

Slovenia

Farm's performance, restructuring & modernisation

Location
Nationwide

Programming period
2014 – 2020

Priority
P2 – Competitiveness

Measure
M16 - Cooperation

Funding
Total budget 249 940 (EUR)
EAFRD 199 952 (EUR)
National/Regional 49 988 (EUR)

Project duration
2019 – 2021

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www.bf.uni-lj.si/sl/raziskave/raziskovalni-projekti/140/povecanje-produktivnosti-kmetijske-pridelave-z-ucinkovito-in-trajnostno-rabovode-propridelava/

A cooperation project that promotes sustainable water use and smart irrigation, contributing to the mitigation of climate change and improving the quantity and quality of crop production.

Summary

This EIP AGRI operational group aimed at establishing an Irrigation Decision Support System (IDSS) at national level for the optimisation of irrigation practices. Based on the advice of the IDSS, farmers decide on the time and amount of water to add. The main activities were the development and public use of the IDSS and the training of farmers, agricultural advisers, students, professionals and lay public on irrigation technologies, including the installation of water meters in the soil on participating farms.



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Project Results

The results of the IDSS system, which maintains the water content at 85% of the field capacity, showed a 25% reduction in water consumption.

Calculations have shown that this also means a reduction in energy consumption and carbon dioxide emissions of 24% (Cvejić et al., 2020).

Corn grain production results confirm that the yield on light soils was practically the same at 85% field capacity (13.43 t/ha) as it was at 100% (13.83 t/ha).

Lessons & Recommendations

- ❑ A data-informed rather than instinct-led approach to irrigation results in better water management and climate change mitigation.

Context

High added value agricultural production is at an extremely low level in Slovenia. Part of the reason for this is a lack of knowledge about water use. Only 1.3% of the total agricultural land area of Slovenia is irrigated. When farms use irrigation on agricultural holdings, they usually do so without any technical knowledge of how to perform irrigation correctly: based on an understanding of the water-holding properties of the soil; its pre-existing water content; the phenophases of the crop; and the weather conditions of the days ahead.

Research has shown that growers in Slovenia often irrigate "by instinct", meaning that it is frequently carried out too early or too late, too infrequently or too often, and in quantities that are either too small or too large (Pintar et al., 2006; Cvejić et al., 2020). As a result, the water in the soil is not optimally distributed throughout the growing season of the plant, which results in a negative environmental impact and economically inefficient agricultural production.

Objectives

The aim of the EIP AGRI PRO-PRIDELAVA project was to promote high productivity in agricultural production through sustainable irrigation and the reduction of water abstraction.

Activities

The main activities were the development of an Irrigation Decision Support System (IDSS) and the provision of training in irrigation technologies.

Step 1 - Technical establishment of the IDSS. This involved establishing an infrastructure for monitoring water in the soil and modelling the water balance while taking account of the weather forecast. Applying the IDSS in real world conditions was a learning process: the growers first had to understand how to operate the system; correctly interpret its forecast; and apply the irrigation ration it advised. This last step required that they have a good understanding of their irrigation infrastructure and its water supply.

Step 2 - Monitoring the growth of the plants and checking the appropriateness of the IDSS's recommendations. This was a cooperative process of comparing the farmers' intuitive judgements with the forecast and recommendations provided by the IDSS and assessing the efficacy of each through observation and discussion. Farmers needed to see the benefits of a data-informed approach in action.

Step 3 - Use demonstration farms to promote the IDSS and recruit new users by disseminating the project results. In addition to theoretical knowledge, potential users needed the opportunity to meet existing users and talk to them about their experience. The project ran a series of lectures and practical demonstrations of the IDSS in order to reach a broad range of stakeholders. A diverse set demonstration farms were selected in order to apply the technology to a broad range of agricultural crops, soil types and terrain / environmental settings.

Step 4 - Handover Now that the project is complete, the IDSS system is managed by the Slovenian Environment Agency (ARSO). A private service provider is in charge of the installation of equipment and technical support for the user, and a specific advisory service is provided within the framework of the public Agricultural Advisory Service of Slovenia's Chamber of Agriculture and Forestry.

Main Results

The results demonstrate that a reduction in the volume of water in the soil from 100% to 85% of the field capacity does not significantly affect yields but does lead to an average of 25% less water consumption. This has to do with the physics of the soil and the fact of taking previous rainfall and future forecast precipitation into consideration.

Calculations have shown that this also means a 24% reduction in energy consumption and carbon dioxide emissions (Cvejić et al., 2020).

Corn grain production results confirm that the yield on light soils was practically the same at 85% field capacity (13.43 t/ha) as it was at 100% (13.83 t/ha). (For comparison: non-irrigated conditions on average yielded 2.87 t/ha).

Key lessons

A frequent problem related to water management, as observed by agricultural advisers on the ground, is the sub-optimal supply of water to plants, due to an instinct-led approach to irrigation.

An important part of fostering change is to demonstrate to farmers, in a way that they can relate to, that their yields will not be adversely affected by following data informed advice which may advocate a reduction of irrigation.

Additional sources of information

www.youtube.com/watch?v=WvtUbuR6MwY