

Improved colouring of bi-coloured apples

Summary

Improving the colouring of bi-coloured cultivars is key to the profitability of plantations, given that the price farmers can charge for them is defined by the colour percentage and the calibre or size of the fruit. In Catalonia deficient colouring can generate annual losses of €3.25–3.9 million.

A number of new tools are available to improve the colouring of apples. One of them is the use of remote sensing to categorise the vigour of the plantations and subsequently implement measures in accordance with this classification.

These corrective measures are: (1) N reduction and irrigation adjustment, (2) defoliation, (3) combined application of phytohormones (prohexadione-calcium and paclobutrazol) and green pruning, (4) application of biostimulants and (5) refractory meshes. Accordingly, once the category that provides the best quality fruit has been determined, various combinations of corrective measures can be applied. The use of anti-hail nets in orchards is an option that is growing in popularity in Catalonia, given that it guarantees protection from hailstorms and, moreover, improves the quality of the fruit by reducing the damage caused by the wind and the heat of the sun. Despite these benefits, this protection may hinder the use of remote sensing, given that multispectral images may be altered by the presence of the net and also by its material, colour and state of repair. A preliminary study was therefore undertaken to assess the use of remote sensing in the presence of anti-hail nets. Over the course of this year multispectral images and data were taken in the field at 45 plots of Gala and Pink Lady apples, of which 27 had an anti-hail net and 18 did not. Of these 45 plots, 26 showed uniform vigour throughout the plot and 19 presented marked variability. Vigour was classified into five different categories, and the fact there was an anti-hail net installed did not prove to be an impediment, given that the different zones were clearly distinguished in the case of variable plots. This preliminary study shows, then, that it is possible to zone and categorise vigour using multispectral imaging in plots that have anti-hail nets installed, achieving results very close to those obtained in plots without nets.

Objectives

The main objective of this project is to improve the colouring of bi-coloured apples, specifically the Gala and Pink Lady cultivars.

This general objective is broken down into the following specific objectives:

1. Classification and zoning of the vigour of the plantations by means of multispectral remote sensing.
2. Assessment of additional colour improvement strategies.
 - A) N reduction and irrigation adjustment to improve colour by reducing vigour.
 - B) Use of phytohormones to favour the colouring of the fruit through the abscission of leaves and increasing light interception.
 - C) Use of phytohormones in combination with green pruning to favour the colouring of the fruit.
 - D) Use of biostimulants to favour the colouring of the fruit by means of physiological changes.
 - E) Use of refractory meshes to increase light interception and thereby favour the colouring of the fruit.
3. Definition of individual strategies for each plot and zone according to their vigour.

Conclusions

The fact that it is possible to zone and categorise vigour using multispectral imaging in plots that have anti-hail nets installed opens up a new way of improving colouring. Making use of a combination of different corrective measures may improve the colouring of the fruit in a more precise and effective manner and have positive repercussions in terms of the farm's profitability.

Task force leader

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Typology of entity:
Agri-food industry

Subject area(s) of application

Agricultural production system

Geographical area(s) of application

Province(s)

Lleida
Girona

Region(s)

Pla d'Urgell
Noguera
Baix Empordà
Alt Empordà

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

Specific training and monitoring sessions have been carried out for the fruit producers to ensure that the transferred information is used at their farms.

Project website

- Fruilar: www.fruilar.com
- IRTA: www.irta.cat
- Agropixel: www.agropixel.com
- Foment Les planes S. Coop C. Ltda: www.falesplanes.org
- Giropoma: www.giropoma.com

More information on the project

Project dates

Starting date (month-year): March 2018
Completion date (month-year): July 2018
Current status: *Executed*

Budget approved

Total budget:	€13,600.00
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<i>EU funding:</i>	€4,093.60
<i>Own funding:</i>	€4,080.00

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