Pace International LLC

RainGard™

Your Best Defense Against Cherry Cracking

Why do Sweet Cherries Crack?

Rain cracking is one of the main limiting factors for production of high quality sweet cherries worldwide. A number of factors have been implicated as contributors to cherry rain cracking. Factors contributing to cherry rain cracking may include:

- Rapid uptake of rain water absorbed through the fruit surface
- Rapid change in water status of the whole tree
- High relative humidity

The natural barrier to water uptake is the fruit's cuticle. As cherries grow, the fruit skin gets progressively thinner while the number and size of the microcracks on the cuticle increase. The development of microcracks in the cuticle during rapid fruit expansion in stage III ("final swell") has been reported as a crucial factor in cherry cracking susceptibility (Figure 1).

Multiple applications of RainGard have been shown to increase the integrity of the cherry cuticle and reduce susceptibility to cracking during rain events.

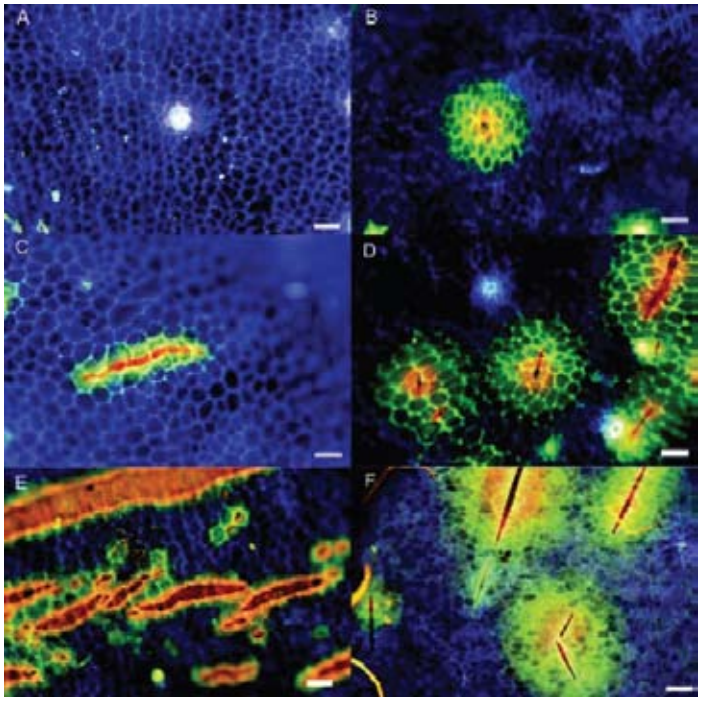


Figure 1. Fluorescence micrographs of sweet cherry fruit surface. (A) Intact fruit surface with stoma. (B-C) Small microcracks; typical of fruit in early stages of development. (D-F) More and larger microcracks; typical of fruit in the latest stages of development (Stage III).

Source: Adapted from Peschel and Knoche (2005) J. Amer. Soc. Hort. Sci.,130:487-495.

RainGard™ Features and Benefits

RainGard™ is an effective preharvest treatment to reduce cherry cracking. RainGard™ is applied as a protective film on cherries to decrease uptake of rain water by the fruit. RainGard™ helps maintain cuticle integrity throughout the final stages of fruit growth, thus reducing cracking susceptibility.

- Not affected by Calcium Carbonate levels below 900 ppm $CaCO_3$
- Possible to tank mix with commonly used pesticides (Refer to Label)
- No unsightly residues on fruit surface
- Does not induce dehydration of fruit
- Does not affect natural process of photosynthesis
- Does not negatively affect fruit quality parameters such as color, fruit firmness, or stem browning

RainGard Decreases Rain Water Uptake

The Washington Tree Fruit Research Commission (WTFRC) has evaluated the susceptibility to rain cracking of cherries treated with RainGard™ for several seasons. RainGard™ effectiveness in decreasing rain water uptake by cherries can be assessed by immersing cherries in distilled water to mimic rain water. WTFRC results have shown cherries treated with RainGard™ to be more resistant to rain cracking under both laboratory and field conditions (Figure 2).

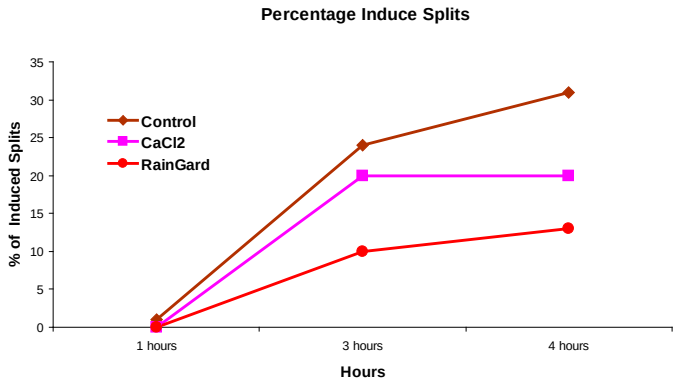
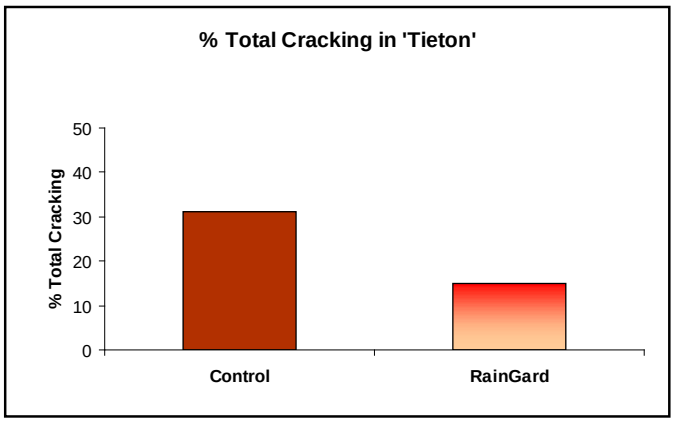


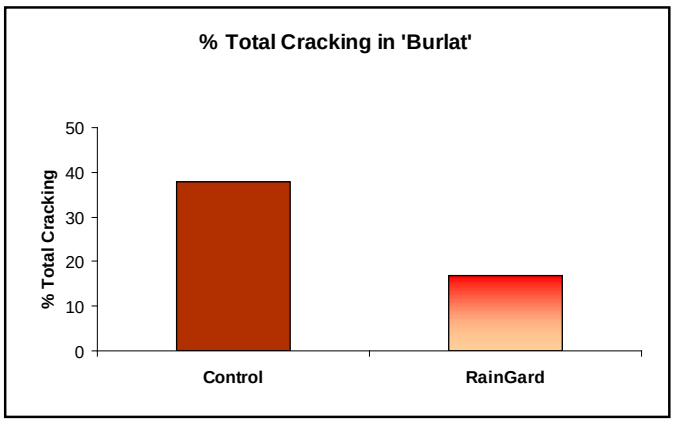
Figure 2. Graph shows the percentage of lab-induced cracking in control vs. RainGard™ treated cherries. Note: RainGard™ treated cherries developed half the amount of cracking compared to the untreated control.

RainGard™ - Efficacy Trial Results

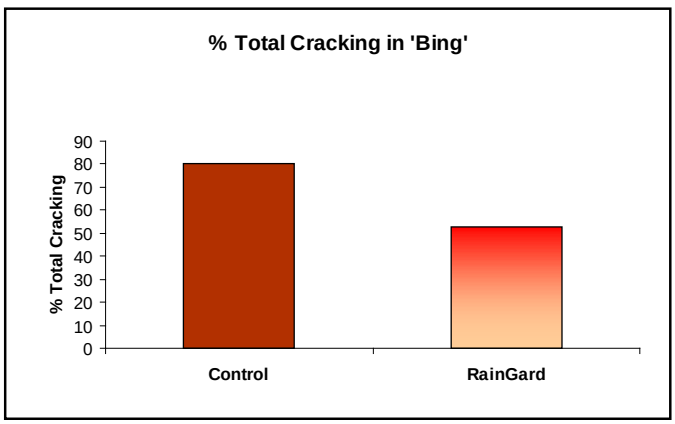
In field condition trials conducted by the WTFRC in 2009, RainGard™ significantly reduced cherry cracking by more than 50%.



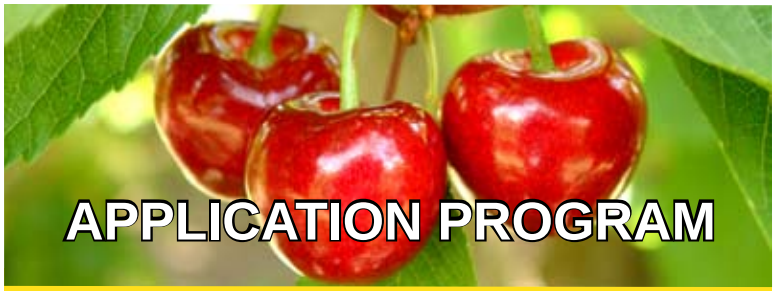
Source: 2009 Study by WTFRC, Washington.



Source: 2008 Study by ARDA, Spain.



Source: 2007 Study by Pace International, Washington.



Successful Protection against Cherry Cracking Requires an Application Program

Traditional approaches to minimize rain cracking have focused on fruit protection late in the season using rain covers, rain blowers (wind machines, helicopters, etc) and calcium applications. Recent research conducted at the University of Halle-Wittenberg, Germany concluded that steps to prevent rain cracking should begin much earlier. Maintaining cuticle integrity during the final stage of fruit growth will help reduce the incidence of rain cracking.

Surface area of a cherry increases rapidly during the period 4 weeks before harvest (stage III). Surface area increases in excess of 3 times for 'Bing' and 'Rainier' varieties. This rapid increase of surface area together with the low elasticity of the protective hydrophobic film explains the benefits of a multiple application program (Figure 3).

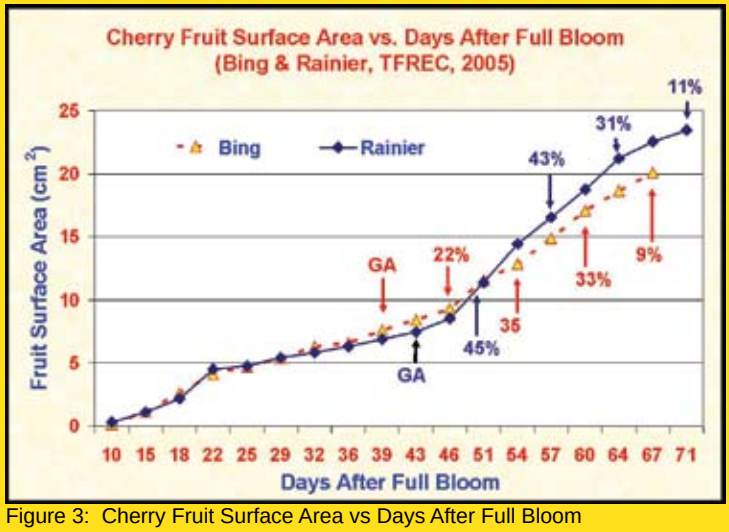


Figure 3: Cherry Fruit Surface Area vs Days After Full Bloom
Source: Schrader and Sun, 2006. Oregon Horticultural Society Meeting 2006 Proceedings.

Application Recommendations

For best performance, use RainGard in a 3-Application Program. A single application prior to a rain event has been shown to be less effective in reducing rain cracking than a program of multiple applications.

- Apply first application 4 weeks prior to estimated harvest date or when cherries reach straw color stage
- Re-apply every 7-10 days until harvest. Timing of the application may be adjusted according to rain forecasts.
- Apply at least 100 gal/acre final spray solution by airblast or boom sprayer to the trees
- For larger spray volumes, a minimum dilution of 0.8% must be maintained

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Pace International LLC

For additional information, contact your local distributor or Pace representative.

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