



Agriculture et
Agroalimentaire Canada

Agriculture and
Agri-Food Canada



Field to Packer: Postharvest Methods for Fruit Quality

P.M.A. Toivonen

AAFC, Pacific Agri-Food Research Centre, Summerland, BC.

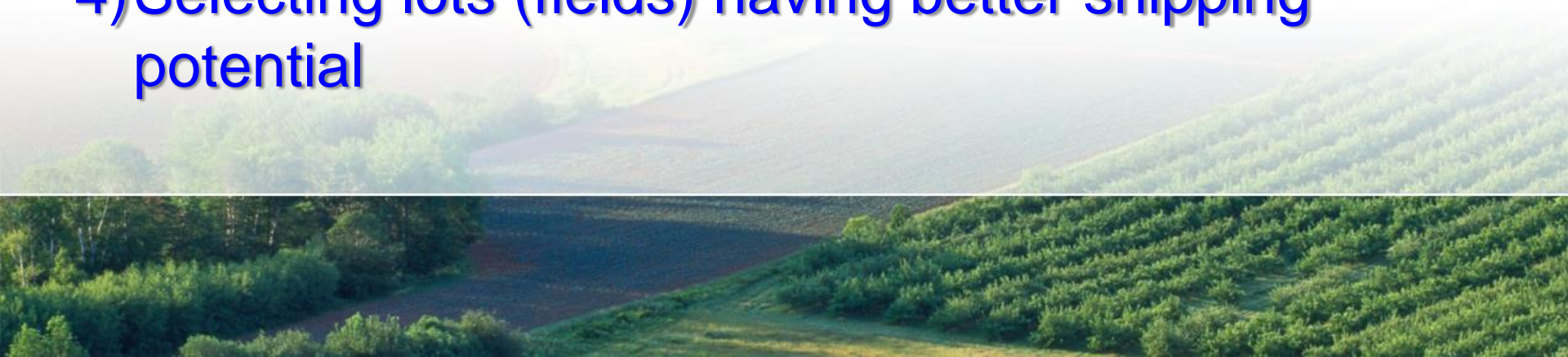
Lower Mainland Horticultural
Improvement Association

Agriculture and Agri-Food Canada's
Matching Investment Initiative

Canada 

Quality at the packing house depends on:

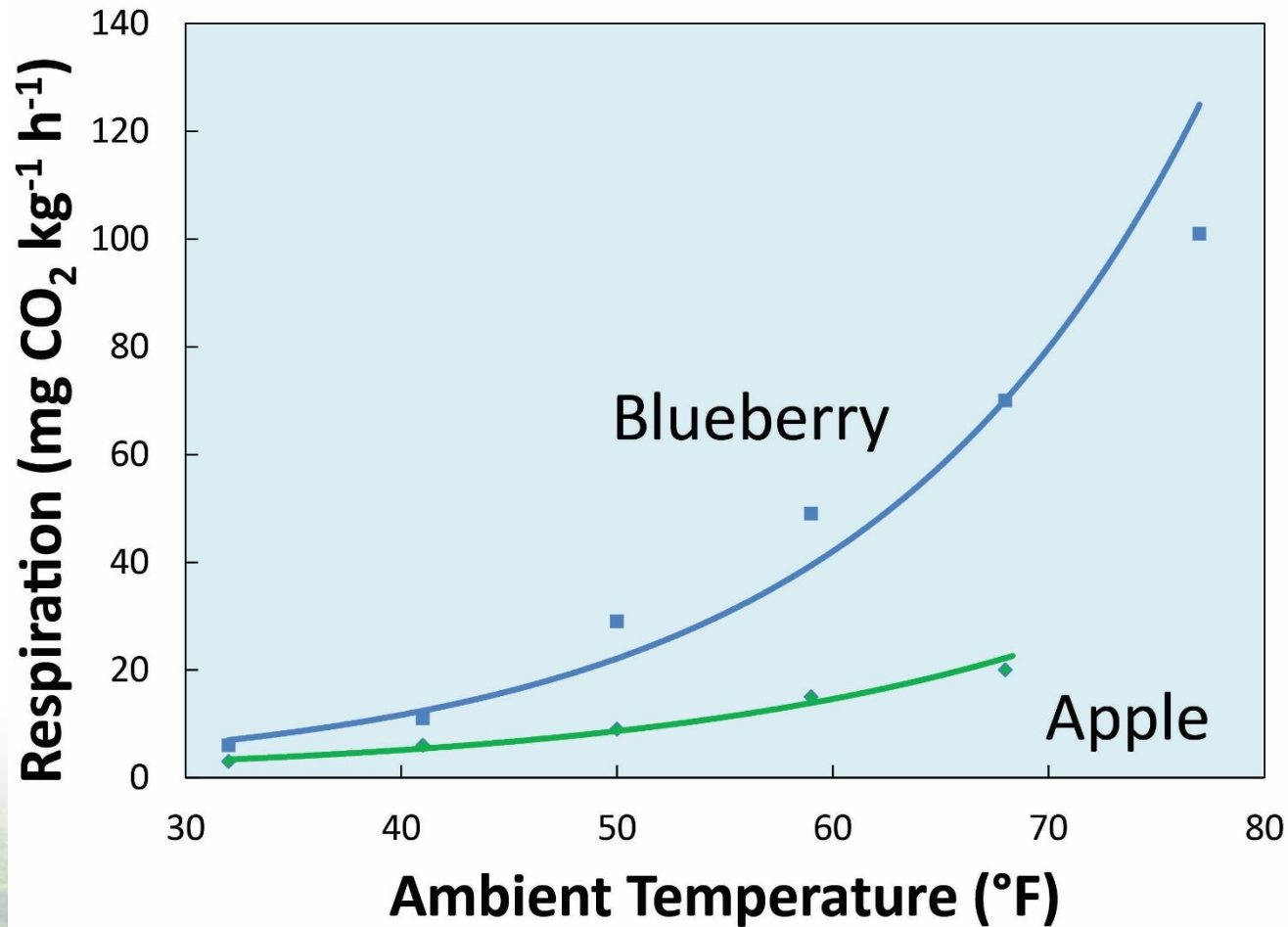
- 1) Good production practices – optimize the quality of the fruit
- 2) Good harvest practices – minimize handling injury to the fruit
- 3) Prevention of solarization and rapid transit to the packing house
- 4) Selecting lots (fields) having better shipping potential



Blueberry country – similar to the Okanagan
– hot dry weather during harvest



Temperature - Challenge for blueberry much greater than for apple



At harvest – need to have strategies to ‘buy’ time

- Need to have a good logistics plan together before harvest – otherwise no time to think during season
- Reflective tarps have been the most practical approach in BC



Reflective tarp covers – to prevent exposure to sunlight (solarization)



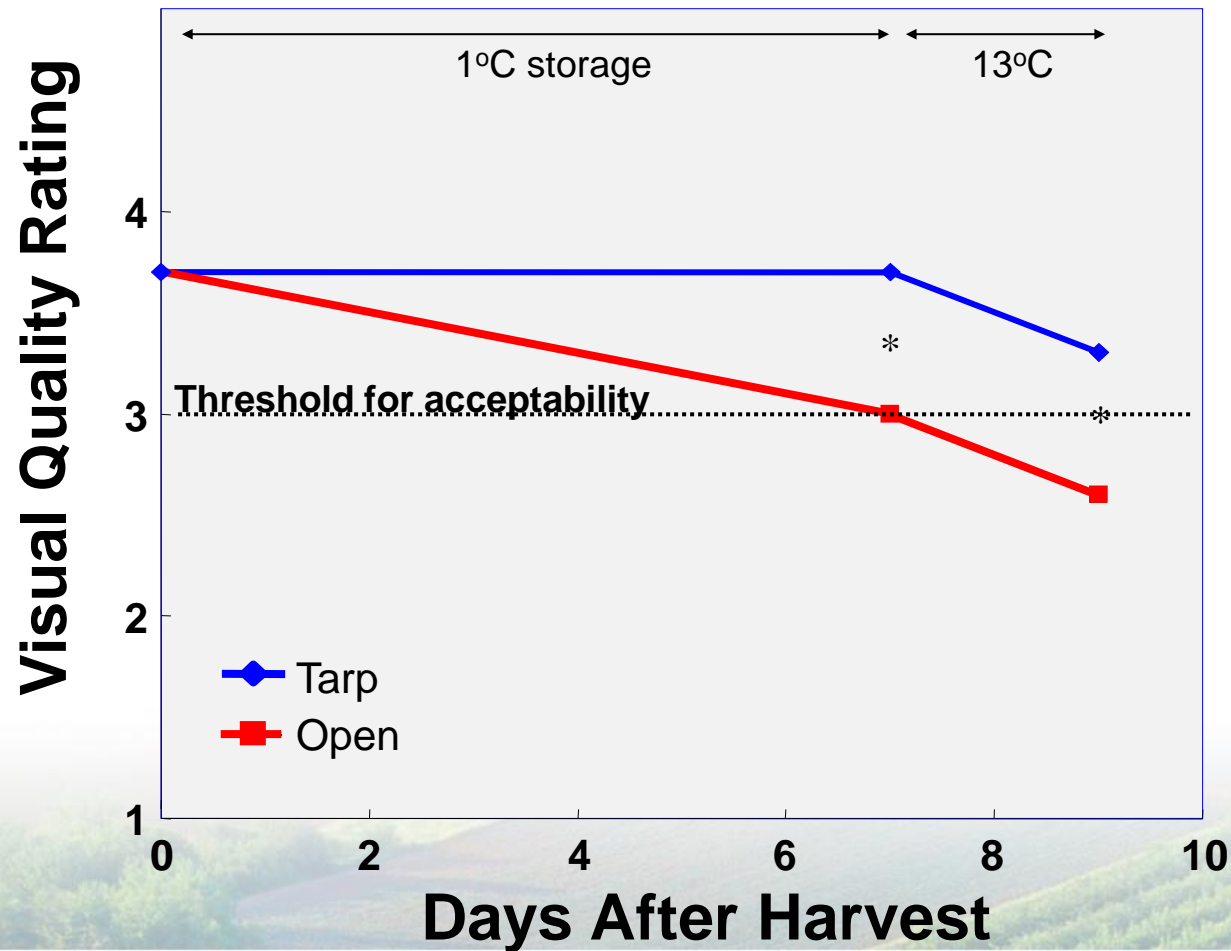
http://www.bushpro.ca/index.php?page_id=1004



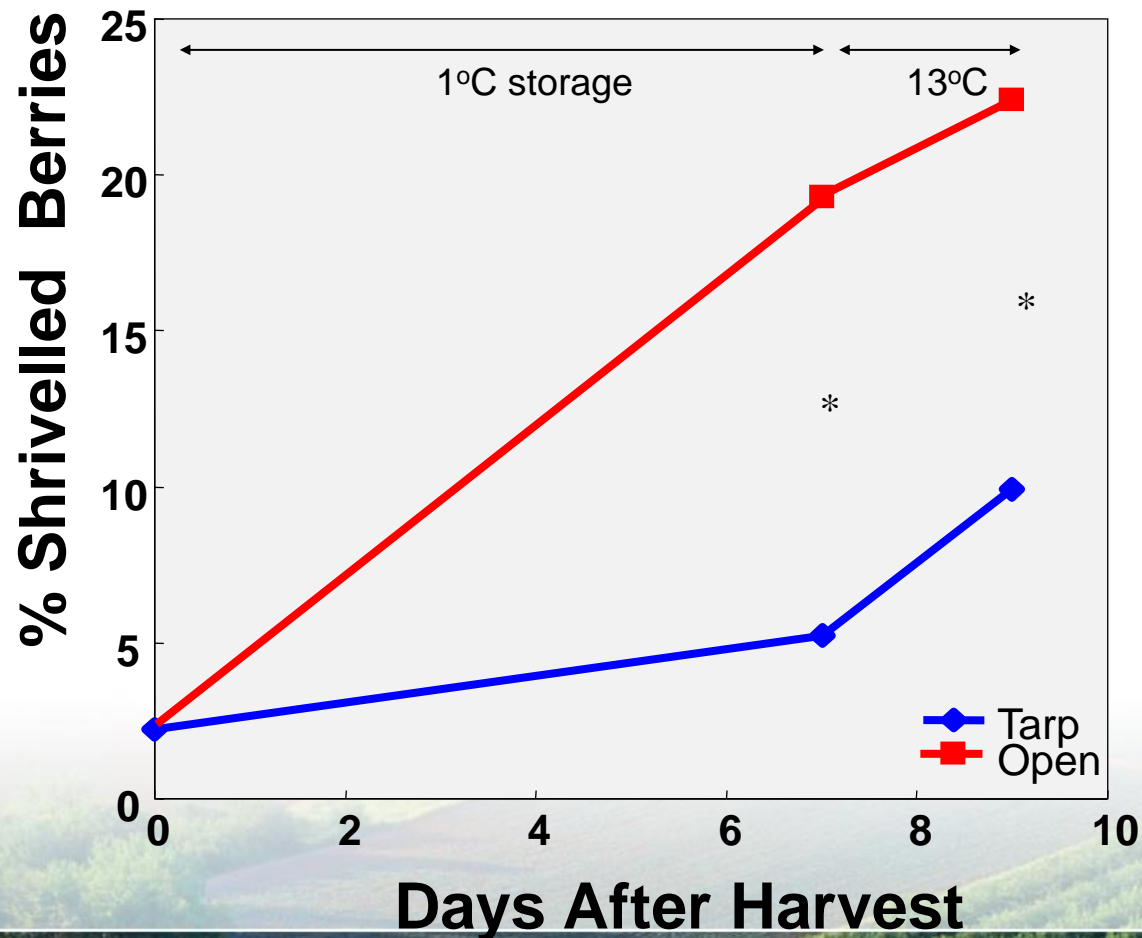
Reflective tarp covers – can be fabricated to your needs



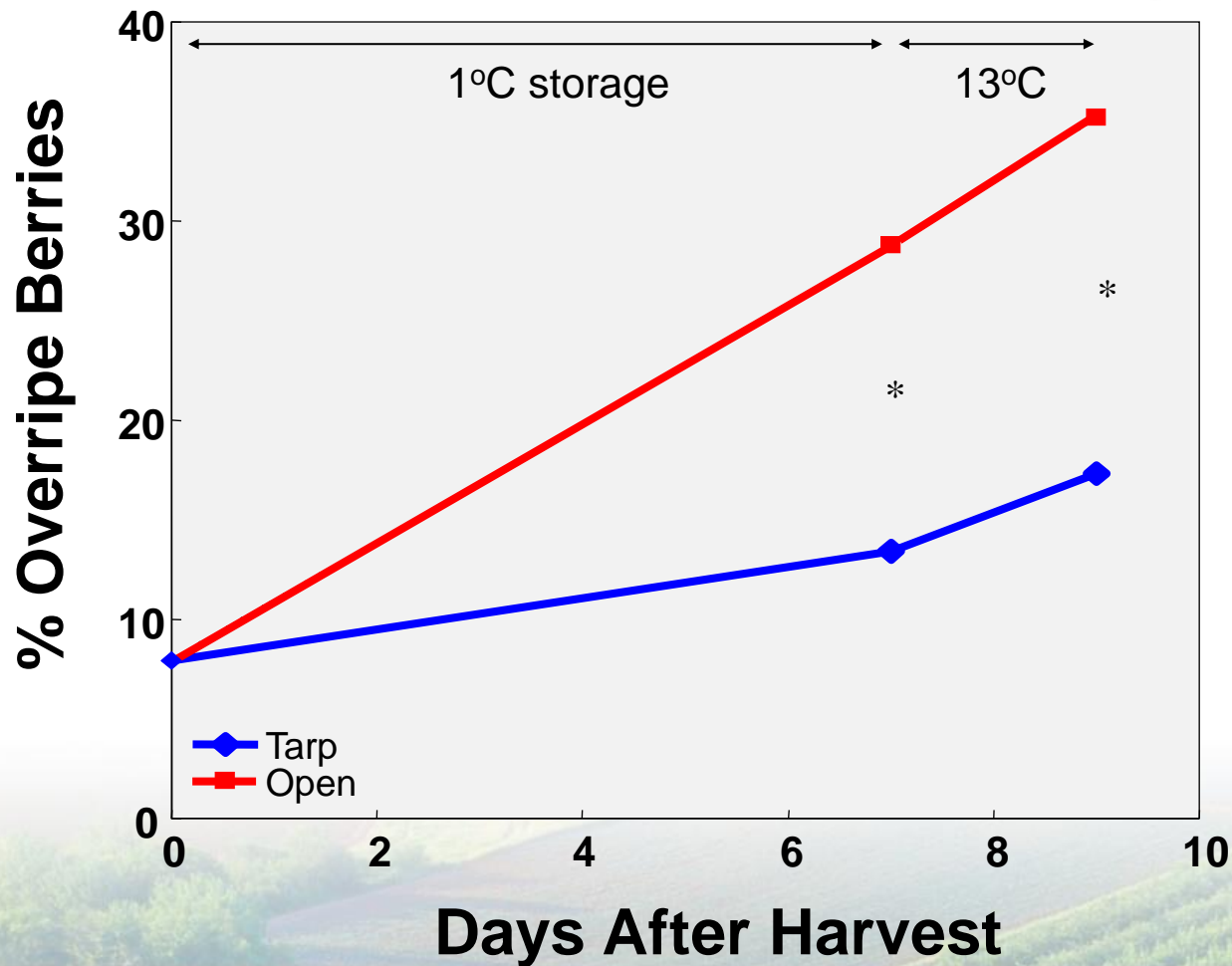
Response to using reflective tarp until blueberries delivered to packing house



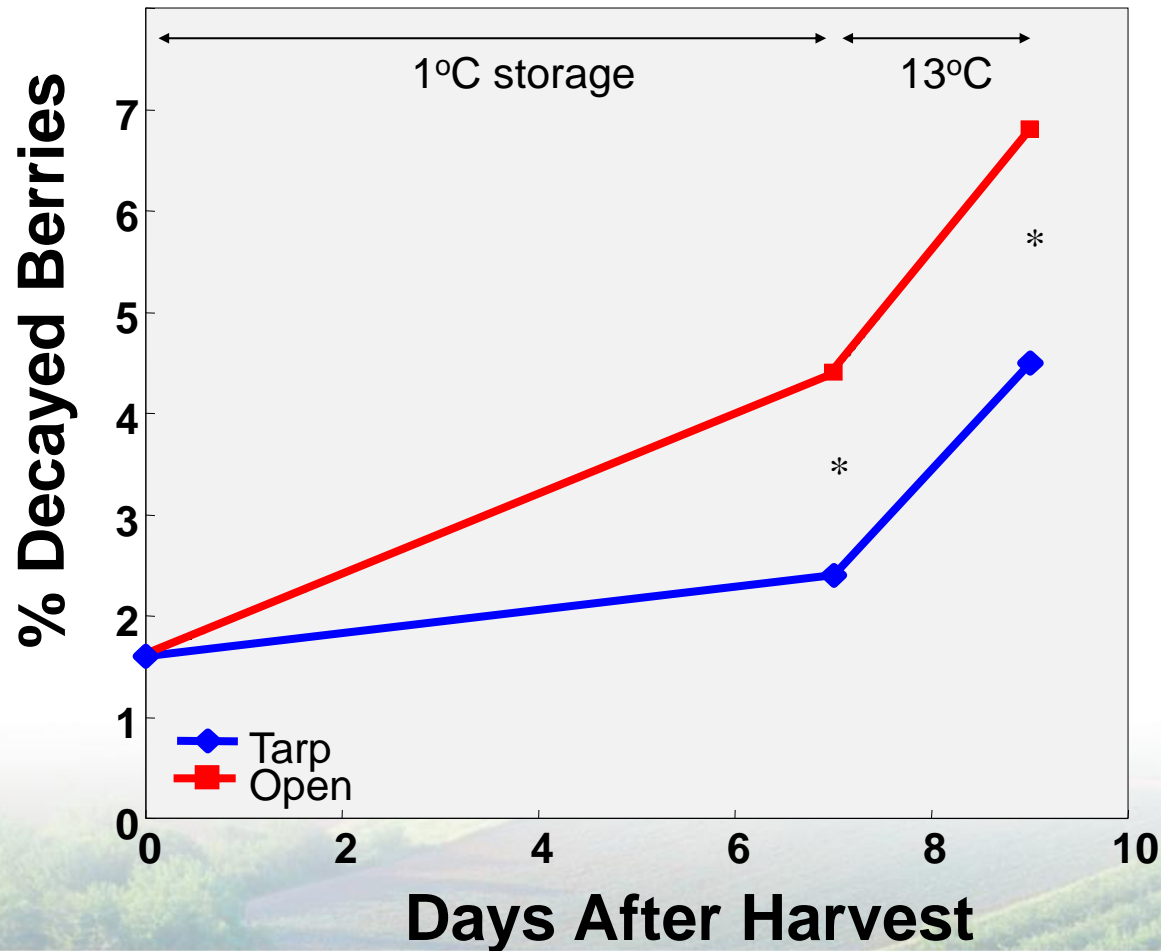
Response to using reflective tarp until blueberries delivered to packing house



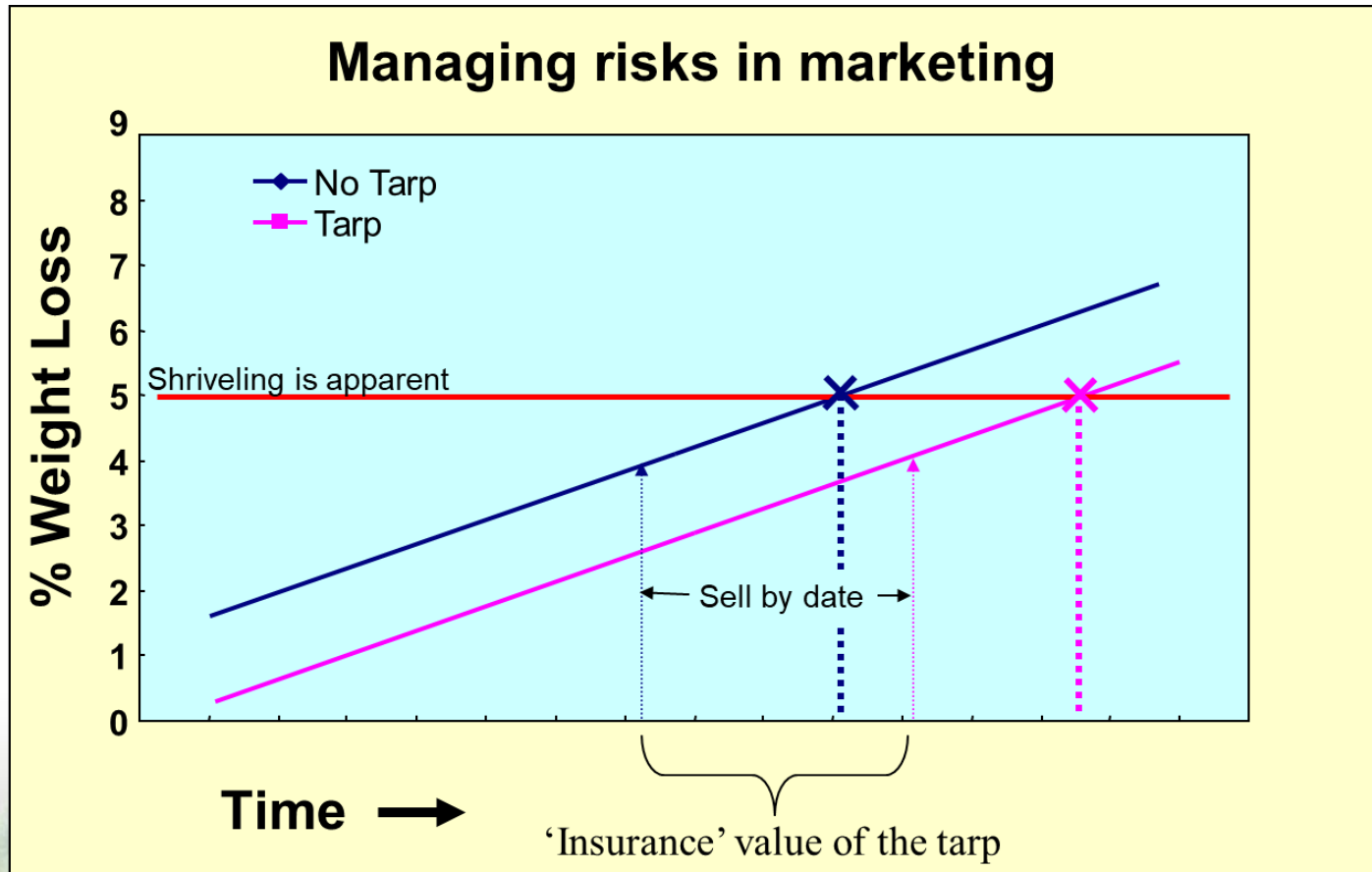
Response to using reflective tarp until blueberries delivered to packing house



Response to using reflective tarp until blueberries delivered to packing house



Another way at looking at the benefit of the reflective tarp in marketing



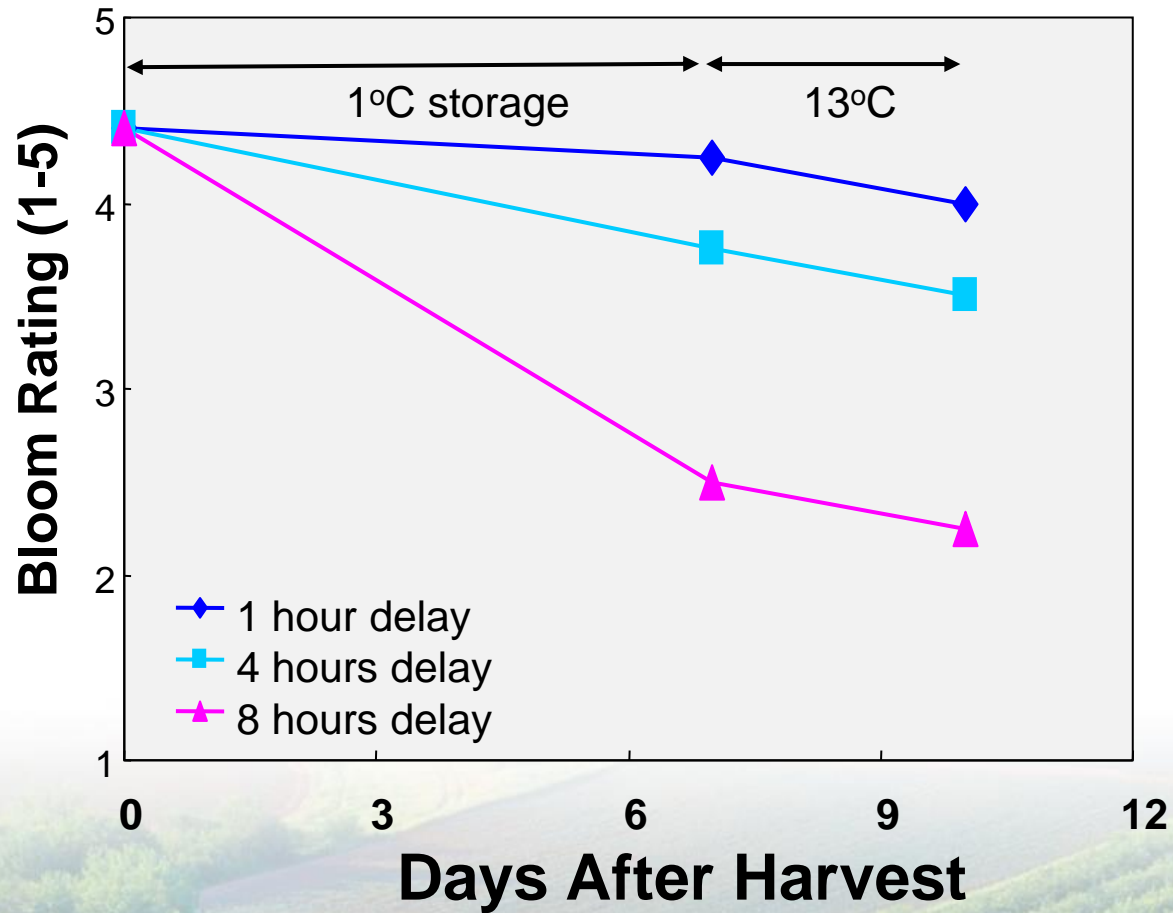
**If you don't use the reflective
tarp – problems with quality
outcomes**



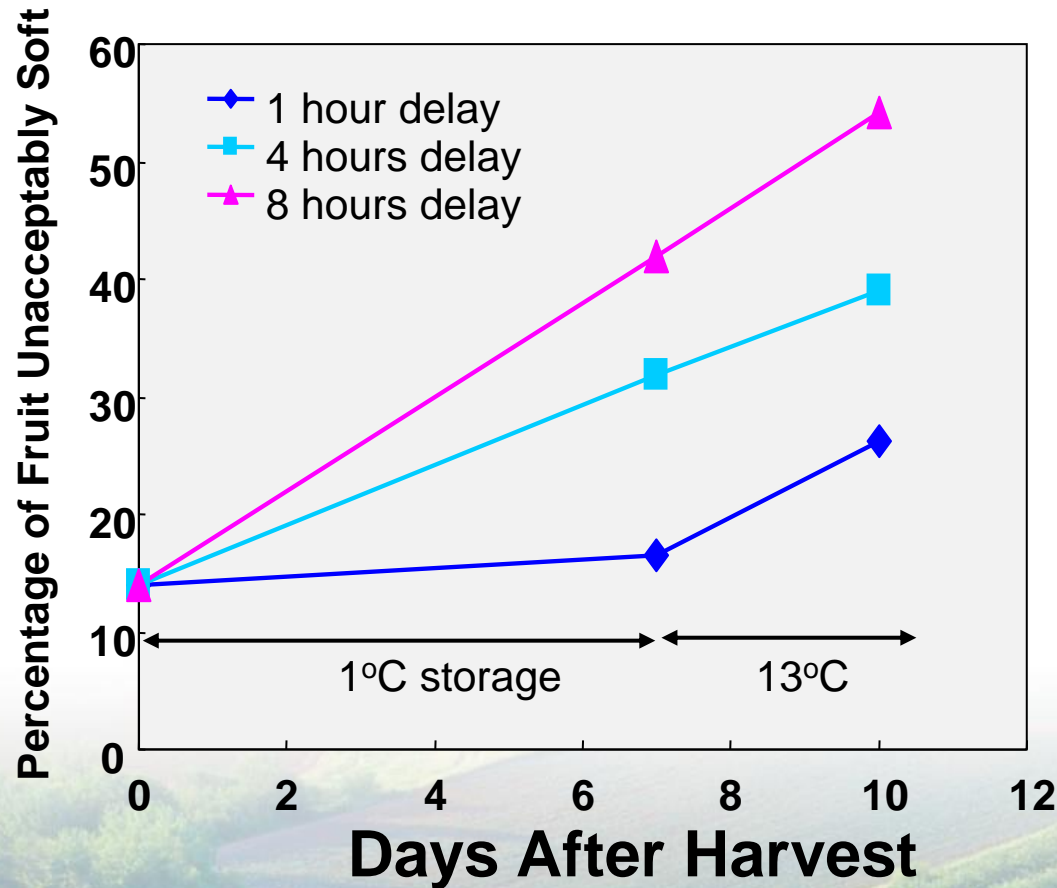
Visual quality at the time of receiving at the packing house doesn't reflect the quality at market! – Why?



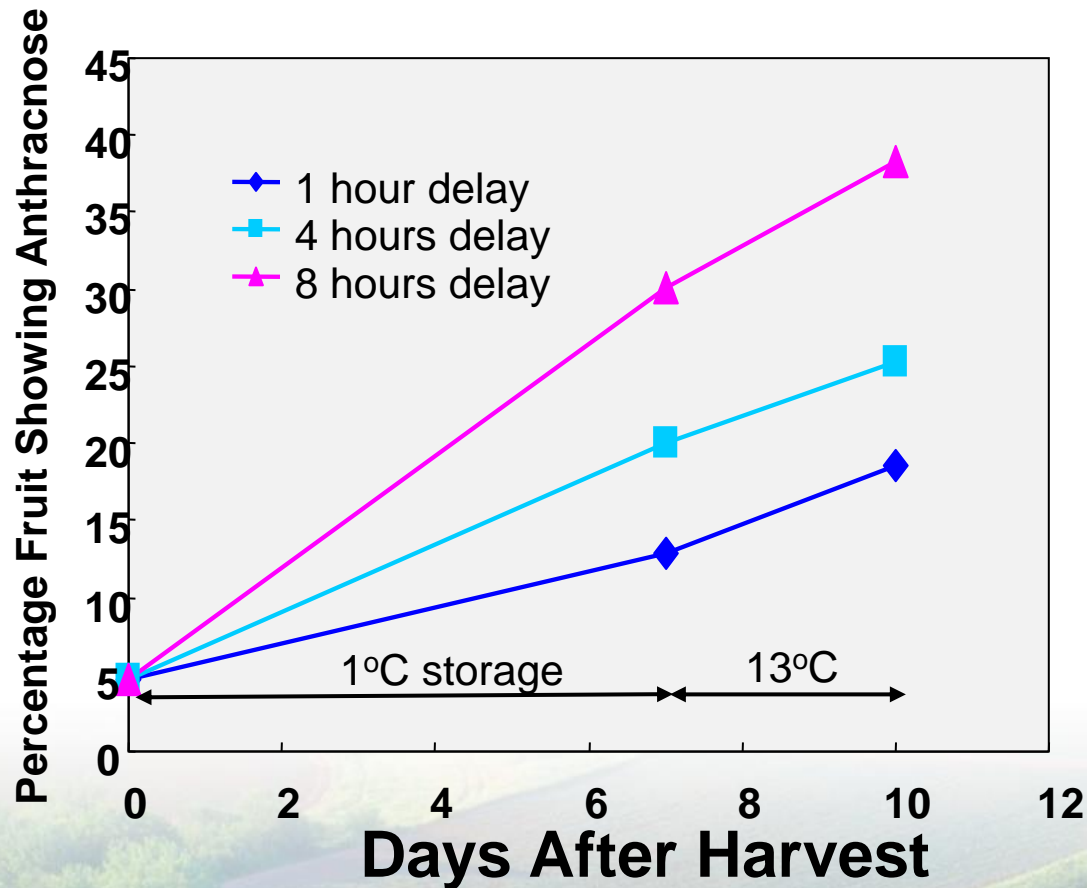
Effect of delays to cooling to 0.5 °C



Effect of delays to cooling to 0.5 °C



Effect of delays to cooling to 0.5 °C



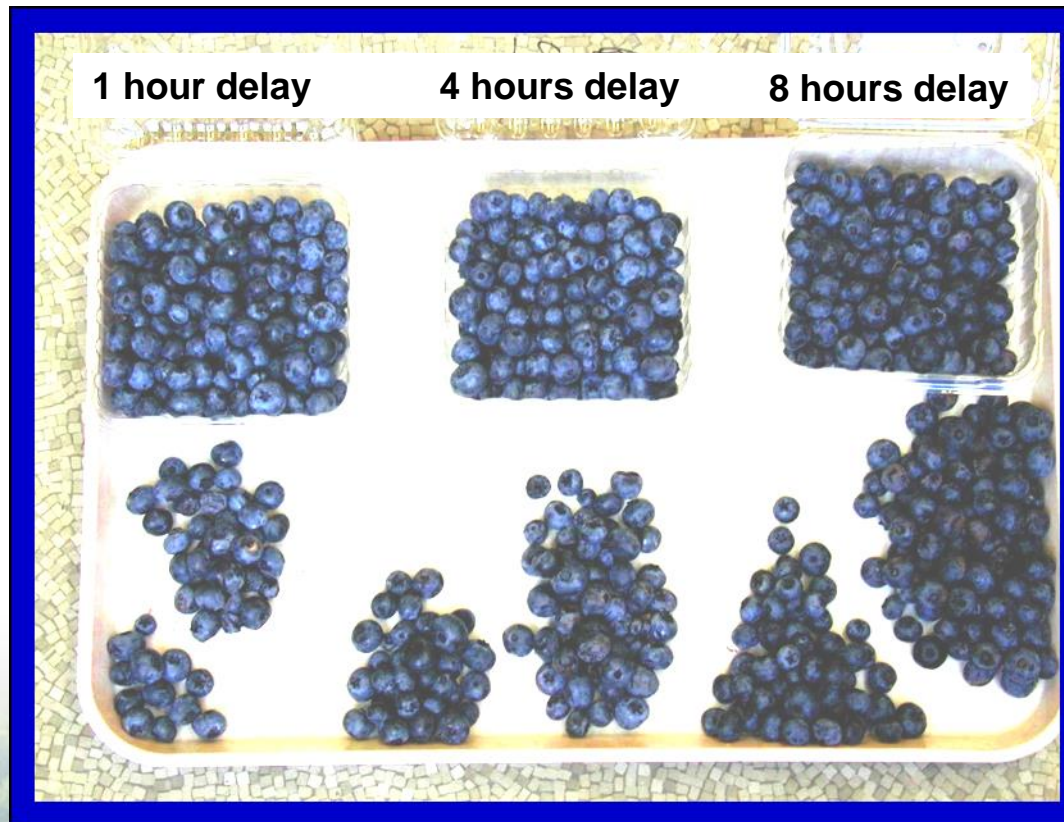
Visual evaluation of delays in cooling



Visual evaluation of delays in cooling – cull fruit removed

Sound Fruit

Cull Fruit



Bruising is the second biggest problem for quality at the market.

Visually, there may be no problem at the packing house.

Bruise injury becomes apparent after some time, usually at the buyer or consumer

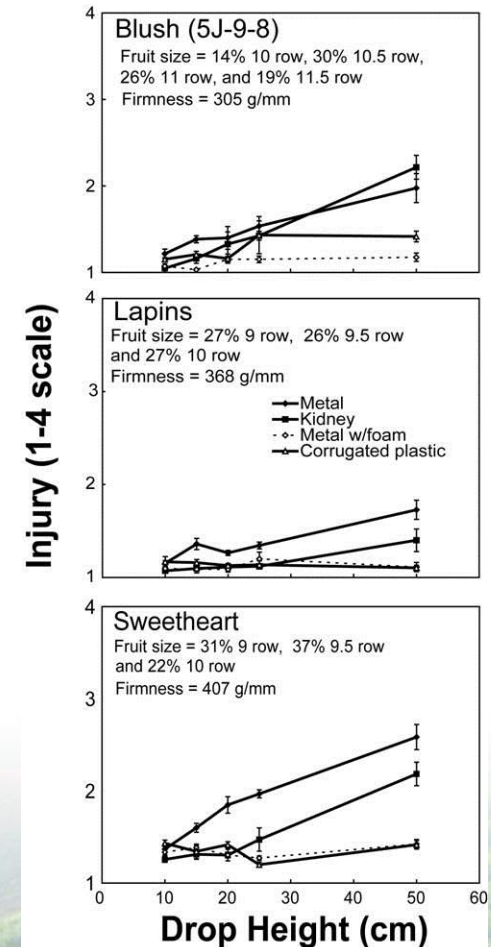


Assessing drop heights and bruising – simple apparatus



Fruit drops a leading cause of pick associated pits and bruises.

Different varieties have differing susceptibility to bruising injuries!



Every Transfer Causes Bruising – fewer transfers, fewer bruises



Bruising Facts

Every transfer leads to new bruising injury in the field

Impact bruising increases when temperatures are cooler (i.e. below 5-7 °C)

Impact bruising increases with drop height

Impact bruising can be reduced if pick containers and/or flats/totes are designed to be “soft”

Compression bruising increases when temperatures are warmer (i.e. in the field, transport to the packing house, etc.)

Compression bruising effects often are very delayed and often seen as “soft” berries during packing and sorting



Production factors affecting bruising (sweet cherries)

**Canopy management – cherries from shaded canopies
are more susceptible**

**Excessive nitrogen application relative to calcium affects
susceptibility**

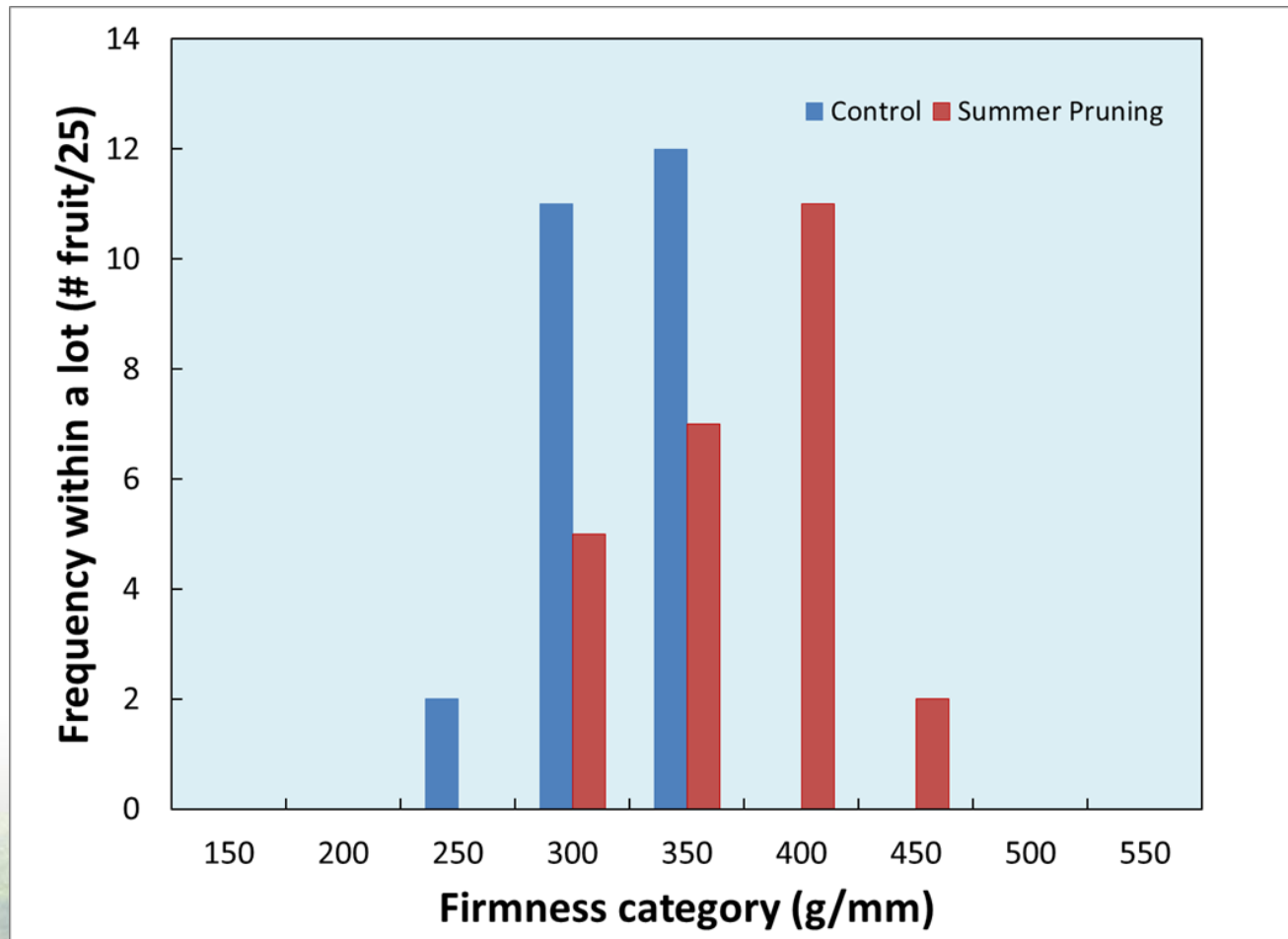
**Heavy crops – due to mechanical injury on the tree
(wind-related)
- due to greater picking-related injuries**

Harvest maturity affects susceptibility

Some varieties are more susceptible to bruising



Canopy management effects on fruit firmness at harvest



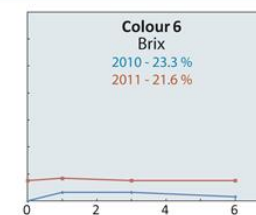
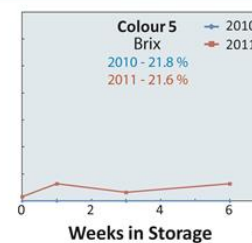
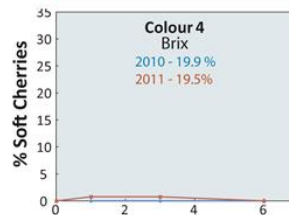
Consequences of poor canopy management in cherries?

Poor consistency in market quality due to soft fruit.



Grower 3

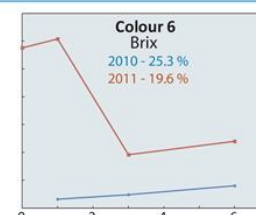
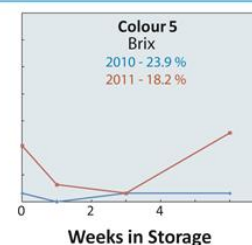
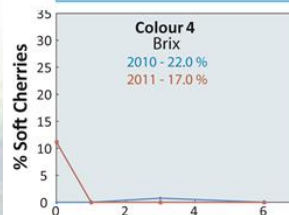
Good Canopy Management



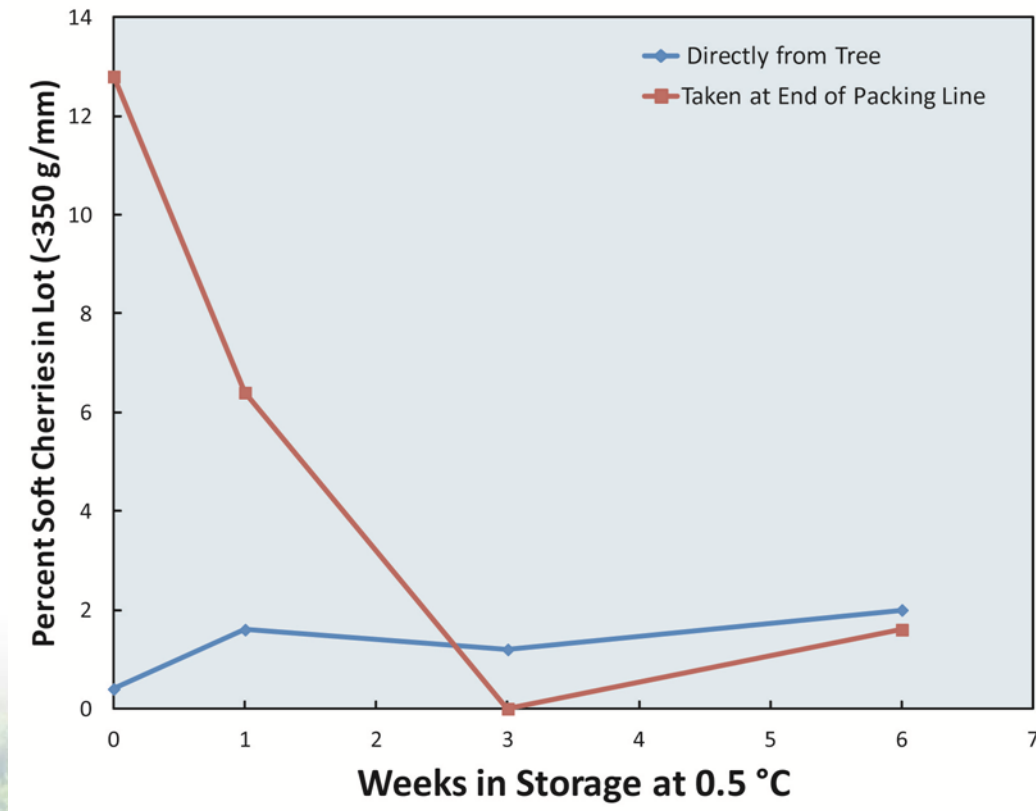
19.9 21.78 23.3

Grower 1

Poor Canopy Management



Compression injury at picking and transport to the packing house leads to soft cherries at the time of packing!



How to avoid compression injury

Don't have bins/totes where fruit is too deep – keep 12 inches or shallower depth

Ensure that pickers do not excessively “squeeze” the fruit during harvest (picker training)

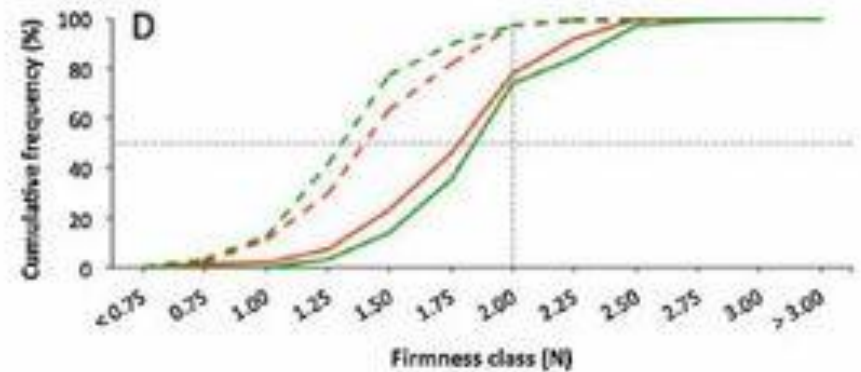
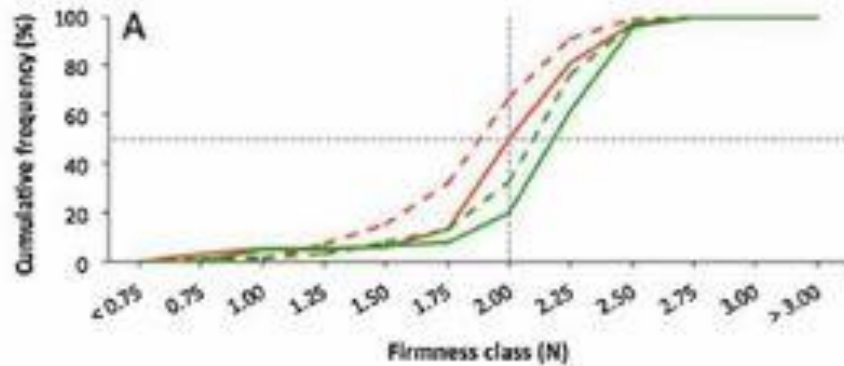
If the lane way in the field is rough and/or has ruts – fill in and make the laneway smooth – every bump causes compression bruises

Use rigid containers that will not be easily deformed when handling the fruit

Fruit from second and third picks may have suffered compression injury from prior harvests – softer fruit (picker training)



Second pick blueberries can be softer – is it the fruit itself or the previous handling?



From: Lobos, G.A. et al. 2018. Within-plant variability in blueberry: maturity at harvest and position within the canopy influence fruit firmness and postharvest. *Postharvest Biology and Technology* 146: 26-35.

Take home messages

- Protect blueberries from sun and low humidity after picking – reflective tarps
- Reduce need for transfers as much as possible
- **BE GENTLE** during picking and at transfers
- Do not “squeeze” the blueberries
- Get to the packing shed ASAP





Agriculture et
Agroalimentaire Canada

Agriculture and
Agri-Food Canada



Thank you for your attention !

Lower Mainland Horticultural
Improvement Association

Agriculture and Agri-Food Canada's
Matching Investment Initiative

Canada 