Integrated and sustainable control of bacterial spot to minimise the economic and environmental impact on almond and peach trees - XAPFREE

Summary

Bacterial spot is a disease caused by the bacterium *Xanthomonas arboricola* pv. *pruni*, which is now widespread throughout the world. This disease affects all fruit trees of the genus *Prunus*, but especially almond and peach trees. It can cause significant losses not only because the affected fruits have no commercial value but also because it can lead to severe defoliation that weakens the tree and progressively decreases its productivity. Specifically, in Spain, the disease is widespread and far from being effectively controlled, clearly endangering the economic viability of almond and peach tree cultivation. In Spain, a loss of around 50% of production is estimated. In this context, **alternatives are needed which provide effective control of bacterial spot**, in order to bring this disease under control and contribute to the stability of the sector.

Objectives

The main objective of this project is to improve the efficiency of bacterial spot control in almond and peach trees, thus reducing dependence on phytosanitary products. The specific objectives of the project are listed below:

- Evaluate and define a phytosanitary control strategy based on copper compounds, biological products and plant defence inducers.
- Define different management strategies aimed at sanitising plots to reduce disease pressure on farms with a high incidence of bacterial spot
- Validate, evaluate and implement a bacterial spot risk prediction model to reduce the number of fungicide treatments, improving their positioning
- Determine the varietal sensitivity of commercial varieties and varieties under development in order to establish a recommendation by risk zones
- Define a comprehensive bacterial spot control strategy which is highly effective and reduces the need for phytosanitary treatments
- Transfer the most relevant results to the sector to promote the strategy's implementation

The secondary objectives of the project are to rationalise the use of plant protection products; prioritise defence methods with low environmental impact, reduce the level of residues in fruit and, finally, foster cooperation for innovation between the production sector and the research community.

Description of the actions planned in the project

The activities to be carried out to properly implement the project and achieve its objectives are described below:

- Activity 1. Evaluate and define a phytosanitary control strategy. Study the effectiveness of new low-impact products, such as biological products and plant defence stimulants, which will offer a broader set of control alternatives and reduce dependence on copper, thus taking into consideration the associated problems of phytotoxicity and environmental impact.
- Activity 2. Management strategies aimed at sanitising plots. Provide fruit growers with tools that will enable them to manage bacterial spot more efficiently and sustainably, reducing inoculum pressure on plots and helping to reduce dependence on phytosanitary products.
- Activity 3. Validate, evaluate and implement a bacterial spot risk prediction model to reduce the number of fungicide treatments, improving their positioning. Create a model for predicting the risk

of bacterial spot infections that will improve the positioning of treatments, obtaining an efficient control with a significant reduction in the number of treatments.

- Activity 4. Determine the varietal sensitivity of commercial varieties and varieties under development in order to establish a recommendation by risk zones. Determine the sensitivity of the different commercial varieties as well as the varieties still in the development phase, so this information is available when selecting the most suitable varieties in the areas where bacterial spot is present.
- Activity 5. Transfer of results to the sector. Field days and workshops will be organised, where the improvements can be seen in situ.

Expected results and practical recommendations

The expected results of the project are listed below:

- Improve the phytosanitary strategy to combat bacterial spot
- Reduce the use of copper in the phytosanitary strategy
- Decrease the incidence of bacterial spot through some of the inoculum management strategies
- Incorporate some of the management strategies into the bacterial spot control commercial strategy
- Validate the risk prediction model for almond and peach trees to confirm its usefulness in decision-making
- Reduce at least 20% of the treatments following the risk prediction model, while maintaining the same effectiveness as with the conventional strategy.
- Make the bacterial spot risk prediction model operationally available for consultation by project partners
- Identify which varieties of both peach and almond trees are the most suitable for the different production areas, depending on the presence of the disease
- Identify areas with a high incidence of bacterial spot
- Disseminate the most innovative results obtained in the project, both at sector and scientific level

Leader of the Operational Group

ORGANISATION: GRUP COOPERATIU FRUITS DE PONENT, SCCL

Coordinator of the Operational Group

ORGANISATION: IRTA - Institute of Agrifood Research and Technology

Other members of the Operational Group (grant recipients)

ORGANISATION: AGROPECUARIA DE SOSES, SCCL
ORGANISATION: VIVERS VILADEGUT, SL
ORGANISATION: AGROSORIGUÉ, SAU
ORGANISATION: UNIÓ FRUITS, SCCL

Other members of the Operational Group (not recipients of the grant)

ORGANISATION:

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, Tarragona	Segrià, Baix Camp

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

As the project develops, an activity will be carried out to disseminate the results obtained during the project in the fruit sector. This is provided for in Activity 5: *Transfer of the results to the sector*, which will involve several dissemination conferences at the end of each trial season. Field days, conferences and seminars will be held to transfer the results obtained in each phase of the project. Finally, using the results obtained at the end of the project, a practical guide will be produced with new guidelines for an improved treatment and prevention system against bacterial spot.

Project website

More information on the project

PROJECT DATES	TOTAL BUDGET
Starting date: July 2021	**Total budget:** €215,604.00
	DACC funding: €99,706.68
Current status: Under way	**EU funding:** €75,217.32
	Own funding: €40,680.00

With funding from:

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Order ARP/113/2021 of 20 May, 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 ACC/1660/2021, of 27 May, announcing the call for the grant.

Generalitat de Catalunya
Departament d'Acció Climàtica, Alimentació i Agenda Rural

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