

## **A Review of Cherry Rain Cracking**

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Unfortunately, rain cracking is a problem that affects cherry growers to some extent or other throughout the world. This seems to be particularly true in northern Europe where early summer rains are common. Therefore, it is not surprising that a number of papers on rain cracking causes and prevention were presented from scientists from this part of the world.

It appears that cracking can be caused by both external and internal influences. The first cause of cracking, that associated with external influences, is the most common and can be easily seen when cherries split in the rain. Rain water is absorbed through the cuticle due to a high osmotic potential inside the fruit. This high osmotic potential is caused by sugar content of the fruit. The water moves across the membrane in order to equalize the potential. The cherry then swells to the point beyond which the skin can expand and the fruit splits open.

One of the factors that appears to affect the movement of water across the membrane is the thinning of the cuticular membrane as the fruit grows. The cuticle becomes thinner in the stage II and III period of fruit development, associated with pit hardening and the rapid period of growth between pit hardening and harvest. During this period the surface area of Bing increases 124%, but the wax content of the cuticle remains unchanged.

Other factors affecting rate of cracking include the contents of substances within the cherry that contribute to osmotic potential. It was found that these substances differed by variety. In addition, fruit were also prone to develop cuticular fractures that are not visible to the human eye. It is thought that rain water may be able to easily move into the fruit through these fractures. A discontinuous water supply, where trees become water-stressed between irrigations increased the amount of cuticular fractures. The development of cuticular fractures was also influenced by variety and rootstock.

The second cause of cracking is caused by the build up of tensile forces within the cherry as a result of water uptake through the vascular system within the tree itself. This can be most clearly seen in covered orchards where cherries occasionally split, although protected from the rain.

Two methods of rain cracking protection were discussed at the symposium, chemical treatments and covers. Currently, calcium chloride is used by growers in Belgium to help reduce cracking but the effect of this treatment varies and when precipitation levels are large the percentage reduction in cracking is very small. Calcium chloride was also said to affect the taste of the fruit. Therefore Vercammen, et al tested three other products to determine their affect on cherry cracking.

Frutasol is a foliar fertilizer consisting of amino acids of vegetable origin. This product was found to be “very effective” when the water is absorbed through the skin, but not at all effective when water is absorbed through the roots.

Nutrileader 469 is a foliar fertilizer with a base of seaweed. The results of this treatment varied with a maximum reduction of cracking of only 10%. However, Nutrileader was found to have an effect on cracking caused by water absorbed through the roots.

Platina is also a foliar fertilizer with a natural amino acid base. This product was able to reduce cracking by 17%. Platina is most effective when applied prior to a rain, but there was reduced cracking with a post rain application.

Rain covers were tested by Blamer and Blanke. Several early ripening varieties were tested. Flowering under covers advanced bloom by 6-13 days and ripening by 12-19 days. Fruit under covers were found to be slightly smaller and softer than the uncovered control. Covered cherries also showed an increase in sugar and acid but there was no affect on color.

Reports cited:

Blamer M.M. and M.M. Blanke. Forced cultivation of sweet cherry under overall cover from rain.

Sekse, L. Fruit cracking in sweet cherries – some recent advances.

Vercammen, J., G. van Daele and T. Vanrykel. Cracking of sweet cherries: Past tense?