

BEST PRACTICE GUIDELINE FOR

APPLE BRUISING MANAGEMENT

(with a special focus on 'Cripps Pink' apples)



Prevent impacts, compression, rubbing and repeated vibration throughout the value chain.

This is the most reliable strategy for reducing bruising.

1 PURPOSE AND KEY MESSAGE

Provide practical measures to reduce mechanical bruising of apples threughout the postharvest chain.

KEY MESSAGE



- Bruising is a multifactorial, system-level problem.
- The outcome depends on the mechanical event, fruit properties, packaging, transport, storage history and previous impacts.
- Use literature-informed best practice principles – they are cultivar-, season-, impact- and equipment-specific and not universal limits.

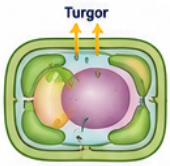
2 WHAT IS AN APPLE BRUISE?



- Caused by impact, compression, rubbing or repeated vibration.
- Involves cell deformation, cell rupture and disruption of tissue structure.
- Often results in internal browning that is not always visible on the outside.
- Bruising reduces appearance, market value and shelf life, and can make fruit unsuitable for export.

3 FRUIT TURGOR, WATER STATUS AND TEMPERATURE

Fruit turgor: why it may matter



Turgor is the pressure of water inside cells. Higher turgor can increase tissue stiffness and may make fruit more susceptible to bruising. This is a plausible mechanism, but not proof under commercial conditions.

Plant water status: the practical interpretation



Tree water status can influence fruit water status and turgor, but the relationship between irrigation, fruit turgor and bruising has not been directly established for 'Cripps Pink'.

Fruit temperature: manage risk do not rely on warming



Studies show conflicting temperature effects. Do not rely on warming fruit to reduce bruising. Focus on gentle handling and minimising impacts throughout the chain.

4 ORCHARD MANAGEMENT

Irrigation management (before harvest)



- Heavy soils: stop irrigation 3–4 days before harvest.
- Sandy soils: stop irrigation 2 days before harvest.
- For large orchards (>2 days harvest), consider a short irrigation to wet the top 30 cm of soil, especially before a weekend or heatwave.

Rainfall management



- If >10 mm of rain falls, wait 24 hours before harvesting.
- If ≥20 mm of rain falls, wait 48 hours before harvesting.
- Cold, cloudy weather after rain results in lower evaporation. Warm, windy weather promotes faster soil drying.

Thinning and crop load



- Good hand-thinning and proper fruit spacing are essential.
- Excessive crop loads make it difficult for fruit to develop colour and increase the need for multiple pickings, which increases damage.

Tree and canopy management



- Summer pruning, partial leaf removal and reflective materials improve colour and reduce the need for multiple pickings.
- Do not overload the tips of soft branches.
- Protective nets can reduce wind damage.

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5 HARVESTING AND FIELD HANDLING

Harvest timing



- For 'Cripps Pink', do not harvest until the trees are dry.
- Cold mornings are often wet mornings. Trees are usually dry by 09:30.
- This allows fruit stomata time for evapotranspiration.

Picking technique



- Pick carefully and avoid dropping fruit.
- Use well-designed picking bags and keep them in good condition.
- Let picking teams first collect fallen fruit and clear the orchard floor.

Field bins



- Use clean, padded, well-maintained bins.
- Avoid overfilling.
- Minimise drop heights.
- Train and supervise picking and bin-handling crews.

Bin trailers and orchard roads



- Keep bin trailers in good condition and level.
- If bins are leaning when lifted, they can twist, causing excessive fruit movement and pressure.
- Repair and level orchard roads to reduce jolting.

6 PACKHOUSE HANDLING

Receiving, tipping and conveyors



- Minimise all drop heights and transfer points.
- Use soft surfaces, padding and gentle sorting settings.
- Avoid compression from guides, brushes and narrow gates.
- Regularly maintain and calibrate equipment.
- Train staff and monitor handling practices.

Packaging and palletising



- Use packaging that absorbs energy and limits fruit movement.
- Ensure correct fit between fruit size and carton.
- Stack pallets correctly and avoid over-compression.
- Use trained operators and handle pallets carefully.
- Secure loads for transport.

7 TRANSPORT, STORAGE AND DISTRIBUTION

Vehicle and load management



- Use vehicles with good suspension and suitable temperature control.
- Minimise driving speed and harsh braking/acceleration.
- Avoid over-stacking and compression.
- Secure loads to prevent movement.

Temperature management



- Maintain appropriate temperature regimes for quality.
- Minimise temperature fluctuations during transport and storage.

Road conditions



- Repair and maintain orchard and transport routes.
- Uneven roads increase vibration and the risk of bruising.

8 QUALITY CONTROL AND MONITORING

Assess and monitor



- Regularly assess fruit for external and internal bruising.
- Use data loggers in crates and on pallets to identify problem areas.
- When adjusting a process (e.g. driving speed), loggers can quickly show whether the change had an impact.

Continuous improvement



- Audit your system with a consultant e.g. Henco Smit (Primadefensio).
- Use logger data to make quick, significant improvements.
- Review and refine protocols each season.

9 IMPORTANT CONSIDERATIONS

- Current evidence does not establish a simple, cultivar-specific rule for irrigation, fruit turgor or fruit temperature for 'Cripps Pink'.
- Treat these factors as risk indicators to monitor, not as reasons to relax handling standards.
- Focus on gentle handling and minimising impacts at every stage of the value chain.

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