



Figure 1 Fruit condition at post-harvest of sweet cherries (cv. Regina) subjected to one control (without reflective film) (A), one treatment with reflective film placed at 21 DBH (B), and a second treatment with reflective film placed at 34 DBH (C) (Adopted from Muñoz-Alarcón et al., 2025)

In contrast, fruits located in the upper canopy with sufficient light generally have higher soluble solids content (SSC) than shaded fruits in the lower canopy, and this difference is especially obvious in covered orchards (Pino et al., 2023).

A well-designed canopy structure can create an appropriate leaf-to-fruit ratio, providing more photosynthates for individual fruits and promoting SSC and dry matter accumulation. However, overly dense canopies, excessive fruit load, or long-term shading can inhibit sugar accumulation and delay fruit ripening.

5.3 Effects on fruit firmness and shelf life

Light conditions and the canopy microenvironment also affect fruit firmness and postharvest storage performance. Under plastic covering or shading conditions, cherry fruits usually show reduced firmness and changes in acidity, which may be related to insufficient light, altered calcium and dry matter distribution, and accelerated softening during storage (Xin et al., 2021).

In dense and heavily shaded canopy areas, poor air circulation and high humidity can lead to moisture retention on the fruit surface and increased metabolic activity. These conditions can increase the incidence of fruit cracking and reduce postharvest quality, such as higher risks of browning, decay, and tissue breakdown (Abdipour et al., 2020).

In contrast, optimizing canopy structure (such as open tree forms and good ventilation) or using reflective ground films to improve light distribution can enhance fruit firmness, promote uniform ripening, and extend shelf life. However, it should be noted that reflective films may increase soil moisture, which under certain conditions can raise the risk of fruit cracking (Correia et al., 2017).

6 Practical Strategies for Cherry Orchard Canopy Management

6.1 Cherry-specific pruning strategies

In high-density modern cherry production systems, pruning mainly focuses on renewing fruiting wood, avoiding excessive shading, and maintaining an open canopy structure with good light exposure (Long et al., 2020). Summer pruning is commonly used to remove overly vigorous shoots and shorten excessive vegetative growth, which helps improve light penetration inside the canopy and enhances fruit coloration, soluble solids content, and dry matter accumulation in shaded areas (Anthony and Minas, 2021).

Targeted removal of overlapping branches, crossing branches, and inward-growing shoots can reduce canopy complexity, improve air circulation, and prevent the formation of blind wood and dense outer “wall-like” structures. These structures tend to retain moisture and negatively affect spray coverage and the efficiency of protective systems (Macit et al., 2017; Hansen and Black, 2019).

Techniques that promote uniform bud break and branch distribution along the central leader (or main axis) help efficiently fill canopy space while avoiding excessive lateral branching, which can lead to overcropping and reduced fruit quality.