PROENV

CHALLENGE

Across Europe, economic factors have led to increased intensification of crop and livestock production, an increase in the specialisation of farming, a local to regional concentration of animals, increased imports of nutrients in feed and synthetic fertilisers and a simplification of crop rotations. These developments have created barriers to achieving an optimum balance between food production and the environmental impact. In parallel with climate change and nitrogen emissions, there is increasing political focus on the role of agriculture in compromising other ecosystem services, especially biodiversity. There are two fundamental methods of achieving a balance between agricultural production and other ecosystem services; land spare and land share. In land spare, the landscape is partitioned into areas with highly-productive agriculture and areas with extensive or no agriculture that provide the other ecosystem services. In land share, by limiting the farming intensity, the landscape is less partitioned and the whole area provides all ecosystem services, including agricultural production. This latter approach is the one used in organic and agroecological farming.

APPROACH

The PROENV (balancing PROduction and ENVironment) project will have an interdisciplinary approach, with theoretical and practical components that build on existing knowledge but contain innovative developments. The theoretical component will consider the relative merits of the land spare and land share approaches to balancing production and ecosystem services. This will provide a theoretical framework for deciding whether for a particular region, the balance between production and other ecosystem services is best achieved using a land spare, land share or a mixed approach. Such considerations are already relevant for policymakers and will become more so in the future, as they strive to maintain rural economies and employment while achieving prescribed reductions in GHG emissions and losses of N to the air and water, and increasing biodiversity.

The practical component will consist of the investigation of specific measures to reduce nitrogen (N) losses from manure and in the further development of an existing software tool that enables scenarios to be constructed for manure N utilization at field, farm and regional scales. This tool was developed for use in one specific region but in PROENV, its technical and modelling capacities will be extended to enable its use in other regions of Europe, using data available Europe-wide. Finally, the practical and theoretical components will come together in an exploration of today's production and scenarios including feeding strategy for reducing GHG emissions at farm-scale in the different partner countries, including the use of Life Cycle Assessment and evaluating the energy, nitrogen and area utilisation.

PROENV will organise meetings with stakeholders (farmer's organisations and environmental regulators) internationally and locally, and public webinars to which we will invite environmental organisations. In addition to scientific articles in peer-reviewed journals and a PhD thesis, results from the project will be presented in short, targeted videos and popular articles on PROENV's webpage and on partners' social media channels.

FIRST RESULTS

WP2 has defined regional case studies in North and South Europe for analyzing mitigation options through improved manure management in conventional and organic dairy farming, as well as in intensive pig farming systems. Besides, preliminary results of yield and on and off-season GHG emissions in maize-cover crop systems in Denmark, Italy and Spain, show that the performance of the tested agronomical practices varies with the environment.

In WP3 (farm level), a PhD-student has been employed as planned and he is in good progress.

In WP4 data is been collected that will be used when the model of WP5 is operational.

The framework of WP5 has been set up and a prototype is currently under assessment, in collaboration with WP4.

Consortium

Coordinator

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Partners

- NORWAY: Norwegian Centre for Organic Agriculture, NORSØK - Norwegian Institute of Bioeconomy Research, NIBIO
- SPAIN: Institute of Agrifood Research and Technology, IRTA)
- ITALY: University of Milano - Università Cattolica del Sacro Cuore, UCSC

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