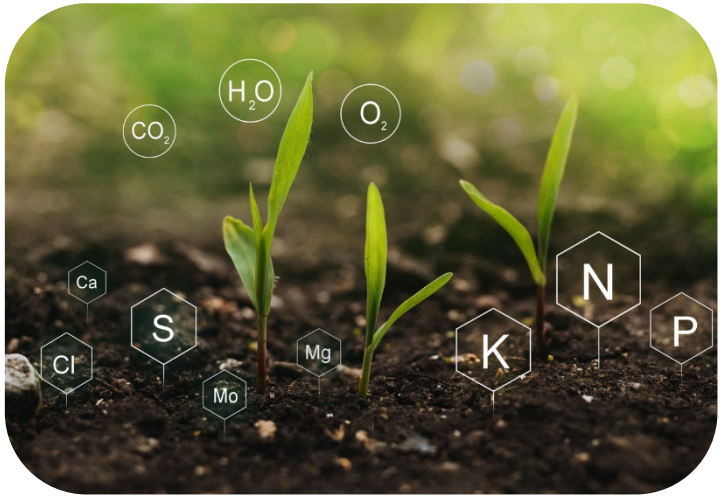
SOIL CIRCLE

Do you have any **needs** for further collaboration?

- Digitalisation
- AI applications on production process and on the field
- Monitoring tools and sensors

What can you **offer** to your future partners?

- Conformity assessment according to FPR
- Process validation (acc. to 142/2011), HACCP study, etc.
- Analytical methodologies for stability criteria
- Qlab participates at “CEN/TC 223 – Interlaboratory studies for the validation of European Standards in support of the Fertilising Products Regulation (EU 2019/1009)”
- Quality Assessment of compost (nutrients, trace elements)
- Microbiome characterisation (NGS tools, Bioinformatics)



THANK YOU!

Anastasios Mitsopoulos

- Visit our website: www.soilcircle.gr
- Email: info@q-lab.gr
- More about Qlab: www.q-lab.gr/en

K. Karamanli 122, Diavata, Thessaloniki, PC 57008, T: +30 2310 784 712 | F: +30 2310 784 713 | W: www.q-lab.gr | E: info@q-lab.gr

Soybean cultivation without chemicals

Petra Hajzser-Novák

Investigation of the possible pesticide and herbicide free cultivation of GMO-free, high nutrient content (PROFAT) soybeans at 7 several Hungarian soybean production areas

Funded by the European Union

Project info – state of play

What challenges are addressed by your OG?

- The climate changes
- The narrowing range of available herbicides
- The newly appearing weed and pest species

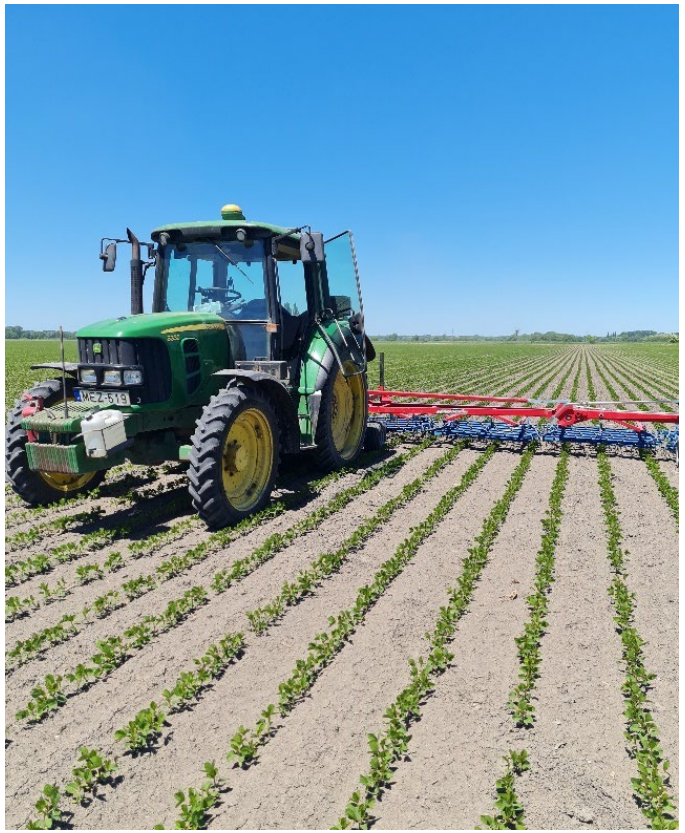
What innovative solution(s) are developed / tested by your OG?

- Cultivation of soybeans without chemicals

Further project development

What other challenges came up during the implementation of the project?

- The invasive pests coused a lot of harm in some years
- The sudden, abundant rain makes the mechanical weeding hard/impossible



What other solutions (that are not currently tested by the OG) would need to be tested or developed?

- We investigated varieties only from the 000 to 0 maturity groups – the other maturity groups should be also tested

Future project idea

What project ideas you would like to develop in the future?

- Adaptation of currently not grown grain legumes in Hungary
- Developing crop technology solutions in the light of the climate changes

Future collaboration (needs and offer)

Do you have any **needs** for further collaboration?

- Funding
- International network

What can you **offer** to your future partners?

- Administrative management
- Professional project coordination
- National network of professionals

Thank you for your attention!

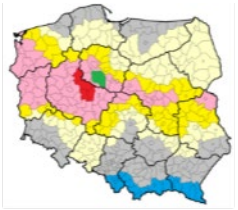
Innovative system of agro-meteorological monitoring, forecasting and operational planning of irrigation at farms in the Kujawy region

Wiesława Kasperska-Wołowicz
WATER FOR KUYAVIA

Funded by the European Union

EU CAP Network cross-visit 'Climate adaptation on the ground – innovative solutions to build farm resilience' | Thessaloniki, Greece| 26-27 June 2024

Project info – state of play



Precipitation (P, mm)

1971-2020	average	min	max
April-September	320	113	651
January-December	520	269	809

Climatic Water Balance (CWB, mm)

1971-2020	average	min	max
April-September	-190	-425	230

What challenges are addressed by your OG?

- ✓ Kuyavia – an important agricultural region with rainfall and surface water deficit;
- ✓ increase of farm resilience to climate change and weather variability;
- ✓ water resources rational management;
- ✓ increase of water use efficiency;
- ✓ irrigation according to actual crop water needs.

What innovative solution(s) are developed / tested by your OG?

- ✓ irrigation decision support system at farm level (IDSS);
- ✓ short term (2-3 days ahead) irrigation prediction based on weather forecast;
- ✓ precise irrigation based on soil-crop-weather data, mathematical models, sensors, ICT and OG members practical knowledge);
- ✓ farm work better organization.

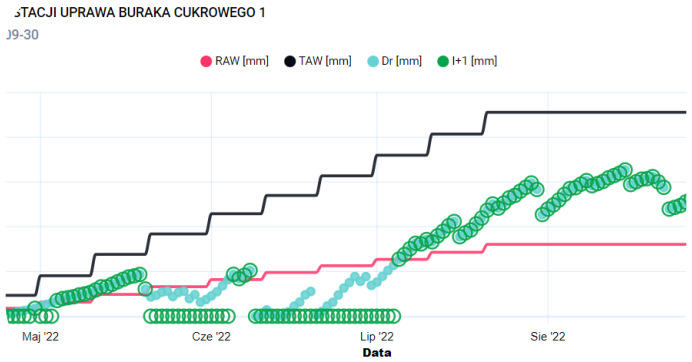
Further project development

What other challenges came up during the implementation of the project?

- ✓ data access from different sources and data transmission from sensors in the fields, data quality;
- ✓ unify the method of data acquisition and user-friendly interface;
- ✓ customization of some parameters by the user: soil depth to be irrigated and daily irrigation limit).

What other solutions (that are not currently tested by the OG) would need to be tested or developed?

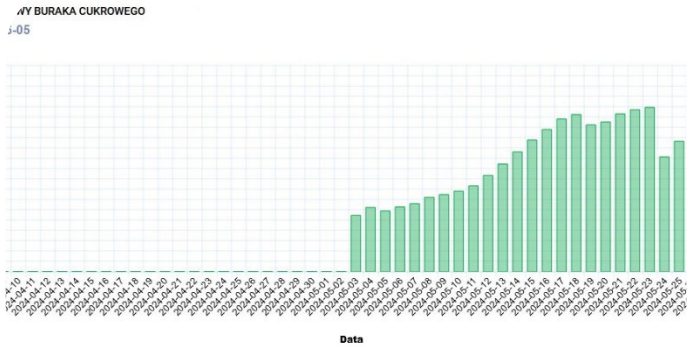
- ✓ different irrigation systems – sprinkler, drip and sub-irrigation;
- ✓ more crops to be monitored – including grasslands;
- ✓ including remote sensing to crop development modelling;
- ✓ automatic control of data quality.



Future project idea

What project ideas you would like to develop in the future?

- ✓ remote sensing (satellite, UAV) images – to monitor crop actual development;
- ✓ ensemble weather forecast to predict irrigation needs for the next few days;
- ✓ different sources of water – surface natural and artificial, ground water;
- ✓ artificial intelligence (AI) solutions;
- ✓ user interface improvement (more user-friendly).



Future collaboration (needs and offer)

Do you have any **needs** for further collaboration?

- ✓ to develope and improve the IDSS modules;
- ✓ to add another modules, e.g. precise fertilization and plant protection;
- ✓ to extend the system to the other regions in Europe;
- ✓ IT support, including AI tools (big dataset management);
- ✓ small water retention measures (increase retention).

What can you **offer** to your future partners?

- ✓ knowledge in the field of agro-meteorology and water management in agriculture;
- ✓ long data series;
- ✓ ideas for new projects and active work in project preparing;
- ✓ small water retention measures.

THANK YOU
for your attention!

Water for Kuyavia http://wodadlakujaw.pl/

w.kasperska-wolowicz@itp.edu.pl

Control of crop variability and maturation time through precise application of growth regulator in conjunction with real-time satellite monitoring of crop response

Kamil Wojtaś
SatAgro

Funded by the European Union

EU CAP Network cross-visit ‘Climate adaptation on the ground – innovative solutions to build farm resilience’ | Thessaloniki, Greece| 26-27 June 2024

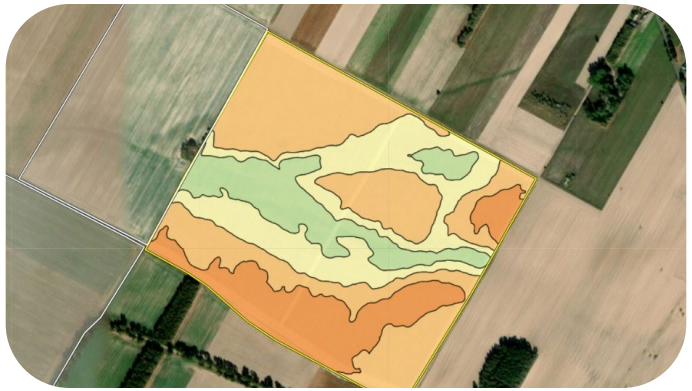
Project info – state of play

What challenges are addressed by your OG?

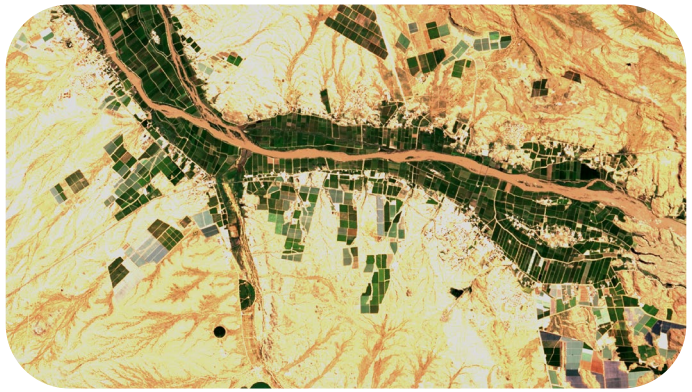
- Plant pests and diseases
- Earlier frosts in autumn and increased occurrence of spring frosts during the flowering period
- Volatility of agricultural production and increasing instability in the economic situation of farmers

What innovative solution(s) are developed / tested by your OG?

- The operation aims to enhance technologies for generating variable-rate maps of plant growth regulators, crucial in grain cultivation. By utilizing control computers and precision spraying systems, it addresses the lack of solutions providing demand information for these regulators.



- The innovation will utilize new biomass indices, allowing farmers to adjust regulator application to current agricultural needs, thus reducing resource consumption. It promises greater accuracy than standard NDVI-based solutions and facilitates quick assessment of regulator effects, aiding agronomic decisions.



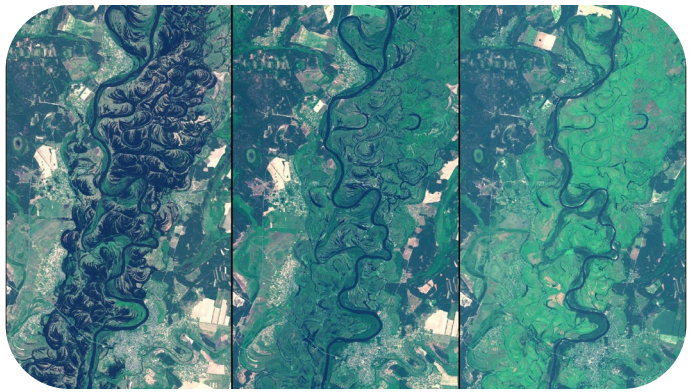
Further project development

What other challenges came up during the implementation of the project?

- Managing weather variability: The introduction of precise growth regulators requires an accurate analysis of weather conditions, which are increasingly unpredictable due to climate change.
- Adapting technology to different soil conditions
- Integrating data from various source

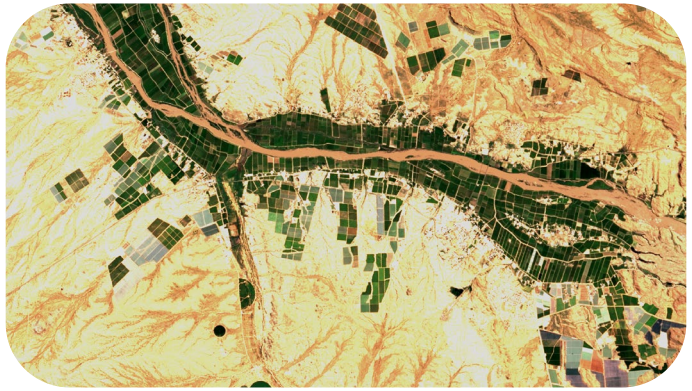
What other solutions (that are not currently tested by the OG) would need to be tested or developed?

- Advanced weather forecasting systems
- Integration with soil management systems: Developing and testing systems that integrate soil health data and its properties with crop growth management systems could increase the precision and effectiveness of the applied solutions.
- Water management solutions: Developing technologies that allow for more precise irrigation management to optimize water usage and improve crop growth conditions in the face of changing climate conditions.



Future project idea

What project ideas you would like to develop in the future?

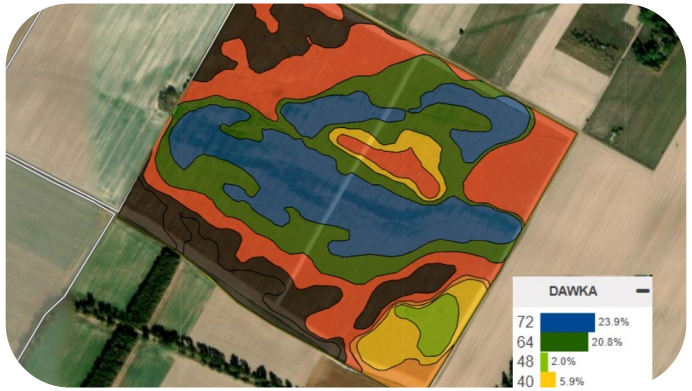


•**Integrated Farm Management Systems (IFS)**: Developing comprehensive systems that integrate data from various sources (e.g., satellites, drones, soil sensors) to optimize all aspects of farm management, from planting to harvesting.

•**Precision Irrigation and Water Resource Management**: Creating technologies and systems that allow for precise monitoring and management of water usage in farms, which is crucial in the face of climate change and limited water resources.

•**Agricultural Automation**: Implementing robots and autonomous agricultural machines that can perform fieldwork with high precision and efficiency, reducing human labor and increasing productivity.

Future collaboration (needs and offer)



Do you have any **needs** for further collaboration?

1. Research and Development: Collaboration with research institutions and technology developers to further innovate and refine our precision agriculture technologies.
2. Knowledge Exchange: Working with other operational groups and agricultural experts to share knowledge, best practices, and insights that can help improve our methodologies and approaches.
3. Market Access: Partnering with distributors and agricultural cooperatives to enhance the market reach of our technologies and solutions.

What can you **offer** to your future partners?

1. Cutting-Edge Technology
2. Expertise and Knowledge
3. Data and Insights
4. Networking Opportunities

WWW.SATAGRO.NET

Digital tools and early warning system for the adaptation of olive production to the climate change

Dr. Dimitrios Voloudakis
OLIVEALARM

Funded by the European Union

EU CAP Network cross-visit 'Climate adaptation on the ground – innovative solutions to build farm resilience' | Thessaloniki, Greece| 26-27 June 2024

EU CAP NETWORK

OliveAlarm

Project info – state of play

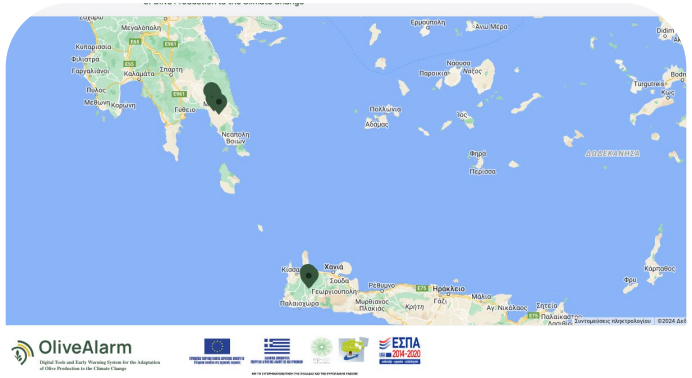
What challenges are addressed by your OG?

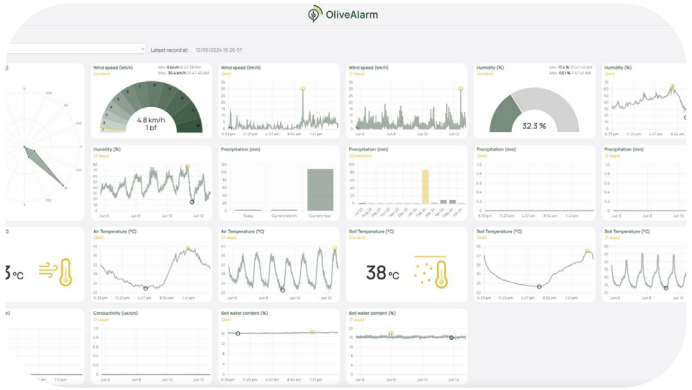
The objective of the O.G. OLIVEALARM is the reduction of the negative consequences of climate change (C.C.) through an early warning mechanism for two biotic (Bactrocera oleae, Cycloconium oleaginum) & abiotic risks with an emphasis on water scarcity & extreme temperatures (frost/heat).

What innovative solution(s) are developed / tested by your OG?

The innovation of the Operational Group (O.G) is based on:

- creating an easy-to-use early warning & decision support service
- organization of a business team in the logic of continuous interaction & exchange of know-how & experiences where everyone learns from everyone
- certification of the reduction of the climate footprint of olive cultivation so that the participating cooperatives can use it to improve the marketing & promotion strategy of olive oil giving & higher added value.





Further project development

What other challenges came up during the implementation of the project?

- Efficiency in peer to peer learning of the farmers in the usage of digital tools.
- Difficulties in convinsing some farmers to implement adaptation measures in their olive orchards.
- Beauracratic delays

What other solutions (that are not currently tested by the OG) would need to be tested or developed?

- Usage of new soil products for increasing soil moisture.

Future project idea

What project ideas you would like to develop in the future?

- Include more pest and diseases warnings for the farmers.
- Expand the geographical areas of implementation of the EWS.
- Implementation of cultivation management techniques using robots and UAVs

Future collaboration (needs and offer)

Do you have any **needs** for further collaboration?

- Further collaboration is necessary especially with other O.G. in olive oil sector and climate change adaptation for exchanging experience and expertise.

What can you **offer** to your future partners?

- Expertise in technological advancements and building knowledge capacity in local farmers communities.
- Technical assistance for EWS for diseases, entomological threats and extreme weather risks focused on personilized consultation to farmers and agronomists.

Partners

- ACADEMY OF ATHENS, Research Center for Atmospheric Physics and Climatology
- ELGO- DIMITRA (Institute of Olive Tree, Subtropical Crops and Viticulture)
- OPENIT – Information Technology Solutions
- KASELL – Union of Agr. Cooperatives Lakonia Peloponnese Greece
- ROUMATON GI- Agr. Cooperative Chania Crete Greece

Clonal selection of Kékfrankos in Hungary

Tamás Bardocz

A study of Kékfrankos (Blue Franc), the most widely cultivated grape variety in Hungary, exploring its viticultural and oenological values through clonal selection and genetic variability

Funded by the European Union

Project info – state of play

What challenges are addressed by your OG?

- Change of the market, change of the need of the consumers
- Appearance of new pests
- Climate changes

What innovative solution(s) are developed / tested by your OG?

- Comparison of several Blue Franc clones to choose the most suitable one for the partaking wineries

Further project development

What other challenges came up during the implementation of the project?

- The list of the clones could be shortened, but further investigations are needed

What other solutions (that are not currently tested by the OG) would need to be tested or developed?

- Further and more throughout investigations are needed

Future project idea

What project ideas you would like to develop in the future?

- The further research about the most suitable clones for the Hungarian wine regions

Future collaboration (needs and offer)

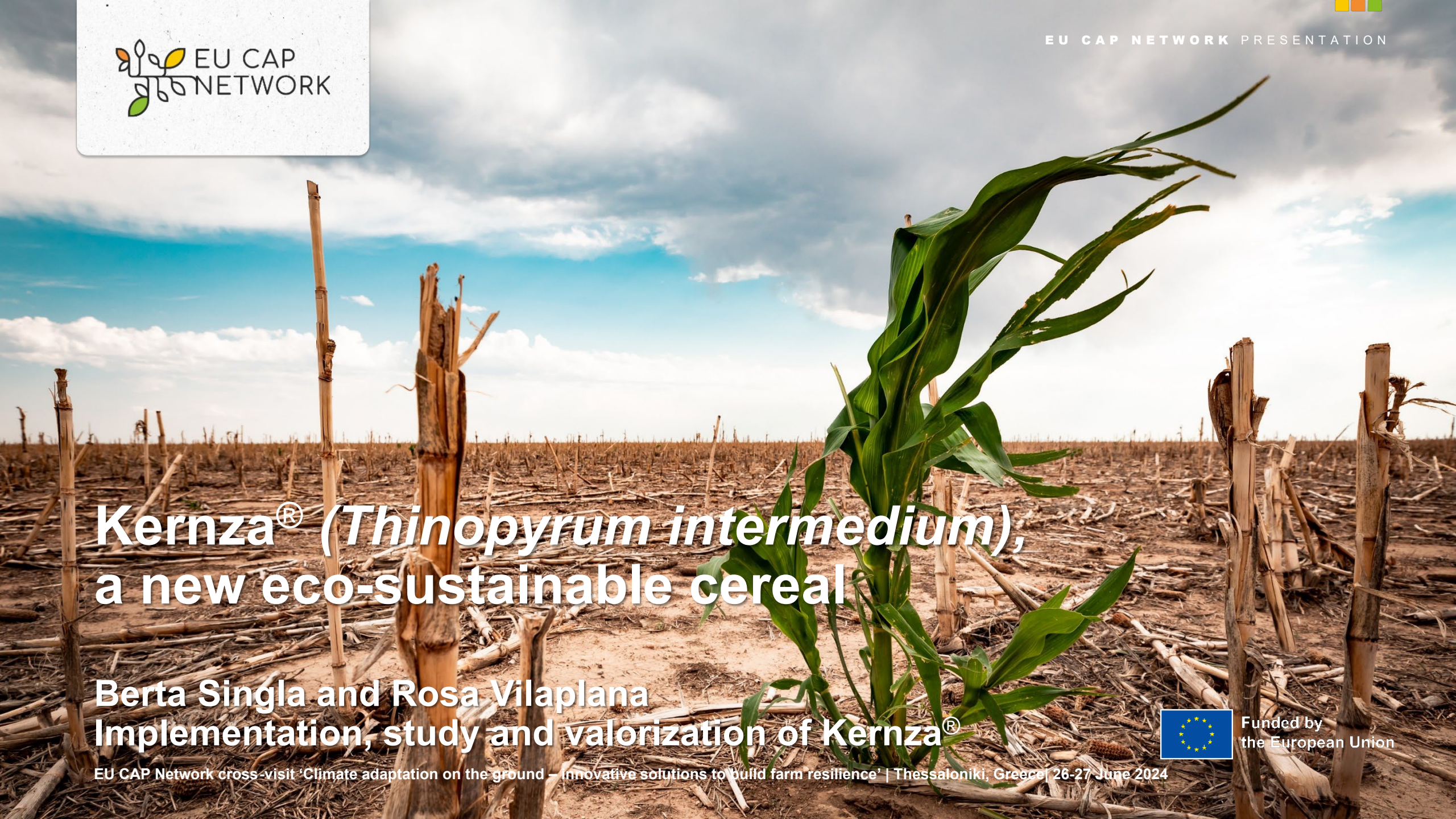
Do you have any **needs** for further collaboration?

- The funding opportunities are essential to support the further collaborations
- International networking opportunities

What can you **offer** to your future partners?

- Administrative management
- Active and professional project coordination
- Wide national network with connections of the sector

Thank you for your attention!



Kernza® (*Thinopyrum intermedium*), a new eco-sustainable cereal

Berta Singla and Rosa Vilaplana
Implementation, study and valorization of Kernza®

EU CAP Network cross-visit 'Climate adaptation on the ground – innovative solutions to build farm resilience' | Thessaloniki, Greece| 26-27 June 2024

Funded by the European Union

Operational Group located
Spain, Catalonia, Vic

Project info – state of play

What challenges are addressed?

- **Assess the adaptability of the perennial crop (Kernza®) in Catalonia**
- **Enhance resilience to climate change**
- **Improve soil health through carbon sequestration and reduction of nitrate leaching**

What innovative solutions are developed?

- **Better adaptation to adverse conditions due to climate change**
- **Protecting water resources from nitrate leaching**
- **Alternative flour for human consumption products and fodder animal**

Further project development

What other challenges came up during the implementation of the project?

Effective weed management is crucial to ensure crop establishment during the first year

What other solutions (that are not currently tested by the OG) would need to be tested or developed?

- **Has the potential to contribute to carbon farming**
- **Kernza® can be processed for various products, including bread production and brewing beer**

Future project idea

What project ideas you would like to develop in the future?

- **Collaboration with research centers to develop perennial cereals across the Mediterranean zone or EU**
- **Developing specific strategies to enhance soil health and build resilience to climate change**
- **Working with other research institutes to help us evaluate these systems' environmental and economic sustainability**

Future collaboration (needs and offer)

Do you have any **needs** for further collaboration?

Our goal is to have results/data, and experience from other research institutes involving Kernza® or other perennial crops

What can you **offer** to your future partners?

- **Sharing innovative knowledge about Kernza®**
- **Three years of comprehensive data on biomass, root system carbon stock, and nitrate leaching**
- **Future projects based on management resilient practices in the Mediterranean area**

Optimization of cattle housing conditions and production efficiency through application of innovations in barn and calf building equipment

dr Dorota Godyń, dr Andrzej Kaczor
CATTLE COOLING

EU CAP Network cross-visit 'Climate adaptation on the ground – innovative solutions to build farm resilience' | Thessaloniki, Greece| 26-27 June 2024

Funded by the European Union

Project info – state of play

What challenges are addressed by your OG?

Microclimatic conditions in barns significantly influence the thermal comfort of cattle. High air temperatures in summer (above 25°C) lead to heat stress in cows, which can be further exacerbated by elevated humidity and increased concentrations of harmful gases (primarily CO2 and NH3).

Heat stress in cows results in financial losses, including decreased milk production, higher somatic cell counts in milk, reproductive problems. Generally- it impacts negatively animal welfare, health and productivity. These problems have become more prevalent during recent years, also in countries with a temperate climate as heat waves are becoming more and more frequent.

The main goals of the project were; to develop an improved ventilation system in curtain barns, to develop an innovative method of cooling cows in the milking parlor and holding area, as well as to implement a technology for keeping calves in conditions of higher welfare (including better comfort during heat waves).

What innovative solution(s) are developed / tested by your OG?

1. An improved ventilation system in the curtain barn was developed and then applied. The improvement of the system is based primarily on the innovative location of openings with curtains in the gable walls and the installation of an innovative ventilation light ridges.

2. An energy-efficient cooling and air exchange system was developed and applied to the milking parlour and holding area. An innovative chiller with a moisture-absorbing section using heat from solar energy was used in the system.

3. An innovative technological and functional system for maintaining calves in open-type building, using igloo-type stalls and lifting curtains made of windbreak nets (these solutions were implemented to improve air exchange). In group pens, protective canopies were installed over the calf lying area. An innovative system for regulating the intensity and length of the lighting period of Led illumination was also installed.

Further project development

What other challenges came up during the implementation of the project?

- The biggest challenge/obstacle in the implementation of the operation were huge delays in the payment of funds by the executive agency.

What other solutions (that are not currently tested by the OG) would need to be tested or developed?

- We are interested in solutions providing mitigation of the heat stress effects on other species of farm animals (pigs, poultry). In particular, we are interested in cooling systems that reduce water use and are powered by renewable energy sources.

Future project idea

What project ideas you would like to develop in the future?

We are interested in air cooling technology projects for other livestock buildings as well as technologies purifying the air.

We are also interested in heat stress markers in farm animals (heat shock proteins, cortisol, respiratory rate, heart rate variability, body temperature, skin surface temperature, genetic markers of thermotolerance).

All systems that allow you to monitor both; microclimatic conditions and an animal's physiology, its behavior are interesting to us and we would like to work on this type of projects in the future.

Future collaboration (needs and offer)

Do you have any **needs** for further collaboration?

Any new opportunity for cooperation in the field of reducing the effects of heat stress in farm animals, physiological markers, or broadly understood animal welfare - would be important to us.

What can you **offer** to your future partners?

We have good cooperation with several farms in Poland, therefore, we offer a base for conducting experiments.

In past years we acquired a significant amount of equipment; such as microclimate meters (Aranet, Delta OHM, Dräger, Nanosens), thermographic cameras (Testo, Optis), and devices for monitoring and analyzing of animal behaviour (Observer XT).

We also have good, long-term cooperation with a laboratory that is able to obtain many reagents useful for assessing physiological indicators in animals.

New technology for cooling the milking parlor and holding area

HPQ INVEST

“Optimization of cattle housing conditions and production efficiency through application of innovations in barn and calf building equipment” - results

- lower air temperature in the barn, lower gas concentration, greater resting comfort for cows
- lower air temperature and gas concentration in the milking parlor and holding area
- higher comfort for calves kept in the new barn

The use of solar energy for heating greenhouses, processing produce

Aivars Jermus, Adolfs Rucins
Latvia University of Life Sciences and Tehnolgies
Green energy group
adolfs.rucins@lbtu.lv ; aivars.jermuss@lbtu.lv

Funded by the European Union

Latvia

10 partners

- *Latvia University of Life sciences and Technologies*
- *University of Latvia*
- *Ritausma Ltd farm*
- *Skudrinas farm*
- *Farmers' Parliament (ZSA) NGO*
- *Latvian Rural Consultation and Education Center Ltd*
- *Progressive Technologies Institute Society*
- *InfoPols.lv Ltd*
- *A.Pundura consulting center Ltd*
- *Baltic Open Solution Center Ltd*

Project info – state of play

What challenges are addressed by your OG?

Our technology can help reduce CO_2 emissions, for example by using energy more efficiently or switching to renewable energy sources.

New technologies, such as synthetic biofuels, can help reduce CO2 emissions in the future.

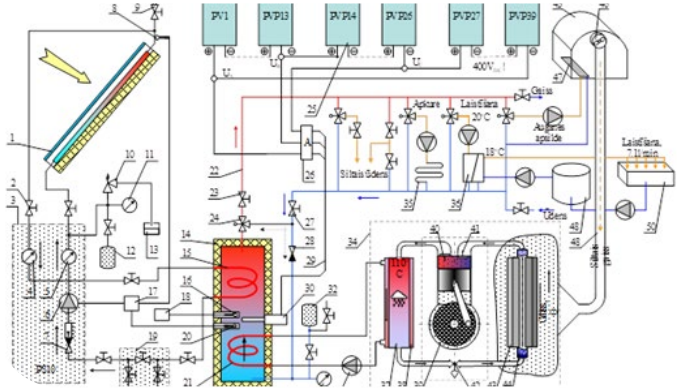
What innovative solution(s) are developed / tested by your OG?

Our OG developed an innovative solution while testing it in real farm conditions: energy storage. Energy storage was our main and one of the most important aspects of solar energy. Finding a way to store both electrical and thermal energy.

Further project development

What other challenges came up during the implementation of the project?

- The main challenge of this project was to develop and test a solar-powered device consisting of 8.0 kW photovoltaic panels connected to a 5 kW air-to-water heat pump, 15 kW solar collectors, a 10 kWh solar cell, an energy storage battery and a 1600 litre thermal water storage tank. The tests were carried out in a 50 m^2 experimental greenhouse.



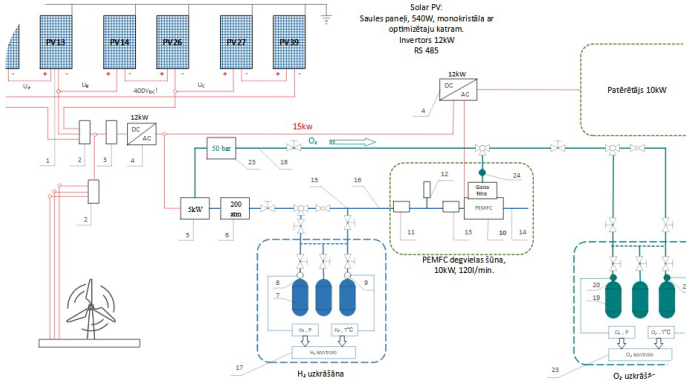
What other solutions (that are not currently tested by the OG) would need to be tested or developed?

- Our OG would like to focus on possible ways of storing solar energy that are more economically viable.

Future project idea

What project ideas you would like to develop in the future?

- Development of technology for energy-intensive agricultural and forestry processes using solar and wind energy stored as hydrogen and recoverable for use as electricity or heat.
- The use of hemp shives/wood raw materials and environmentally friendly binders (lignin) to create higher value-added products is a promising avenue.
- The idea is based on the sustainable use of local natural resources and the creation of high value-added products. As a result, the production of the composite to be developed will reduce CO_2 emissions by about 110 kg/m^3 compared to the production of traditional materials.



Future collaboration (needs and offer)

Do you have any **needs** for further collaboration?

We are ready to engage potential partners in projects of varying levels of complexity. We need access to a wide range of data on farming practices, climate, soil and other factors that affect CO_2 emissions.

What can you **offer** to your future partners?

Co-developing modern technologies such as remote sensing, precision agriculture and machine learning to analyze data and develop solutions to reduce CO_2.

EU CAP NETWORK

The use of solar energy for heating greenhouses, processing produce

The main arguments for using solar energy to heat and process produce are:

- Energy efficiency: Solar energy is a renewable form of energy that can provide a continuous supply of energy. It can reduce dependence on fossil fuels and lower energy costs.
- Environmental protection: Solar energy is clean energy that does not emit greenhouse gases. It can therefore help reduce the greenhouse effect and combat climate change.
- Economic viability: Although the purchase and installation of solar panels may require a large initial investment, it can be economically viable in the long term.

Farmamyc, “Increasing the uptake of soil nutrients through the use of mycorrhizae”

Ioannis Ipsilantis
Vegiday

EU CAP Network cross-visit ‘Climate adaptation on the ground – innovative solutions to build farm resilience’ | Thessaloniki, Greece| 26-27 June 2024

Co-financed by the European Union and Greek national funds

Funded by the European Union

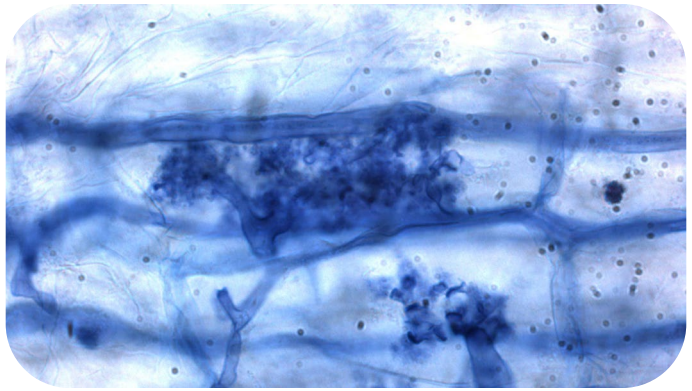
Project info – state of play

What challenges are addressed by your OG?

Minimizing inputs

Enhancing soil microbiota

Enhancing soil resilience



What innovative solution(s) are developed / tested by your OG?

On-farm production of mycorrhizal inoculum

Inoculum application in a commercial vegetable farm

Further project development

What other challenges came up during the implementation of the project?

Optimizing inoculum substrate

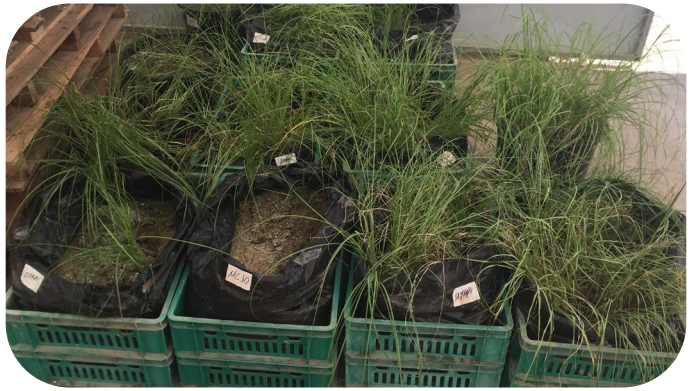
Producing high quality inoculum

Inoculum formulation for field application

Input adjustments

What other solutions (that are not currently tested by the OG) would need to be tested or developed?

Adjustments in production system to increase soil organic mater



Future project idea

What project ideas you would like to develop in the future?

Biostimulants – Microbial inocula

Soil conditioners and biochar application effects

Co-culture, Cover crops and Soil Health improvement

Crop breeding and mycorrhizal fungi

Future collaboration (needs and offer)

Do you have any **needs** for further collaboration?

Mission Soil, “living labs” and “lighthouses”

What can you **offer** to your future partners?

Expertise in Soil Science and Soil Microbiology

The Soil Science Lab and Faculty of Agriculture, AUTH

EU CAP Network cross-visit 'Climate adaptation on the ground – innovative solutions to build farm resilience'

26-27 June 2024 | **Thessaloniki, Greece**

All information on the workshop is available on the event webpage:

https://eu-cap-network.ec.europa.eu/events/eu-cap-network-cross-visit-climate-adaptation-ground