

# **New natural strategies to reduce postharvest physiopathies in seed fruit**

## **Summary**

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One of the most important problems in the fruit growing sector is the preservation in the cold room of some varieties of pear and apple susceptible to superficial scalding. The main consequence of the scalding is the deterioration of the appearance and the market value of the fruit, reason why the fruit only happens to be considered suitable for industrial processes. For this reason, a large company in the fruit sector (COOPERATIVA DE SAN DOMENECH) in collaboration with one of the leading organic product companies for the control of diseases (ALTINCO), IRTA, and the DBA (University of Lleida) aim to study a joint strategy in the field and postharvest to improve the parameters that can influence scalding, with the use of natural products.

## **Objectives**

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The objective of the project is to evaluate different conditions of management both in the field and in post-harvest using natural products to reduce the problems linked with cold storage such as surface scalding.

Specific technical objectives:

- 1) To determine the application of natural products to increase the absorption of macro and micro elements and to evaluate its influence on the quality parameters of the fruit and its predisposition to the appearance of physiopathies.
- 2) To study different natural treatments for post-harvest application for seed fruit.
- 3) To monitor the scalding process of this fruit during its conservation in controlled atmosphere by studying  $\alpha$ -farnesene, conjugated trienes or ethylene.
- 4) To evaluate of the effectiveness of the field and post-harvest management regarding the fruit scalding and its quality.
- 5) To develop a dissemination plan to explain the results obtained to the sector.

## **Description of project activities**

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Action 1. – Performance of a field test to improve the mineral content of the fruit: this test aims to study the effect of natural products to increase the absorption of macro and micro elements as well as to evaluate its influence on quality parameters of the fruit and the appearance of physiopathies.

Action 2. - Application of different treatments with natural products for the prevention of scald of seed fruit: the application of different natural products with different concentrations as post-harvest treatment will be done before entering the cold room, both in Red apple and in Blanquilla pear. Later, this fruit will be preserved under controlled atmosphere.

Action 3. – Monitoring the fruit evolution during the storage period: control of  $\alpha$ -farnesene, trienes conjugates and ethylene, the degree of affectation by scalding and the determination of parameters of fruit quality.

Action 4. - Joint evaluation of the results and conclusions. Expected results include data on how the different alternatives tested can reduce the incidence of scalding in fruit.

Action 5. - Dissemination of the results.

## Final results and practical recommendations

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The results of the experimentation to evaluate the efficacy of a natural product to increase the fruit absorption of macro and micro elements, and its influence in the parameters of quality in Red Delicious Apple and Blanquilla Pear have been:

- Pear: there is no increase in the firmness with the application of the product, although the trend is that the treated fruit achieve higher levels. Slight improvement in the absorption levels of macro and micro elements and the K content in the treated plots. In the treated fruit, significant improvement in the Ca levels is obtained.
- Apple: there is no increase in the firmness with the application of the product, although the trend is that the treated fruit achieve higher levels. In the treated plots, there is no difference regarding the increase in the absorption of macro and micro elements and the improvement of the contents in K. Regarding the Ca levels, a slight improvement in the treated fruit is observed.

The results of the experimentation to evaluate different post-harvest natural treatments, to control the scalding during their conservation in a controlled atmosphere (through the study of  $\alpha$ -farnesene, trien conjugates or ethylene) have been:

- The monitoring of the parameters comparing clove oil, sunflower oil and sugars of fatty acids, has given little difference between them, making it difficult to recommend one.
- Pear: results are similar for all the parameters analysed, but a tendency to higher values is observed with the clove oil treatment. The ratios CT269:CT281 and CT258:CT281 resulted greater than 1, indicating a little tendency to scald.
- Apple: the results are dispersed among treatments, however smaller values were achieved by clove oil. The ratios CT269:CT281 and CT258:CT281 indicated little tendency to scald with all the treatments.
- The results achieved showed that the 3 treatments considered are valid to control the scalding

## Conclusions

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In conclusion, in spite of observing a tendency to improve the firmness and the fruit K and Ca levels with natural products, and to verify the effectiveness of the post-harvest treatments to control the scalding, these results do not show significant differences to the control ones. Therefore, to obtain conclusive results, a longer study should be carried out, since there are many annual variables that can influence the occurrence of scalding, out of the scope of the current project.

## Operational Group Leader

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Tipologia d'entitat:

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## Operational Group Coordinator

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## Other Operational Group members (beneficiaries of aid)

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## Keyword-category

Agricultural production system  
Pest / disease control

## Territorial scope

| <b>Province</b> | <b>County</b> |
|-----------------|---------------|
| Lleida          | Segrià        |

## Project dissemination (publications, seminars, multimedia...)

Participació en jornades del sector, cursos de formació als socis, i servei d'assessorament agrari.

## Pàgina web del projecte

[www.grupocatala.com/ca/projectes](http://www.grupocatala.com/ca/projectes)

## Other project information

### Projecte period

Starting date (month-year): Novembre 2015

End date (month-year): Setembre 2017

Project status: *Finalised*

### Approved budget

**Total Budget: 276.412,86 €**

*Funding source DARP:* 112.910,16 €

*Funding source UE:* 85.177,84 €

*Own funds:* 78.324,86 €

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*Id. projecte: 54 2015*