

CRACKCIRERA: new strategies to reduce cracking in cherry cultivation

Summary

The cherry business is a growing and stable market both internationally and domestically. In Catalonia it is considered a strategic crop due to the fact that we have the necessary capacity to offer a fruit that ripens earlier than in other countries, which means that we can cover a market niche that guarantees significant exports, especially to European countries.

In an effort to make this crop even more profitable, in recent years work has been carried out on the use of new plant material, in the search for improvements in production yields, as well as in the reduction of handling costs.

However, the major challenge of cherry cultivation is that it is highly perishable and is greatly affected by plot management and environmental conditions, such as excessive rainfall before harvest. **Rain-induced cracking is the main cause of cherry crop loss in most production areas of the world, including Catalonia.**

Climate change predictions point to an increasing frequency of excessive rainfall which is likely to increase the incidence of cherry cracking. **Very few current varieties are tolerant to cracking and the mechanisms involved have not been fully identified.** The physiological, biochemical, environmental, cultural, anatomical and genetic factors are unclear, as are the management strategies needed to mitigate it. Finding strategies to reduce cherry cracking is considered key to ensure productions in the coming years.

Objectives

The overall objective of this project is to **reduce cherry cracking by adopting various strategies that affect multiple mechanisms involved in its development.** The project aims to establish an action protocol to determine the percentage of cracking reduction that the use of each strategy alone and in combination with others implies in the particular climatic and soil conditions of our country. This protocol, through a cost/benefit assessment, will determine the most appropriate strategy or combination of strategies for each specific situation.

This general objective can be broken down into the following specific objectives:

- Reduction of cracking by using covers to protect the crop from rain.
- Reduction of cracking by protecting the soil at different critical stages of fruit development.
- Use of products that improve the elasticity of the cuticle, the structure of the cell walls of the fruit and reduce its permeability.
- Post-harvest evaluation of fruit from the 5 best strategies (or combinations of strategies) to reduce cracking.

Description of the actions planned in the project

The Crackcirera project has been classified into four groups according to the strategies and factors that can address cracking and improve fruit productivity and quality:

1. Use of rain protection netting (M).
2. Soil protection against rain and light refraction (P).
3. Use of green roofs (C).
4. Use of products applied to the skin of the fruit (E).

The different objectives of the project will be addressed by following a roadmap. In the first part (year 1), a maximum of two different treatments of each of the four strategies described above (M, P, C and E) will be evaluated individually and in combination. Based on the results obtained in the first year, the best-performing treatments will be selected and re-evaluated in multiple combinations with other strategies. The aim, therefore, is to draw up a protocol to control cracking depending on its incidence and the

cost/benefit of each strategy and combination of these, also taking into account the variety, the training system and the particularities of each plot, producer and production system. As far as the post-harvest evaluation of the cherries is concerned, the 5 best strategies or combinations will be selected each year and using the fruit from these, all the physical-chemical parameters, the profile of volatile aromatic compounds and the degree of consumer satisfaction will be monitored.

Expected results and practical recommendations

The expected results are listed below:

- Knowledge of which treatments will reduce cracking to varying degrees, depending on their effectiveness. This will allow us to categorise each of them and classify them according to their impact.
- Development of a protocol to control cherry cracking which, taking into account the cost/benefit of each strategy, will help producers to choose the best possible combination adapted to their particular situation.

Leader of the Operational Group

ORGANISATION: SAT BEPA Nº 1544 CAT

Coordinator of the Operational Group

ORGANISATION: IRTA - Institute of Agrifood Research and Technology

Other members of the Operational Group (grant recipients)

ORGANISATION: ACTEL SCCL

Subject area(s) of application

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

Geographical area(s) of application

PROVINCE(S)	REGION(S)
Lleida	Segrià

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

Various initiatives will be carried out to disseminate the Operational Group at different levels and in different types of publication:

- An informative note on the results of the project will be sent to specific technical publications in the target sectors.
- The results will be disseminated OG members using their dissemination networks such as newsletters, workshops, websites and social media.
- Dissemination of results at sectoral events.

Project website

--

More information on the project

PROJECT DATES	TOTAL BUDGET
Starting date: July 2021	Total budget: €216,240.00
	DACC funding: €100,000.80
Current status: Under way	EU funding: €75,439.20
	Own funding: €40,800.00

With funding from:

Project funded through Operation 16.01.01 (Cooperation for Innovation) through the Catalan Rural Development Programme 2014-2022.

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.

