

**Support Facility for Innovation & Knowledge Exchange
EIP-AGRI**

EU CAP Network cross-visit

**Climate adaptation on the ground – innovative
solutions to build farm resilience**

Project information

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Host project

1. SoilCircle – Application of circular economy principles in 2 pilots crops using Ecolabel soil conditioner

Country, region: Greece, region of Central Macedonia, Megali Panagia Chalkidiki

Start and end date of the project: 14/12/2022 - 30/06/2025

Project objectives and activities:

The project aims to address the negative impacts of synthetic fertilisers on crop growth and the environment by applying soil amendments, specifically compost, to enhance soil structure and fertility. The project focuses on creating an environmentally friendly business model that converts agri-food waste into a value-added product, certified as organic. The main objectives include following the necessary procedures for compost certification and promoting its use as a soil conditioner to improve agricultural sustainability and productivity.

Practices that are covered in the project:

The project involves the integrated management of agro-livestock waste through composting processes to produce Ecolabel-certified soil improvers. These practices support organic feed production and adhere to circular economy and green growth principles. The project also includes the development of a comprehensive guide for applying certified soil improvers in animal feed crops, aiming to showcase a sustainable business model that enhances agricultural practices and environmental protection.

Challenges tackled by the project:

- Volatility of agricultural production and increasing instability in the economic situation of farmers.
- Plant pests and diseases.

Project results:

The project has successfully developed and applied Ecolabel-certified compost from agro-livestock waste, demonstrating its effectiveness in organic feed crop cultivation. The project has resulted in a sustainable business model that significantly contributes to environmental protection. Key achievements include a 25% increase in crop efficiency, reduced agro-livestock waste management costs, and a lower environmental footprint compared to synthetic fertilisers. These outcomes highlight the project's role in promoting sustainable agricultural practices. The project has developed an innovative product: Ecolabel-certified compost derived from agro-livestock waste, designed for organic feed crop cultivation.



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

<https://soilcircle.gr>

<https://www.linkedin.com/company/soilcircle>

<https://www.facebook.com/profile.php?id=61552785576004>

Participating representatives:

Name	Profession	Organisation	Type of organisation
Anastasios Mitsopoulos	Advisor on technical, economic, environmental and/or social dimensions for farmers/ foresters; Researcher	Ergoplanning Ltd	Advisory organisation (on technical, economic, environmental and/or social dimensions for farmers/ foresters)
Sofia Zioupou	Advisor on technical, economic, environmental and/or social dimensions for farmers/ foresters; Innovation support agent and/ or innovation broker	Ergoplanning Ltd	Advisory organisation (on technical, economic, environmental and/or social dimensions for farmers/ foresters)



Participating projects

2. PreConAgri – Sustainable soil management and precision agriculture techniques to ensure the viability of arable crops

Country, region: Greece, Western Macedonia and Thessaly regions

Start and end date of the project: 22/02/2023 - 31/08/2025

Project objectives and activities:

The project aims to implement and evaluate an alternative cultivation scheme for durum wheat in two Greek agricultural areas which incorporates methods of Conservation Agriculture (CA) and Smart Agriculture (SA). CA methods include minimum or no-tillage and permanent soil cover with vegetation and residues (mulching). SA methods include variable rate fertilisation and controlled traffic farming (CTF) with the estimation of optimal pathways inside and outside the plots. The project seeks to demonstrate the viability and benefits of these practices under real production conditions.

Practices are covered in the project:

This alternative cultivation scheme incorporates:

- Conservation Agriculture techniques such as minimum or no-tillage and permanent soil cover with vegetable and residues (mulching).
- Variable Rate Nutrient Application (VRNA) based on real-time sensing and actuation (AUGMENTA technology) and map-based actuation using Machine Guidance (TRIMBLE technology).
- Controlled Traffic Farming to optimize machine passages and reduce soil compaction.

Challenges tackled by the project:

- High soil degradation due to sloping terrain and intensive mechanical soil disturbance.
- Soil compaction from intensive tillage and frequent machine passages.
- Irrational use of nitrogen fertilisers leading to pollution, increased greenhouse gas emissions, and higher production costs.
- Increased fuel consumption and corresponding greenhouse gas emissions.

Project results:



The project is in its second year and undergoing the second growing season. Preliminary activities were conducted during the first growing season, and the initial results are expected by June-July 2024.

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

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

Participating representatives:

Name	Profession	Organisation	Type of actor
Myrto Kosti	Researcher	iBO/CERTH (Institute for Bio-Economy and Agri-Technology, Centre for Research and Technology Hellas)	Research organisation
Charisios Lampropoulos	Farmer/Farm manager or farm worker		



3. Innovative post harvesting technologies to restore soil sustainability

Country, region: Lithuania, Kaunas region

Start and end date of the project: 13/04/2022 - 01/07/2024

Project objectives and activities:

This project aims to utilise the post-harvest period of plants to comprehensively address issues related to increasing plant diversity, applying modern techniques, and incorporating plant residues to achieve sustainable soil use. The project tasks include assessing post-harvest technologies, determining their impact on soil nutrient mobilization, organic matter accumulation, stabilisation of agrophysical indicators, and restoration of soil productivity. The goal is to recommend the most suitable post-harvest measures for restoring soil productivity and stabilising plans.

Practices covered in the project:

- Identifying the most suitable plants for an intermediate crop.
- Selecting plants based on specific farm conditions.
- Evaluating nutrient conservation methods.

Challenges tackled by the project:

- Volatility of agricultural production and economic instability of farmers.
- Higher frequency and intensity of extreme weather events, increasing the risk of damage to infrastructure and crops.

Project results:

The project aims to enhance the qualifications of farmers, agricultural consultants, and specialists by introducing them to the principles of plant residue decomposition. This understanding will help them appreciate the importance of plant diversity for soil sustainability and productivity, plan crop rotations more effectively, and manage soil processes during the post-harvest period to restore soil fertility. Additionally, the project will encourage farmers to adopt more rational agricultural technologies for sustainable use.

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

<https://www.kaimotinklas.lt/lt/projektai/inovatyvios-popjutinio-laikotarpio-technologijos-tvariam-dirvozemiui-atkurti>



Participating representatives:

Name	Profession	Organisation	Type of actor
Lina Šarūnaitė	Researcher	Lithuanian Research Centre for Agriculture and Forestry	Research organisation



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

Country, region: Poland, Kuyavian-Pomeranian Province, Wojnowo near Bydgoszcz

Start and end date of the project: 14/06/2022 - 31/12/2024

Project objectives and activities:

The project aims to create an innovative plant production management system for farms. Building on the standard system, the project is developing a tool that leverages IoT, ML and AI to collect and analyse data from precision farming systems. The goal is to support agricultural producers in making decisions that enhance the sustainability of plant production. The research focuses on determining the optimal fertilisation dose that maintains soil fertility and biodiversity of soil microbiota while achieving optimal crop yields.

Practices are covered in the project:

- Reducing nitrogen fertilisation by 20% and 40%.
- Analysing the yield of wheat, rapeseed and corn.
- Studying the dynamics of changes in soil microbiota.
- Assessing the impact of soil microbiota on climate change resilience.
- Exploring the roles of microorganisms in carbon and nutrient cycling, and overall plant health.
- Evaluating communication methods between precision agriculture sensors using IoT technology.

Challenges tackled by the project:

- Volatility of agricultural production.
- Increasing instability in the economic situation of farmers.

Project results:

The research has shown that soil microbiota diversity and the response of microorganisms to environmental changes during tillage play a crucial role in regulating climate change. The study found that reducing nitrogen fertilisation by up to 40% often does not impact the yield potential of plants. The IT system developed in the project is integrated with an AI module and a database, which helps determine the optimal (reduced) level of nitrogen fertilisation.

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

<https://projektsfcftf.cgfp.pl/>



Participating representatives:

Name	Profession	Organisation	Type of actor
Andrzej Słomczewski	Farmer/farm manager or farm worker		



5. Diversification of cover crops and use of multifunctional properties to increase soil sustainability and carbon equestration potential and reduce fertiliser requirements

Country, region: Lithuania, Kaunas region, closest city Vilnius, Kedainiai

Start and end date of the project: 02/01/2023 - 31/12/2024

Project objectives and activities:

This project aims to develop and improve technologies for cultivating different species of intercrop plants and their mixtures to enhance carbon sequestration, optimize plant nutrient use, and reduce soil degradation and greenhouse gas (GHG) emissions. It focuses on various crop rotations, soils, and farming systems to maintain and increase farm profitability, promote sustainable farming, and mitigate climate change impacts. The project seeks to determine the most suitable types of intermediate crops and their combinations for effective soil carbon sequestration.

Practices covered in the project:

- Evaluating the impact of extended periods of carbon sequestration on soil organic carbon content.
- Analysing agrochemical, physical, and biological diversity indicators.
- Diversifying intercrops to address climate change impacts.
- Evaluating CO₂ gas emissions by sequestering carbon compounds during favourable periods for photosynthesis.
- Using Drone XAG M500 to collect plant growth data.

Challenges tackled by the project:

- Volatility of agricultural production.
- Increasing instability in the economic situation of farmers

Project results:

The project has identified actual increases in carbon accumulation in ecological and intensive production farms of the project partners. It has tested the impact of intermediate crop cultivation on GHG accounting at the farm level, assessing accumulations of organic matter and evaluating agrochemical and physical indicators of the soil.

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

www.zur.lt



Participating representatives:

Name	Profession	Organisation	Type of actor
Edita Karbauskiene	Advisor on technical, economic, environmental and/or social dimensions for farmers/ foresters	Chamber of Agriculture of the Republic of Lithuania	Farmers' organisation / association



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

Country, region: Hungary (in six several counties)

Start and end date of the project: 20/06/2020 - 20/06/2024

Project objectives and activities:

During the project period, field experiments were set up over three years. Ten soybean varieties were cultivated by seven individual farms using both conventional and chemical-free methods. At the end of each year, samples were collected from each parcel and analysed for content such as protein, oil, fiber, amino acids, etc. The project also examined economic aspects, including yields, costs, and market prices.

Practices covered in the project:

- Comparison of chemical-free soybean cultivation with conventional methods, considering economic aspects.
- Analysis of climate adaptation practices, given the increasing difficulty of cultivation due to climate change.
- Evaluation of cost minimization strategies and ensuring acceptable yields, particularly through the reduction of herbicide use and the adoption of alternative mechanical methods.

Challenges tackled by the project:

- Volatility of agricultural production; Increasing instability in the economic situation of farmers.
- Plant pests and diseases.

Project results:

The project results indicate that the use of suitable machinery and equipment alone is not enough; the timing and cost optimization are crucial for successful herbicide-free soybean cultivation. The project showed that completely chemical-free cultivation is sometimes impossible due to the presence of pests and diseases. For instance, in some years, mites (Acari) or the Painted Lady (*Vanessa cardui*) caused significant yield losses without chemical protection.

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

<https://gazdakontroll.hu/europai-innovacios-partnerseg/szoja-vegyszeres-es-mechanikus-gyomirtasanak-osszefuggesei/>



Participating representatives:

Name	Profession	Organisation	Type of actor
Petra Hajzser-Novák	Advisor on technical, economic, environmental and/or social dimensions for farmers/ foresters	Magyar Szója Nonprofit Kft	Advisory organisation (on technical, economic, environmental and/or social dimensions for farmers/ foresters)
László Novák	Advisor on technical, economic, environmental and/or social dimensions for farmers/ foresters	Magyar Szója Nonprofit Kft	Advisory organisation (on technical, economic, environmental and/or social dimensions for farmers/ foresters)



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

Country, region: Poland, Kuyavian-Pomeranian Province, Bydgoszcz

Start and end date of the project: 31/07/2020 - 30/07/2022

Project objectives and activities:

The aim of the project was to develop an innovative system to support decision-making in farms, particularly in irrigation and rational water management. This advisory tool for farmers utilises IT techniques and mathematical modeling for real-time control of crop irrigation and short-term forecasting of crop irrigation needs. The system comprises two main modules: the agro-meteorological monitoring module with a database, and the operational irrigation planning module.

Practices covered in the project:

- The project developed an innovative advisory tool to assist in agro-technical works, specifically irrigation, on farms.
- The tool helps estimate irrigation dates and amounts based on current water needs determined by plant growth stages, meteorological conditions, and soil type.
- The system provides information on current agro-meteorological conditions and allows comparisons with previous years and periods, aiding in comprehensive farm management and planning of agro-technical works.

Challenges tackled by the project:

- Volatility of agricultural production and increasing economic instability for farmers.
- Shorter grazing periods and decreased forage production both quantitatively and qualitatively.
- Water stress for plants and animals inter-annual and seasonal variability of rainfall and increasing competition for water.

Project results:

The meteorological and irrigation planning modules were integrated into a prototype system that provides real-time information on agro-meteorological conditions, water demands, and irrigation needs for crops such as sugar beet, maize, carrot, and onion. The system was tested and improved in both field conditions with farmers and laboratory settings, involving cooperation among researchers, agricultural advisors, and farmers. The system's visualization application is being enhanced to improve user experience and functionality.



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

<http://wodadlakujaw.pl/>

Participating representatives:

Name	Profession	Organisation	Type of actor
Wiesława Kasperska-Wołowicz	Researcher		
Łukasz Busse	Farmer/farm manager or farm worker		



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

Country, region: Poland, Warsaw

Start and end date of the project: 01/01/2023 - 31/12/2024

Project objectives and activities:

The aim of the project is to develop improved methods for controlling the development of wheat and rapeseed through precisely dosed growth regulators. This will help reduce losses associated with uneven crop growth. The project will result in technological and organizational innovations that allow for more accurate recognition of crop variability prior to applying growth regulators, rapid remote assessment of regulator effects, and planning and execution of field experiments. These actions are intended to improve production profitability and environmental protection, mitigating the effects of climate change.

Practices covered in the project:

- Enhanced technologies for generating variable-rate maps of plant growth regulators.
- Utilisation of control computers and precision spraying systems to provide demand information for growth regulators.
- Implementation of new biomass indices to allow farmers to adjust regulator application according to current agricultural needs.
- Rapid remote assessment of regulator effects to aid in agronomic decisions.

Challenges tackled by the project:

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

Project results:

The project has resulted in three key outcomes:

- Rapid assessment methods for the effects of growth regulators have been introduced, aiding in subsequent agronomic decisions.
- Enhanced vegetation indices have improved differentiation of soil coverage and plant nutrition.
- A tool for objective assessment of growth regulator dosing has been developed, significantly boosting crop production efficiency.



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

<https://satagro.pl/>

Participating representatives:

Name	Profession	Organisation	Type of actor
Kamil Wojtaś	Advisor on technical, economic, environmental and/or social dimensions for farmers/ foresters	AgroWe	Innovation Support Service



9. OLIVEALARM – Digital tools and early warning system for the adaptation of olive production to the climate change

Country, region: Greece, Crete and Peloponnese regions

Start and end date of the project: 02/02/2024 – 31/10/2025

Project objectives and activities:

The objective of the project is to mitigate the negative impacts of climate change on olive production by implementing an early warning mechanism for both biotic (*Bactrocera oleae*, *Cycloconium oleaginum*) and abiotic risks (water scarcity, extreme temperatures). This project aims to provide localized, species-specific risk information at the prefecture level, reducing the use of excessive pesticides and irrational irrigation. It seeks to encourage farmers to seek personalized, specialized advice from agronomists and consultants.

Practices are covered in the project:

- Creation of an easy-to use early warning and decision support service.
- Establishment of a business team for continuous interaction and knowledge exchange.
- Certification of the reduction in the climate footprint of olive cultivation.
- Leveraging modern sensors and cloud tools to develop a useful service for end users and Promotion of AKIS systems to create a network for mutual knowledge production, exchange, and use.

Challenges tackled by the project:

- Plant pests and diseases.
- Increased occurrence and intensity of heat waves.
- Excessive amounts of pesticides used or irrational irrigations.

Project results:

To date, the project has developed an information matrix combining crucial weather parameters for abiotic and biotic threats in olive cultivation. A repository of cultivation practices has been created through questionnaires and consultations with local farmers. A network of digital weather and soil stations with sensors has been established in selected locations in Crete and Peloponnese. The cloud service has been established and is operating at a pilot level, receiving weather and soil information. A dissemination event in Peloponnese and a short press release were conducted in 2023.



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

<https://olivealarm.eu/>

Participating representatives:

Name	Profession	Organisation	Type of actor
Dimitrios Voloudakis	Advisor on technical, economic, environmental and/or social dimensions for farmers/ foresters; Innovation support agent and/ or innovation broker	Academy of Athens	Research organisation



10. LUCAN CEREALS – Sustainable crop management for standardizing lucan cereals productivity

Country, region: Italy, Basilicata region, Potenza

Start and end date of the project: 21/06/2018 - 21/10/2022

Project objectives and activities:

The project aimed to improve the productive and environmental performance of wheat production systems in the Basilicata region. It encouraged the use of available technology through field demonstrations and dedicated workshops, promoting innovative practices such as precision farming, no-till farming, and sustainable organic farming techniques. Additionally, the project sought to drive innovation within the agricultural industry.

Practices covered in the project:

- Precision farming techniques.
- Combining the use of innovative geophysical tools and vegetation proximal sensing for monitoring wheat yield and soil biophysical quality.

Challenges tackled by the project:

- Shorter grazing periods and decreased forage production quantitatively and qualitatively.
- Water stress for plants and animals Inter-annual and seasonal variability of rainfall and increasing competition for water.
- Risk of input overuse due to uniform management of spatially variable fields.

Project results:

- Development and validation of an operational protocol for the use of geophysical galvanic surveys for precision management of wheat fields.
- Provision of the first regional data on wheat productivity using innovative agronomic strategies, including dual-purpose wheat management.

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

https://www.alsia.it/opencms/opencms/agrifoglio/agrifoglio_online/dettaglio/articolo/Crearecoltura-le-innovazioni-con-il-Progetto-LUCAN-CEREALS/



Participating representatives:

Name	Profession	Organisation	Type of actor
Roberta Rossi	Researcher	Council of Research in Agriculture and Economic Analysis (CREA) Research center Animal Production and Aquaculture	Research organisation



11. 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

Country, region: Hungary, Tolna and Bács-Kiskun counties

Start and end date of the project: 27/01/2020 - 30/06/2023

Project objectives and activities:

The consortium aimed to select the varieties of Blue Franc grapes in the Szekszárd and Hajós-Baja wine regions that meet the challenges of modern times. The project focused on the clonal selection of the Kékfrankos grape variety, examining 188 clonal variations identified by vine breeder Dr. Kozma Pál Jr. The project evaluated the quantitative and qualitative characteristics of the clones' yields and their oenological values over three vintages from 2020 to 2022.

Practices covered in the project:

- Planting and analysing 188 Blue Franc clones.
- Evaluating yield, fruit quality, must, and oenological characteristics.
- Selecting the most suitable clones for sustainable winemaking adapted to climate changes and market expectations.

Challenges tackled by the project:

- Volatility of agricultural production and economic instability of farmers.
- Increased occurrence and intensity of heat waves.
- Higher frequency and intensity of extreme weather events, increasing the risk of damage to infrastructure and crops.

Project results:

The project significantly narrowed down the range of Kékfrankos clones suitable for quality winemaking adapted to climate changes. The evaluation of the clones' performance helped in identifying the most resilient and suitable ones for sustainable winemaking.

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

<https://gazdakontroll.hu/europai-innovacios-partnerseg/kekfrankos-klonszelekcio/>



Participating representatives:

Name	Profession	Organisation	Type of actor
Bardocz Tamás	Advisor on technical, economic, environmental and/or social dimensions for farmers/ foresters	Gazda Kontroll Kft	Advisory organisation (on technical, economic, environmental and/or social dimensions for farmers/ foresters)
Beatrix Kopácsi	Advisor on technical, economic, environmental and/or social dimensions for farmers/ foresters	Gazda Kontroll Kft	Advisory organisation (on technical, economic, environmental and/or social dimensions for farmers/ foresters)



12. Project Implementation, study and valorisation of Kernza®, a new eco-sustainable cereal

Country, region: Spain, Catalonia, Vic

Start and end date of the project: 01/07/2020 - 30/06/2022

Project objectives and activities:

The main objective of the project is to evaluate the productive potential of the perennial cereal crop Kernza® under the climatological conditions of the Catalan territory, which frequently experiences droughts and high temperatures due to climate change. Additionally, the project aims to assess the quality of Kernza® grain for flour production for human consumption and to evaluate the root system's exploration capacity to estimate its environmental potential in carbon fixation and nitrate leaching reduction in groundwater.

Practices covered in the project:

- Cultivation of the innovative perennial cereal crop Kernza®.
- Evaluation of Kernza®'s adaptation to drought and high temperatures.
- Production and innovation of local flours and human-consumable products from Kernza®.
- Assessment of Kernza® as fodder for animals.
- Development of a comprehensive farming guide for optimal Kernza® cultivation in the Catalan environment.
- Collection of data to aid in the development of an industrial process for extracting flour from Kernza® grain.

Challenges tackled by the project:

- Volatility of agricultural production and increasing instability in the economic situation of farmers.
- Water stress for plants and animals Inter-annual and seasonal variability of rainfall and increasing competition for water.
- Improvement of soil health.
- Enhancement of resilience to climate change.

Project results:

The project has shown that Kernza® cultivation can increase root mass and soil organic matter compared to conventional cereals, even under drought conditions. Kernza®'s potential to reduce chemical input use and its minimal water requirements make it particularly suitable for areas facing water scarcity and those seeking to adopt regenerative agricultural practices.



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

<https://betatechcenter.com/projects/implantacio-estudi-i-valoritzacio-dun-nou-cereal-ecosostenible/>

https://ruralcat.gencat.cat/documents/20181/117530/CAT+INICIAL+pilot+2019_034_panificadora+alimentaria_21_09_CA_EN_ACC.pdf/ec15358a-3f18-

Participating representatives:

Name	Profession	Organisation	Type of actor
Rosa Vilaplana	Researcher	Technological Center BETA	Research organisation
Berta Singla Just	Researcher	Technological Center BETA	Research organisation



13. Cooling of cattle – Optimisation of cattle housing conditions and production efficiency through application of innovations in barn and calf building equipment

Country, region: Poland, Kołbacz (near Szczecin)

Start and end date of the project: 09/02/2021 - 29/02/2024

Project objectives and activities:

The project aimed to optimize cattle housing conditions and production efficiency by developing and applying innovative equipment for barns and calf buildings. Key activities included the development and implementation of an improved ventilation system in curtain barns, an energy-efficient cooling and air exchange system for the milking parlour and holding area, and an innovative chiller with a moisture-absorbing section utilizing solar energy. Additionally, the project introduced a novel system for maintaining calves in open-type buildings, using igloo-type stalls and lifting curtains made of windbreak nets.

Practices covered in the project:

- Development and application of an improved ventilation system in curtain barns.
- Implementation of an energy-efficient cooling and air exchange system for the milking parlour and holding area.
- Use of an innovative chiller with a moisture-absorbing section powered by solar energy.
- Application of a technological and functional system for calf housing using igloo-type stalls and windbreak net curtains.

Challenges tackled by the project:

Increased occurrence and intensity of heat waves.

Project results:

The project demonstrated that the solutions developed could be modified and applied to other areas of animal production. The new equipment in the barn improved air exchange and flow, providing a significant cooling effect during summer. The prototype ventilation and cooling model implemented in the milking parlour and holding area can be adapted for use in buildings for other animal species such as poultry and pigs, enhancing overall animal housing conditions.



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

chlodzeniebydla.pl

Participating representatives:

Name	Profession	Organisation	Type of actor
Dorota Godyń	Researcher	National Research Institute of Animal Production in Poland	Research organisation
Andrzej Kaczor	Researcher	National Research Institute of Animal Production in Poland	Research organisation



14. Researching effective heat capture and supply solutions in covered areas

Country, region: Latvia

Start and end date of the project: 01/03/2019 - 30/06/2023

Project objectives and activities:

The project aimed to develop energy-efficient technology suitable for Latvia's climatic conditions for heat energy production to heat covered areas (for air temperature regulation), heat energy storage, and the utilisation of surplus heat energy for primary agriculture and forest product processing, such as drying. Key activities included experimental development and long-term testing of a demonstrator model of the developed technologies in real covered greenhouse areas. Additionally, the project focused on analyzing research results and comparing the operational parameters of the new collector with integrated heat pump (air-water) with existing systems. Studies on heat energy storage and electricity generation possibilities were conducted, with practical applications for periodic air temperature regulation in covered areas.

Practices covered in the project:

- Development and testing of a demonstrator model of technologies for covered greenhouse areas.
- Analysis and comparison of the new collector with integrated heat pump (air-water) against existing systems.
- Research on heat energy storage and electricity generation for air temperature regulation in covered areas.

Challenges tackled by the project:

- Volatility of agricultural production and increasing instability in the economic situation of farmers.
- Earlier frosts in autumn and increased occurrence of spring frosts during the flowering period.
- Increased occurrence and intensity of heat waves.

Project results:

The overall project analysis indicated that replacing existing gas heating with solar and air-water heat pump heating, supplemented by existing gas heating, is economically advantageous for reducing CO₂ emissions. The project technology allows for an 8 to 10 times reduction in CO₂ emissions compared to the existing gas heating system. Additionally, operating costs during the spring-summer-autumn period are lower than those of gas heating. After price stabilization, the method of CO₂ emission reduction using this technology should be compared with the replacement of gas boilers with biomass combustion.



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

<https://www.lbtu.lv/lv/projekti/apstiprinatie-projekti/2019/efektivu-siltuma-ieguves-un-apgades-risinajumu-izpete-segtajas>

Participating representatives:

Name	Profession	Organisation	Type of actor
Ādolfs Ruciņš	Researcher	Latvia University of Life Sciences and Technologies	Research organisation
Aivars Jermušs	Researcher	Latvia University of Life Sciences and Technologies	Research organisation



15. FARMAMYK – Increasing the uptake of nutrients in the soil through the use of mycorrhizae

Country, region: Greece, region of Central Macedonia

Start and end date of the project: 05/12/2022 – 31/05/2025

Project objectives and activities:

The project aimed to familiarize producers with mycorrhizal inoculants, their specificities and capabilities, which they will be able to produce and apply themselves at low cost. The project focused on innovation in the production process of mycorrhizal inoculants, ensuring their quality and formulation for application. Producers of conventional vegetables, who are used to high inputs to ensure their production, were encouraged to adopt reduced inputs combined with increased biological fertility. This approach could potentially lead to better marketing prospects with environmental certifications. The project also aimed to improve the sustainability of soil ecosystems and promote low-input agriculture.

Practices that are covered in the project:

- Production and application of mycorrhizal inoculants by the growers themselves.
- Training producers on the capabilities and proper application of mycorrhizal inoculants.
- Utilisation of arbuscular mycorrhizal fungi (AMF) to develop symbiotic relationships with plants, enhancing nutrition, pathogen protection, stress resilience, and soil structure.
- Local production of endomycorrhizal inoculants using containers or trenches, incorporating mixtures of local soil and lighter materials like peat, compost, and vermiculite.
- Use of host plants with vigorous root systems to multiply fungi, followed by the application of the inoculum.

Challenges tackled by the project:

Slow spreading of the arbuscular mycorrhizal fungi in roots, low sporulation. Optimizing the way of applying the inoculum in a field scale.

Project results:

Project ongoing, 40% progress.



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

<https://farmamyk.gr/en/>

Participating representatives:

Name	Profession	Organisation	Type of organisation
Ioannis Ipsilantis	Associate Professor	Faculty of Agriculture, Aristotle University	Academia
Fitis Biliadis	Post Doctoral Researcher	Faculty of Agriculture, Aristotle University	Academia

