



# Handle with care

Good post-harvest practices are critical to get top-quality fruit to the consumer and maintain the industry's reputation.

BY JOHN GOLDING

*NSW Department of Primary Industries*

**W**hile Australian cherry growers are some of the best in the world, the passage of this high-quality fruit from the tree, and through the packing house and supply chain to the consumer, is critical. Poor harvest practices, post-harvest handling, grading, packing and the supply chain itself can affect fruit quality and therefore grower returns and the industry's reputation. To avoid this situation, it is important to understand the effects of post-harvest handling and treatment on fruit quality and to manage these factors to maintain quality.

The NSW Department of Primary

Industries recently completed a Hort Innovation review of post-harvest practices for the Australian cherry industry. The review identified key pre-harvest and post-harvest management practices to consistently deliver high-quality fruit to the consumer.

Cherry fruit are still alive after harvest and their naturally high respiration rates make them perishable. Unlike some other fruit, cherries do not undergo further ripening (such as an increase in sugar levels) after harvest and fruit are picked at optimum quality. Therefore, post-harvest handling and technology can only reduce the decline in quality after harvest. Post-harvest technology cannot improve fruit quality. It is critical that only good-quality fruit are harvested and packed. If poor-quality fruit is harvested, it is important to cut the

risks and losses and not pack it.

Cherries are perishable and quality can quickly deteriorate after harvest. The major limitations in the storage and marketing of cherries are: the development of post-harvest rots; fruit softening; water loss; stem browning; and the development of post-harvest disorders such as pitting, bruising and pebbling. Cherries are relatively delicate and pitting and bruising damage can easily occur during handling and packing. These disorders are insidious as they do not immediately appear during handling but are expressed during storage in the supply chain.

## Pitting

Pitting is the most serious post-harvest problem and only develops during

storage. Pitting is characterised by irregular hardened pits in the fruit surface, predominantly on the shoulders after the fruit has been mechanically damaged. As well as detracting from the overall visual appearance of the fruit when on display, it increases the rate of respiration and is a site of decay development – so it also reduces shelf and market life.

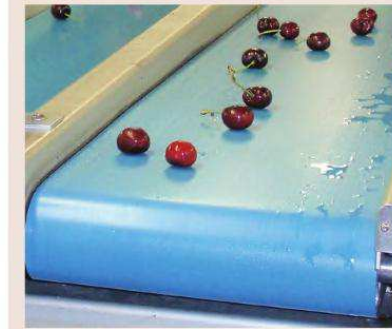
The review identified several major areas where fruit pitting occurs. The greatest damage is often caused by cluster cutters and shower-type hydrocoolers. The height of drop on to the sorting belt has also been identified as a critical point for mechanical damage.

The incidence and severity of pitting is difficult to predict as it has been shown to vary from year to year, between cultivars and even between trees of the same cultivar. However, the review identified cultivar, crop load and maturity differences which result in different pitting susceptibility.

In addition, it was shown that flesh temperature of the fruit at the time of injury is critically important, with fruit expressing more severe pitting at very low temperatures than at cool packing temperatures. It has been shown that the incidence of pitting doubles when fruit is handled during the packing process at 2°C instead of at 5°C. It is important that growers and packers continually manage their packing operations to prevent pitting and other storage disorders.

## Temperature

The most important factor affecting storage and market life of cherries is temperature. The maintenance of the cold chain is critical to deliver high-quality cherries. The cold chain should be established as soon as possible after harvest to remove field heat from the fruit in the orchard, especially in hot weather and for warm fruit picked late



**Above** Major problem areas in the packing line: large fruit drops (top) and cluster cutters (above) responsible for pitting damage.



**Above** Surface pitting produced by mechanical damage where the symptoms differ due to the origin of the damage during harvest and packing.

PHOTOS: DR JUAN PABLO ZOFFOLI

in the day. The elimination of the field heat should be conducted as soon as possible; delays in cooling have been shown to reduce storage quality. After packing, the maximum post-harvest life of cherries is achieved with storage temperatures at 0°C. Storing fruit at higher temperatures increases respiration rates and leads to stem dehydration and accelerated fruit softening. While the cool chain can be directly managed on-farm and in the cool room, it is essential to work with the entire supply chain, including trucking companies and retailers, to maintain the cool chain and fruit quality through to the consumer.

## Packaging

Packaging is an increasingly important part of marketing and product differentiation. High-quality packaging of premium fruit can justify premium returns to the grower and packer. As production and handling costs rise, improved packaging and marketing can help achieve increased returns to growers. Different packaging

types and systems are required for different markets. It is important to match market requirements with optimising fruit quality and shelf life. The review identified numerous innovations and developments in post-harvest technologies and packaging, but the ultimate use of any packaging provides optimum performance at the lowest economic and environmental cost.

The future profitability of the Australian cherry industry will depend on the application of international best practice for the post-harvest management of cherries both for the domestic and export markets. While temperature management and correct handling to reduce storage problems such as pitting are essential to good post-harvest practices, continual improvement in post-harvest practices is also essential to improve quality and out-turn. ◀

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