

AUSTRIA

Soil erosion & soil management

Location

Austria

Programming period

2014 – 2020

Priority

P4 – Ecosystems management

Measure

M16 - Cooperation

Funding (EUR)

Total budget 558 223

Project duration

2017 – 2020

Project promoter

ARGE Begrünung (Consortium)

Contact

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Website

<http://bioforschung.at/projects/minnc-emissionsminderung-durch-begrueunungen/>

Set up an operational group to test different practices for optimal catch crop management and assess their efficiency in reducing nitrogen and carbon emissions.

Summary

Catch crops reduce nitrate leaching to deeper soil layers and gaseous nitrogen and carbon emissions. Hence catch crops are an important measure for groundwater protection. To achieve an optimised “Catch Crop Function” many factors must be taken into account, starting from the sowing of the catch crop; up to the release of nutrients from the died-off catch crop plants. Some of these factors have not been investigated before.

In this context, the project set up an operational group to test different practices for optimal catch crop management and assess their efficiency in reducing nitrogen and carbon emissions.



Results

Hosted a public workshop titled “Catch crop management today” with domestic and foreign experts.

6 practical field trials with a total of 58 variants were set up, covering each of the arable farming regions of Austria. In addition, plots with 35 cover crop species were established.

6 very successful field days were held, involving 4 agricultural colleges and a total of 430 participants.

The results were published in four articles in agricultural newspapers.

Lessons & Recommendations

- ❑ When transferring examples and results in arable farming, it is essential to take into account soil and climate conditions and to adapt the examples to the local situation.

Context

High nitrate concentrations caused by intensive agriculture are found in several groundwater bodies in the eastern part of Austria. For example, in Marchfeld the nitrate concentrations show a continuously increasing trend. Between 2011 and 2015 the average nitrate content was 55 mg/l NO₃, which is well above the maximum legal concentration.

Catch crops take up the residual nitrate in autumn and capture it in the plant biomass. This prevents nitrates from leaching into deeper soil layers during the winter. Therefore, catch crops are an important element in the Austrian Agri-environmental Programme ÖPUL. Funding from the RDP will be used to investigate the preconditions that help intercrops fulfil their role as catch crops in an optimal way.

Objectives

The main objectives of the project include:

- to decrease nitrate leaching into deeper soil layers
- to decrease gaseous nitrogen and carbon emissions
- to optimise the management of intercrops and under sown cultures
- to disseminate the results through field days and a catch crop brochure and manual and by setting up a cover crop network at Austrian and European level

Activities

The project planned and implemented field trials over a 3-year period, at key sites where nitrate leaching is a problem. Specific actions included:

- analysing soil nitrate content, field emergence, biomass and root development of catch crops
- preparing an annual report on the results of the field trials and laboratory tests. The findings are presented during field days as the actual catch crops are growing.
- disseminating the results by publishing a catch crop brochure and manual, providing recommendations for customised catch crop seed mixtures, establishing a cover crop network, and setting up a training programme for farmers.



Main results

- Hosted a public workshop titled “Catch crop management today” with domestic and foreign experts.
- The project set up 6 practical field trials with a total of 58 variants, covering each of the arable farming regions of Austria. Each trial focused on the most pressing questions in the respective area. In addition, plots with 35 cover crop species were established.
- Samples of plant and root biomass and soil were taken and analysed for nitrates, dry matter, total nitrogen and C/N ratio. Soil surface roughness, soil cover and rooting were examined. An experiment on frost-hardiness of catch crop plants in different developmental stages was set up.
- 6 very successful field days were held, involving 4 agricultural colleges and a total of 430 participants.
- The results were published in 4 articles in agricultural newspapers.

Key lessons

The focus of the European Innovation Partnership, to foster cooperation between farmers and researchers to find a solution for a specific issue, is highly efficient. The institute Bio Forschung Austria has been working in this way with farmers for 35 years. When transferring examples and results on arable farming, it is essential to take into account soil and climatic conditions and to adapt examples to the local situation.

Bio Forschung Austria is trying to establish a Europe-wide network of EIP-projects on the topic of minimising emissions through optimisation of catch crops together with partner organizations in other European countries. The institute would welcome interested stakeholders, farmers, organisations and operational groups to get in touch.