

Improving marketable yield of fruit; reducing cherry cracking.

Cracking of sweet cherry fruit can be a costly problem for growers. Late season rainfall and the extent of damage from cracking is unpredictable. The mechanisms behind fruit cracking in association with rainfall are complicated and dependent on a number of factors. Recent Tasmanian research has explored some of these factors. It should be remembered that much of the available research into cherry fruit cracking has been undertaken in the northern hemisphere and therefore may not be applicable to the Tasmanian climate and varieties.

Factors influencing fruit cracking

Variety

Varietal differences in cracking susceptibility have been seen in Tasmania. In addition, varieties seem to be predisposed to crack in particular ways. (See Figure 1)

Mechanisms

Two modes of water entry (vascular or skin) means dual approaches to management. Cuticular cracking can be enhanced through water sitting on the fruit surface, and side cracking can be enhanced through excess water entering the fruit via the internal water pathways.

Fruit and Skin

No relationship between size alone and cracking has yet been found in Tasmania. The skin is however important in cracking resistance; it was found that a combination of factors such as fruit skin thickness, fruit size and turgor pressure best explains differences in cracking levels seen in the field.

Soil Moisture

A link has been found between root-zone water uptake and 'side' cracking. It is important that soil moisture is evenly maintained, and trees are not put under water stress.

Crop Load

Research has shown that crop load can significantly impact on cracking incidence. Higher crop loads show lower proportions of cracked fruit than lower crop loads. This is an important factor to keep in mind during fruit set.

Environment

Although associated with rainfall, cracking incidence is not related to just the amount of rainfall experienced in the critical cracking period (the few weeks leading into harvest). The season leading up to harvest will also affect potential responses to rain. For example wet springs may alter soil moisture levels, or fruit set and ultimately crop load.



Figure 1. A- Stem end crack, B- Apical (nose) end crack and C – Side Crack

Strategies for Management

Variety

It is important to know which varieties perform well in your particular area when selecting varieties for planting. The cracking index (low, medium, high) is determined in the laboratory and may not hold true for every region and climate. Once fruiting, get to know your variety and how it responds to rainfall. This may assist in making decisions about how best to manage that variety in the event of future rainfall.

Spray Applications

A significant reduction in cracking was seen with all spray treatments assessed. Reductions in total cracking of up to 50% were observed in some trials. No decrease in size, firmness or sugars was recorded. These results were seen over two consecutive seasons; both experiencing late season rainfall. The sprays worked well in rainfalls of up to 50 mm in the three weeks prior to harvest, and were more effective in trees with higher crop loads.

Irrigation

Daily fruit growth patterns showed fruit under low volumes of water experienced daily shrinkage, and did not recover on very hot, dry days. Maintaining irrigation to avoid water stress during the later stages of fruit development should provide some resistance to cracking through cuticular integrity. Cracking indices were higher in fruit from trees under low volume irrigation in two consecutive seasons, and these trees recorded higher levels of side-cracked fruit when rainfall occurred.

Crop Load

Low crop loads experienced high levels of cracking, the majority of which were side cracks. The effect of crop load on cracking levels were determined during the later stages of growth and cell expansion. Maintaining a medium or high crop load reduced cracking by as much as 50%.

Pruning

Removing top extension growth just after the commencement of rainfall during the two weeks prior to harvest resulted in a reduction in cracking of up to 50%. However, pruning before a rainfall event showed a slight increase in cracking. Timing of pruning is critical; leaves can both provide a water source for fruit, and divert water away from them. Pruning showed an increase in sugars but no decrease in size or other quality characteristics in both seasons.

Dr. Penny Measham
Perennial Horticulture Centre
Tasmanian Institute of Agricultural Research
Private Bag 98
Hobart TAS 7001 Australia
Telephone +61 3 62261870
Penelope.Measham@utas.edu.au

This project has been supported by HAL, through the cherry Industry levy and government contributions.

The advice provided in this publication is intended as a source of information only. TIA does not guarantee that the publication is wholly appropriate for your particular situation and therefore disclaims all liability for any error, loss or other consequence which may arise from you relying on any information in this publication.