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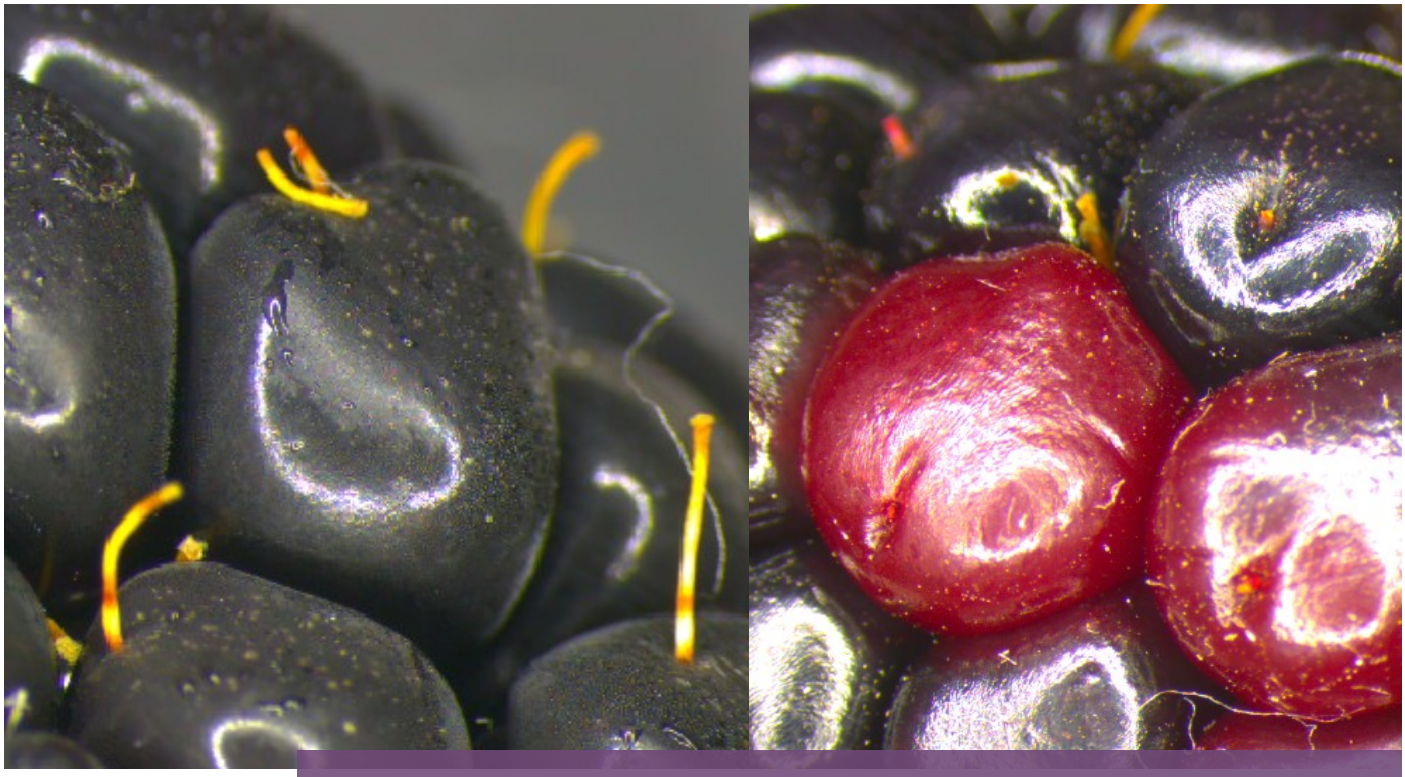

Blackberry fruit quality

Key Points

- **Mechanical injury to fruit** during harvest and shipping is the main cause of red drupelet reversion but fruit is more prone under certain conditions
- **High nitrogen fertigation during harvest** can significantly increase the amount of fruit with red drupelet reversion post-harvest
- **Fruit flesh temperatures exceeding 23°C** at harvest significantly increase the amount of red drupelet post-harvest
- **Harvest times, techniques, and shipping conditions** can be manipulated to reduce incidence of reversion
- **Fruit handled at very warm temperatures** and **cooled rapidly** loses more colour than fruit cooled more slowly

Managing Red Drupelet Reversion

Introduction

Red drupelet reversion (RDR), sometimes referred to as drupelet reversion or reddening, is a physiological disorder of blackberry fruit. Individual drupelets that appear uniformly black in colour at harvest revert to a red colour following cool storage. Although there are a number of other causes for blackberries to change colour including UV damage, freeze damage, leakage, and insect damage, RDR is thought to be independent of these. The disorder can affect up to 50% of a crop and is one of the least understood postharvest problems in blackberry fruit production.

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Underlying Physiology

The underlying mechanism responsible for the disorder is a degradation of the anthocyanin pigments which give blackberry fruit their colour. This happens when the cells of the fruit are damaged at harvest or during transport, and is exacerbated by certain environmental conditions such as rapid changes of temperature after damage.

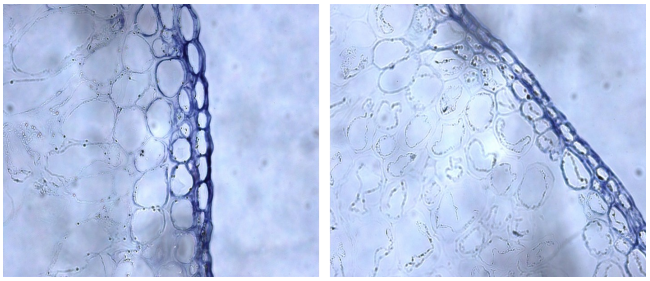

Image 1: Healthy blackberry cells (left) compared to damaged cells in drupelets affected by red drupelet disorder (right)

Harvest and Post-harvest Conditions

Environmental conditions such as temperature, humidity, and plant water status at harvest may influence expression of RDR. Fruit which has a higher skin temperature at harvest is significantly more prone to developing red drupelet post-harvest.

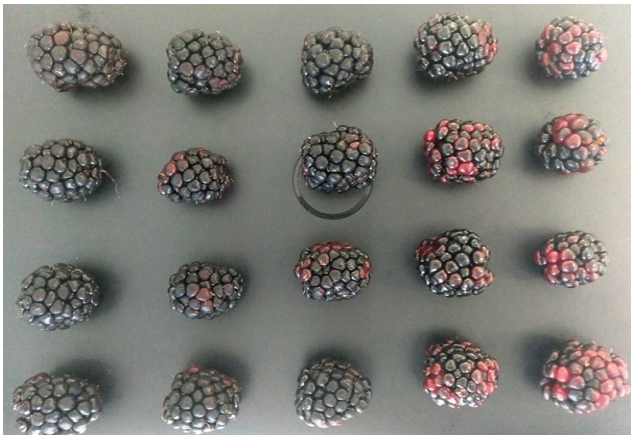

Image 2: Fruit harvested at increasing skin temperatures (left to right)

Rate of Cooling

The rate at which fruit is cooled post-harvest has also been shown to play a role in the expression of the disorder. In one trial, fruit which was cooled extremely quickly after being damaged had more severe colour change than fruit which was cooled at a slower rate.

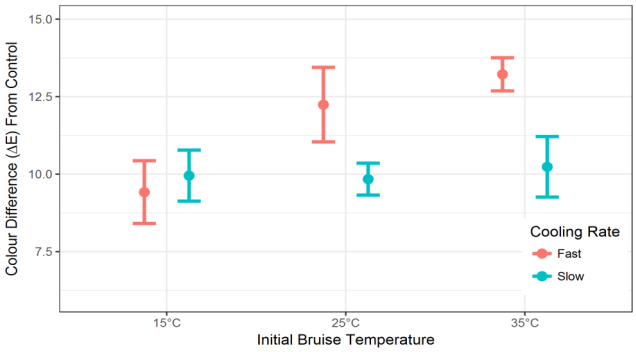

Figure 1: Results comparing bruise temperature and rate of temperature change on colour change

Nitrogen Fertigation

The project has included a two-year field trial looking into the effects of nitrogen fertigation rates on post-harvest expression of the disorder. The results of this study include:

- High nitrogen application rates during harvest produced higher rates of red drupelet reversion
- Higher nitrogen rates also produced larger fruit for parts of the season, and higher overall yields

Ongoing Work

Further analysis and results from the project are ongoing and will be available later this year.

More Information

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