Organic rice production in areas with natural limitations such as the Ebro Delta

Summary

The aim is to promote the cultivation of organic rice in the Ebro Delta, while preserving and improving biodiversity in an agricultural system with high natural and landscape value as well as natural limitations, such as the Ebro Delta.

The area subject to organic rice growing in the delta does not currently amount to 2%. This is due to the major difficulty that the rice growing sector in the Ebro Delta has in being competitive in terms of obtaining a viable and sustained long-term yield in plots where organic rice is grown.

The main problem is weed infestation, which becomes apparent in cultivated areas after organic rice has been grown there for a few years. The labour costs of removing the weeds increase exponentially every year, and rice plots become infested with weed seeds.

Our aim is to find solutions for controlling the fungal diseases and pests that severely affect the crop.

The extremely restrictive factor of the high salinity levels in the soils in the delta must also be taken into account. This salinity becomes a key factor in defining cultivation strategies and agronomic practices for water management, tillage, weed management and types of sowing and/or planting strategies.

Another aspect we aim to address is the various fertilisation strategies in organic rice production.

Finally, the project also aims to assess the impact of all the biodiversity strategies for cultivated plots, in order to improve biodiversity and the agricultural system in the Ebro Delta area.

Objectives

Main objective

- Increase the competitiveness of the rice sector in organic rice production in areas with natural limitations such as the Ebro Delta.

Specific objectives

- Optimise the management of pests, weeds, diseases and fertilisation by defining new agronomic strategies for organic rice cultivation in the Ebro Delta.
- Define and disseminate a good practice guide for organic rice growing in areas with specific natural limitations such as the Ebro Delta.
- Preserve and improve biodiversity in an agricultural system with high natural and landscape value.
- Evaluate the effects of different cultivation strategies on biodiversity.

Description of the actions carried out in the project

- Creation and implementation of a working and monitoring commission consisting of all the organic rice producers in the Ebro Delta, institutions in the sector (cooperatives, irrigation associations, ADV, PRODELTA), companies with prior knowledge and experience in the field, the IRTA/EEE research centre, the DARP Terres de l'Ebre Plant Health Service, and the organic crop Coordinator in Terres de l'Ebre.
- Work sessions to share and discuss weaknesses, threats, strengths and opportunities for organic rice growing in the Ebro Delta.
- Identification of the main problems faced by farmers when producing organic rice in the delta.
- Orientation of the trials and their design to provide a response to the real needs and problems identified in the previous working sessions of the working and monitoring commission.
- Planning of the organisation chart and schedule of the tests, and establishment of the various technologies to be used and tested to meet the innovation needs of the project.
- Assignment of the tasks to be carried out by each institution involved in the project, and by the research centre and contracted execution companies.

Final results and practical recommendations

As a result of the actions carried out described above, the trials which will be carried out during the 2021 and 2022 campaigns will be undertaken as follows:

Review of strategies of interest

Compilation of studies carried out in the Ebro Delta compatible with organic rice production.

Plots

The trials will be carried out on plots representative of the soil and climate conditions in the Ebro Delta.

Depending on the type of trial, small plots will be used to monitor specific variables that need to be isolated, and trials will be carried out with larger plots that are more similar to real conditions in the field.

Varieties

Varieties that are commercially and agronomically interesting and representative of the territory will be chosen.

Fertilisation

Diverse strategies will be studied with fertilisers authorised for use in organic farming, using both dry seeding and conventional sowing and planting strategies. All the strategies will be studied for different varieties.

These trials will be conducted on small plots at the IRTA to minimise any factors, particularly weeds, that may interact with the results.

Weed Control

Various strategies for the direct or indirect control of weeds will be evaluated. Some are innovative, and we intend to improve or finish developing others, using either machinery and/or specific prototypes for weed control, strategies for the management and administration of water, and various types of crop sowing and/or planting.

Assessment of chironomid damage according to cultivation strategies

Different types of irrigation and plot watering management will be studied to minimise damage by chironomids. This water management must be compatible with proper management of the other initiatives in cultivated areas.

The population of chironomids in crop fields will be monitored in order to identify the impact of the different strategies on the populations of this pest, and the damage it does to rice.

Assessment of biodiversity

Organic rice production in the Ebro Delta can help increase the biodiversity of the ecosystem, and various fields cultivating organic rice will be monitored and compared with others used for conventional production.

The results obtained will provide indicators for the biodiversity of the two production systems. We will also be able to assess the impact on biodiversity of the various strategies tested, and take these results into account when making recommendations on the different strategies.

Preparation of a guide containing recommendations and good practices for ecological rice production

A guide will be produced to advise and guide both rice farmers wishing to produce organic rice for the first time, and those who are already doing so who are encountering problems that mean that its long-term economic viability is not guaranteed.

This guide will cover agronomic, environmental and administrative aspects.

Conclusions

As no field trials began in 2020, we are not yet in a position to draw any conclusions from the project. However, we have already identified the main problem with organic rice production in the Ebro Delta as the decline in economic viability starting in the third year of cultivation on the same plot as a result of infestations of weeds caused by the weed control strategies currently in place. The main objective or focus of the project is therefore to determine an innovative weed control technology, within the framework of organic farming, which means that the economic viability of the activity can be maintained.

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Subject area(s) of application

- ☒ Agricultural production system
- ☒ Agricultural practice
- ☒ Agricultural equipment and machinery
- ☐ Livestock farming and animal welfare
- ☒ Vegetable production and horticulture
- ☐ Landscape / Territorial management
- ☒ Pest and disease control
- ☒ Fertilisation and nutrient management
- ☐ Soil management
- ☐ Genetic resources
- ☐ Forestry
- ☒ Water management
- ☒ Climate and Climate Change
- ☐ Energy management
- ☐ Waste and by-product management
- ☒ Biodiversity and environmental management
- ☐ Food quality/processing and nutrition
- ☐ Supply chain, marketing and consumption
- ☒ Competitiveness and agricultural and forestry diversification
- ☐ General

Geographical area(s) of application

PROVINCE(S)	REGION(S)
Tarragona	Baix Ebre and Montsià

Dissemination of the project (publications, conferences, multimedia...)

Seminar presenting the project to institutions, organic rice producers and companies with previous experience in the area, which took place at the IRTA/EEE facilities on 13 June 2019.

Project website

All the results and conclusions of the project will be posted on the website of the Plant Protection Group for Rice and Other Crops in the Ebro Delta (ADV) in a specific tab for the GO Eco-DE.
http://www.advdelta.cat/ADV/

More information on the project

PROJECT DATES	BUDGET APPROVED
Start date (month-year): July 2020	Total budget: €152,000.00
Completion date (month-year):	DARP funding: €86,640.00
Current status: Executed execution	EU funding: €65,360.00
	Own funding: €65,142.86

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