Cherry Rain Cracking

Rain-Induced Cherry Cracking is often the greatest single cause of sweet cherry fruit cullage, even in the arid regions east of the Cascade Mountains in the Pacific Northwest. Cherry growers know how devastating a rain event can be if it occurs when cherries are nearing maturity. Cherry cracking has been studied for several decades, but the causes of cracking are still not fully understood.

Evidence exists for two causes of cherry cracking. The first relates to excessive water being supplied to the fruit through the tree's vascular system and is termed “plant internal water-induced cracking”. This builds up tensile forces acting on the skin from inside the fruit, somewhat akin to a water balloon bursting after being overfilled. This cracking can occur in orchards that have been over-irrigated and can be exacerbated when rain follows shortly after irrigation or with large fluctuations in soil water content. There are no well-established remedies for this type of cracking.

The more common type of cracking occurs as a result of direct osmotic water absorption through the fruit cuticle and skin and is termed “rain-induced cracking”. Consequently, factors affecting the permeability of the cuticle and skin are of major importance in determining fruit resistance to water absorption. Penetration of the cuticle occurs by diffusion or via mass flow through cuticular cracks and other surface structures. As water penetration increases, the cuticle can separate from the epidermal cell wall. As more water is absorbed, the inner epidermal cell wall swells and detaches from sub-epidermal cells. Cellular contents are lost from epidermal cells near the fracture. Swelling of the epidermal cell wall region results in cuticular fracturing that generally precedes fruit cracking. This is the putative mechanism for postharvest cracking which can manifest in the packinghouse or during shipping.

Physical Water Removal

Fruit losses from rain-induced cracking can be reduced by drying cherries with airblast sprayer fans or helicopter rotor wash shortly after a rain event.

Osmoticum Sprays

Salts (usually calcium chloride) can be used to reduce and slow the osmotic infiltration of water into the fruit by decreasing the osmotic potential of the water on the fruit surface. To be effective, the salt must be delivered to the fruit surface while it is still dry. As these salts are water-soluble, they will need to be re-applied after a rain event.

0.5 – 1.0 % $CaCl_2$ has proven effective at reducing splitting with proper application and timing. A non-ionic wetter/spreader should improve effectiveness. Note that the salt can leave a residue on the fruit that may require postharvest washing.

Fruit Coatings

Coatings like Parka contain natural compounds that supplement the natural fruit cuticle and seal micro-fractures, limiting the movement of water on the fruit surface into the fruit; coatings do not reduce internal-water cracking. Coatings require good fruit coverage to be effective.

These products have the greatest efficacy when they have fully dried on the fruit surface before the onset of rain. As cherry fruit grow, the protective coating from these products breaks apart, so 2 - 3 repeat applications at 7 - 10-day intervals are advised to maintain adequate coverage throughout the period of cracking susceptibility.

There are cultivar differences in cracking susceptibility, and cherries generally become more susceptible to rain-induced cracking as they mature, but recent research has demonstrated that there is considerable variability in cracking susceptibility from site to site within the same year, as well as year-to-year at the same site. It can, therefore, be difficult for growers to anticipate how vulnerable their fruit is to rain damage at any given time.

See General Recommendations for guidelines on table use. Read all product labels carefully.

Cherry cracking

	Chemical	Rate per Acre	Notes
Cherry Rain Cracking	**fruit protectant** Parka	1 gal	Do not exceed 1% V/V Parka in spray solution. Do not apply with sulfur, EC materials, surfactants, stickers, or pinolene-based materials. Consult product label for more details.

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