How can we find a balance between agricultural PROduction and the ENVironment (PROENV)?

- Should the balance be at field, farm or regional level?

Introduction

Balancing production and the environment can be achieved at many levels, but how to get a closer balance on a regional scale, via the implementation of measures at lower scales?

Land share - Land spare

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 in particular the one used in organic and agroecological farming.

In the project balancing PROduction and Environment (PROENV) the question what to do on a landscape level will be investigated by using a combined GIS and crop model to analyze measures to optimize manure N utilization on a regional scale. As an input to the model we need ground truth data, which are being measured during the project. During field trials we test mulitple GHG mitigation measures at field- and farm-scale and integrate livestock and manure management in field- and farm-scale GHG mitigation measures. By combining data from these different levels in a software model, different approaches for balancing production and the impact on the environment at the farm and regional scales will be evaluated. At the end of the project, PROENV will thereby provide open-source software to improve N management at different scales.

Figure 1: Group photo taken during Kick-off meeting - June 2022 in Piacenza, Italy - photo credit: Sissel Hansen

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