Analysis and improvement of the critical points of almond transformation processes – CUALINUD

Summary

In recent years, there has been an increase in the technical production of almonds, using new varieties and intensive planting models, with greater nutrient input and irrigation. The current level of knowledge on the relationship between agronomy and quality, as well as on post-harvest handling and post-industry behaviour, is insufficient.

New areas are currently being identified where R&D activities are needed in order to determine the optimal working recommendations. Both at producer level and at the level of the post-harvest and final processing industry. The **new demands of the industry**, apart from the varietal characterisation that is already being carried out and for which there are studies both at a physical, chemical and organoleptic level, **require identifying and knowing in what ways new varieties and their handling in the field influence the losses and defects in each of the different industrial processes applied to the new varieties**

Objectives

The main objective of this project is to identify and describe the main conditioning factors and defects derived from the new varieties in the industry and to study whether some of these can be corrected through changes in agronomic management in the field. This knowledge will provide relevant information to improve the industrial processes in which the new varieties are involved and thus increase the economic profitability of the processing industry.

In order to achieve the general objective, the following specific objectives have been established:

Objective 1. Identify and characterise the different defects in post-harvest and processing.

- Physical defects: “double-shell” and problems in the crusher, breakages and generation of half almond kernels (with skin and peeled) during the usual industrial processes.
- Chemical defects: darkening and discolouration of the skin as well as of the peeled kernel itself.
- Other kernel alterations. Black spots on raw almonds with skin.

Objective 2. Study the different factors that influence and condition defects in post-harvest and processing.

- Genetic component
- Phenotypic component (yield load, irrigation and nutrition, moisture at harvest and storage, disease and pest alterations, storage conditions and time, etc.).

Objective 3. Use sensory and volatile compound analysis as a tool for detecting problems, as well as varietal characterisation during post-harvest and processing.

Objective 4. Disseminate and transfer knowledge through scientific articles, communications at congresses and conferences with the processing industry and farmers. Communicate to society through social media, science dissemination events.

Description of the actions planned in the project

In order to achieve the above objectives, 6 activities will be carried out:

- Activity 1. Characterisation of defects and losses in the almond industry.
- Activity 2. Identification and characterisation of defects in processing under commercial conditions in the industry.
- Activity 3. Identification and characterisation of defects in processing under controlled laboratory conditions.
- Activity 4. Study of factors influencing post-harvest and processing.

- Activity 5. Sensory evaluation and volatile compound analysis.
- Activity 6. Dissemination and transfer of results.

Expected results and practical recommendations

The expected results are described below:

- Catalogue or data sheets describing the different defects and losses according to variety, origin and industrial process.
- Descriptive catalogue of the different defects according to variety, origin and industrial process, detected through sensory evaluation.
- Transfer of all results to the almond sector (both at producer and industrial level).

Leader of the Operational Group

ORGANISATION: CRISOLAR NUTS, SL

Coordinator of the Operational Group

ORGANISATION: IRTA - Institute of Agrifood Research and Technology

Other members of the Operational Group (grant recipients)

ORGANISATION: UNIÓ NUTS, SCCL

ORGANISATION: TRENCADORA D'AMETLLES MARTÍ, SL

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 CAMP

LLEIDA	SEGRIÀ

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

- Dissemination of the results at the Almond Conference.
- Dissemination of the results at the IRTA Fruit Growing Conference.
- Dissemination of the results at the annual conference held by Almendrave, Descalmendra and the Association of Catalan nougat makers.
- Drafting of a dissemination article. Based on the results obtained, an article will be published in national journals in order to present these results to other companies located in other parts of the country.
- Drafting of a scientific article. Based on the results obtained, a scientific article will be published to make the results available to the entire scientific community.
- Digital dissemination

Project website

More information on the project

PROJECT DATES	TOTAL BUDGET
Starting date: July 2021	**Total budget:** €141,192.00
	DACC funding: €65,294.64
Current status: Under way	**EU funding:** €49,257.36
	Own funding: €26,640.00

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