

Inking on peaches. Causes and solutions

Summary

Inking is the internationally used name for a physiological disorder that is common in stone fruit, and peaches in particular.

It consists of the appearance of dark spots on the surface of the fruit, affecting only the epidermis, due to bumps and friction during the harvesting and transportation process. It is an aesthetic defect, which reduces the fruit's sale value in the fresh market.

Its prevalence varies depending on the year, variety, plot and producer, but in some cases it can be very high (80%), which can entail a very important financial loss for the producer, and significantly reduce the profitability of their operation as a result. The interest in a more in-depth knowledge of this physiological disorder arose for these reasons.

Objectives

Under the conditions found in peach production areas in Catalonia, the aim is to identify the causes that lead to the appearance of inking on peaches, and provide strategies to eliminate or reduce its occurrence.

Description of the actions carried out in the project

Determine the influence of various factors on the prevalence of inking during two campaigns. These factors are studied based on the existing literature, and the experience of the various participants in this project. The factors carried out were:

1. Determination of varietal sensitivity.
2. Determination of the effect of the harvesting method.
3. Determination of the effect of the ripeness of the fruit.
4. Determination of the effect of irrigation and fertilisation.
5. Determination of the effect of plant health and nutritional products applied to the leaves.

Pilot plots were established to demonstrate techniques to prevent inking in the third campaign.

Final results and practical recommendations

The factors set out above were evaluated for at least one year of the three years that this operational group has been in existence, in peach varieties grown on commercial plots in our production area. The results obtained showed that there is a great deal of variability between varieties in terms of the manifestation of this physiological disorder. Of the varieties assessed, the "Royal Summer" variety is very sensitive, while the "Ryan Sun" and "Summer Rich" varieties are the least sensitive. The "Sweet Dream" variety varies a great deal depending on the year in which it is assessed.

No conclusive results were found to reduce the expression of this physiological disorder in the different harvesting methods used (box, sack and bucket). However, in practical terms, any measure aimed at reducing the impacts and/or friction involved in the harvest and transportation of the fruit was shown to improve the incidence of inking.

Harvesting the fruit at different stages of ripeness did not yield any clear results. However, of the three varieties evaluated ("Sweet Regal", "Flatstar" and "Sweet Henry"), "Sweet Henry" showed some differences depending on the degree of ripeness.

Fruits harvested during the commercial harvest showed 20% less inking than those harvested 3-4 days after the commercial harvest.

The watering and fertilisation strategies applied to the different varieties of peach during this project showed no clear results as to which dose of watering and fertiliser is best to reduce or mitigate expression of this physiological disorder. However, doubling the usual dose of water was found to increase the number of fruits with this physiological disorder by 10%.

Finally, the last two factors mentioned (5 and 6) did not show any significant reduction of the physiopathy.

The practical recommendations for reducing the incidence or expression of inking are therefore as follows:

1. Be aware of the variety's susceptibility to this physiological disorder before planting.
2. Minimise the number of intermediaries used to pour the fruit into the box.
3. Harvest and pour the fruit into the crate as carefully as possible.
4. Harvest the fruit with at an appropriate and uniform level of ripeness.
5. Control and monitoring of watering throughout the fruit's ripening process.
6. Avoid high doses of watering in the last month before harvest.

Conclusions

Some varieties of peach are more sensitive to this physiological disorder than others. Knowing which variety is most susceptible to inking can therefore be very useful information for the grower when choosing which variety to plant. Although no significant differences were found for the harvesting method, it is reasonable to think that harvesting and transporting the fruit with the utmost care can help to reduce the incidence of this physiological disorder. The ripeness and water dose are also important factors to monitor control in order to reduce or mitigate its incidence. However, and in conclusion, none of the strategies applied provided satisfactory and/or conclusive results for understanding why it happens and therefore being able to eliminate it. Having said that, we believe that the incidence of inking is the result of a combination of factors: climate, fruit physiology and soil composition, which together with the management of the plot can accentuate or mitigate this physiological disorder.

Leader of the Operational Group

ORGANISATION: COOPERATIVA AGROPECUÀRIA DE SOSES, SCCL

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

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Subject area(s) of application

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|-------------------------------------|---------------------------------------|
| ☒ | 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):

In all the provinces where peaches are grown.

REGION(S):

In all the regions where peaches are grown.

Dissemination of the project: publications, seminars, multimedia, etc. (State links)

Plans for the dissemination of the project involve:

1. Writing a technical article for a specialist journal.
2. Dissemination of the project through the Cooperativa de Soses website (www.coopsoses.cat) and the IRTA website (www.irta.cat).
3. Participation in the dissemination of results at the Annual Technology Transfer Plan and Plant Protection Associations seminars and similar events.
4. Communication to the members of the Cooperativa de Soses.

More information on the project

PROJECT DATES	TOTAL BUDGET
Starting date: July 2019	Total budget: €123,100.00
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Current status: Executed	EU funding: €37,053.10
	Own funding: €36,930.00

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