Precision treatment systems and inoculum management techniques for rationalising the use of phytosanitary products to control apple scab - SCABKILL

Summary

One of the problems affecting apple production in the Girona area is apple scab, caused by the fungus *Venturia inaequalis*, which significantly affects the viability of the apple crop. In the Girona area, scab control makes up over 80% of phytosanitary treatments. One of the critical points for managing the disease is controlling primary infections that develop in spring. A highly effective way of limiting or reducing primary infections is by reducing the primary inoculum, through farm sanitation, and by applying treatment based on agro-climatic prediction models (the best known are the Mills and RIMpro models), which indicate favourable conditions for infections to thrive. However, the number of pesticide treatments used to control the disease is still very high, and in the current European context, with the imposition of reductions in pesticide use imminent, **developing and defining new control strategies for apple scab that significantly reduce the number and impact of pesticide treatments is essential**.

Objectives

The main objective of the project is to **define a comprehensive strategy for the sustainable control of apple scab** through the following specific objectives:

- Develope tools to manage the primary inoculum, consisting of fallen leaves on the ground during autumn and winter
- Assess different systems to force the release of the inoculum at a time when there is no risk, in order to inactivate it
- Improve the efficiency of phytosanitary treatments, either by using precision spraying systems or by using different treatment strategies
- Assess organic, biological and defence-boosting products as alternatives or supplements to synthetic products
- Define an integrated strategy for apple scab control that helps reduce the number and environmental impact of phytosanitary treatments, while maintaining good efficacy
- Inform the sector of the actions carried out and their results in the framework of the project, to promote the implementation of the innovations with the best results.

Description of the actions planned in the project

This project is structured into three activities, in line with their objectives and expected results:

- Activity 1. Assessing different primary inoculum management systems. This activity will involve the design and manufacture of a leaf suction prototype and a leaf management system to eliminate or inhibit the development of the fungus. Finally, different systems to force the release of spores and deplete their reserves will be studied.
- Activity 2. Improving treatment strategy and efficiency to reduce the economic and environmental impact. This activity will address different aspects to improve the efficiency of applying fungicide products to control apple scab, which can have a major impact on reducing the use of phytosanitary products. The activity will study variable application of pesticides, depending on tree height, different precision application systems and the development of a proprietary model adapted to the study conditions.
- Activity 3. Transferring results to the sector. Priority will be given to drawing up a communication plan with field trips and workshops, where the improvements and their contribution to the sector can

be shown in situ. Finally, the results and conclusions will be compiled in a practical guide that aims to improve the current strategy for the control of apple scab.

Expected results and practical recommendations

The expected results of the project are listed below:

- Defining the design of a leaf suction machine adapted to the conditions of apple tree cultivation, which is efficient in collecting and transporting leaves.
- Reducing the incidence of apple scab by using one of the inoculum management strategies
- Reducing fungicide volume by at least 10% through the tree height-dependent variable application prototype
- Defining a proprietary functional and operational scab risk prediction model
- Reducing the number of fungicides by 15% through a preventive control strategy
- Availability of low-impact alternative products
- Encouraging the sector to use the strategy defined in this project

Leader of the Operational Group

ORGANISATION: GIROPOMA COSTA BRAVA, SL

Coordinator of the Operational Group

ORGANISATION: GIROPOMA COSTA BRAVA, SL

Other members of the Operational Group (grant recipients)

ORGANISATION: GIRONA FRUITS, SCCL
ORGANISATION: FRUCTÍCOLA EMPORDÀ, SL
ORGANISATION: SERRATER, SL
ORGANISATION: AGROALIMENTARIA MAS SAULOT, SL

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

ORGANISATION: IRTA - Institute of Agrifood Research and Technology

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)
Initially in Girona, but the knowledge generated should be valid for other apple-producing areas with apple scab problems	Alt Empordrà, Baix Empordà, Selva and Gironès

Project dissemination (publications, congresses, multimedia...)

As the project progresses, a dissemination activity will be carried out to publicise the results. The communication plan envisages actions at various levels, including technical meetings with technical advisors, transfer conferences and participation at specialised congresses. Plans include field trips, consisting of visits to the trial fields with technical advisors from Girona fruit companies, annual fruit conferences at the Mas Badia centre in the summer, and workshops where the results from the trials will be discussed. Finally, using the results obtained at the end of the project, a practical guide will be produced containing the new improvement guidelines as an apple scab treatment and prevention system.

Project website

http://www.giropoma.com/

More information on the project

PROJECT DATES	TOTAL BUDGET
Starting date: July 2021	**Total budget:** €165,360.00
	DACC funding: €76,471.20
Current status: Under way	**EU funding:** €57,688.80
	Own funding: €31,200.00

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