CONNECTFARMS

CHALLENGE

The ConnectFarms project will develop approaches to increase in a sustainable way integrated crop-livestock production while benefiting soil resilience to stress and climate change. This will include an extensive toolbox for farmers and stakeholders addressing crop-livestock integration, precise farming, organic amendments, reuse of residues in circular economy and sustainability improvements of farming practices. A set of recommendations for sustainable strategies leading to environmentally sound production in compliance with the Farm to Fork strategy will be given. Emphasis will be given to new approaches based on science and nature-based solutions to manipulate crops, livestock, soil and plant microbial communities to maximize positive ecological interactions and enhance ecosystem services.

APPROACH

The ConnectFarms concept is highly interdisciplinary and joins together expertise from many research fields, to achieve an integration of crop, livestock and ICT to obtain ecosystem services in agreement with the needs of sustainable agriculture. Partners will work in experimental sites in all – Bulgaria, Estonia, Italy, Lithuania, Poland, Spain and Turkey. Focused aspects of the project will concern agriculture and soil fertility–crop and livestock–amendments and biochar for soil health–welfare and sustainability for animals–precision farming–life cycle and ecosystem services assessment - stakeholder involvement.
The ambition of the project is to contribute to innovative strategic food systems by targeting enhanced agricultural technology, food processing and preservation innovation, environmental issues, and ultimately human health. ConnectFarms explores the interaction between arable crops, e.g. barley, and pulses with farm animals of high relevance, sheep and chicken. The connection is maintained through triangulation - crop becomes feed for animals, residues become amendments, amendments feed and boost crops and animals. The sustainable use of biochar is our keystone to improve both plant and animal farming in a circular economy approach.

The presenting consortium includes 10 partners: one Interuniversity Consortium, 5 universities, and 4 research institutions, based in 7 countries. The project is highly interdisciplinary as it includes:

- Ecological and agronomic studies;
- Soil and crop management to improve diversity and functionality;
- Studies of ecosystem services such as C sequestration, nutrient cycling, and pest control.

FIRST RESULTS

- Production of biochar and amendments from residues, characterization and distribution to partners.
- Availability of pale green barley lines with low beta glucan content, achieved by crossing and backcrossing mutants and accessions.
- Greenhouse trials with pale green barley mutants on soil from Estonia, Italy, Lithuania, Poland, Spain and Turkey.
- Identification of barley accessions with high and low beta glucan content, and development of a method based on Near-Infrared Reflectance Spectroscopy.
- Identification of crops and crop rotations for different agroclimatic conditions in Estonia, Poland, Lithuania, Bulgaria, Spain and Turkey and set up of first season experiments.
- Experimental rearing of poultry with biochar in litter, first trial: a significant reduction in ammonia evolution was observed when adding biochar to the poultry litter.
- First investigation of machine learning techniques to predict soil organic carbon and evapotranspiration
- Definition of indicators for Life Cycle Sustainability Assessment.

Consortium

Coordinator
- Nelson Marmiroli - Consorzio Interuniversitario Nazionale per le Scienze Ambientali, CINSA, Italy

Partners
- BULGARIA: Agricultural University - Plovdiv
- LITHUANIA: Lithuanian Research Centre for Agriculture and Forestry
- ESTONIA: University of Tartu
- SPAIN: CIEMAT - NEIKER
- POLAND: Warsaw University of Life Sciences
- TURKEY: Niğde Ömer Halisdemir University
- ITALY: University of Milano - Consiglio per la Ricerca in Agricoltura e l'Analisi dell'Economia Agraria (CREA)

Duration

01/12/2021 - 30/11/2024

https://ir.sggw.edu.pl/instytut-rolnictwa/nauka-w-instytucie/badania-naukowe/connectfarms/

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