Control of *Myzus cerasi* in cherry trees through functional biodiversity (using ecosystem services)

Summary

In modern intensive agriculture, the only effective method of controlling some pests has been based on the generic and indiscriminate use of insecticides, which even requires various active substances to be applied simultaneously to control a pest effectively. The vast majority of insecticides (and their waste products) have a persistence that can exceed 21 days, which means that if they are applied when fruit is ripening (which is usually when most insect damage occurs), residues of pesticide may be detected in the fruit. This leads to a loss of quality, and they cannot be sold in more demanding markets with higher sale prices. As a result, action must be taken to solve one of the main problems that affects the fruit sector when marketing their product: the presence of traces of synthetic insecticide residues.

Given the above, the general objective of the project is to reduce the use of synthetic pesticides in cherry cultivation, and to replace them with a means of pest control based on fostering functional biodiversity. In agronomy, functional biodiversity is considered to be all insects that act as auxiliary fauna or natural enemies that can control one or more pest insects. This project therefore aims to enhance functional biodiversity by implementing auxiliary crops (plant cover) which benefit humans, and are also known as an ecosystem service.

Objectives

The specific objectives of the project are to:

- Determine the capacity and viability of implementing a plant cover system in cherry cultivation.
- Quantify the evolution (yearly and year-on-year) of the ecosystem associated with this plant cover in terms of its auxiliary fauna.
- Confirm the capacity of auxiliary fauna as the main or combined method for controlling *Myzus cerasi* in cherry cultivation, compared to the usual pest control method.
- Assess the health and quality and the post-harvest development free of phytosanitary treatments (synthetic pesticides).
- Assess the economic and environmental impact (soil conservation, ecological footprint and water retention, among others) of the use of plant cover compared to the usual pest management measures.
- Transfer the results of the pilot project to the sector and the territory, so that those results can be applied to the cultivation of both cherries and to other crops with similar problems.

Expected results and practical recommendations

The expected results are:

A plant cover system that improves the state of the auxiliary fauna by effectively controlling the black bean aphid in cherry crops, as well as effectively reducing the use of pesticides during the ripening phase of the fruit.

Recommendations:

The plant cover selected must be appropriate for the type of crop and its management, and for the type of auxiliary fauna to be enhanced.

Description of the measures planned in the project

The measures planned in this project are as follows:

I. Analyse the current state of the ecosystem by means of biodiversity indices related to the auxiliary fauna.

II. Implementation of plant cover based on selecting auxiliary crops and implementing them in the main crop.

III. Assess the effect of the auxiliary crop on the cherry crop. Assess the changes in biodiversity in the agroecosystem, the effectiveness of the biological control, the effect on the quality of the fruit, and the economic and environmental impact of the measures taken.

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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)
LLEIDA	EL SEGRIÀ

Dissemination of the project (publications, seminars, multimedia, etc.)

All members will carry out project communication and dissemination activities, including:

- Participation as speakers at dissemination seminars (DARP (Ministry of Agriculture, Livestock, Fisheries and Food), intersectoral and other events).
- Production of information leaflets.
- Publication of the results on social media.
- Publication of scientific and technical articles on the actions carried out in the project.

More information on the project

PROJECT DATES	TOTAL BUDGET
Start date (month-year): July 2019	Total budget: €195,318.36
Completion date (month-year):	DARP funding: €79,822.56
Current status: Underway	EU funding: €60,217.02
	Own funding: €55,278.78

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Order ARP/133/2017 of 21 June, approving the regulatory bases for grants for cooperation for innovation by promoting the creation of European Association for Innovation operational groups in the areas of agricultural productivity and sustainability and the execution of innovative pilot projects by those groups, and Resolution ARP/1282/2018, of 8 June, announcing the call for the grant.

Generalitat de Catalunya
Departament d'Agricultura, Ramaderia, Pesca i Alimentació

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