



Figure 2 Comparison of fruit cracking and quality parameters of cherries under protective net covering systems (Adapted from Gonçalves et al., 2023)

7.2 Water and irrigation management

Soil moisture plays an important role in fruit cracking by influencing plant water relations. Excessive soil water or a sudden increase in soil moisture before harvest promotes root water uptake, thereby aggravating fruit cracking, even under rain-shelter conditions (Bustamante et al., 2021). In covered tunnels, poor soil moisture control may still result in severe cracking despite the absence of rainfall.

In contrast, deficit irrigation (for example, about 70% of crop evapotranspiration) can reduce cracking incidence from 27% to 8% and lower the cracking index, indicating that moderate control of water supply under precise management can effectively reduce cracking risk (Blanco et al., 2022).

7.3 Nutritional and chemical regulation measures

Pre-harvest calcium spraying is widely used to strengthen cell walls and improve the mechanical properties of the fruit skin. It generally reduces fruit cracking and increases fruit firmness. However, its effectiveness is inconsistent due to differences in product type, application timing, cultivar, and climatic conditions. Calcium chloride, calcium nitrate, and calcium hydroxide have all shown effectiveness in reducing the cracking index in both laboratory and field trials. However, because surface calcium can be washed off by rain, reapplication may be necessary after heavy rainfall (Kafle et al., 2016).

Foliar spraying of calcium and potassium can not only reduce fruit cracking but also improve the proportion of marketable fruit, as well as enhance fruit firmness and postharvest quality. These effects have been observed under both open-field and protected cultivation conditions (Varaldo et al., 2023). New anti-cracking agents include silicon applied to the canopy and hydrophobic biofilms (such as palm oil-cellulose coatings). Under suitable conditions, their effects can match or even exceed those of calcium treatments, while also increasing soluble solids content and improving the stability of fruit–pedicel attachment (Rombolà et al., 2023).