Catalogue of projects of the Polish EIP Operational Groups

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Centrum Doradztwa Rolniczego
w Brwinowie
Oddział w Warszawie

Catalogue of projects of the Polish EIP Operational Groups

Warszawa
2022

KRZYSZTOF JANIAK

Deputy Director
of the Agricultural Advisory
Centre in Brwinów

Dear Sirs,

It with great pleasure that I present to you the first publication in Poland presenting, in the form of a catalogue, the activities of Operational Groups constituting the essential part of the European Innovation Partnership ("EIP") for efficient and sustainable agriculture.

These multi-actor partnerships successfully conduct research and implementation projects under Measure 16 "Cooperation", covered by the Rural Development Programme for 2014-2020.

In the period of 2017-2022, 6 calls for Operational Groups were made, including 4 calls dedicated to research and implementation projects and 2 thematic calls for the development of Short Food Chains. To date, over 300 Operational Groups have been established (including 106 research and implementation projects and about 200 SFC projects) with over 900 prepared and submitted applications for assistance. The number of projects will increase even more, as the Agency for Restructuring and Modernisation of Agriculture is at the final stage of evaluating applications from the last call and, at the beginning of 2023, it will announce their ranking list and sign tens of new contracts.

This success was possible thanks to the involvement of many entities and people working for them. Multi-actor partnerships, which are the basis for the operation of Operational Groups, are a major organisational and management challenge. Bringing together a wide and diverse group of farmers, agricultural advisors, researchers and entrepreneurs in one project is not easy. The key role was played by the very efficient functioning of the Network for Innovation in Agriculture and Rural Areas (SIR), coordinated by the Agricultural Advisory Centre in Brwinów and carrying out tasks with the participation of the Voivodeship Agricultural Advisory Centres. The most important people in this system were innovation brokers who cooperated with the beneficiaries, promoted the concept of creating partnerships and assisted in the preparation and implementation of projects. At this point, I would like to thank all of them for their commitment, in many cases going well beyond the job description, which translated into the effective preparation and creation of so many Operational Groups and the implementation of interesting and innovative projects.

Thanks to the actions of Operational Groups in solving current problems and through the implementation of innovative solutions, the competitiveness of Polish agriculture, as well as its adaptability to changing regulatory and market conditions, has significantly increased. This makes it possible to feel optimistic about the future: Poland is already among the leaders in Europe in terms of the number of created Operational Groups.

The descriptions of Operational Groups contained in this publication will demonstrate that Polish Operational Groups implement many very important and interesting projects in the area of primary production and processing of agricultural products. I should also emphasise the role of farmers who, in accordance with the assumptions of the "Cooperation" measure, are often leaders of, or entities directly involved in the creation and operation of the Operational Group and their role in defining needs and in the subsequent implementation of projects is necessary to achieve practical results that may be further disseminated and developed. In addition, Polish Operational Groups included in their projects activities related to reducing the negative impact on the natural environment, reduction in the use of fertilisers, pesticides and shortening of the food chain. We already know that the results of our Operational Groups' projects can be replicated in other EU Member States, which can be the basis for creating international consortia using the multi-actor approach.

During the implementation of the Common Agricultural Policy Strategic Plan 2023-2027, support for cooperation between farmers and partners with expertise in complementary fields will be continued. The partnerships in question will be able to apply for co-financing under intervention I. 13.5 "Cooperation of EIP Operational Groups". Support for innovation, establishing cooperation and creating EIP Operational Groups will be provided as part of the tasks carried out by the national CAP network - National Rural Network+ (NRN+), using the experience and potential of the SIR Network.

The Agricultural Advisory Centre in Brwinów is open to extensive cooperation with farmers in the assessment of needs and expectations, as well as cooperation with institutions, organisations and individuals who are willing to actively participate in improving the competitiveness of Polish agriculture and processing, while promoting practices beneficial to the environment, climate and animal welfare.

I hope that our work will translate into many innovative projects of Operational Groups, which will lead in turn to a stronger and more sustainable Polish agriculture and attractive rural areas.

Best regards,

Krzysztof Janiak

Contents

PLANT PRODUCTION 06

ANIMAL PRODUCTION 56

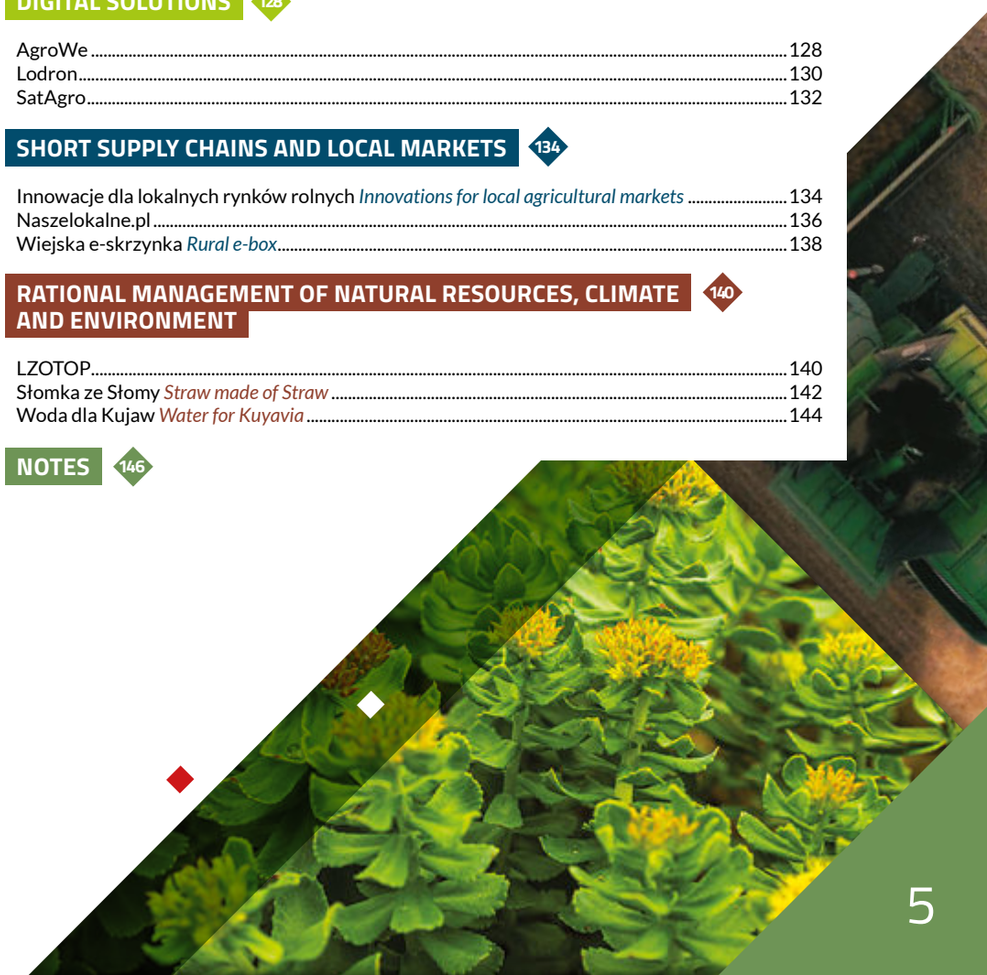
AGRICULTURAL AND FOOD PROCESSING 96

DIGITAL SOLUTIONS 128

SHORT SUPPLY CHAINS AND LOCAL MARKETS 134

RATIONAL MANAGEMENT OF NATURAL RESOURCES, CLIMATE AND ENVIRONMENT 140

NOTES 146



Agro Wiosna I

Agro Spring I

PLANT PRODUCTION

"Innovative technology for the production of berries - raspberries with an increased content of bioactive compounds and increased commercial value"

Agro Wiosna

Project objectives:

- Determination of the impact of various substrate components and the applied production support methods on the yield and quality of the final product.
- Determination of the impact of innovative additives to the substrate on its increased durability in the tunnel cultivation of berry plants.
- Determination of the results of the use of ozonation as a method of supporting plant protection against fungal pathogens.
- Determination of the effect of ozone as an elicitor on increasing the content of bioactive compounds, mainly antioxidants (especially vitamin C).
- Conducting process analysis of raspberry production and life cycle analysis of plug plant product.
- Development of optimisation models for manual harvest of raspberry

Expected results:

- Elimination of fungal pathogens on raspberry fruit, which will improve their durability in transport.
- Increasing the content of bioactive compounds in fruits by treating raspberries with ozone.
- Increasing the competitiveness of production in relation to traditional, hitherto used methods, by increasing the commercial value of fruit produced with the use of innovative technology.
- Development of solutions to reduce labour inputs and the costs of harvesting, and thus increase the economic efficiency of dessert fruit production.
- Extending the durability of coconut substrates used in the tunnel cultivation of soft fruit through the use of waterproofing with an isolate which is a by-product of fibreboard production.
- Reinforcement of the substrate with biodegradable elements made of biochar obtained from sunflower husk, which should affect the durability of the substrate, as well as increase its retention properties, which is extremely important in fertigation-based plant production

Further plans:

- Continuation under the next call for Measure 16 "Cooperation"

Leader name - AGRO WIOSNA I Sp.z o.o.	Leader category - enterprise
Main location of the project	Pomeranian Voivodeship, Puck County
Contact person	Natalia Matłok
Contact e-mail	natalia.matlok@onet.pl
Project duration	from 02-2021 to 12-2022 (call III)
Total project budget	PLN 6 285 348,46
Grant amount	PLN 3 148 419,00
Project website	www.agrowiosna.pl

Bazydrill

PLANT PRODUCTION

"Innovative technical solutions used in a seeder for overseeding grasslands to improve the quantity and quality of feed for ruminants and protect soils, waters and climate"

Project objectives:

- Improving the efficiency of overseeding grasslands by using new technical solutions in the seeder and adding herbs to seed mixtures (apart from grasses and legumes selected for specific habitat conditions and the method of use), which will improve the quality and quantity of animal feed and benefit soil, water and climate protection.
- Adaptation of the seeder to the use on different types of soil and to perform reseeding at different periods.

Results achieved:

- The tests carried out (for two growing seasons) showed a positive impact of the pastoral agricultural practices on both the plant and soil parameters, without interruption in use (which was ensured by the innovative coulter system).
- Higher yields and better feed quality were obtained.
- The innovative sowing system ensured the proper foundation of the seeds, which translated into satisfactory emergence and establishment of seedlings.
- Better turfing of the surface was obtained, which in the long term will contribute to more effective protection of soil, water and climate. Thanks to improved use of fertilisers by grasses, ammonia emissions and nitrogen losses (including water pollution with nitrates) will decrease.
- The proposed overseeding technology will, with greater precision, ensure better protection of soils against excessive mineralisation processes (especially on organic soils) and will not only reduce the loss of organic carbon, but also contribute to its greater sequestration.
- Equipping the seeder with GPS has contributed to improving the efficiency of overseeding grassland also through lower losses of seeds and fertilisers, fuel savings, higher work efficiency and lower labour inputs.
- The suitability of the seeder prototype and seed mixtures for overseeding permanent grassland, especially in the first and second application dates, was confirmed. However, taking into account the effects of the third overseeding, it can be assumed that in the near future it will be possible to introduce it on a larger scale. This, in turn, can be used for better organisation of farm operations.
- During the research period (2 years), only slightly higher effectiveness of overseeding with the seeder prototype was found on mineral soils than on organic soils, which does not exclude its use on both types of soils.

Further plans:

- Continuation under the next call for Measure 16 "Cooperation"

Leader name - University of Life Sciences in Lublin	Leader category - scientific and research unit
Main location of the project	Lublin Voivodeship, Lublin County
Contact person	Halina Lipińska
Contact e-mail	halina.lipinska@up.lublin.pl
Project duration	from 02-2021 to 12-2022 (call III)
Total project budget	PLN 987,888.12
Grant amount	PLN 906,147.00
Project website	www.bazydrill.lodr.konskowola.pl

Innowacyjne Technologie Rolnicze (ITR)

Innovative Agricultural Technologies

PLANT PRODUCTION

"Improvement of the technology for the production of protein plant raw materials through the use of a product that improves the biological binding of atmospheric nitrogen (BIOBIAŁKO)"

Project objectives:

- Development of an improved technology for the production of soybean, pea and horse bean seeds by improving the process of biological reduction of atmospheric nitrogen, as a result of using an innovative product that increases the exchange of information between symbiotic bacteria and legumes.
- Increasing the amount of domestic high-protein raw materials for production.
- Improvement of the size and quality of the yield of soybean, pea and horse bean seeds through the use of an innovative product that improves the symbiotic binding of atmospheric nitrogen.

Expected results:

- Increasing the yield level, improving the feed quality of seeds (e.g. higher protein content and improved amino acid composition), sowing quality (better germination capacity due to better formation of seeds in the pod - larger seeds that germinate better and bring higher yields).
- Increasing the commercial value (better sales of good seeds).
- There is no need for mineral nitrogen fertilisers or only small (starting) doses are required as a result of ensuring conditions for proper binding of atmospheric nitrogen. The environment is not burdened with chemicals and the leaching of N (nitrogen) to groundwater is limited.
- Improvement of symbiotic N (nitrogen) fixation will improve the chemical, physical and microbiological properties of the soil.
- Legumes, thanks to the ability to biologically reduce atmospheric nitrogen, supply themselves with nitrogen and leave significant amounts of it for succeeding plants, as a result of which the plants grown after them require less nitrogen fertilisation.
- Increasing the yield of seeds will improve the profitability of the production of the above-mentioned legumes.
- Leaving larger amounts of biologically bound nitrogen in the soil will reduce fertilisation doses for succeeding plants (usually cereals).

Leader name - Institute of Soil Science and Plant Cultivation - National Research Institute in Puławy	Leader category - scientific and research unit
Main location of the project	Lubelskie Voivodeship, Puławy County
Contact person	Janusz Podleśny
Contact e-mail	Janusz.Podlesny@iung.pulawy.pl
Project duration	from 04-2022 to 12-2024 (call III)
Total project budget	PLN 1,884,196.72
Grant amount	PLN 1,643,493.12
Project website	www.itr.iung.pl

Teledis

PLANT PRODUCTION

"The use of near-remote sensing and artificial neural networks (ANN) in the diagnosis and assessment of health of selected varieties of cereal - wheat and triticale"

Project objectives:

- Development of innovative software for detecting wheat and triticale diseases through:
  - creation of a database of disease patterns based on photos,
  - identification of diseases thanks to a database of patterns with the use of artificial neural networks (ANN),
  - development and provision of software consisting of public (for mobile devices and web browsers) and expert modules.
- The use of remote sensing technology based on drones and artificial neural networks in the assessment of spring wheat and triticale in terms of reaction to Fusarium head blight caused by fungi of the genus Fusarium spp.
- Launch of the Plant Health Information Centre in the form of an Internet platform and a smartphone application, operating on the basis of the innovative technology proposed in the project, available throughout the country.
- Development of a farmer-friendly software that will allow them to upload photos from the plantation to verify disease symptoms and consult with an expert, advisor or researcher via the platform.

Results achieved:

- As part of the project, thanks to the cooperation of the Institute of Plant Breeding and Acclimatisation (IHAR) with the Voivodeship Agricultural Advisory Centres and the Agricultural Advisory Centre, photographic documentation of wheat and triticale diseases (yellow rust, brown rust, septoria, ear fusariosis) was collected.
- The photos were placed in the database of patterns located on the server operating at IHAR-PIB, which recognises cereal diseases in real time thanks to the created database of patterns.
- Software has been developed that allows users to send cereal disease reports (in the form of mobile phone photos) for diagnosis and consultations with advisors and experts, and to keep their own records of fields and crops with access to the history of their own reports. The system is currently in the testing phase.

The process of expanding photo databases will continue and the stage of implementation to advisers and interested farmers will begin.

Further plans:

- Continuation under the next call for Measure 16 "Cooperation"

Leader name - Agricultural Advisory Centre in Brwinów	Leader category - advisor
Main location of the project	Mazowieckie Voivodeship, Pruszków County
Contact person	Aleksander Bomberski
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Project duration	from 02-2021 to 12-2022 (call III)
Total project budget	PLN 2,203,990.00
Grant amount	PLN 2,203,990.00
Project website	www.teledis.pl

Zdrowy Sadzeniak

Healthy seed potato

PLANT PRODUCTION

"Development of a strategy to prevent the development of seed potato phytopathogens based on ecological biotechnological solutions and a new method of storage"

Project objectives:

- Development of a method for the preparation of seed potato and its storage in order to inhibit the development of phytopathogens responsible for potato diseases.
- Obtaining biopreparations that effectively inhibit the infestation with phytopathogens in model tests and seed potatoes and show cytotoxic and genotoxic activity against the Spodoptera frugiperda insect cell line (Sf-9).
- Development of a prototype of a storage chamber enabling cleaning, biopreparation application and storing of potatoes in appropriate hydrothermal conditions ensuring the preservation of high quality seed potatoes.
- The developed method will contribute to restoring the biological balance and protecting the natural environment.

Results achieved:

- Development of biopreparations to be applied to seed potatoes - plant (10% aqueous garlic extract) and microbiological (cultures of Lactiplantibacillus plantarum KB2 LAB 03 bacteria or Metschnikowia pulcherrima TK1 yeast on an optimised whey substrate) are a fully natural, ecological solution for the farmer. The strains of microorganisms used are Polish isolates from sauerkraut and strawberry flower; they provide biological and chemical protection, inhibit the development of fungal and bacterial pathogens of potato and provide protection against Spodoptera frugiperda (fall armyworm). Biopreparations for application on seed potatoes have a positive effect on the development of the root system and, as a consequence, the development of plants and increased yields. These products can be used instead of currently used fungicides and insecticides, which are characterised by poor biodegradability and disturb the proper functioning of soil microflora.
- Development of a prototype of a storage chamber enabling cleaning, biopreparation application and storing of potatoes in appropriate hydrothermal conditions ensuring the preservation of high quality seed potatoes.

Further plans:

- Continuation under the next call for Measure 16 "Cooperation".
- Continuation of the cooperation of the consortium members of the Operational Group in other projects

Leader name -Łódź University of Technology	Leader category - scientific and research unit / university
Main location of the project	Łódź Voivodeship, City of Łódź
Contact person	Beata Gutarowska
Contact e-mail	beata.gutarowska@p.lodz.pl
Project duration	from 12-2019 to 07-2022 (call II)
Total project budget	PLN 2,019,434.04
Grant amount	PLN 2,026,493.00
Project website	www.zdrowysadzeniak.pl

Centrum Innowacji w Ochronie Antyprzymrozkowej

Innovation Centre in Anti-frost Protection

PLANT PRODUCTION

"Innovative technologies of anti-frost protection for fruit and horticultural crops"

Project objectives:

- Introduction of a comprehensive method of counteracting spring frosts, which includes a specialised, mobile heating machine compatible with a modern IT system.
- Development of a mobile heater with high heating power and high air mixing efficiency.
- Development of a measurement system that will enable the creation of a customised temperature model that takes into account the unique shape of the orchard surface.
- The system will monitor the air temperature in the orchard and notify the farmer via e-mail or text message about reaching the critical temperature threshold as well as support the effective use of mobile heating devices.

Results achieved:

- Development and construction of a mobile heating device.
- Creation of an innovative IT system that coordinates the protection process and provides information for the farmer with numerous indicators, including:
  - determination of the protected area at a given temperature,
  - suggested speed of the heating device,
  - distance from rows with frost basins,
  - determination of the machine's route.
  - Integration of the ICT system with the mobile heater.
- Publication of information on the innovative anti-frost protection technology for fruit and horticultural crops on websites (www.epicoa.pl; www.mcms.pl) and at international scientific conferences (ITEA-2021; CMES'2021).

Leader name - MCMS WARKA Spółka z Ograniczoną Odpowiedzialnością	Leader category - enterprise
Main location of the project	Mazowieckie Voivodeship, Grójec County
Contact person	Krzysztof Bąk
Contact e-mail	mcms@mcms.pl
Project duration	from 03-2021 to 03-2022 (call III)
Total project budget	PLN 2,286,020.00
Grant amount	PLN 1,983,518.00
Project website	www.epicoa.pl

Ekoinnowacje w uprawach

Eco-innovations in crops

PLANT PRODUCTION

"Improving the quality of cereal grains, rape seeds and legumes through innovative cultivation technology using basalt dust and sulphur"

Project objectives:

- Increasing the yield of one of the economically important plants for Poland, despite the predominance of sandy soils in the country (approx. 60% of soils) and soil acidification.
- Minimising the problem of sulphur deficit as a nutrient by using the commercially non-valuable waste fraction of basalt dust.
- Development and implementation of an innovative technology to improve the quality of grain or seeds of at least one economically important crop, such as selected cereals, legumes or rape. It is assumed that as a result of the introduction of this technology in the cultivation of the above-mentioned plants, grain or seed will increase the protein, methionine amino acid or fat content.

Expected results:

- Obtaining products, i.e. grains or seeds (cereals, rape, legumes) of economically important subsistent crops of better quality and nutritional value compared to those currently obtained from acidified soils and soils low in sulphur.
- Development of an innovative plant cultivation technology with the use of Bazalt-S (granulated basalt dust with the addition of sulfur contributing to an increase in soil pH). The technology is planned to be presented and implemented in agriculture in the form of information materials (brochures). The brochures will describe the method of including Bazalt-S in the cultivation technology of the above-mentioned plants (doses, dates of use, methods of application). If the results of the research are satisfactory, we plan to develop separate information materials for cereals, rape and legumes.
- Environmental benefits thanks to the use of commercially non-valuable basalt dust, which is generated during the extraction and processing of rocks.
- Improving the quality of acidified and sulfur-deficient soils, as well as their microbiological diversity.

Further plans:

- Continuation under the research programmes of the National Centre for Research and Development

Leader name - "Poltegor-Instytut" Opencast Mining Institute	Leader category - scientific and research unit
Main location of the project	Lower Silesian Voivodeship, Wrocław County
Contact person	Dominika Kufka
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Project duration	from 10-2021 to 01-2024 (call III)
Total project budget	PLN 1,274,579.00
Grant amount	PLN 1,163,743.00
Project website	https://poltegor.igo.wroc.pl/bazalts/

EPI Boguchwała

PLANT PRODUCTION

"Increase in competitiveness through the implementation of process, technological and marketing innovations related to the cultivation of roses at a horticultural farm in Boguchwala"

EPI - Boguchwała
European Partners for Innovation

Project objectives:

- Implementation of process, technological and marketing innovations related to the cultivation of roses at the horticultural farm in Boguchwała, including modernisation of the horticultural farm (installation of a high-pressure fogging system) as well as conducting a number of tests in the greenhouse facility (greenhouse climate control) and on plants (flower quality, yield) and observation of the market's reaction to the product resulting from the use of innovative technology.
- Demonstration of profitability, plant productivity and high-quality of cut roses in summer greenhouse cultivation, in conditions of high insolation, using an innovative technology for the production of cut roses - a high-pressure fogging system.

Results achieved:

- Increase in the profitability of production along with an increase in the quality of cut roses, which translates into an increase in the competitiveness of this product on the difficult floriculture market.
- More efficient use of water and mineral fertilisers and obtaining better-looking and healthier plants.
- Increased demand for the product.
- The ability to grow roses using innovative technology, especially in the summer.
- Increased consumer demand for the domestic product, which is more attractive (better colour of flowers, more durable) than other roses available on the market.

Leader name - AGRO WIOSNA I Sp.z o.o.	Leader category - farmer / farm
Main location of the project	Subcarpathian Voivodeship, Rzeszów County
Contact person	Aneta Haba
Contact e-mail	aneta_haba@vp.pl
Project duration	from 07-2017 to 02-2019 (call I)
Total project budget	PLN 1,743,302.00
Grant amount	PLN 605,986.98
Project website	www.epi-boguchwala.pl

EPI Kwiaty Cebulowe

EIP Bulb Flowers

PLANT PRODUCTION

"Implementation of an improved product, innovative technology and production organisation methods in bulb plants production using high-pressure fogging of cooling chambers with silver-stabilised hydrogen peroxide"

Project objectives:

- Development and implementation of significantly improved products, new technologies and methods of organisation in the production of potted bulb flowers - hyacinths, narcissus and tulips.
- Development of an innovative method of fogging with silver-stabilised hydrogen peroxide, which has not been used or tested in the production of potted bulb flowers, resulting in a product free from saprophytic fungi.

Expected results:

- Development and implementation of a significantly improved agricultural product in the form of bulb flowers - hyacinths, narcissus and tulips with better health, quality and purity of plant parameters, as well as an innovative production technology that completely eliminates the need for bulb treatment and application of fungicides to the plants during forcing with the use of silver-stabilised hydrogen peroxide.
- Implementation of a new production organisation method in forcing bulb plants by introducing fogging of cooling chambers and the production of cut flowers in plastic tunnels from bulbs forced in a new technology.

Leader name - Institute of Horticulture - National Research Institute	Leader Category - scientific and research unit
Główna lokalizacja realizacji projektu	Mazowieckie Voivodeship, Otwock County
Imię i nazwisko osoby do kontaktu	Emilia Waszkiewicz
Adres e-mail do kontaktu	epikwiatycebulowe@gmail.com
Czas trwania projektu	od 03-2020 do 12-2022 (nabór III)
Całkowity budżet projektu	6 878 768,46 zł
Przyznana kwota dofinansowania	3 935 697,00 zł
Strona internetowa projektu	www.epikwiatycebulowe.pl

Further plans:

- Continuation under the next call for Measure 16 "Cooperation"

Fieldstone Investments II

PLANT PRODUCTION

"Innovative technology for high-yield production of plug plant and long cane berry plant seedlings - raspberry and thornless blackberry"

Project objectives:

- Implementation of a new technology for the production of plug plant and long cane raspberry and blackberry seedlings, using substrates that reduce water loss and additives that stimulate growth and rooting, while protecting the crop against pathogens, which reduces the negative effects of oxidative stress.
- Development and implementation of effective water saving technologies through the use of biodegradable containers with hydrogel or dendrimers in the substrate.
- Development and implementation of technology accelerating the rooting of cuttings and the production of buds through the use of optimal mineral / organic fertilisation.
- Development and implementation of protection technologies using biopreparations limiting the development of phytopathogens in the substrate and plants.
- Developing an innovative system for mapping seedling buds along the entire length of the shoot, which will allow us to determine the quality of flowers at a very early stage of production, which will have a positive impact on the entire cultivation process and will allow us to select optimal doses of fertilisation and water tailored to the needs of particular plants, and will enable precise yield estimation.

Expected results:

- Developing a production technology conducive to reducing oxidative stress in propagated plants, which will allow us to obtain more and better quality planting material.
- Development of a more effective technology for rooting raspberry cuttings.
- Implementation of an innovative telemetric irrigation and fertigation control system enabling economical management of water and fertilisers and limiting eutrophication of the natural environment.
- Development of a system for early mapping of flower buds of long cane seedlings enabling early diagnosis and classification of material in terms of quality at various stages of production, as well as modification of work organisation.
- The end result of the project will be plug plant and long cane raspberry and blackberry seedlings with high and predictable yield, healthy, resulting from highly specialised production process conducive to environmental protection, and reduced production costs per unit area.

- Continuation under the next call for Measure 16 "Cooperation"

Leader name - Fieldstone Investments II Sp. z o.o.	Leader category - enterprise
Main location of the project	Województwo Łódzkie, Powiat radomańszczański
Contact person	Mirela Kotlicka
Contact e-mail	mkotlicka@fieldstone.pl
Project duration	from 03-2020 to 12-2022 (call III)
Total project budget	PLN 5 368 474,20
Grant amount	PLN 3 332 014,00
Project website	www.fieldstone.pl

Gardena

PLANT PRODUCTION

"Innovative solutions in cultivation, storage and placing on the market of a Polish potato variety highly resistant to Phytophthora infestans"

Project objectives:

- Dissemination of pro-environmental, innovative solutions in agriculture by developing dedicated cultivation methods (both conventional and organic), a storage and marketing system for the innovative "*Gardena*" potato variety.

Results achieved:

- Development of a conventional (similar to integrated) technology for the production of seed potatoes of the "Gardena" variety, taking into account the optimisation of the number of shoots and the reduction of the occurrence of diseases during the growing season.
- Development of an ecological technology for the cultivation of the "Gardena" variety for seed potatoes, including a strategy to prevent the occurrence of diseases during the growing season.
- Development of the technology of ecological cultivation of the "Gardena" variety for consumption, taking into account the methods of mitigating the effects of stress and the strategy of maintaining plant health in order to maximise the level and quality of tuber yield.
- Development of a conventional technology (similar to integrated) of cultivation of potatoes of the "Gardena" variety for consumption, taking into account the optimisation of nitrogen fertilisation, sprout density, protection against diseases and the method of mitigating the effects of stress.
- Development of a technology for storing tubers of the "Gardena" variety with the use of environmentally friendly silver-stabilised hydrogen peroxide and a natural product based on grapefruit extract to disinfect seed potatoes in order to increase their storage durability.
- A new marketing strategy for the "Gardena" potato variety, based on the cooperation of entities (scientific and advisory institutions, farmers and entrepreneurs) in the supply chain, using a multi-faceted market analysis (of producers and consumers) and innovative solutions in cultivation (conventional and organic) and storage.

Further plans:

- Continuation under the next call for Measure 16 "Cooperation"

Leader name - Bydgoszcz University of Technology	Leader category - scientific and research unit
Main location of the project	Kuyavian-Pomeranian Voivodeship
Contact person	Małgorzata Szczepanek
Contact e-mail	malgorzata.szczepanek@pbs.edu.pl
Project duration	from 03-2020 to 11-2022 (call III)
Total project budget	PLN 2,997,602.00
Grant amount	PLN 1,993,543.00
Project website	www.projektgardena.pl

GPO - Genotypowanie Pszenicy Ozimej

Winter Wheat Genotyping

PLANT PRODUCTION

"Development of a method for identifying winter wheat varieties cultivated in Poland"

Project objectives:

- Development of DNA profiles of common wheat varieties listed in the National Register or the Common Catalogue.
- Demonstration of the effectiveness of this method of identifying wheat varieties in comparison to the classical methods based on the measurements of morphological and physiological features.
- Providing support for a breeding company in characterising lines prepared for registration as potential new varieties.

Expected results:

- Developing a technology for identifying wheat varieties, which will enable quick and relatively cheap differentiation of varieties cultivated in Poland, both currently and historically.
- Study of the characteristics of breeding lines provided by the breeding company in terms of its use in the analysis of biodiversity and support for breeding programmes.
- The developed method can be used to verify the identity of varieties in resolving court disputes, e.g. whether the farmer was sold exactly the variety he wanted, and in the legal protection of varieties.
- The developed method may be helpful in assessing the fulfilment of the Distinctness, Uniformity and Stability (DUS) criteria when registering a new variety at the Research Centre for Cultivar Testing and entering the variety into the Common Catalogue of Varieties of Agricultural Plants (CCA) and the Common Catalogue of Varieties of Vegetable Plants (CCV).

Further plans:

- Continuation under the research programmes of the National Centre for Research and Development

Leader name - West Pomeranian University of Technology in Szczecin	Leader category - scientific and research unit
Main location of the project	West Pomeranian Voivodeship, City of Szczecin
Contact person	Paweł Milczarski
Contact e-mail	pmilczarski@zut.edu.pl
Project duration	from 01-2021 to 12-2023 (call III)
Total project budget	PLN 1,327,779.00
Grant amount	PLN 1,193,180.00
Project website	www.genotypowaniepszenicy.pl

Rhodiola

PLANT PRODUCTION

"Rhodiola rosea - innovative cultivation, innovative raw material"

Project objectives:

- Improvement of the efficiency of cultivation of the medicinal plant Rhodiola rosea L through the use of a biotechnological method of microclonal propagation of rare plant species as well as a significantly improved technology of cutting and drying the raw material - rhizomes with roots.
- Development and implementation of innovations in the production of Rhodiola rosea extract.

Expected results:

- Planning of activities aimed at increasing the effectiveness and quality of cultivation of the medicinal plant "Rhodiola rosea" through the use of the microclonal propagation method, as well as thanks to the improved technological line for the preparation of the raw material (washing, cutting and drying) equipped with innovative solutions. These solutions will directly ensure obtaining high quality product with maximum energy savings and minimal losses.
- The use of innovative, ecological, green technologies and products during the project (ecological fuel in the heater, propane instead of Freon to power the heat pump, photovoltaics, recuperation and supercritical extraction) will directly contribute to environmental protection and mitigation of climate change.
- Development and implementation of innovations in the production of Rhodiola rosea extract, standardised for the content of active substances - a finished product for the pharmaceutical or food industry.

Further plans:

- Continuation under the next call for Measure 16 "Cooperation"
- Continuation as part of the Horizon Europe Programme
- Continuation under the research programmes of the National Centre for Research and Development
- Continuation within international Operational Groups

Leader name - Bialystok University of Technology	Leader category - scientific and research unit
Main location of the project	Podlaskie Voivodeship, Bialystok County
Contact person	Ewa Zapora
Contact e-mail	e.zapora@pb.edu.pl
Project duration	from 02-2021 to 04-2023 (call III)
Total project budget	PLN 2,705,077.89
Grant amount	PLN 1,741,888.00
Project website	www.rhodiola.pb.edu.pl

Innowatorzy Upraw

Crop Innovators

PLANT PRODUCTION

"Innovative technology of growing vegetables in a closed water cycle"

Project objectives:

- Achieving the most favourable water and energy balance while maintaining high quality vegetable crops using soilless and traditional cultivation methods.
- The use of innovative solutions to significantly reduce water consumption by eliminating water losses in the ground and due to evapotranspiration. Soilless cultivation allows you to reduce water consumption 10-20 times compared to soil cultivation. This project envisages the construction of a transpiration recovery system and further reduction of consumption to a level as close as possible to the amount of water incorporated in the plants. This objective will be achieved by condensation of water on the heat exchanger in a specially designed system.

Expected results:

- Development of a new technology for the transpiration water recovery while maintaining the assumed environmental parameters of the crop (T, RH).
- Development of improved technology for tight and energy-saving tunnels.
- Development of an improved method of organising farm work.
- Obtaining better yields with a water and heat recovery system.
- Support for the agricultural sector in the use of resources and increasing resilience to climate change and the harmonious use of natural resources.
- Determination of profitability thresholds for cultivation at different prices of water, crops and energy.
- Increasing the awareness and knowledge of farmers and gardeners.

Leader name - Dolnośląska Zielona Dolina Sp. z o.o.	Leader category - scientific and research unit / advisor
Main location of the project	Lower Silesian Voivodeship, Wrocław County
Contact person	Urszula Mikiewicz
Contact e-mail	urszula.mikiewicz@zielonadolina.biz
Project duration	from 03-2021 to 09-2023 (call II)
Total project budget	PLN 1,530,027.00
Grant amount	PLN 1,316,602.00
Project website	www.zielonadolina.biz

Minikiwi mały wielki owoc

Mini kiwi small big fruit

PLANT PRODUCTION

"Development of an optimal post-harvest technology for mini kiwi fruits (Actinidia arguta) and a prototype of a non-invasive sorting machine that sorts fruits in terms of their maturity (MODOM)"

Project objectives:

- Development of harvesting technology and post-harvest procedures for mini kiwi, a new fruit on the Polish market.
- Development of optimal procedures for refrigerated storage that will address the uneven ripening of mini-kiwi, which affects the storage ability of these fruits.
- Developing an innovative technology of non-invasive sorting in terms of maturity level as well as building a prototype of a sorting machine. It is necessary to sort the mini kiwi fruits non-invasively after harvesting so as not to deteriorate their quality and to be able to store fruits of uniform maturity in the refrigerated storage.

Expected results:

- Development of post-harvest procedures for mini-kiwi fruit, including post-harvest fruit treatment and long-term refrigerated storage,
- Developing an innovative technology and building a prototype of a non-invasive sorting machine for mini kiwi fruit that sorts them in terms of their level of maturity (MODOM).

Leader name - Warsaw University of Life Sciences	Leader Category - scientific and research unit
Main location of the project	Mazowieckie Voivodeship, City of Warsaw
Contact person	Piotr Latocha
Contact e-mail	piotr_latocha@sggw.edu.pl
Project duration	from 02-2021 to 06-2023 (call III)
Total project budget	PLN 1,883,851.64
Grant amount	PLN 1,692,603.00
Project website	www.minikiwi.sggw.pl

Nova Trawa

PLANT PRODUCTION

"Introduction to the market of an innovative variety of perennial ryegrass inhabited by symbiotic endophytic fungi"

NOVA **TRAWA**

Project objectives:

- Introduction to the market of an innovative variety of perennial ryegrass inhabited by symbiotic endophytic fungi of the genus Epichloë with increased durability and resistance to stress factors, primarily drought stress, and development of a technology for the production of grass varieties symbiotically improved with endophytes.
- Development and implementation of a significantly improved, innovative marketing strategy for the promotion, dissemination and commercialisation of innovative varieties of perennial ryegrass.

Expected results:

- Development of a product innovation - a new, symbiotically modified line of perennial ryegrass, which will be used to register a new variety characterised primarily by higher resistance to drought and other abiotic and biotic stress factors. Agricultural producers will be able to cultivate a higher value variety.
- Development of a technological innovation involving the process of inoculating endophytes into plants to reduce the time needed to create and market new varieties of symbiotically modified grasses.
- Development of an innovative marketing strategy enabling more effective promotion and dissemination of information on the cultivation of symbiotically modified grasses.

Further plans:

- Continuation within international Operational Groups

Leader name - Bydgoszcz University of Technology	Leader category - scientific and research unit
Main location of the project	Kuyavian-Pomeranian Voivodeship, Bydgoszcz County
Contact person	Dariusz Pańka
Contact e-mail	dariusz.panka@pbs.edu.pl
Project duration	from 06-2021 to 12-2023 (call III)
Total project budget	PLN 2,148,755.11
Grant amount	PLN 1,045,523.61
Project website	www.novatrawa.com

Original Food

PLANT PRODUCTION

"Adaptation and implementation of an innovative water treatment technology in a closed irrigation system with the use of biological protection measures and biostimulators in the production of large-fruited cranberry"

Project objectives:

- Development and implementation of a water purification system based on innovative water filtration technologies along with the introduction of biological stimulants and biological plant protection products in a closed circuit on a cranberry plantation using an innovative decision support system in the cultivation of large cranberries using the "wet" harvesting method.

Results achieved:

- A significantly improved water purification technology was developed as a result of research carried out as part of the "Adaptation and implementation of an innovative water treatment technology in a closed irrigation system with the use of biological protection measures and biostimulators in the production of large-fruited cranberry" project.
- The developed technology using a cascade filtration system is cheap, easy to install and maintain. It is easily scalable if you need to expand it. Laboratory and field tests have shown its sufficient effectiveness. The use of a cascade filtration system enables significant reduction in the fungal growth in the water used in a closed circuit in field conditions.
- Model studies have shown that the effect of eliminating fungi propagation increases in successive cycles of water flow through the filtration system. The developed technology prevents the accumulation of various species of fungi in water resources used in a closed circuit in field conditions in the production of large-fruited cranberries.

Further plans:

- Continuation under the next call for Measure 16 "Cooperation"

Leader name - Original Food Spółka z ograniczoną odpowiedzialnością	Leader category - enterprise
Main location of the project	Subcarpathian Voivodeship, Stalowa Wola County
Contact person	Mirela Kotlicka
Contact e-mail	mkotlicka@originalfood.pl
Project duration	from 12-2018 to 04-2022 (call II)
Total project budget	PLN 8,933,108.99
Grant amount	PLN 3,920,680.00
Project website	www.originalfood.pl

Original Food

PLANT PRODUCTION

"Implementation and adaptation to the climate and soil conditions of Poland of innovative fruit production technology with a closed irrigation system and biofortification with iodine and selenium in the production of cranberries"

Original Food

Project objectives:

- Development of an innovative technology for the cultivation of large-fruited cranberries on a commercial scale using very poor soils of 5th and 6th class. This goal was to be achieved as a result of the development and implementation of innovative construction and agrotechnical solutions allowing farmers to optimise costs and use very poor soils.
- Obtaining a healthier product as a result of the use of biofortification of plants with selenium and iodine in order to increase the content of these elements in fruits.
- Improving the rooting and spreading of large-fruited cranberry seedlings by applying growth regulators from the group of natural (strigol, deoxystrigol) and synthetic (GR24, Nijmegen-1) strigolactones and a strigolactone synthesis inhibitor.

Results achieved:

- The extensive research has been carried out, as a result of which an innovative technology was developed for the cultivation of large-fruited cranberries on a commercial scale, using very poor soils (5th and 6th class) in the climatic conditions of Poland. The conducted research concerned the use of marginal soils, where it was necessary to apply innovative additives increasing water retention

For this purpose, the following additives were applied to the substrate in the experimental quarters: perlite, brown coal, hydrogel with dendrimer, halloysite, horticultural hydrogel, peat, biochar. The tests carried out showed that the best results were obtained when the innovative hydrogel with dendrimer was used, followed by the hydrogel. It has been demonstrated that these sorbents retain water and nutrients in the substrate in the most effective way, which at the same time enables the control of the spread of nutrients in the natural environment. These sorbents accumulate water and nutrients in forms easily accessible to plants and show high stability in the conditions of a very permeable substrate, i.e. sand.

- In order to improve the composition of cranberry fruits, biofortification with iodine and selenium was used, which led to obtaining fruits with an increased content of these elements.
- The research on the effect of growth regulators from the group of natural (strigol, deoxystrigol) and synthetic (GR24, Nijmegen-1) strigolactones and a strigolactone synthesis inhibitor, proved that they significantly affected the growth and development of cranberry seedlings. In addition, as part of the project, the cost-intensity and efficiency of production of selected cranberry varieties in industrial conditions were determined, depending on the substrates and cultivation technology used.

Further plans: ■ Continuation under the next call for Measure 16 "Cooperation"

Leader name - Original Food Spółka z ograniczoną odpowiedzialnością	Leader category - enterprise
Main location of the project	Subcarpathian Voivodeship, Stalowa Wola County
Contact person	Mirela Kotlicka
Contact e-mail	mkotlicka@originalfood.pl
Project duration	from 06-2018 to 06-2022 (call I)
Total project budget	PLN 7,732,031.18
Grant amount	PLN 4,255,404.00
Project website	www.originalfood.pl

Original Food

PLANT PRODUCTION

"Innovative method of improving the microbiological condition and storage life of large-fruited cranberry"

Original Food

Project objectives:

- Analysis of the impact of the use of the ozonation process during the harvest of large-fruited cranberry on its microbiological condition and storage life.
- Selection of the conditions of the ozonation process, i.e. time and ozone concentration to achieve the desired effects.
- Analysis of the impact of UV irradiation during the harvest of large-fruited cranberries on its microbiological condition and storage stability. Selection of conditions for irradiation with UV radiation, i.e. time and intensity of this radiation to achieve the desired effects. Analysis of the impact of the combined method of ozonation and UV irradiation during the harvest of large-fruited cranberry on its microbiological condition and storage life.
- Selection of conditions for the combined method of ozonation and UV irradiation, i.e. time, ozone concentration and UV radiation intensity to achieve the desired effects.

Expected results:

- Development and implementation of a globally innovative method of improving the microbiological condition of large-fruited cranberry fruits, and thus storage life, through the use of the ozonation process combined with UV irradiation.
- Large-fruited cranberries can be harvested with two technologies. In one of them, called "wet", the quarters are flooded with water, and then the berries are mechanically shaked from the plant. Thanks to their natural buoyancy, the fruits float to the surface of the water, from which they are pulled to the edges with belts and extracted with special conveyors. Water is a medium that favours the transfer of all kinds of storage pathogens. The methods used during harvesting make it possible to remove excess water, but drying the fruit causes pathogenic microorganisms to turn into spores, which makes their removal much more difficult. When fruits are stored in lower temperature, they usually increase water activity, which favours their reactivation, thus generating storage problems.

The analysis of the storage of fruits harvested in this method indicates a vital need to increase the durability of cranberry fruits, which are subject to decomposition and rotting processes under the influence of infections with fungal and bacterial pathogens that arose at the stage of harvesting. Large-fruited cranberry fruits subjected to the innovative method of improving the microbiological condition and storage life will demonstrate an increased commercial value compared to traditionally wet-harvested fruits. It should be noted that the application of the proposed method of improving the storage life of large-fruited cranberries will contribute to extending the period of availability of these fruits on the market, the price of which increases significantly over time.

Further plans: ■ Continuation under the next call for Measure 16 "Cooperation"

Leader name - Original Food Spółka z ograniczoną odpowiedzialnością	Leader category - enterprise
Main location of the project	Subcarpathian Voivodeship, Stalowa Wola County
Contact person	Mirela Kotlicka
Contact e-mail	mkotlicka@originalfood.pl
Project duration	from 02-2021 to 12-2022 (call III)
Total project budget	PLN 732,258.45
Grant amount	PLN 520,787.00
Project website	www.originalfood.pl

Pasza z prosa

Switchgrass feed

PLANT PRODUCTION

"Selecting domestic and foreign populations of switchgrass intended for cultivation for fodder purposes in light of ongoing climate changes in Poland"

Project objectives:

Selection of varieties and populations of switchgrass (Panicum virgatum) available in Poland intended for fodder purposes in order to offer farmers an alternative source of green roughage (hay, silage). The assessment of the economic value of varieties and populations will be carried out on sandy and loamy sand soils, considering changing climate resulting mainly in water shortage and high air temperature. Until now, switchgrass was known in Poland as an ornamental plant planted as seedlings. According to the literature however, fodder varieties of millet are elsewhere successfully cultivated and fed as roughage. Sowing seeds in the field will make cultivation easier, eliminating the need to purchase special planting machines. The farmer will be able to sow the plant in the field with the seed drill, and the harvested crop will be an alternative green roughage.

Expected results:

Development and implementation of a new product - switchgrass intended for roughage and development and implementation of a new technology of cultivation of switchgrass intended for roughage. The results of the project will be interesting especially for farmers with sandy and loamy sand soils. Cultivation of a perennial plant, tested in field conditions, yielding green matter harvested for hay for at least 10-12 years can be interesting for, among others, cattle breeders. A one-off purchase of seed material will significantly reduce the costs of establishing a plantation of plants yielding twice a year for 10 to 12 years on soils at risk of poor development of plants of other crop species, especially in drought seasons. Single sowing will additionally reduce labour costs, equipment and fuel consumption, while reducing exhaust emissions.

Leader name - Pomeranian Agricultural Advisory Centre in Lubań	Leader category - advisor
Main location of the project	Pomeranian Voivodeship, Kościerzyna County
Contact person	Katarzyna Jasińska
Contact e-mail	k.jasinska@podr.pl
Project duration	from 05-2022 to 11-2024 (call III)
Total project budget	PLN 2,345,804.81
Grant amount	PLN 1,412,349.73
Project website	www.podr.pl/pasza-z-prosa/

Pradawne Ziarno

Ancient Grain

PLANT PRODUCTION

"Innovations in the cultivation, processing and marketing of ancient forms of Indian dwarf and Persian wheat with increased nutritional value"

Project objectives:

- Development and implementation of innovations in the technology of cultivation, processing and marketing of innovative products from ancient forms of Indian dwarf and Persian wheat with increased nutritional value.

Results achieved:

- New technologies for low-input, integrated and organic cultivation of ancient forms of Indian dwarf and Persian wheat were developed.
- New production processes and innovative products have been developed – breads, pasta and flakes processed from Indian dwarf and Persian wheat. These products are characterised by increased nutritional value.
- A new marketing method has been developed to introduce innovative Indian dwarf and Persian wheat products with increased nutritional value to the market.

Further plans:

- Continuation under the next call for Measure 16 "Cooperation"
- Continuation as part of the Horizon Europe Programme
- Continuation within international Operational Groups

Leader name - Bydgoszcz University of Technology	Leader category - scientific and research unit
Main location of the project	Kuyavian-Pomeranian Voivodeship
Contact person	Małgorzata Szczepanek
Contact e-mail	malgorzata.szczepanek@pbs.edu.pl
Project duration	from 05-2018 to 03-2021 (call I)
Total project budget	PLN 1,857,983.00
Grant amount	PLN 1,299,252.00
Project website	www.pradawneziarno.pl

Precyzyjne Ogrodnictwo

Precision Horticulture

PLANT PRODUCTION

"National system of precise diagnosis of diseases, pests and fertilisation needs in horticultural production"

FARM SMART
Powered by Agro Smart Lab

Project objectives:

Improving the safety and quality of cultivated vegetables/fruits and reducing production costs thanks to a nationwide decision support system for horticultural crops, including:

- Development of an information system about the occurrence of diseases in open-field and indoor crops, based on mathematical disease models and actual climate conditions.
- Development of a system for forecasting the occurrence of infections 24-48 hours before their occurrence, based on mathematical models and weather forecasts.
- Development of a pest warning system based on a pest monitoring system and mathematical (phenological) models of pest development adapted to domestic climate conditions.
- Development of a mobile application containing a disease and pest monitoring system and a field manager.

vDevelopment of a method, innovative on the Polish market, for rapid testing of macro- and micronutrient content in soil and plants using XRF, FTIR, ICP spectrometry.

- Development of a method for predicting the risk of economically significant physiological diseases caused by lack of calcium or boron in plants.

Expected results:

- Implementation in all regions important for fruit and vegetable cultivation in Poland of an accessible system of precise diagnosis of the occurrence of diseases, pests and diagnosis of the nutritional needs of horticultural plants.
- Implementation of the mobile application and launch of the website www.farmsmart.pl.
- A functional information system about the occurrence of infections and the threat from pests, as well as a forecast (prediction) of the occurrence of an infection 24-48 hours before its occurrence.
- Development and calibration of an innovative method for testing the content of available forms of nutrients in soil using XRF and MIR spectrometry.
- Development of a method for predicting the risk of deficiency of micronutrients responsible for economically significant physiological diseases based on weather forecast, analysis of soil fertility and chemical composition of indicator parts of plants.
- Implementation of the field manager - a software facilitating the management of a horticultural farm along with a fertiliser calculator and a CO2 calculator.
- A functional software that combines all components of the project with a mobile app.
- Scientific publications and popular science articles in horticultural magazines.

Leader name - AGRO SMART LAB sp. z o.o.	Leader category - advisor
Main location of the project	Lesser Poland Voivodeship, Proszowice County
Contact person	Mirosław Maziarka
Contact e-mail	miroslaw.maziarka@agrosmartlab.com
Project duration	from 02-2020 to 01-2023 (call III)
Total project budget	PLN 4,935,414.00
Grant amount	PLN 3,920,088.00
Project website	www.farmsmart.pl

Agroleśnictwo w Dolinie Zielawy

Agroforestry in the Zielawa Valley

PLANT PRODUCTION

"Innovative model of production, processing and distribution of herbs in the Zielawa Valley"

Project objectives:

- Development and implementation of new cultivation technologies taking into account climate changes, the need to develop methods for rational management of water resources, preventing soil wind erosion, increasing humus content and biodiversity.
- Development and marketing of new, healthy, functional food products, in response to the high demand for raw materials from wild-growing medicinal plants (including those under protection), necessary for the production of high-quality functional food, which can be used in the prevention of lifestyle diseases.
- Development and implementation of a new farm-to-fork production management model that will be sustainable, environmentally beneficial and climate-neutral. The developed model can track the origin of the product and its environmental footprint.
- Development and implementation of an improved marketing method for introducing healthy products to the market, developed as part of the operation based on a new product passport system and a production management system.

Expected results:

- New technologies for the cultivation of selected species in the alley cropping agroforestry system and in the agroforestry system with productive hedgerows, increasing the water capacity of the field, providing protection against the effects of drought and soil wind erosion, increasing the content of humus in the soil, as well as improving biodiversity.
- Development and implementation of unique cultivation technology (agricultural engineering techniques) for healthy wild plants, such as lungwort sp., cloudberry, speedwell and cabbage thistle.
- Development of innovative, based on new technologies, healthy functional food products (teas and spices) based on raw materials from plant species introduced into cultivation.
- Development of an innovative method of production management from field to shelf, allowing the producer and consumer to track the product's route and its environmental impact.
- Development of a new marketing method based on enabling the consumer to track the product's route from cultivation to the finished healthy product.

Further plans:

- Continuation under the next call for Measure 16 "Cooperation"
- Continuation as part of the Horizon Europe Programme
- Continuation under the research programmes of the National Centre for Research and Development
- Continuation within international Operational Groups

Leader name - ECO – FARM Sosnówka sp. z o.o.	Leader category - enterprise
Main location of the project	Lubelskie Voivodeship, Biała Podlaska County
Contact person	Barbara Baj Wójtowicz
Contact e-mail	biuro@lubelskieziola.pl
Project duration	from 07-2018 to 12-2022 (call I)
Total project budget	PLN 1,054,328.80
Grant amount	PLN 784,023.00
Project website	www.lubelskieziola.pl

EPI Bio-Food Roztocze

PLANT PRODUCTION

"Innovative in vitro technology for the production of healthy, high-quality rhubarb (Rheum rhaponticum L.) seedlings"

Project objectives:

- Development and implementation of in vitro production technology of high-quality red-stalked rhubarb planting material (genetically homogeneous, virus-free) enabling an increase in plantation profitability, expansion of sales and export, which will be achieved through the implementation of joint ventures covering scientific research, development works and investment projects. Plants selected on plantations for high content of anthocyanins will be tested for the presence of viruses, propagated by organogenesis of shoots from axillary buds and in vitro rooting, acclimatised to ex vitro conditions in a greenhouse with a controlled microclimate and evaluated in terms of genetic stability and performance characteristics (quantitative and qualitative content of phenolic substances, including anthocyanins) and then grown on organic plantations where research and development works will be carried out. In the next stage, the material will be transferred to the processing plant.

Expected results:

- Development of an innovative technology of in vitro propagation of rhubarb, which will enable the mass production of virus-free rhubarb seedlings with improved sensory, processing and health properties. A wide access to the unique quality rhubarb seedlings will increase the competitiveness of Polish plantations, improve the size and quality of crops, and thus increase the attractiveness of the obtained healthy product for direct consumption and for the processing industry. Favourable conditions for the development of exports will also be created. Many reports indicate a high demand on European markets for high-quality, preservative-free food.
- The research results will be presented at scientific conferences, in brochures and publications.

Further plans:

- Continuation under the next call for Measure 16 "Cooperation"

Leader name - Grupa Producentów „Bio-Food Roztocze" Sp. z o.o	Leader category - enterprise
Main location of the project	Subcarpathian Voivodeship, Przeworsk County
Contact person	Marcin Fujarowicz
Phone number	+48 601 535 760
Project duration	from 03-2021 to 05-2023 (call III)
Total project budget	PLN 556,828.42
Grant amount	PLN 508,531.18
Project website	www.epibiofood.pl

Zdrowa żywność

Healthy food

PLANT PRODUCTION **also applies to ANIMAL**

"The use of electrolysed water in plant and animal production as an innovative and safe agent, reducing the use of harmful chemicals and antibiotics in agriculture"

Project objectives:

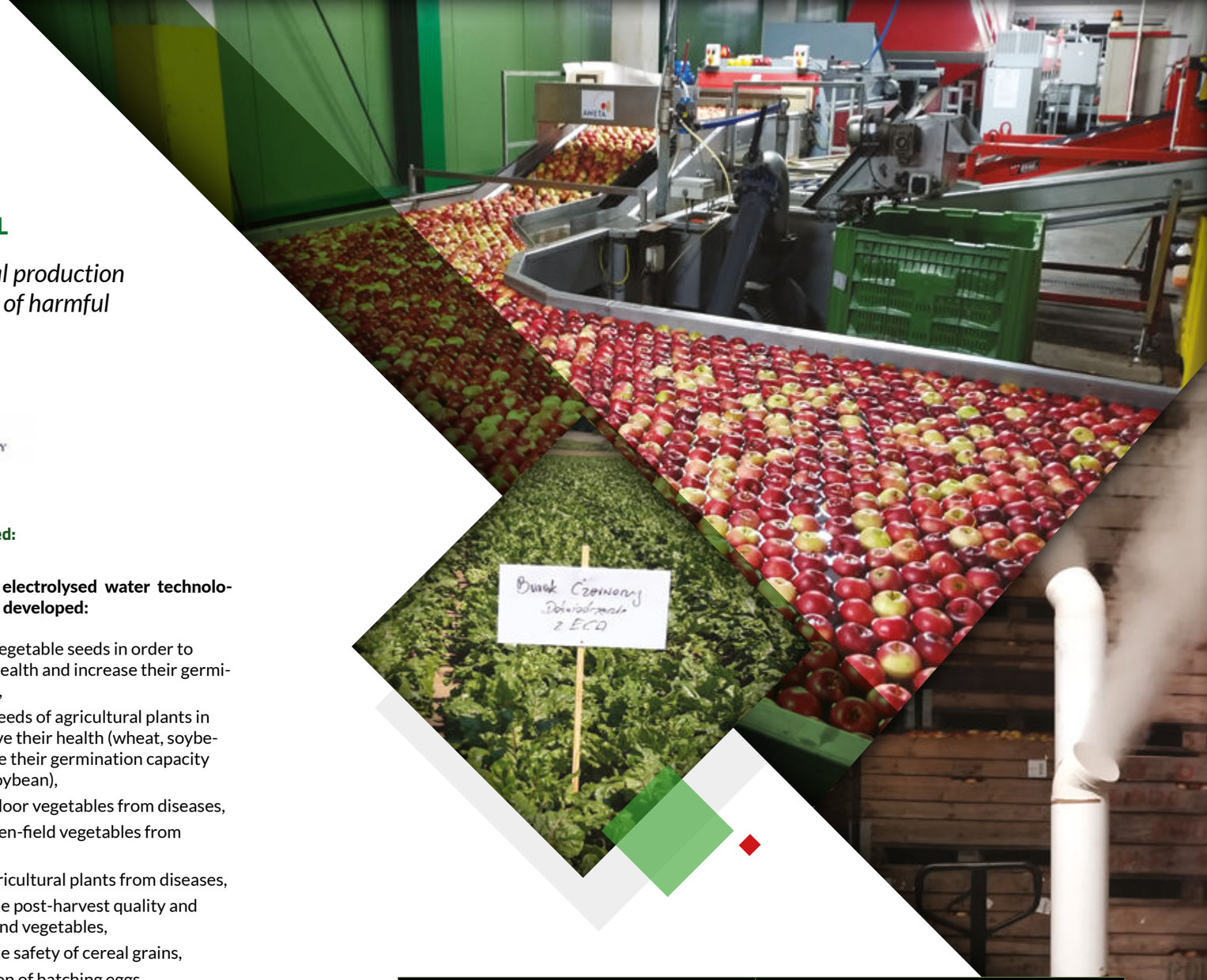
Development of a technology that uses electrolysed water in plant and animal production as an innovative and safe agent, reducing the use of harmful chemicals, pesticides and antibiotics in agriculture. The technologies in question are intended to:

- protect plants against diseases with the use of electrolysed water,
- improve the safety and quality of fruit and vegetables in the post-harvest process, combating bacteria, viruses and fungi that are pathogenic to humans, and combating pathogens causing fruit and vegetables to spoil during storage and cleaning,
- improve the health of farm animals and reduce the use of antibiotics in fighting diseases of the digestive tract by disinfecting the cows' udders and improving the health conditions of animals through safe disinfection of facilities,
- disinfect hatching eggs to eliminate formaldehyde.

Results achieved:

The following electrolysed water technologies have been developed:

- for treating vegetable seeds in order to improve their health and increase their germination capacity,
- for treating seeds of agricultural plants in order to improve their health (wheat, soybean) and increase their germination capacity (wheat, corn, soybean),
- to protect indoor vegetables from diseases,
- to protect open-field vegetables from diseases,
- to protect agricultural plants from diseases,
- to improve the post-harvest quality and safety of fruit and vegetables,
- to improve the safety of cereal grains,
- for disinfection of hatching eggs,
- for poultry farming,
- for rearing calves,
- for disinfection of cows' udders,
- for hygienisation of slurry.



Leader name - Bio ActiW sp. z o.o	Leader category - enterprise
Main location of the project	Subcarpathian Voivodeship, Dębica County
Contact person	Eugeniusz Maziarka
Contact e-mail	Eugeniusz.maziarka@bioactiw.pl
Project duration	from 01-2021 to 04-2022 (call III)
Total project budget	PLN 1,097,753.49
Grant amount	PLN 925,715.44
Project website	https://zdrowazywnosc.bioactiw.pl/

Agroinsect

ANIMAL PRODUCTION

"Diversification of protein sources for fodder based on the breeding of insects in organic farms"

AgroInsect

Project objectives:

- Development of a mobile technology for insect breeding on a farm.
- Development of solutions thanks to which farmers will have access to a new source of high-quality protein that can be used in animal nutrition as feed material.
- Enabling farmers to biorecycle plant waste generated both on the farm and purchased by farmers from other sources, e.g. from vegetable and fruit processing plants, farms or even households.

Results achieved:

Development of technological innovation on an international scale. Development of a technology for mobile, container-based and fully automatic insect breeding on farms, based on the proprietary, patented technology of insect larvae breeding by HiProMine and adapted to be carried out in a container. The resulting technology is the first in Poland and one of the first in the world that uses a container for the production of insects for fodder purposes. It is the world's first container technology that enables automatic breeding, where human work is limited only to feeding the larvae at the beginning of the process. It is also the first container technology that can be self-sufficient thanks to the use of renewable energy sources.

Leader name - HiProMine S.A.	Leader category - enterprise
Main location of the project	Greater Poland Voivodeship, Poznań County
Contact person	Krzysztof Dudek
Contact e-mail	krzysztof.dudek@hipromine.com
Project duration	from 12-2019 to 11-2020 (call II)
Total project budget	PLN 1,458,694.93
Grant amount	PLN 1,337,577.00
Project website	www.agroinsect.pl

Further plans:

- Continuation under the next call for Measure 16 "Cooperation"

Bezpieczna Ferma

Safe Farm

ANIMAL PRODUCTION

"Safe Farm - product, process and marketing innovations related to the breeding of broiler chickens"

Project objectives:

- Evaluation of the impact of the use of zeolite and halloysite both as a feed additive for chickens for fattening and in hygienisation of a livestock facility, in particular with regard to: quality of slaughter material, presence of FPD (Foot Pad Dermatitis), quality of foot pads of chickens for fattening (limiting Foot Pad Dermatitis), - production results (feed consumption per 1 kg of body weight, assessment of growth, etc.).
- Evaluation of odour emission reduction in livestock facilities covered by the research.
- The use of natural minerals (zeolite and halloysite) in the rearing of chickens for fattening in order to obtain a product of increased quality - development of guidelines and recommendations for poultry producers.
- Promoting the project and poultry meat as part of innovative marketing activities, such as creating sketches and short videos for consumers explaining the realities of industrial production in Poland.

Results achieved:

- Development and implementation of an improved technology for the production of broilers with the use of the most optimal ratio and methods of using a mixture of natural minerals as part of: the feeding process of chickens, the microclimate of the henhouse, as part of disinfestation and reduction in the insect population.
- Obtaining improved products, i.e. better quality chicken for fattening compared to standard production methods.
- Implementation of new marketing methods for the production, processing and marketing of products.
- Dissemination of the obtained results through various information distribution channels - publication of research results in a reputable scientific journal / popular science journal addressed to the community, a conference summarising the project and other meetings with farmers, promotion of the solution among breeders through the Association, which is a member of the consortium.

Leader name - Kuyavian-Pomeranian Association of Poultry Breeders and Egg Producers	Leader category - association
Main location of the project	Kuyavian-Pomeranian Voivodeship, Bydgoszcz County and Toruń County
Contact person	Anna Rybka
Contact e-mail	bezpiecznaferma.wspolpraca@gmail.com
Project duration	from 02-2020 to 01-2022 (call II)
Total project budget	PLN 3,168,803.75
Grant amount	PLN 2,686,465.25
Project website	www.bezpiecznaferma.pl

Zdrowy Drób - Innowacyjne metody produkcji drobiu

Healthy Poultry - Innovative methods of poultry production

ANIMAL PRODUCTION

"Innovative poultry production technology with the use of products aimed at eliminating antibiotics"

Project objectives:

- Understanding the impact of bacteriophage products on the health and production parameters of poultry and, as a result, developing an innovative technology for the production of poultry for fattening using natural bacteriophage antibacterial products BAFASAL® and BAFACOL that provide protection against Salmonella spp. and Escherichia coli.
- Determination, through research, of the impact of these products on the production results and health of chickens, on the quality of meat and the emission of harmful gases into the environment.
- Promotion of poultry farming with the use of bacteriophages and the related improvement in the production of broiler chickens as well as the quality and safety of poultry meat.

Expected results:

- The main result of the project will be an innovative technology for the production of poultry for fattening with the use of natural products developed on the basis of the conducted research.
- The technology and the research results obtained will be presented on the operational group's website and in the form of reports, brochures and information leaflets for poultry producers, as well as published in the form of popular science articles, and presented during training, seminars and meetings of the poultry industry. We also plan to implement the developed technology into practice in the form of a pilot project.

Leader name - Institute of Animal Production - National Research Institute	Leader Category - scientific and research unit
Main location of the project	Subcarpathian Voivodeship, Mielec County
Contact person	Katarzyna Połtowicz
Contact e-mail	katarzyna.poltowicz@iz.edu.pl
Project duration	from 12-2019 to 12-2022 (call II)
Total project budget	PLN 4,223,225.14
Grant amount	PLN 3,292,437.58
Project website	www.zdrowydrob.eu

Chłodzenie Bydła

Cattle cooling

ANIMAL PRODUCTION

"Optimisation of cattle rearing and production efficiency through innovative solutions in barn and calf barn"

Project objectives:

- The development and implementation of modern solutions for cooling farm animals, including dairy cattle, is a priority task, counteracting the increasing losses in animal production, which are the result of ever-higher temperatures in the summer.
- Development and practical application of an innovative ventilation system for curtain barns.
- Development of a method of cooling cows, as well as technology for keeping calves in conditions of an increased level of welfare.
- Development of an innovative curtain barn ventilation system and an innovative cooling system for facilities such as the waiting area and milking parlour. The technology is not supposed to increase the humidity of the air in the livestock facilities and, moreover, it will be an energy-saving system - partly based on solar energy.
- Research covering the analysis of microclimate parameters, animal welfare indicators, as well as economic analysis of the effectiveness of the solutions used will be conducted.

Expected results:

- Developing and providing effective solutions for rearing cattle in a barn with an improved ventilation system, developing an innovative technology for cooling cows in the waiting area and milking parlour, as well as improved technology for rearing calves, which will contribute to improving the welfare of these animals, and perhaps also bring some health benefits.
- The innovative cow cooling system, developed as part of the group's activities, with appropriate modifications, can be used in other areas of animal production, such as poultry or pig farming.

Leader name - Institute of Animal Production - National Research Institute	Leader category - scientific and research unit
Main location of the project	West Pomeranian Voivodeship, Gryfino County
Contact person	Andrzej Kaczor
Contact e-mail	andrzej.kaczor@iz.edu.pl
Project duration	from 02-2021 to 12-2022 (call III)
Total project budget	PLN 3,246,515.70
Grant amount	PLN 2,311,965.00
Project website	www.chlodzeniebydla.pl

Dobry Miód

Good Honey

ANIMAL PRODUCTION

"Apiary with controlled conditions and regulated microclimate in the hive and controlled production of nectar-producing flowers"

Project objectives:

- Production – development and implementation of an improved product - high-quality honey, without the use of active substances (amitraz) to combat varroasis, by creating appropriate welfare conditions for bees and honey crops, as well as ensuring nectar-producing plants and appropriate soil conditions.
- Improved honey production technology based on innovative hive construction and controlled nectar-producing plants.
- Accelerated development of bee colonies in spring.
- Obtaining more honey by improving the conditions in the hives.

Expected results:

- Creation of six prototype mini-apiaries with a modified structure in order to obtain controlled conditions and automatically regulated microclimate in hives.
- Combating and significantly reducing varroosis in mini-apiaries thanks to the innovations in hive construction.
- Obtaining honey of better quality and in larger quantities compared to typical apiaries, with limited use of chemicals in bee protection and thanks to the use of specially selected nectar-producing flowers and field crops.
- Promotion of mini-apiaries and improved honey production technology through innovative marketing methods with the use of social media.

Further plans:

- Continuation under the next call for Measure 16 "Cooperation"

Leader name - Foundation Institute of Innovation	Leader category - enterprise
Main location of the project	Masovian Voivodeship, Warsaw County
Contact person	Joanna Chodor
Contact e-mail	joanna.chodor@ii.org.pl
Project duration	from 05-2022 to 11-2024 (call III)
Total project budget	PLN 2,035,689.00
Grant amount	PLN 1,863,259.00
Project website	www.dobrymiod.edu.pl

Gendrob

ANIMAL PRODUCTION

"Improvements to the Polish population of laying hens with the use of innovative IT and biotechnological solutions"

Project objectives:

- Genetic improvement of the population of laying hens in Poland, so that Polish breeders, in times of progressing globalisation, are able to effectively compete with foreign breeding companies and play a significant role on the domestic and foreign markets.
- Development of prototype solutions for a new IT system supporting hen breeding. The new IT tool will have implemented a newer BLUP method - an animal model for assessing the genetic value of poultry, taking into account an extended range of characteristics along with the ability to define economic weights at the level of estimating the total breeding value. In addition, the system will provide the user with control of the level of inbreeding. This will be helpful in the process of creating selection flocks, in which the total breeding value, the degree of relatedness of individuals and good practices will be taken into account.

Expected results:

- Development and introduction of an innovative IT system that enables a more accurate assessment of the breeding value through the implementation of the BLUP method.
- Development and implementation of an original method of cooling and diluting semen, useful and justified for insemination, and necessary for full control of the origin of chicks.
- Introduction of a more comprehensive mechanism to support the process of creating selection flocks (taking into account all characteristics, their weights and the degree of relatedness of individuals).
- Expanding the spectrum of measured characteristics (ultrasonic measurement of egg shell thickness).
- Introduction of an original mechanism for full identification of the origin of all chicks (cage system with the use of barcodes).
- Creation of a rooster sperm bank.
- Improving the method of identifying individuals based on the chick number.
- Automation of measurements and recording of characteristics of individuals extended by ultrasonic measurement of egg shell thickness.

Leader name - Institute of Animal Production - National Research Institute	Leader category - scientific and research unit
Main location of the project	Łódź Voivodeship, Pabianice County
Contact person	Katarzyna Połtowicz
Contact e-mail	katarzyna.poltowicz@iz.edu.pl
Project duration	from 04-2021 to 10-2023 (call III)
Total project budget	PLN 3,211,564.20
Grant amount	PLN 2,159,508.00
Project website	www.gendrob.pl

Grupa Operacyjna Wolce

Operational Group Bullocks

ANIMAL PRODUCTION

"Development of the "Smart Feeding" beef cattle fattening technology, using the "Smart Through" system for automatic monitoring of beef cattle feeding efficiency, aimed at minimising the carbon footprint in beef production"

Project objectives:

- Reduction of the negative impact of beef production on the environment by developing a feeding technology and comparing the size of the carbon footprint in the fattening of heifers, bullocks and bulls with the use of an automatic cattle feeding monitoring system.
- Development of a feeding technology and comparing the size of the carbon footprint in the fattening of heifers, bullocks and bulls with the use of an automatic cattle feeding monitoring system.

Expected results:

- Implementation of Smart Feeding monitoring systems that monitor the feeding behaviour of bulls and analyse the phenomena that may interfere with both the efficiency of their feeding and production indicators, i.e., for example, the intake of individual feeds during the day or daily weight gains.
- Monitoring of greenhouse gas emissions and their reduction by optimising the feeding process.

Leader name - Wiesław Pilch	Leader category - farmer / farm
Main location of the project	Kuyavian-Pomeranian Voivodeship, Grudziądz County
Contact person	Jerzy Wierzbicki
Contact e-mail	jerzy.wierzbicki@pzpbm.pl
Project duration	from 06-2022 to 06-2024 (call III)
Total project budget	PLN 4,370,812.00
Grant amount	PLN 3,049,706.00
Project website	www.grupawolce.pl

Further plans:

- Continuation under the research programmes of the National Centre for Research and Development

Grupa Wołowina
Beef Group

ANIMAL PRODUCTION

"Building a system of connections in the area of innovative calf rearing and final fattening technologies"

Project objectives:

- Research and implementation of modern specialist calf rearing and final fattening technologies on Polish farms.
- Verification of usefulness of ear biosensors for calves.
- Introduction of innovative, improved technology related to preventive health care, nutrition and animal welfare monitoring, which will contribute to improving the efficiency of calf rearing and obtaining a standardised, repeatable final product through innovative changes in the final stage of cattle fattening.

Results achieved:

- Reduction in calf mortality in the first period of rearing up to 5%.
- Reduction in the use of antibiotic therapy in favour of prevention of diseases.
- Improvement of production indicators - daily gains, feed efficiency, implementation of systems monitoring animal welfare and facility microclimate on an ongoing basis.
- Obtaining a more standardised and repeatable final product; improvement in gains depending on the genotype of animals from 1300-1700g/day, reduction of antibiotic therapy in favour of disease prevention, reduction of mortality in this period to 2% in the final stage.

Leader name - Łukasz Karmowski	Leader category - farmer / farm
Main location of the project	Masovian Voivodeship, Warsaw County
Contact person	Jerzy Wierzbicki
Contact e-mail	jerzy.wierzbicki@pzpbm.pl
Project duration	from 12-2019 to 11-2021 (call II)
Total project budget	PLN 6,800,130.00
Grant amount	PLN 4,716,537.00
Project website	www.grupawolowina.pl

Further plans:

- Continuation within international Operational Groups

Nowe praktyki chowu zwierząt inwentarskich

New livestock breeding practices

ANIMAL PRODUCTION

„New livestock breeding practices in cooperation with the University of Life Sciences in Lublin”

Project objectives:

- Introduction of improved technology to reduce the negative effects of intensive farming, mainly pig rearing, on animal welfare and the environment.
- Modernisation of the ventilation system with solar energy recovery to power the thermoacoustic chiller and optimisation of the autonomous climate control system.
- Improving the microclimate, animal welfare and meat quality.
- Reducing the emission of gaseous pollutants, including odorous substances, by using a natural sorbent as a feed additive.

Expected results:

- During the project, the functionality of an integrated air purification system based on activated carbon filters together with an air-conditioning system powered by solar energy will be demonstrated. The second solution to the problem of pollution emissions will be provided in the form of feed additives reducing the amount of gaseous pollutants emitted by animals (e.g. ammonia, methane, sulphur compounds).

These solutions will improve the microclimate of the facilities, which will improve the breeding conditions and translate into increased quality of the final product. It will make it possible to minimise the adverse impact of animal husbandry on the natural environment without depleting the national stock.

- The impact of these solutions will be examined thanks to the direct cooperation of breeders with the University of Life Sciences in Lublin.
- As a result of the project, the following issues will be addressed:
  - measurements of the amount of gaseous pollutants released from pig farming,
  - selection and development of a method of supplementation of feed additives reducing the emission of ammonia and other gaseous pollutants from pig farming,
  - energy balance of the air-conditioning system,
  - the impact of the solutions on animal health and meat quality.

Further plans:

- Continuation under the next call for Measure 16 "Cooperation"

Leader name - Łódź Agricultural Advisory Centre in Bratoszewice	Leader category - advisor
Main location of the project	Łódź Voivodeship, Zgierz County
Contact person	Katarzyna Nowak
Contact e-mail	k.nowak@lodr-bratoszewice.pl
Project duration	from 07-2021 to 12-2022 (call III)
Total project budget	PLN 1,757,897.53
Grant amount	PLN 1,335,286.00
Project website	www.animalwal-tech.pl

Owce w Zielonej Dolinie

Sheep in Green Valley

ANIMAL PRODUCTION

"Innovative methods of sheep rearing and breeding in times of changing climate conditions of Lower Silesia"

Project objectives:

- Optimisation of sheep production in changing climate conditions along with reducing the environmental impact and improving the biodiversity of pasture sward.
- Restoring biodiversity by renovating pastures while creating a feed base for sheep.
- The use of interbreed crossing (Polish Heath Sheep with Cameroon sheep) resistant to difficult environmental conditions and seasonality.
- Optimising the breeding process by introducing new organisational methods.

Expected results:

- Better use of local natural resources (grasslands after renovation).
- Increasing the efficiency of the use of local feed resources - basic nutrition is based on local feed resources (produced on site).
- Increasing the efficiency of the use of organic fertilisers and rainwater.
- The final product obtained - sheep meat with better quality parameters will positively affect the competitive position of Lower Silesian breeders.
- Increasing the level of qualifications (know-how) of breeders in the area of effective mutton/lamb production: rearing methods, breeding, reproduction, welfare, nutrition, economic considerations and proper veterinary care.
- Improvement of the infrastructure of farms in the organisation of breeding.
- Creation of significantly improved breeds with improved characteristics, i.e. crosses of Polish heath ewes with Cameroon rams.
- Introduction of innovative breeding solutions, thanks to the use of molecular genetic methods, such as the identification of polymorphisms of some genes considered crucial for meat and reproductive performance.
- Introduction of new methods of organising production, such as a mobile trailer with specialist equipment for transporting sheep and an innovative device for collecting seeds of meadow species.
- Creating a new sheep meat product.
- Increase in competitiveness and profitability of regional breeding and the related increase in the standard of living of breeders.

Leader name - Dolnośląska Zielona Dolina Sp. z o.o.	Leader category - advisor /scientific and research unit
Main location of the project	Lower Silesian Voivodeship, City of Wrocław
Contact person	Urszula Mikiewicz
Contact e-mail	urszula.mikiewicz@zielonadolina.biz
Project duration	from 03-2021 to 03-2023 (call II)
Total project budget	PLN 1,752,220.93
Grant amount	PLN 1,562,208.00
Project website	www.zielonadolina.biz

Rodzime konie – innowacyjna metoda treningu i oceny wartości użytkowej

Native horses - an innovative method of training and value evaluation

ANIMAL PRODUCTION

"Development and implementation of an innovative method of preparation and evaluation of the performance value of stallions of the Wielkopolski and Malopolski breeds"

Project objectives:

- Strengthening the protection of genetic resources of endangered populations of Polish horse breeds by developing and implementing an innovative method of training (preparation) and assessment of stallions of native breeds: Wielkopolski and Malopolski in a training facility. The project objective is to increase the value of the horse as a product through alternative method of rearing from a foal to an adult stallion and to increase its performance value.

Expected results:

- Obtaining native stallions, which will be used to recreate and preserve the original gene pool of Wielkopolski and Malopolski breeds. The current population of these horses is mostly crossed with foreign breeds, which in turn will lead to the complete loss of native genetic resources of Polish breeds.

Obtaining stallions of native Wielkopolski and Malopolski breeds will be carried out with the use of newly developed methods of preparation (breeding, selection and training) and performance value evaluation. The fact that the developed methods will be used on stallions from the age of about 18 months is an additional benefit. Organising and carrying out all activities in one centre, in uniform conditions, gives the opportunity to fully and comprehensively use the methods developed as part of the project and enables us to achieve the main goal, which is to obtain full-fledged stallions of native breeds with high health, performance and genetic values.

- Creating a network of contacts to establish cooperation between breeders for stallion exchange and improving the quality of breeding stock of horses.

Leader name - Institute of Animal Production - National Research Institute	Leader category - scientific and research unit
Main location of the project	Lesser Poland Voivodeship, Gorlice County
Contact person	Iwona Tomczyk-Wrona
Contact e-mail	iwona.wrona@iz.edu.pl
Project duration	from 02-2021 to 06-2023 (call III)
Total project budget	PLN 4,815,174.94
Grant amount	PLN 4,030,217.10
Project website	www.rodzimekonie.pl

System jakości gwarancją dobrej wieprzowiny

The quality system guarantees good pork

ANIMAL PRODUCTION

"The quality system guarantees good pork"

Project objectives:

- Developing an innovative non-GMO pig feeding programme. The developed model of feeding for pigs has not yet been used on a large scale. In particular, the project envisages non-GMO pig farming, i.e. from birth to slaughter the animals will not come into contact with GMO materials. This also applies to piglets who, before weaning, will drink milk from sows fed concentrate mixtures that do not contain GMO components.
- Development of a certification system covering the entire production cycle, giving consumers a guarantee that the final products manufactured with the use of the developed quality system will be of the highest quality.
- Production of a high-quality pork product from animals fed with non-GMO feeds, which, thanks to its uniqueness on the domestic market, will also promote processing plants.

Expected results:

- Pig nutrition will consist of an improved and repeatable pig feeding system developed by an independent animal nutritionist.
- Introduction of a quality system based on a step-by-step chain of processes that the farmer should introduce to the farm. The quality system will be a guarantee of good pork product, its marking will allow the customer to trace the origin of the product. The system is an innovation not yet used in Poland.
- The development of the website will be the beginning of the information and marketing campaign presenting quality, features and advantages of pork meat. A special tab will be created dedicated to farmers whose commitment and compliance with the rules will allow them to produce high-quality pork. The process of animal breeding, selection of breeds and feeding methods will also be demonstrated. The website will also have a culinary section with pork recipes.
- Participation in fairs and events related to the production and processing of pork, but also to farmng itself, which will enable direct contact with the consumer. This form of marketing will contribute to the dissemination of knowledge related to nutrition and consumption. Product tasting will also be organised. An information brochure that will be distributed during the fair and the conference summarising the project will be prepared.

Further plans:

- Continuation under the next call for Measure 16 "Cooperation"
- Promotion of the results achieved in the project, promotion of non-GMO pork and Polish native breeds

Leader name - Kuyavian-Pomeranian Agricultural Advisory Centre in Minikowo	Leader category - advisor
Main location of the project	Kuyavian-Pomeranian Voivodeship, Nakło County
Contact person	Martyna Zielińska-Tadych
Contact e-mail	martyna.zielinska-tadych@kpodr.pl
Project duration	from 10-2021 to 10-2023 (call III)
Total project budget	PLN 3,335,107.00
Grant amount	PLN 3,063,361.00
Project website	www.dobrawieprzowina.pl

Grupa Operacyjna Śruta rzepakowa w żywieniu trzody chlewnej

Operational Group Rapeseed meal in pig feeding

ANIMAL PRODUCTION

"Innovative fermentation technology of rapeseed meal as feed for pigs"

Project objectives:

- Selection of yeast and lactic acid bacteria strains for the preparation of starter culture. Both groups of microorganisms must be added in the appropriate density, in proportion to the amount of rapeseed meal. Different conditions of the fermentation process, appropriate for both fermentation processes (alcoholic and lactic), will be taken into account.
- Determination of the percentage addition of fermented meal to the feed.
- Examination of the weight gain of animals fed with fermented meal in relation to the control group fed with conventional fodder.
- Qualitative assessment of slurry and manure. A metagenomic and metataxonomic analysis of the microbiome of both groups of animals (control and experimental sample) will be performed and research on the impact of both groups' faeces on the microbiome of the fertilised soil will be performed.
- Determining the conditions for drying fermented meal in the drying room.
- Quantitative and qualitative evaluation of pork meat after slaughter.
- Production of meat products and their qualitative assessment, as well as shelf-life testing.

Expected results:

- Development and implementation of an innovative technology for the preparation of rapeseed meal as a fermented feed ingredient. Fermented meal, with increased nutritional value and reduced content of bitter components, can be used as a feed ingredient, replacing the commonly used imported soybean meal.
- The expected effects of the planned activities include the appropriate weight gains during breeding and improvement of animal health thanks to the shaping of the microbiome of the digestive tract (comparison of disease resistance between the control and experimental groups) and the appropriate quality of pork and meat products from the experimental group of animals fed with fermented rapeseed meal. In addition, the level of odorous emissions and nitrogen compounds in animal faeces is likely to decrease. These faeces will also have positive impact on the environment (lower amounts of nitrogen compounds), especially on the soil microbiome.
- A lower cost of fattening is another expected and measurable economic effect.
- Meat products derived from animals fed with feed without the addition of GMO soya will enjoy increased consumer interest. The obtained results will be used to prepare publications for scientific journals.

Further plans: ■ Continuation under the next call for Measure 16 "Cooperation"

Leader name - Silesian Agricultural Advisory Centre in Częstochowa	Leader category - advisor
Main location of the project	Silesian Voivodeship, Częstochowa County
Contact person	Jacek A. Lupa
Contact e-mail	j.lupa@odr.net.pl
Project duration	from 06-2021 to 06-2023 (call III)
Total project budget	PLN 4,045,485.00
Grant amount	PLN 3,573,031.00
Project website	www.srutarzepakowa.odr.net.pl

Zdrowe zwierzęta – zdrowa żywność ThermoEye

Healthy animals - healthy food ThermoEye

ANIMAL PRODUCTION

„ThermoEye - an innovative system for improving the welfare of pigs”

THERMOEYE
ZDROWE ZWIERZĘTA • ZDROWA ŻYWNOŚĆ

Project objectives:

- Development of solutions to improve the pig farming process - an unattended and contactless system that analyses the temperature of animals in a continuous mode.
- Development of a multi-level methodology for detecting temperature and behavioural anomalies.
- Evaluation of animal behaviour models (e.g. aggression) that negatively affect the growth and welfare of animals.
- Developing a conjunction of relations, illustrating the correlation between the increase in body surface temperature of animals and their behaviour and environmental conditions.

Results achieved:

- Reducing the use of antibiotics in metaphylaxis.
- Evaluation and possible stimulation of natural immune mechanisms, symptomized by, among others, fever and an individual approach to disorders of the immune system.
- Easier and stress-free control of therapy effects through ongoing monitoring of body surface temperature.
- Selection of individuals with a low level of welfare manifested by increased body surface temperature (“Pig Stress Syndrome”)
- Selection of individuals with a low level of welfare manifested by a reduced body surface temperature.
- The ability to detect correlations between reactions consistent with the ethogram and behavioural disorders that are accompanied by an increase or decrease in body surface temperature.
- Improved heat detection in gilts by monitoring body surface temperature.
- Faster and more accurate detection of postpartum infections in sows (mastitis, metritis).
- The ability to monitor animals with an unusual course of the sexual cycle in order to provide them with faster and more effective hormonal treatment.
- Optimisation and fattening control based on temperature data recorded by the ThermoEye system at the start, during and after feeding.
- Improvement of production and economic conditions (more efficient use of feed).
- Antibiotic-free meat.
- Obtaining higher quality pork and improving standards that lead to reduced stress factors at individual stages of production.
- Development of organic farming.

Leader name - Łódź Agricultural Advisory Centre in Bratoszewice	Leader category - advisor
Main location of the project	Łódź Voivodeship, Zgierz County
Contact person	Anna Walas
Contact e-mail	a.walas@lodr-bratoszewice.pl
Project duration	from 12-2019 to 05-2022 (call II)
Total project budget	PLN 1,529,657.64
Grant amount	PLN 1,520,689.00
Project website	www.zdrowezwierzetaepi.pl

Wołowina z Zielonej Doliny

Beef from Green Valley

ANIMAL PRODUCTION

"Innovative cattle breeding methods to obtain the best quality Lower Silesian beef"

Project objectives:

- Obtaining the best quality meat thanks to the introduced innovative methods of cattle breeding.
- Generating regional food products and semi-finished products with unique, healthy properties, recognisable in Poland and around the world, made of beef from farms in Lower Silesia.

Results achieved:

- Development of a new product - beef. The product responds to market research, e.g. the local beef market was explored to find out whether similar products already existed on the market. The results of the surveys made it possible to identify the current market behaviour of consumers, their attitudes towards beef, as well as their needs and expectations towards the new product (e.g. preferred features, estimated demand, preferred method of packaging and distribution, acceptable price level).
- Implementation of a specific model of meadow/pasture production adapted to the farm's individual fodder needs.
- Cattle population increased by 30%, breeding and calving dates for the winter-spring period were selected, the purity of the Charolais and Limousin breeds was improved, animal welfare was improved, the acquisition of very good fodder from own grasslands was increased by approx. 50%, increase in daily weight gain of calves by approx. 25% was obtained.
- Development of a meadow/pasture production model adapted to the farm's individual fodder needs.
- Verification of procedures for the care of newborn calves in individual herds with special attention paid to the activities that should be performed after birth in connection with the care of calves.
- Improvement of cattle rearing conditions on farms.

Further plans:

- Continuation under the next call for Measure 16 "Cooperation"

Leader name - Dolnośląska Zielona Dolina Sp. z o.o.	Leader category - scientific and research unit / advisor
Main location of the project	Lower Silesian Voivodeship, Wrocław County
Contact person	Urszula Mikiewicz
Contact e-mail	urszula.mikiewicz@zielonadolina.biz
Project duration	from 10-2019 to 10-2021 (call II)
Total project budget	PLN 2,879,895.79
Grant amount	PLN 2,219,354.00
Project website	www.zielonadolina.biz

Konsorcjum Agro Integracja Wieprzowina

Agro-integration Pork Consortium

ANIMAL PRODUCTION

"Effective production of the highest quality non-GMO and antibiotic-free pork"

Project objectives:

- Implementation of new innovations in the following areas: product, technology, organisation.
- Development of a feeder-to-market (from 30 kg live weight) pig production methods, which will enable a reduction or even elimination of the use of antibiotics.
- Development of a model including a network of cooperation between breeders, veterinarians, nutritionists, technologists and leaders of producer groups. An economic indicator will be developed that will enable pig producers to assess the level of additional expenditure on welfare, preventive health care, professional nutrition and other components of animal husbandry, the use of which will allow them to reduce the use of antibiotics.
- Developing a non-GMO pig production model and determining the level of additional costs associated with it.

Expected results:

- Implementation of innovations: new product, new technology, new method of organisation.
- Multi-stakeholder cooperation in the area of animal health bringing above-average production results - piglet producer - fattening pig producer - veterinarian - nutritionist - transport company - zootechnician - producer groups (exchange of information, identification of needs, goal-setting and stages of their implementation).
- The high quality of the piglet (obtained thanks to the cooperation) in terms of health status and genetic potential. The piglet is then transported and further kept in conditions of above-average welfare, which enables the reduction of antibiotics in pig production.

Leader name - AGRO INTEGRACJA sp. z o. o.	Leader category - enterprise
Main location of the project	Greater Poland Voivodeship, Krotoszyn County
Contact person	Wojciech Styburski
Contact e-mail	w.styburski@agrointegracja.pl
Project duration	from 03-2022 to 12-2024 (call III)
Total project budget	PLN 14,788,837.99
Grant amount	PLN 5,001,100.00
Project website	www.wieprzowinaantibioticfree.pl

Further plans:

- Continuation as part of the Horizon Europe Programme
- Continuation through participation in groups of agricultural producers

EPI Algama.eu

ANIMAL PRODUCTION

"Increase in the company's competitiveness on the poultry market by implementing an innovative organisation of production, marketing and technology of hatching turkey chicks"

EPI ALGAMA

Project objectives:

- Development and implementation of an innovative organisation of production, marketing and technology of hatching turkey chicks aimed at improving their health, production parameters and welfare.
- Increasing the number of eggs for hatching from 2.5 million to 7.5 million per year, and thus increasing the number of turkey poults obtained per year by approx. 4.3 million.
- Implementation of an innovative, non-invasive embryo development control system.
- The annual increase in hatching of turkey chicks in Poland by 10-12%, which is important considering the current global increase in demand for poultry meat, including turkey meat.
- Reducing the stress of chicks thanks to the implementation of innovative hatching and transport solutions will translate into a limited use of antibiotics, thanks to which the product obtained will be more attractive to the final recipient - the consumer, and that will improve the profitability of turkey breeding.

Expected results:

- Increasing the hatchability of healthier chicks by approx. 3% compared to traditional hatching and reducing the number of weak chicks killed after hatching from 5% (275,000) to 3% (150,000) by implementing an innovative, non-invasive embryo development control system.
- Prevention or reduction of hatching of chicks with different physiological parameters (body weight) from the same batch of hatching eggs.
- Elimination of hatching eggs with embryogenesis disorders, which leads to the reduction in the number of chicks killed after hatching.

Leader name - Algama S.A.	Leader category - farmer / farm
Main location of the project	Lubusz Voivodeship, Międzyrzecz County
Contact person	Michał Iwaszkiewicz
Contact e-mail	biuro@zwdskwierzyna.eu
Project duration	from 02-2021 to 06-2023 (call III)
Total project budget	PLN 12,505,328.96
Grant amount	PLN 5,358,300.00
Project website	www.epialgama.eu

DROBQ

ANIMAL PRODUCTION

"Improving the efficiency of rearing and welfare of poultry and reducing the environmental burden of farms through the construction of a demonstration chicken coop equipped with innovative heating and ventilation systems"

Project objectives:

ODevelopment and implementation of a new technology for the production of chicken broilers. Innovative poultry fattening technology based on the interoperability of four systems:

- An innovative, and unique in Poland, process of obtaining and using thermal energy thanks to the use of a thermal processing system for chicken manure, supplying the floor heating system, and the installation of heat exchangers.
- An innovative, and unique in Poland, process of optimising the microclimate in the facility through the use of a floor heating system and a ventilation system that significantly reduces air pollution with ammonia and dust.
- An innovative, and unique in Poland, approach (process) aimed at reducing the harmful impact on the environment through the installation of a ventilation system that binds ammonia and absorbs dust, and through the management of chicken manure, which is a source of air, soil and water pollution. Obtaining valuable natural fertiliser, which is harmless to the environment, contains a lot of phosphorus, potassium, calcium and magnesium in the process of thermal processing of chicken manure, is a beneficial side effect.
- Creative combination of the above processes in one technology in order to achieve a synergy effect, which will enable the development of the most optimal animal welfare conditions and the lowest possible environmental impact of broiler chicken production at the lowest possible cost.

Results achieved:

- The effects of the implementation of the new chicken broiler production technology will contribute to a further increase in the production of poultry meat. Higher quality poultry meat at lower price due to lower production costs will increase domestic demand and increase the competitiveness of Polish poultry on international markets.
- Thanks to the use of innovative systems for air heating, ventilation and the use of chicken manure as an energy carrier, energy consumption and the environmental nuisance of poultry farms will be significantly reduced as a result of reducing the emissions of dust, ammonia and other odours. This will contribute to slowing down the pace of environmental pollution and climate change.

Leader name - Zygmunt Stromski	Leader category - farmer / farm
Main location of the project	Pomeranian Voivodeship, Kartuzy County
Contact person	Zygmunt Stromski
Contact e-mail	stromskizygmunt@wp.pl
Project duration	from 07-2020 to 07-2022 (call I)
Total project budget	PLN 5,960,521.00
Grant amount	PLN 1,793,999.00
Project website	https://innowacyjnerozwiązania.pl/

EPI ami.eu

ANIMAL PRODUCTION

"Implementation of innovative technological components in the duck hatching process in order to reduce microbiological infections and improve the health and welfare of hatched chicks"

Project objectives:

- Development and implementation of an innovative organisation of production, marketing and hatching technology of ducklings aimed at improving their health, production parameters and welfare.
- Development and implementation of innovative devices not used so far in waterfowl hatcheries, which will enable better hygienisation of the incubation and hatching process and early removal of dead embryos, thus limiting potential infections of hatching chicks. Healthier chicks with higher biological value, with shorter waiting time for transport to farms thanks to automation and shortening of packing time, will be less stressed and will bring more profit to farmers.

Expected results:

- Improving the health of hatching chicks as a result of the use of innovative solutions.
- Modern disinfection system, selective and non-contact elimination of waste - dead embryos.
- Production of chicks with high biological value.
- Hygienisation of the incubation and hatching process.
- Development of duck production in Poland.
- Reducing the occurrence of infectious diseases in poultry.

Leader name - AMI AGRO s.c. Irena Aksamska, Marek Aksamski, Krystian Aksamski, Ewa Głazik	Leader category - enterprise
Main location of the project	Greater Poland Voivodeship, Ostrzeszów County
Contact person	Irena Aksamska
Contact e-mail	prezes@ami.com.pl
Project duration	from 05-2021 to 12-2023 (call III)
Total project budget	PLN 10,769,424.93
Grant amount	PLN 5,107,000.00
Project website	www.epi.ami.com.pl

Konsorcjum Agrointegracja

Agrointegration Consortium

ANIMAL PRODUCTION

"Cooperation in improving the efficiency of production of beef cattle through the use of high-quality roughage obtained from catch crop and the cultivation of maize after harvesting the catch crop as an alternative income and roughage on farms"

Project objectives:

- Improvement of the efficiency of beef cattle production through the use of high-quality roughage obtained on the farm from catch crops - the project envisages the use of innovative Futter Nova 11 catch crop mix and the Strip-Till strip-tillage technology.
- Minimising the shortage of roughage on farms.
- Obtaining alternative income from farms.

Results achieved:

- Implementation of a significantly improved technological innovation.
- The conducted research and implementation experience allowed us to present the following conclusions:
  - the cultivation of catch crops has a positive effect on the condition and quality of the soil,
  - the cultivation of catch crops provides you with up to 3 additional crops,
  - cultivation in the Strip-Till technology after the last corn harvest brings effects consistent with the average national corn yields of grain and green fodder.
- The introduction of the innovative Futter Nova 11 catch crop mix enabled the optimal use of agricultural land on a beef cattle farm.
- Catch crop harvest in autumn-spring allowed us to meet the feed demand of animals, and the cultivation of maize in the Strip-Till technology enabled its delayed sowing and optimal yield, which brought additional alternative income from the sale.

Further plans:

- Continuation through participation in groups of agricultural producers
- Continuation within international Operational Groups

Leader name - Styburski & Golinski Agricultural Advisory Office	Leader category - advisor
Main location of the project	Greater Poland Voivodeship, Krotoszyn County
Contact person	Wojciech Styburski
Contact e-mail	w.styburski@agrointegracja.pl
Project duration	from 06-2018 to 05-2020 (call I)
Total project budget	PLN 2,405,754.20
Grant amount	PLN 1,195,100.00
Project website	www.agroinnowacja.pl

Agros Group

AGRICULTURAL AND FOOD PROCESSING

"Development of innovative fruit and vegetable preserves with optimal and beneficial composition of healthy substances and unique varieties of carrots and strawberries in order to expand agricultural and processing production"

Project objectives:

- Production of new, innovative products, i.e. sauces, jams, based on varieties of red carrot and white strawberry, which have not been used in Poland so far on an industrial scale, and which are a rich source of minerals, fibre, vitamins and phytochemicals and bring significant health benefits.
- Implementation of new products that will maintain the optimal and beneficial composition of healthy substances while introducing pro-ecological cultivation technologies and a significantly improved method of production organisation.

Expected results:

- Introduction of new varieties of carrots and strawberries, rich in healthy bioactive substances, to food processing.
- Introduction of pro-ecological technologies for growing carrots and strawberries.
- Implementation of an improved technology for thermal processing of carrots and strawberries.
- Obtaining and launching new fruit and vegetable products with significant health benefits.
- Broadening and diversification of the production activities of the processing plant and farms, resulting in an increase in income.
- Dissemination of knowledge about red and purple carrots and white strawberries.
- Launching new fruit and vegetable preserves with optimal and beneficial composition of healthy substances.

Leader name - ZPOW AGROS NOVA Sp. z o.o. Sp.K.	Leader category - enterprise
Main location of the project	Łódź Voivodeship, Łowicz County
Contact person	Angelika Kusińska
Contact e-mail	angelika.kusinska@agrosnova.pl
Project duration	from 11-2020 to 12-2022 (call III)
Total project budget	PLN 6,467,186.31
Grant amount	PLN 4,723,564.00
Project website	http:/agrosnovaepi.pl/

Biała Wrona

White Crow

AGRICULTURAL AND FOOD PROCESSING

"Development of product and process innovation related to the technology of producing organic beer containing probiotic microorganisms, preserved with the use of refermentation process with probiotic microorganisms and the production of a food additive based on spent grain, which is a by-product in the beer production process, for the preparation of bread-enriching mixtures"

Project objectives:

- Development of a product and process innovation related to the technology of producing organic beer containing probiotic microorganisms, preserved using an innovative refermentation process with probiotic microorganisms.
- Development, construction and testing of a new technological line, including tests on the yeast survival rate of Saccharomyces cerevisiae var. boulardii in beers; development of a beer refermentation method with the use of probiotic yeast; obtaining organic probiotic beers preserved by refermentation with the probiotic yeast Saccharomyces boulardii, evaluation of the nutritional value and stability of the beer).
- Carrying out necessary renovation and modernisation works in the building that is the main location of project and is also used for demonstration events. The project is to be implemented in a historic farm, which has long been a strong production and manufacturing centre in the region, one around which local producers gathered and which was the pride of this region.

Expected results:

- Development of an innovative production technology using organic products from local farmers.
- Implementation of new marketing methods regarding production, processing and launching of products through:
  - an innovative marketing communication strategy aimed at creating an authentic brand using "story-telling" - to communicate the product to the customers and increase their brand loyalty,
  - innovative communication tools with the customer,
  - innovative distribution/sales channels.

Further plans:

- Continuation under the next call for Measure 16 "Cooperation"

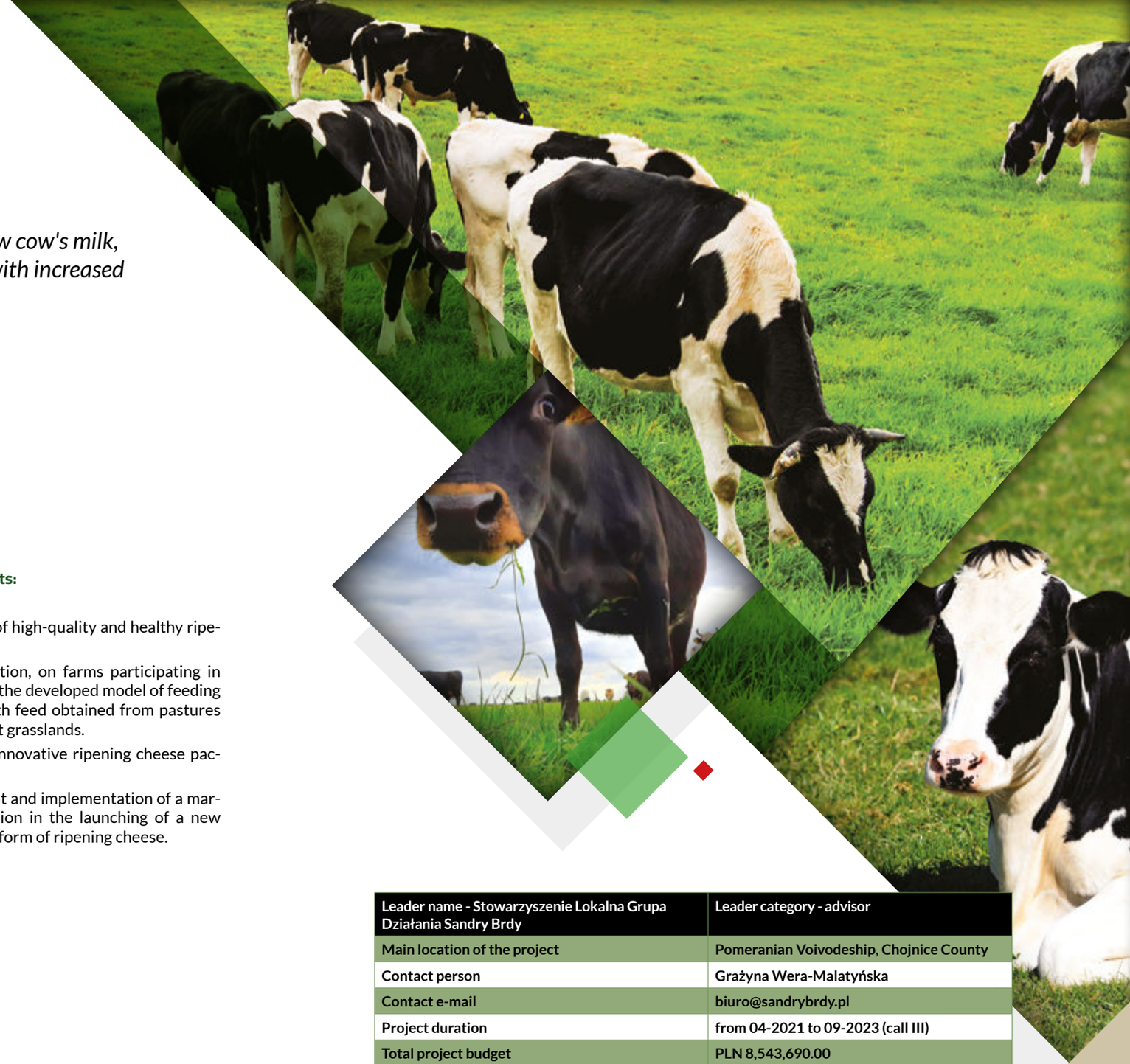
Leader name - Biała Wrona Sp. z o.o. Sp. Komandytowa	Leader category - enterprise
Main location of the project	Greater Poland Voivodeship, Nowy Tomyśl County
Contact person	Piotr Wieła
Contact e-mail	kontakt@bialawrona.pl
Project duration	from 10-2021 to 03-2024 (call III)
Total project budget	PLN 6,922,334.08
Grant amount	PLN 5,264,366.96
Project website	www.bialawrona.pl/wspolpraca

Zielone Mleko

Green Milk

AGRICULTURAL AND FOOD PROCESSING

"Green Milk" Innovations in the production of raw cow's milk, its processing and launching of ripening cheese with increased nutritional values"



Cele operacji:

- Increasing the income of milk producing farms that participate in the project, through the production of milk of high biological quality.
- Presentation to customers, also by a project participant, of innovative food products such as ripening cheese produced from this milk.
- Development of an innovative model for the production of milk and ripening cheese with a unique chemical composition and increased nutritional values (effectively enriched by 20-30% with the polyunsaturated fatty acid β-linolenic acid (omega-3), vitamin E, β-carotene and with beneficial for human health ratio (below 4:1) of omega-6 to omega-3 polyunsaturated fatty acids.

Expected results:

- Production of high-quality and healthy ripening cheese.
- Implementation, on farms participating in the project, of the developed model of feeding dairy cows with feed obtained from pastures and permanent grasslands.
- The use of innovative ripening cheese packaging.
- Development and implementation of a marketing innovation in the launching of a new product in the form of ripening cheese.

Further plans:

- Continuation under the next call for Measure 16 "Cooperation"

Leader name - Stowarzyszenie Lokalna Grupa Działania Sandry Brdy	Leader category - advisor
Main location of the project	Pomeranian Voivodeship, Chojnice County
Contact person	Grażyna Wera-Malatyńska
Contact e-mail	biuro@sandrybrdy.pl
Project duration	from 04-2021 to 09-2023 (call III)
Total project budget	PLN 8,543,690.00
Grant amount	PLN 5,003,000.00
Project website	www.zielonemleko.eu

Doskonałe Bakalie

Perfect dried nuts

AGRICULTURAL AND FOOD PROCESSING

"Development of improved products with better nutritional value, as well as an unconventional process of thermal processing of food-stuffs"

Project objectives:

- Development and implementation of significantly improved products - seeds and nuts with better nutritional characteristics.
- Development and implementation of an innovative product processing technology - thermal treatment of seeds and nuts.
- Development and implementation of a new marketing method for launching products.
- Verification and optimisation of the microwave and conventional roasting processes.
- Performance of storage tests (20 technological tests) of microwave-roasted raw materials according to optimised parameters, for various storage periods.
- Development of the composition of 3 innovative mixtures of seeds and nuts.
- Content analysis of seed and nut mixtures.

Results achieved:

- An innovative processing technology was implemented, in which the obtained seeds and nuts are characterised by significantly better sensory parameters (flavour, colour and taste). Nutritional value has improved compared to Polish and international competitors. The reduced pressure results in a milder process and prevents undesirable oxidation of the fatty acids contained in the material and the breakdown of active substances. This enables longer storage of products as microwave roasting leads to lower susceptibility to rancidity of nuts and seeds.
- The results of the research and development work, defining the most desirable process parameters, were implemented in the Bakalland production plant on purchased machines and devices. The production of innovative mixtures of seeds and nuts was also launched, using the recipe composition developed during the project.

Leader name - EIG FINANCE Spółka z ograniczoną odpowiedzialnością	Leader category - advisor
Main location of the project	Lubelskie Voivodeship, Biała Podlaska County
Contact person	Jan Gargól
Contact e-mail	j.gargol@eig.net.pl
Project duration	from 06-2018 to 01-2020 (call I)
Total project budget	PLN 7,194,494.37
Grant amount	PLN 2,483,022.00
Project website	www.doskonalebakalie.pl

EPI Czyste Jabłko

EIP Clean Apple

AGRICULTURAL AND FOOD PROCESSING

"Cooperation in the development and implementation of a technology for the production of dessert apple with a residual content of chemical plant protection products below 0.01 mg/kg"

Project objectives:

Development and implementation of innovations in the following areas:

- Significantly improved technology for the production of dessert apples with a residual content of chemical plant protection products below 0.01 mg/kg.
- Significantly improved product - dessert apples with a residual content of chemical plant protection products below 0.01 mg/kg.
- Significantly improved marketing method for launching dessert apples with a residual content of chemical plant protection products below 0.01 mg/kg.

Results achieved:

- Development and implementation of a significantly improved technology for the production of dessert apples with the residual content of chemical plant protection products below 0.01 mg/kg, based on the disintegration curve of selected plant protection chemicals, a knowledge of the effectiveness of a number of biological agents approved for use in Poland recently, and advanced analytical research methods.
- Development and implementation of a significantly improved product - dessert apples with a residual content of chemical plant protection products below 0.01 mg/kg, similar to fruit from certified organic farms, which - due to the fact that no pesticides are used in their production - are exposed to rapid growth of harmful microorganisms, including mycotoxin-producing fungi.
- Development and implementation of a significantly improved marketing method for launching dessert apples with a residual content of chemical plant protection products below 0.01 mg/kg.

Leader name - Instytut Praktycznego Sadownictwa Spółka Jawna Robert Sas i Wspólnicy	Leader category - advisor
Main location of the project	Mazowieckie Voivodeship, Piaseczno County
Contact person	Grażyna Wiśniewska-Sas
Contact e-mail	malowanesady@gmail.com
Project duration	from 10-2019 to 10-2021 (call II)
Total project budget	PLN 1,360,726.85
Grant amount	PLN 1,137,704.00
Project website	www.001ppm.pl

Further plans:

- Continuation under the next call for Measure 16 "Cooperation"
- Continuation as part of the Horizon Europe Programme

Grupa 3G

3G Group

AGRICULTURAL AND FOOD PROCESSING

"Polish management system for obtaining high culinary quality beef, profitable for farmers"

Project objectives:

- Development and implementation of a new technology for predicting the culinary (taste) quality of culinary products in order to manage the culinary quality of beef cuts, including building commercial brands of high-quality meat.
- Launching new products with guaranteed and designed culinary quality, e.g. good, very good and premium quality steaks.
- Development of a beef quality prediction model and creation of a new marketing strategy.
- Development and implementation of a slaughter value valuation system for cattle, on top of the EUROP system, increasing the farmer's income in the form of a premium for the culinary quality of meat in the carcass based on the developed new technology for predicting the culinary quality of meat in the beef carcass.

Expected results:

- The project will result in a culinary quality management system and a system for evaluating the slaughter value of beef carcasses based on the prediction of culinary quality, including the following components:
  - 3G application,
  - DataBank,
  - tool for planning consumer research - designed for scientists conducting consumer research with the UNECE methodology,
  - data from consumer research - obtained during the implementation of the project,
  - prediction model - a tool for industrial applications,
  - materials disseminating the results of the project
- Components of the management system of beef culinary quality:
  - implementation of culinary quality prediction tools at the slaughterhouse and cutting plant.
  - implementation of a standardised carcass quality assessment in the slaughterhouse according to the Meat Standard Australia grading system,
  - implementation at the slaughterhouse of a price list for the slaughter value of cattle based on the hitherto used EUROP classification and a calculator for premiums for culinary quality developed as part of the project, depending on the higher prices obtained for beef cuts of higher culinary quality,
  - implementation of a work organisation system at the slaughterhouse according to the new approach to groups.

Further plans:

- Continuation as part of the Horizon Europe Programme

Leader name - Zbigniew Czyżewski	Leader category - farmer / farm
Main location of the project	Mazowieckie Voivodeship, Warsaw County
Contact person	Jerzy Wierzbicki
Contact e-mail	Jerzy.wierzbicki@pzpbm.pl
Project duration	from 08-2022 to 08-2024 (call III)
Total project budget	PLN 3,200,433.13
Grant amount	PLN 2,497,174.00
Project website	www.grupa3g.pl

Grupa Czerwone Jabłko

Red Apple Group

AGRICULTURAL AND FOOD PROCESSING

"Concentrated red-fleshed apple juice as an innovative additive to products with increased health properties produced under the Tymbark brand"

Project objectives:

■ The main objective is to develop concentrated red-fleshed apple juice, which will be a rich source of bioactive compounds with strong antioxidant potential, including anthocyanins and phenolic acids, responsible for health properties (prevention of civilisation diseases) and colouring properties (source of natural red pigments - anthocyanins).

■ Specific objectives:

- Development and implementation of an improved technology for cultivating red-fleshed apple trees in orchards,
- Comparison of the health properties of the raw material, semi-finished product, concentrated juice and pomace from red-fleshed apples and standard white-fleshed apples,
- Determination of the relationship between the level of bioactive compounds and biological properties and the stage of production of concentrated juice,
- Determination of storage time in accelerated and real conditions,
- Planting red-fleshed apple trees,
- Cultivation of red-fleshed apple trees according to individual guidelines.

Expected results:

■ Introduction of an innovative product - concentrated juice from red-fleshed apples not used in Poland, containing phytochemicals with strong antioxidant potential, including anthocyanins and phenolic acids, natural colouring agents (anthocyanins) responsible for the red colour and natural substances regulating acidity (malic acid); these features will increase the health qualities of products made from this juice and expand its use in the production of other preserves (natural additive regulating colour or acidity); this project will also contribute to the use of these apples to manufacture fruit and vegetable products other than concentrated juice.

■ Improvement in the production technology of concentrated red-fleshed apple juice that reduces the loss of bioactive substances.

■ Introduction of the technology of cultivation of red-fleshed apple trees in the Limanowa County with specific terrain conditions.

■ Diversification of the production activities of the processing plant and farms and increasing their competitiveness.

■ Diversification of the production activities of the processing plant and farms and increasing their competitiveness, which will result in increasing their income;

■ Dissemination of knowledge about red-fleshed apples in the form of publications or conference speeches increasing the interest of the scientific, fruit-growing and processing sectors in this raw material.

Leader name - Tymbark-MWS sp. z o.o.	Leader category - enterprise
Main location of the project	Lesser Poland Voivodeship, Limanowa County
Contact person	Karina Boguń-Guzdek
Contact e-mail	k.bogun-guzdek@maspex.com
Project duration	from 10-2020 to 03-2023 (call III)
Total project budget	PLN 8,674,868.76
Grant amount	PLN 5,000,000.00
Project website	www.tymbarkepi.pl

Grupa EUROP

EUROP Group

AGRICULTURAL AND FOOD PROCESSING

"Implementation of the EUROP objective classification system in Poland"

Project objectives:

- Adaptation to Polish conditions (improvement) and implementation of an innovative and objective EUROP beef carcass classification technology, which is currently not used in Poland.
- Implementation of the EUROP objective classification system in Poland on a significant scale, i.e. covering over 50% of cattle slaughter in Poland with the objective classification of beef carcasses in 2022.

Expected results:

- Implementation of objective beef carcass grading techniques in 8 slaughterhouses in Poland.
- Development of an application available online for farm benchmarking for beef carcass parameters.
- Increasing the degree of trust of the participants in the value chain, in particular the trust of producers in processing plants thanks to the EUROP system.
- The fact that the assessment will be done automatically will give the whole process the features of objectivity and will make the system, in the opinion of farmers, resistant to abuse, e.g. lowering the class of livestock.
- Thanks to the increased trust in the system, the number of direct deliveries from producers to slaughterhouses will increase, bypassing intermediaries, which will contribute to an increase in producers' margins.

Further plans:

- Continuation under the next call for Measure 16 "Cooperation"

Leader name - Polish Association of Beef Cattle Producers	Leader category - scientific and research unit
Main location of the project	Mazowieckie Voivodeship, Warsaw County
Contact person	Jerzy Wierzbicki
Contact e-mail	jerzy.wierzbicki@pzpbm.pl
Project duration	from 10-2022 to 09-2023 (call III)
Total project budget	PLN 8,066,140.00
Grant amount	PLN 4,566,560.00
Project website	www.grupaeurop.pl

Grupa OZON

OZONE Group

AGRICULTURAL AND FOOD PROCESSING

"Development of ozone purification technology for spice plants"

Project objectives:

- Development of an ozone decontamination method ensuring effective reduction of the number of infectious microflora and not affecting the chemical composition of the raw material treated with ozone. It was assumed that the research objective could be achieved only when the following research questions were answered:
  - What optimal concentration of ozone is sufficient to minimise the number of microorganisms present in the plant material and what impact does it have on the quality of this raw material?
  - Will the optimal concentration of ozone affect the quality of the plant material?
  - Does ozone have a comparable effect on the survival of particular groups of microorganisms?
  - Is it possible to develop a method of ozone decontamination in dynamic bed based on modelling the survival of microorganisms?
- The implementation of the operational group's project of OZONE innovation will consist in providing answers to the above questions and determining the optimal conditions for the implementation of innovative solutions on an industrial scale, using prototype installations for purification of spice plants.
- Optimisation of technological processes, reducing costs, while improving the characteristics of products (also in terms of durability during storage after the purification process).

Expected results:

- Implementation of developed and proven solutions for spice plant ozone purification into the business practice of Vega Dry. The process conducted at the consortium member's plant will be fundamentally changed (production organisation and technology). An innovative processing method will be documented, which will enable its use on an industrial scale (economically justified, profitable) by entities processing spice plants.
- Carrying out innovative marketing activities at the final stage of the project will allow Vega Dry to achieve measurable economic benefits. Łódź University of Technology plans to document the results of the planned research and present the conclusions from the implementation of innovative solutions in activities carried out on an industrial scale.
- The first implementation in Poland of an innovative method of spice plant ozone purification on an industrial scale, providing significantly improved agricultural products to the market (spice plants with high microbiological purity, preserved nutritional values and high organoleptic qualities, preserved during storage).

Further plans:

- Continuation under the next call for Measure 16 "Cooperation"
- Cooperation of the consortium members of the Operational Group in other projects

Leader name - EIG FINANCE Sp. z o.o.	Leader category - advisor
Main location of the project	Łódź Voivodeship, City of Łódź
Contact person	Jan Gargól
Contact e-mail	j.gargol@eig.net.pl
Project duration	from 03-2021 to 09-2023 (call III)
Total project budget	PLN 5,218,021.57
Grant amount	PLN 4,860,290.00
Project website	www.grupaozon.pl

IQGRAPE

AGRICULTURAL AND FOOD PROCESSING

"Innovative technology for the production and bottling of wine and the method of organising production to increase the quality of locally produced wine"

Project objectives:

- **Improving the quality and attractiveness of Polish wine through:**
  - improvement of wine-growing technology,
  - improvement of the organisation of wine bottling process (creation of a mobile pilot bottling line, unification of the wine bottling standard, elimination of faulty practices),
  - development of a wine marketing method to be implemented on a regional scale with the participation of one intermediary, supporting local products and producers.

Results achieved:

- Implementation of a new method of wine bottling while unifying the wine bottling standard and a new model of cooperation between producers in the area of bottling.
- Automating and improving the economic efficiency of wineries in the bottling process.
- Obtaining wine of increased quality, taste and flavour value, e.g. with a lower degree of oxidation, as confirmed by bromatological analysis, higher content of biologically active compounds, with lower percentage of defective wines, expressed in the percentage of spoiled-defective wines for each of the project participants. These results were confirmed by laboratory and bromatological analyses.
- Developing a modern agrotechnical method, taking into account the reduction of the harmfulness of the PPPs (plant protection products) and the recommendations for integrated grapevine production.
- Implementation of the newly developed "Lower Silesian wine" brand.
- Creation of a short supply chain in the form of a store, which under one brand, will jointly promote the local brand.
- Increasing revenues of the producers by shortening the supply chain.

Further plans:

- Continuation under the research programmes of the National Centre for Research and Developmen

Leader name - Wrocław University of Environmental and Life Sciences	Leader category - scientific and research unit
Main location of the project	Lower Silesian Voivodeship, City of Wrocław
Contact person	Tomasz Pilawka
Contact e-mail	tomasz.pilawka@upwr.edu.pl
Project duration	from 11-2018 to 08-2022 (call II)
Total project budget	PLN 4,794,374.40
Grant amount	PLN 4,306,283.00
Project website	www.iqgrape.pl

Polski Ocet Owocowy

Polish Fruit Vinegar

AGRICULTURAL AND FOOD PROCESSING

"Production of fruit vinegar in the Łódź, Masovian and Silesian Voivodeships in cooperation with the Institute of Biotechnology of the Agricultural and Food Industry as a product, process and technological innovation"

Project objectives:

- Development and implementation of an innovative product - fruit vinegar specific to a given region, farm and fruit variety (apples and grapes). This objective will be achieved thanks to the use of an innovative, low-budget technology consisting in the use of biochemical processes (fermentation of juices with the use of selected yeast breeds and vinegar fermentation with the use of regional strains of bacteria from the IBPRS own collection). The technology will be implemented on fruit juice producing farms in the Łódź, Silesian and Masovian voivodeships.
- Development and implementation of a new marketing method for the production of fruit vinegar. The results of the project will contribute to improving the economic results of farms, facilitate their diversification and restructuring, and increase their market share. Project partners include farmers who operate apple juice and wine processing plants.

Results achieved:

- Implementation of an innovative technology for the production of fruit vinegar using the local microbiome, specific to a given region.
- Development and implementation of an innovative product - fruit vinegar specific to a given region, farm and fruit variety (apples and grapes).
- Development and implementation of a new marketing method for the production of fruit vinegar.

Leader name - Łódź Agricultural Advisory Centre in Bratoszewice	Leader category - advisor
Main location of the project	Łódź Voivodeship, Zgierz County
Contact person	Anna Walas
Contact e-mail	a.walas@lodr-bratoszewice.pl
Project duration	from 11-2019 to 11-2020 (call II)
Total project budget	PLN 992,598.23
Grant amount	PLN 846,817.00
Project website	www.polskiocetowocowy.pl

Sery Zagrodowe

Farmhouse Cheese

AGRICULTURAL AND FOOD PROCESSING

"Production of farmhouse cheese from cow and goat milk in the Silesian Voivodeship in cooperation with the Institute of Biotechnology of the Agricultural and Food Industry as a product, process, technological and marketing innovation"

Project objectives:

- Development and implementation of an innovative product - farmhouse cheese (cottage cheese) made of unpasteurised cow and goat milk, specific to a given region or a given farm. The objective will be achieved thanks to the use of an innovative, low-budget technology using biochemical processes - lactic fermentation, consisting in the denaturation of casein (milk protein) in an acidic environment with the use of regional strains of bacteria, isolated from cheese produced on the farm.
- Development and implementation of a new technology for the production of farmhouse cheese, both from cow's and goat's milk, in ripening rennet, smoked and non-smoked variants, as well as performance of storage tests of these products. Achieving the objective will be possible through the use of rennet and grape must obtained from wine, in which the cheese will be aged. Thanks to this, the products will have unique taste and flavour, constituting a completely new innovative product.
- Smoked cheese produced with this method will have lowest possible contamination with PAHs and other compounds formed in the smoking process.
- Development and implementation of a new marketing method for farmhouse cheese production.

Expected results:

- Development and implementation of an improved technology for the production of farmhouse cottage cheese from unpasteurised cow's milk, using local strains of lactic acid bacteria, enabling the production of a biodiverse and healthy product. The innovative product, containing only natural metabolites of bacteria, will be characterised by high quality and nutritional value, safety and repeatability of sensory, microbiological and physicochemical properties, resulting from the use of the same starter culture each time.
- Development and implementation of an innovative technology for the production of rennet farmhouse cheese from cow's and goat's milk, aged in grape must. The developed technology will also contribute to increasing the use of local grape musts.
- The use of traditional smoking, which minimises the contamination of smoked rennet goat cheese with toxic compounds (PAHs), will contribute to obtaining a product that is healthy, with a taste and flavour highly desired by the customers.
- Development and implementation of a new marketing method for farmhouse cheese production. Customised advertising messages displayed on the County Office's website and social media as well as on the websites of farmers who are part of the consortium.

Leader name - Silesian Agricultural Advisory Centre in Częstochowa	Leader category - advisor
Main location of the project	Silesian Voivodeship, Częstochowa County
Contact person	Jacek A. Lupa
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Project duration	from 02-2021 to 03-2023 (call III)
Total project budget	PLN 2,286,818.00
Grant amount	PLN 1,868,802.00
Project website	www.seryzagrodowe.odr.net.pl

Spersonalizowane Sery twarogowe

Personalised cottage cheese

AGRICULTURAL AND FOOD PROCESSING

"Technological, process and product innovation in the production of personalised healthy cottage cheese in cooperation with the Institute of Biotechnology of the Agricultural and Food Industry"

Project objectives:

- Production of cottage cheese with the use of own - environmental lactic acid bacteria strains, primarily the most important bacteria of the human digestive tract, belonging to the genus Lactobacillus and Bifidobacterium, on a pilot technological line.
- Development of specific sensory and health-promoting features of cheese with immunostimulating properties, dedicated to the elderly, with the use of microorganisms in an innovative production technology.

Expected results:

- Development and implementation of an innovative technology for the production of personalised cottage cheese from pasteurised cow's milk using local strains of lactic acid bacteria of the genus Lactobacillus and Bifidobacterium.

An innovative product, dedicated to the elderly, devoid of chemical preservatives, and containing live bacterial cultures, will be characterised by high quality and nutritional value, safety and repeatability of sensory, microbiological and physicochemical properties.

- The pilot technological line, which does not require high energy expenses, will be a technological innovation. It will enable the diversification of products, i.e. expanding the product range of the dairy plant in Pierzchnica with a new type of personalised and healthy food.

As a result, cottage cheese obtained in this technological process will fit into the category of natural, local food, and will also constitute an alternative, innovative nutritional product for seniors compared to conventional cottage cheese.

Further plans:

- Continuation under the next call for Measure 16 "Cooperation"

Leader name - Świętokrzyski Agricultural Advisory Centre in Modliszewice	Leader category - advisor
Main location of the project	Świętokrzyskie Voivodeship, Końskie County
Contact person	Mariusz Porębski
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Project duration	from 10-2021 to 10-2023 (call III)
Total project budget	PLN 2,387,205.00
Grant amount	PLN 2,121,475.00
Project website	www.sery.sodr.pl

Wino bez siarki

Sulphur-free wine

AGRICULTURAL AND FOOD PROCESSING

"Sulphur-free wine: innovative technologies in the vineyard and winery to support the reduction of the amount of sulphur added to wines"

Project objectives:

- The continuing market trend, resulting from the growing consumer awareness, contributes to the growing interest in products with the lowest possible content of food additives.
- Sulphur, as a stabilising and preserving agent for wine, has been used in traditional production for many years and in this respect it does not pose a particular danger. However, due to common allergies to this ingredient, it is necessary to supplement the market with a product with reduced sulphur content.
- The main objective of the project is to reduce the sulphur content in wine as a result of two research tasks:
  - implementation of innovative management of plant protection products in viticulture in order to reduce sulphur residues in fruit,
  - modification of wine production technology through the use of nanotechnology and physical methods.

Expected results:

- Development of recommendations for production technology of grapes for processing while reducing the use of plant protection products containing sulphur, in the form of recommendations.
- Development of recommendations for production technology and planting in new vineyards.
- Development of technology and good practices for the production of wine with reduced sulphur content, where the reduction of the amount of sulphur added occurs during winery production.
- Production of a trial batch of wine with reduced sulphur content for bromatological tests.

Leader name - West Pomeranian University of Technology	Leader category - scientific and research unit
Main location of the project	West Pomeranian Voivodeship, Szczecin County
Contact person	Ireneusz Ochmian
Contact e-mail	iochmian@zut.edu.pl
Project duration	from 02-2021 to 03-2023 (call III)
Total project budget	PLN 737,870.64
Grant amount	PLN 660,881.00
Project website	www.zdrowszewino.pl

Further plans:

- Continuation under the next call for Measure 16 "Cooperation"
- Continuation within international Operational Groups

Wiśnia bez pestki

Pitless cherry

AGRICULTURAL AND FOOD PROCESSING

"Technological innovation, methods of organisation and marketing of pitting cherries in such a way that the structure of the fruit is affected as little as possible in cooperation with the Kielce University of Technology"

Project objectives:

- Designing, creating and implementing an innovative technology for pitting cherries, involving the removal of the inner part of the drupe (stone), in such a way that the structure of the fruit is affected as little as possible.
- Thanks to the almost intact structure of the fruit (a small hole will be cut in the fruit on one side to remove the pit), it will be possible to use the pitted cherries in the process of, among others, candiing, drying or freezing.

Expected results:

- Development and implementation of an innovative technology and a prototype of a device for pitting cherries, which will ensure minimal damage to the internal and external structure of the pitted fruit.
- The innovative technology as well as the resulting product, will be used by the fruit industry, e.g. for drying and candiing, and by confectionery, and will be characterised by high physical quality and will contain more nutrients and flavours.
- The prototype device for pitting cherries does not require high energy inputs; it will significantly reduce water consumption in the pitting process as the fruit will be washed and pitted simultanously. It will enable the diversification of products, i.e. extending the product range of the entrepreneur being part of the operational group with a new type of product, i.e. almost intact pitted cherry with much greater taste and nutritional values.

Further plans:

- Continuation under the next call for Measure 16 "Cooperation"

Leader name - Świętokrzyski Agricultural Advisory Centre in Modliszewice	Leader category - advisor
Main location of the project	Województwo Świętokrzyskie, Powiat konecki
Contact person	Mariusz Porębski
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Project duration	from 01-2021 to 11-2023 (call III)
Total project budget	PLN 1,435,761.00
Grant amount	PLN 1,278,781.00
Project website	www.wisniabezpestki.pl

Mars

AGRICULTURAL AND FOOD PROCESSING

"Development of technology for obtaining freeze-dried products with a reduced level of microbiological contamination"

Project objectives:

- Development and implementation of innovative products in the form of freeze-dried fruit and vegetables with a significantly higher level of microbiological purity, production technology of these products, including microwave drying, as well as innovative methods of production organisation and marketing. Maintaining an appropriate level of health safety of foodstuffs while maintaining a high level of nutritional values and organoleptic properties is a key issue in food production. The project in question envisages the modification of the freeze-drying process in order to improve the microbiological purity of products preserved with this method. An important feature of the currently used freeze-drying process is the preservation of the viability of the microorganisms preserved with this method. This makes this process perfect for e.g. preserving certain food ingredients (e.g. freeze-dried live cultures). Freeze-dried microorganisms can survive, but they do not multiply in the product dried with this method and do not spoil it. Limitation of vital activities (production of metabolites, reproduction) occurs due to low water availability.

While for some products high survival rate of microorganisms is beneficial, for others it is a disadvantage. Therefore, the project aims to develop freeze-drying technology, which, thanks to the use of microwaves in the final stage of drying, will enable obtaining freeze-dried fruits and vegetables with a high level of microbiological purity, without increasing the processing temperature. These results will be important both for the processing industry (e.g. production of fruit yoghurts) and for products intended for direct consumption.

Expected results:

- Implementation of an innovative process and product - freeze-dried fruit and vegetables with higher microbiological purity in the operations of 2SONS.
- Dissemination of the technology and new product features via publications in scientific, technical and industry journals and via the website.
- The results of this project can be adapted to a wider group of products.

Further plans:

- Continuation of activities of the consortium members of the Operational Group in other projects

Leader name - Łódź University of Technology	Leader category - Scientific and research unit
Main location of the project	Łódź Voivodeship, City of Łódź
Contact person	Piotr Dziugan
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Project duration	from 12-2019 to 10-2023 (call III)
Total project budget	PLN 1,237,205.32
Grant amount	PLN 1,137,841.00
Project website	www.marsliof.pl

AgroWe

DIGITAL SOLUTIONS

"Marketing and organisational innovations in creating automatic models of decision-making, financial, organisational and information transfer processes"

Project objectives:

- Implementing marketing and organisational innovations in order to:
  - increase the level of innovation in the Polish and European agri-food ecosystem
  - increase the level of environmental protection,
  - mitigate climate change.
- Developing effective IT solutions based on a literature review and surveys conducted among farmers.
- Development of solutions supporting the automation of work organisation, crop rotation on the farm and data exchange between farms.

Expected results:

- Creation and improvement of technological innovations: transfer of farm data via API to multiple locations and calculation of interactions between crops on the basis of data imported from the application for direct payments.
- Creation and improvement of organisational innovations: managing bank loan processes for agriculture in a digitised and automatic manner. Another innovation is the automation of organisational processes on the farm with the use of existing data.
- Creation and improvement of organisational innovations: uploading the agricultural technology data to the website in order to share good practices and automating advice services on plant protection products on the basis of crop rotation data.

Further plans:

- Continuation under the next call for Measure 16 "Cooperation"

Leader name - Agrowe App Sp. z o.o.	Leader category - enterprise
Main location of the project	Lubelskie Voivodeship, Parczew County
Contact person	Łukasz Czech
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Project duration	from 03-2022 to 04-2023 (call III)
Total project budget	PLN 1,516,800.00
Grant amount	PLN 1,390,400.00
Project website	www.grupaoperacyjnaagrowe.pl

Lodron

DIGITAL SOLUTIONS

"Improving the use of the production potential of pastures for dairy and beef cattle through the use of a decision and management support system"

Project objectives:

- Optimisation of the use of the production potential of meadows and pastures in feeding beef and dairy cattle.
- Construction of a drone prototype that uses a LIDAR laser scanner and a multispectral camera for monitoring the growth of plant mass and estimating wildlife damage to crops.
- Developing an application for grazing planning and estimating wildlife damage.

Results achieved:

- Development of the design and construction of a drone cooperating with a multispectral camera and LIDAR laser scanner.
- Development of a mobile application consisting of two modules:
  - a module for collecting farm data (agricultural land register, animal status), and a grazing planning panel,
  - a module for estimating losses caused by wildlife,
  - application can be found at: http://146.59.17.57:8000/ authenticate/ login/.

Further plans:

- Continuation under the next call for Measure 16 "Cooperation"

Leader name - Lublin Agricultural Advisory Centre in Końskowola	Leader category - advisor
Main location of the project	Województwo Lubelskie, Powiat puławski
Contact person	Marek Siuciak
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Project duration	from 12-2019 to 12-2021 (call II)
Total project budget	PLN 817,218.15
Grant amount	PLN 708,645.00
Project website	www.lodron.lodr.konskowola.pl

SatAgro

DIGITAL SOLUTIONS

"Organisational, technological and marketing innovations aimed at optimisation of fertilisation and irrigation with the use of satellite data"

Project objectives:

- Development of technological, organisational and marketing innovations aimed at fertilisation and irrigation optimisation with the use satellite data. Innovations in precision nitrogen fertilisation are new solutions and services that will be further improved, while innovations in precision irrigation will result in new solutions.

Results achieved:

- Improved technological innovation in precision nitrogen fertilisation will allow farms to match doses to the actual nutrient needs of the crop.
- The profitability of production, the quality of crops, as well as the condition of the environment will improve, mainly due to the reduced release of nitrogen into ground and surface waters.
- Technological innovation, based on the development of solutions enabling the automatic generation of application maps for irrigation, will allow farmers to optimise water consumption.

Leader name - Łukasz Czech	Leader category - advisor
Main location of the project	Lubelskie Voivodeship, Parczew County
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Project duration	from 01-2021 to 12-2022 (call III)
Total project budget	PLN 3,295,996.07
Grant amount	PLN 2,698,552.00
Project website	www.satelitarneinnowacjerolnicze.pl

Innowacje dla lokalnych rynków rolnych

Innovations for local agricultural markets

SHORT SUPPLY CHAINS AND LOCAL MARKETS

„IQsell: Organisational innovations for the development of Short Food Supply Chains"

Project objectives:

- Development, testing and pilot implementation of an innovative organisational model for the development of local agricultural markets, based on innovative IT, business and institutional solutions.
- Specific objectives:
  - developing appropriate means of promotion of Short Food Supply Chains as an instrument for creating local markets, in light of changing regulations and a favourable state policy in this area,
  - increasing the role of direct sales as a form of sales organisation in the Polish food economy,
  - development of systemic solutions for creating local markets that provide appropriate support to farmers who want to deliver their products directly to consumers,
  - development of a mechanism enabling consumers to have permanent access to high-quality food of known origin from local farmers,
  - introduction of new, non-standard, comprehensive approaches to increasing the importance, scale and efficiency of local agricultural markets in the economy and ensuring compliance with the current regulations.

Expected results:

- Developing and testing on functioning systems of Short Food Supply Chains in Lower Silesia and Lesser Poland of:
  - a system for registering the origin of product along with tracking its delivery path,
  - a logistics system based on self-organisation and the use of existing transport and storage resources of participants in the local agricultural market,
  - a system of direct settlements between producers and consumers.
- Testing and implementation of various sales methods in relation to the functioning systems of Short Food Supply Chains in Lower Silesia and Lesser Poland.
- Developing new financial products that meet the needs of Short Food Supply Chains and participating producers and consumers.
- Implementation of a system for monitoring and assessing the impact of Short Food Supply Chains on the development of local markets and sustainable development of rural areas in Lower Silesia and Lesser Poland.

Leader name - Dolnośląska Zielona Dolina Sp. z o.o.	Leader category - scientific and research unit / advisor
Main location of the project	Lower Silesian Voivodeship, Wrocław County
Contact person	Urszula Mikiewicz
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Project duration	from 06-2021 to 06-2023 (call II)
Total project budget	PLN 2,007,113.00
Grant amount	PLN 1,839,854.00
Project website	www.zielonadolina.biz

Naszelokalne.pl

SHORT SUPPLY CHAINS AND LOCAL MARKETS

"Short Food Chain - pilot project in Toruń"

Project objectives:

- Building a complementary model of a short supply chain and testing it in practice - a pilot project in Toruń. The objective is to be achieved through the sale of a very wide range of food products produced by farmers from the Kuyavian-Pomeranian Voivodeship.
- Designing a dedicated e-commerce platform that includes not only an e-shop but also a module that supports the logistics of the entire process.
- Construction of a model logistics and exhibition centre in Przysiek, aimed at testing conditions for storing, packing and shipping products to consumers in and around Toruń.
- Determining the assortment, conditions and method of delivering products from farmers to consumers, by surveying the inhabitants of Toruń, carried out by the Nicolaus Copernicus University.
- Development of the concept of the Certification and Marketing Agency as a tool ensuring high quality and authenticity of food.
- Designing a specific, dedicated marketing campaign that will in practice determine the effectiveness of various marketing methods.

Expected results:

- Creation of a practical model for the functioning of a short supply chain that will be able to deliver local food in accordance with the locavore concept to the inhabitants of a medium-sized city. It will also enable almost 20 farmers interested in local food production to prepare and test sales of a very wide range of products on regional markets. These results will be achieved through the development and implementation of significantly improved technologies, organisation and marketing methods.

Further plans:

- Continuation as part of commercial activity

Leader name - Regionalny Ośrodek Edukacji Ekologicznej Sp. z o.o	Leader category - enterprise
Main location of the project	Kuyavian-Pomeranian Voivodeship, Toruń County
Contact person	Bartosz Szymański
Telephone number	571 293 072
Project duration	from 06-2021 to 01-2024 (call III)
Total project budget	PLN 11,216,472.69
Grant amount	PLN 5,421,272.00
Project website	www.naszelokalne.eu

Wiejska e-skrzynka

Rural e-box

SHORT SUPPLY CHAINS AND LOCAL MARKETS

"Innovative model of cooperation of agricultural producers within short supply chains"

Project objectives:

- Shortening the supply chain aimed at shortening the path of agricultural products from producers to consumers.
- Increasing the profitability of farms while maintaining consumer satisfaction (lower price for a high-quality product).
- Developing innovative marketing techniques and training farmers/sellers.
- Finding a new, more effective “point” for selling local products than the mainly used local markets.
- Development of a distribution system used jointly by local farmers and individual producers.
- Development of 3 food sales models in order to select the most advantageous method of distributing agricultural products delivered by farmers from the Kuyavian-Pomeranian Voivodeship within short supply chains.
- Development and implementation of an internal quality assurance system and development of a new brand.

Results achieved:

- As part of the project, farmhouse shops, an internet platform tailored to customers' needs and purchasing groups were created. The simultaneous launch of three distribution channels enabled their testing. Thanks to this, the most advantageous distribution channels for individual producers were identified, which will allow them to choose the distribution channel that is most adequate to their individual production conditions.
- The project developed different models for delivering food to the final consumer, including using a refrigerated truck purchased under the project.
- An internal quality assurance system was developed and implemented.
- A new brand "Rural e-box" was developed and implemented.

Leader name - Kuyavian-Pomeranian Agricultural Advisory Centre in Minikowo	Leader category - advisor
Main location of the project	Kuyavian-Pomeranian Voivodeship, Nakło County
Contact person	Wioleta Lorenc
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Project duration	from 12-2019 to 08-2022 (call II)
Total project budget	PLN 1,116,170.64
Grant amount	PLN 726,682.00
Project website	www.wiejskae-skrzynka.pl

LZOTOP

RATIONAL MANAGEMENT OF NATURAL RESOURCES, CLIMATE AND ENVIRONMENT

"Development and implementation of a pilot technological line to prevent emissions of volatile organic compounds generated in the high-temperature process of melting fat from Category 3 animal by-products"

Project objectives:

- A qualitative change expressed by a decrease in VOC emissions. The change concerns both the immediate surroundings - the Plant and the further surroundings - the surrounding area and the entire environment. This is due to the decrease in the concentration of harmful substances in the air.
- Obtaining ecological purity consisting in the fact that biodegradation taking place in the biofiltration process does not move the pollutant from one environmental phase to another (from gas to liquid or solid), but it completely decomposes it, thus not generating any by-products that must be deposited,
- Reduction of investment outlays as the existing infrastructure, such as the company's wastewater treatment plant is used.
- Increasing the positive environmental effect by eliminating the use of expensive and harmful chemicals and using the absorbed organic compounds as a substitute source of organic carbon for microorganisms used in activated sludge technology.

Results achieved:

- Development and implementation of a prototype pilot line for removing VOCs from post-production gas emissions in the production of fat from the high-temperature processing of category 3 animal by-products, with particular emphasis on skin and meat bits.
- Protection of the natural environment by significantly reducing or eliminating VOC emissions into the atmosphere by at least 90%.
- Meeting the standards for improving air quality in the vicinity of the Production Plant (facilities and farmland), which has a positive impact on the value of properties and land for development in the immediate vicinity of the Plant.
- Reducing the costs of improving air quality thanks to the use of the existing infrastructure (inclusion in the Wastewater Treatment Plant).
- Production and replenishment of the missing carbon pool with substitute carbon source consisting of organic compounds absorbed and assimilated by the activated sludge suspension in SBR reactors.
- Reducing the costs of the Wastewater Treatment Plant by eliminating the use of chemical reagents (acetic acid, methanol, KEMCARBO) supplementing the carbon source in the activated sludge technology.
- Reducing the amount (in odour units) of harmful compounds in the direct air stream.

Further plans: ■ Continuation under the next call for Measure 16 "Cooperation"

Leader name - Przedsiębiorstwo Produkcyjno-Handlowe „Agro-Top" sp. z o.o.	Leader category - enterprise
Main location of the project	Mazowieckie Voivodeship, Siedlce County
Contact person	Magdalena Michalak
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Project duration	from 11-2021 to 09-2022 (call III)
Total project budget	PLN 2,412,394.16
Grant amount	PLN 2,222,972.53
Project website	www.lzotop.pl

Słomka ze Słomy

Straw made of Straw

RATIONAL MANAGEMENT OF NATURAL RESOURCES, CLIMATE AND ENVIRONMENT

"Development of an innovative production of straws made of straw for various beverages"

Project objectives:

- Obtaining an agricultural product, i.e. straw with improved usability (in the form of drinking straws).
- Development and implementation of appropriate technical, technological and organisational conditions necessary for the production of straws made of straw, intended for drinking various types of beverages.

Expected results:

- Development of requirements for the semi-finished product (blades or stems):
  - lack of gluten, chemical elements and compounds harmful to humans, as well as absence of taste and smell,
  - minimising mechanical damage (crushing, fractures) - less than 2%,
  - internal diameter from 2 to 10 mm, distance between nodes over 200 mm.
- Development of requirements for the final product (packaged straws):
  - range of internal diameters (from 2 to 10 mm) and lengths (from 100 to 300 mm),
  - number in the package from 5 to 500 pcs.,
  - clean and disinfected (100% free from fungi and bacteria).
- Development of requirements for the technology and method of organising the production and packaging of straws:
  - minimisation of labour and energy inputs,
  - maximisation of the final range of products (internal diameters and lengths of straws and their number in the package),
  - minimisation of the unit cost of production.
- Development and implementation of a prototype of a straw harvesting machine as a semi-finished product for the production of straws from plants grown for this purpose.
- Development and implementation of a prototype of an automated machine for the final production of drinking straws.

Leader name - Świętokrzyski Agricultural Advisory Centre in Modliszewice	Leader category - advisor
Main location of the project	Świętokrzyskie Voivodeship, Końskie County
Contact person	Mariusz Porębski
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Project duration	from 10-2021 to 11-2023 (call III)
Total project budget	PLN 1,646,383.00
Grant amount	PLN 1,325,148.00
Project website	www.slomkazeslomy.sodr.pl

Woda dla Kujaw

Water for Kuyavia

RATIONAL MANAGEMENT OF NATURAL RESOURCES, CLIMATE AND ENVIRONMENT

"Innovative system of agro-meteorological monitoring, forecasting and operational planning of irrigation on farms in Kuyavia"

Project objectives:

- Development of advisory tools enabling rational (economical and effective) management of water resources by determining the amount of irrigation depending on the current needs of plants.
- Creation and development of an innovative, regionally and nationally, integrated system of agro-meteorological monitoring and operational planning of irrigation on farms. The developed system called "Water for Kuyavia" is a decision-supporting tool and consists of: agro-meteorological monitoring module with a database and an operational irrigation planning module. The system will be designed to enable precise determination of the water needs of plants and determination of irrigation doses and dates.

Results achieved:

- **The digital "Water for Kuyavia" system is an innovative advisory tool to support agrotechnical works, in particular irrigation, on farms. Detailed results:**
- Generating information on the suggested irrigation date and dose depending on the current water needs of plants, conditioned by their growth and development, meteorological conditions and soil type, as well as optimisation of yield and water consumption (supplementary, interventional or deficit irrigation).
- Contribution to reducing the risk of crop losses caused by meteorological and agricultural drought and improving the quality of the crop and its commercial value.
- Providing information on current agro-meteorological conditions, including a comparison with previous years and periods (e.g. extreme), which will facilitate the planning and organisation of agrotechnical works on the farm.
- Enabling an increase in production efficiency, including an improvement in the quality of the crop and its commercial value.
- Irrigation in accordance with the current needs of plants allows farmers to avoid excessive and unnecessary irrigation doses, thus contributing to limiting the leaching of nitrates (from fertilisers) to ground and surface waters.
- New knowledge gained and exchange of experience between project participants (farmers, advisors, researchers), can be used in the future by other producers and stakeholders in the Kuyavia region and beyond.

Further plans:

- Continuation under the next call for Measure 16 "Cooperation"
- Continuation as part of the Horizon Europe Programme
- Continuation under the research programmes of the National Centre for Research and Development
- Continuation within international Operational Groups

Leader name - Institute of Technology and Life Sciences - National Research Institute	Leader category - scientific and research unit
Main location of the project	Kuyavian-Pomeranian Voivodeship, Inowrocław County
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Project duration	from 08-2020 to 07-2022 (call II)
Total project budget	PLN 2,057,257.00
Grant amount	PLN 1,624,256.00
Project website	www.wodadlakujaw.pl

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