

Honeycrisp Storage

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Focus of presentation

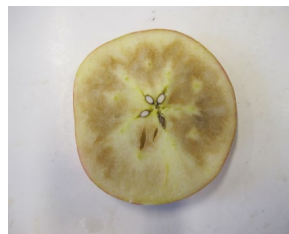
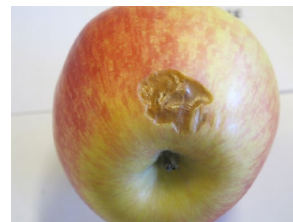
1. Physiological disorders and interaction with PGRs
 - focus on major disorders
2. Storage recommendations



- Bitter pit
- Soft scald
- Soggy breakdown



- Skin wrinkling
- Leather blotch
- Senescent bkdn



- Internal CO₂ injury
- Low O₂ injury



Bitter pit



- **Associated** with mineral contents
- Early harvest
- Std management techniques
 - routine Ca spays, reducing tree vigor, managing fruit/vegetative balance

Bitter pit (%)

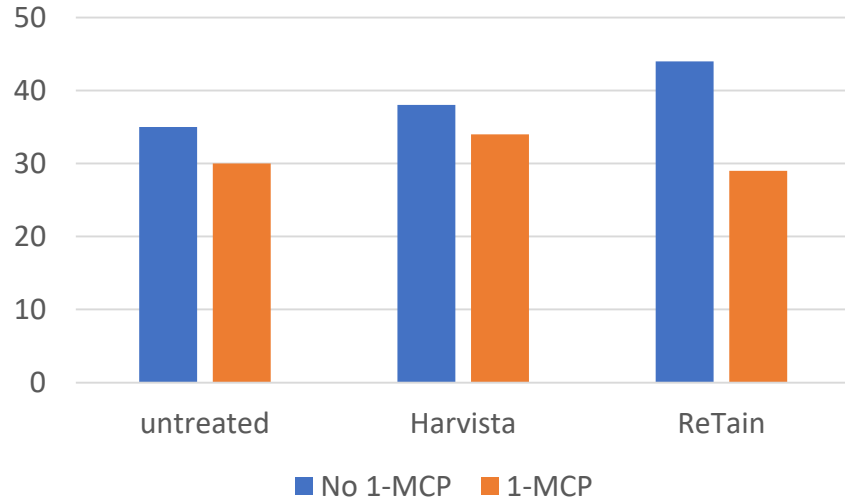
Western NY trial (2010)

- Untreated
- Harvista – 1 week before harvest
- ReTain – half rate 2 weeks before harvest

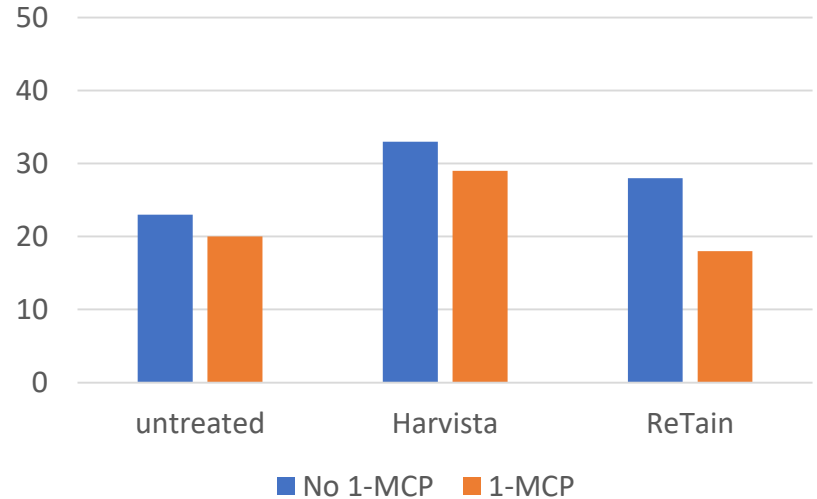
Air storage at 38F after conditioning; 6 months

Bitter pit (%)

Harvest 1



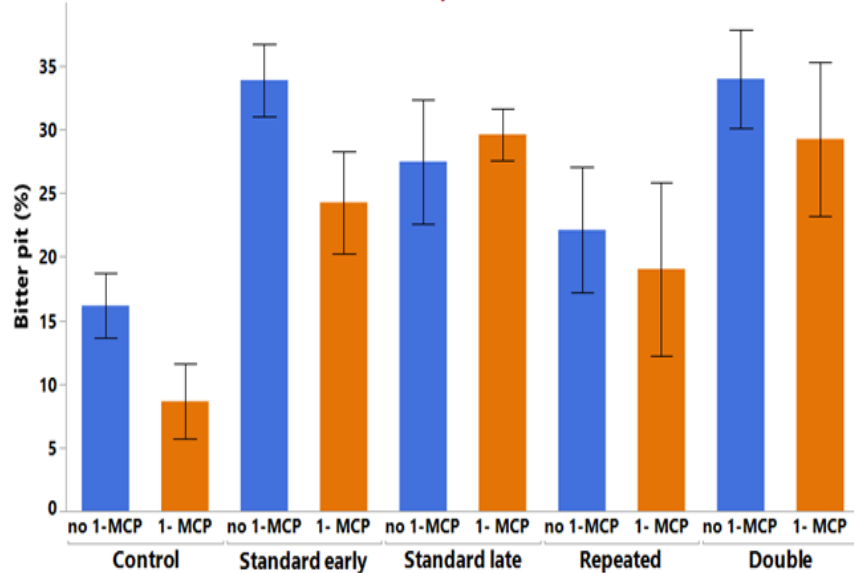
Harvest 2



Bitter pit (%)



Bitter pit- 38°F



Comprehensive Harvista trials in 2018

- Harvista increases incidence of bitter pit
- 1-MCP usually decreases it slightly

Effects of PGRs and postharvest 1-MCP are consistent with understanding of bitter pit

- Harvista and ReTain slow maturation and maintain susceptibility.
- Postharvest 1-MCP slows metabolism.

Leather blotch

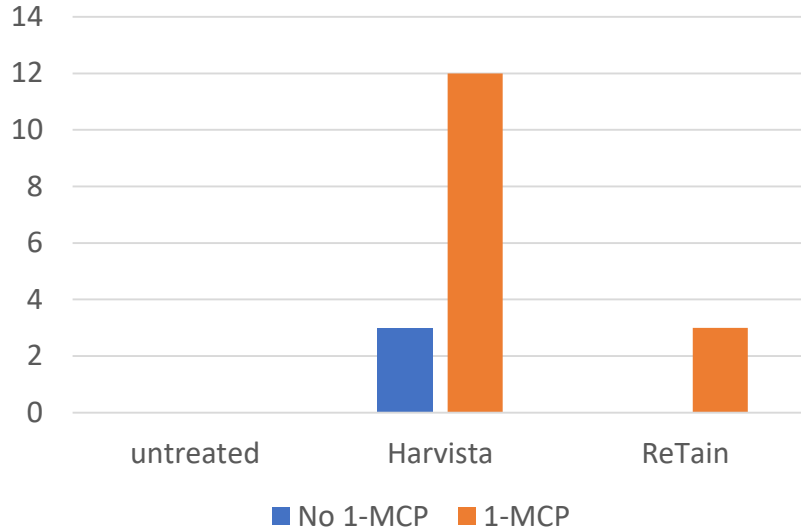


Increasing incidence

Sometimes associated with fruit with bitter pit

Associated with 1-MCP but can occur without 1-MCP

Leather blotch (%)

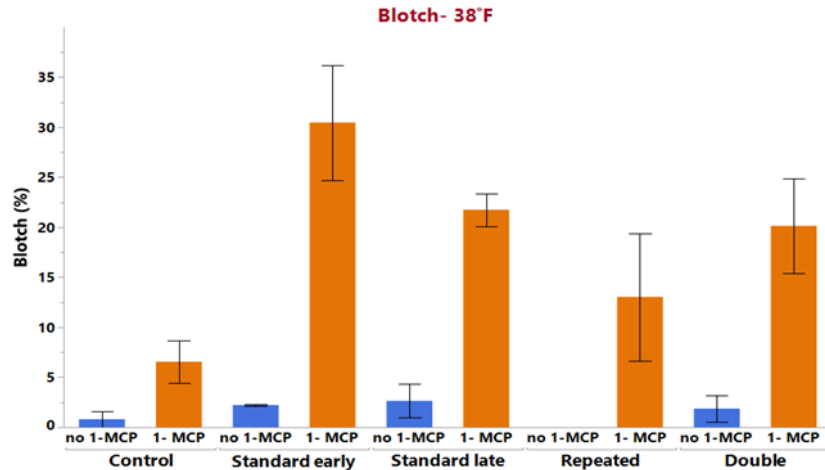


Western NY trial (2010)

- Untreated
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Air storage at 38F after conditioning; 6 months

Leather blotch (%)



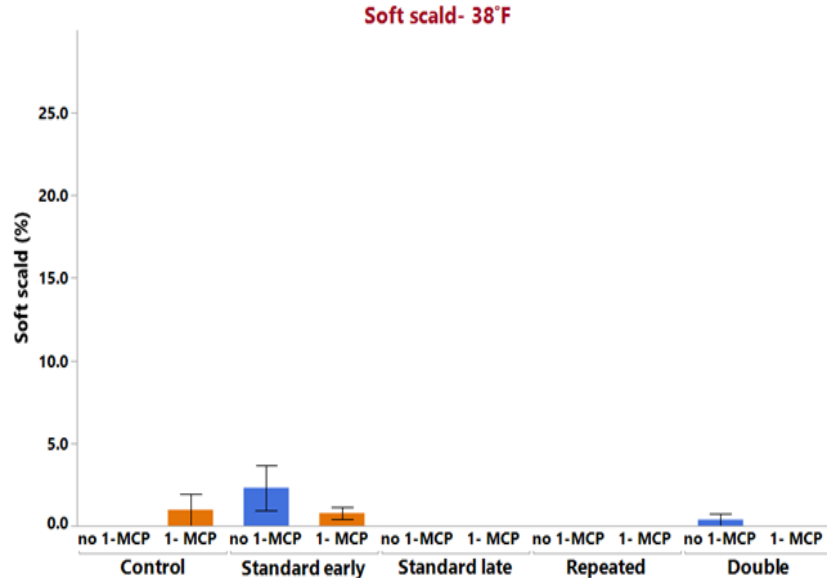
Comprehensive Harvista trials in 2018

- Effects of Harvista small and inconsistent
- 1-MCP aggravates in control fruit but to a much greater extent in Harvista treated fruit

Soft scald and soggy breakdown

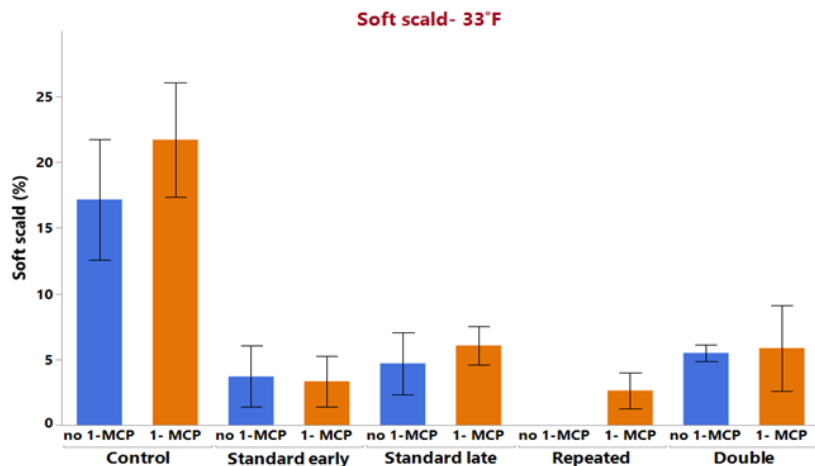


Soft scald (%) at 38F



- Negligible incidence in our PGR trials

But different story at 33F



- Soft scald is greatly decreased by Harvista
- Effects of postharvest 1-MCP inconsistent

AIR STORAGE RECOMMENDATIONS



Standard recommendation

Condition at 50F for 7 days and then store at 38F to reduce low temperature injuries.

Trt	Soggy bkdn (%)	Soft scald (%)
33°F	18a	62a
38°F	1b	9cd
Cond. 33°F	2b	14c
Cond. 38°F	0b	2d

Other factors?

Agnostic about 1-MCP, although does help maintains acidity.

Possible modification of recommendations based on research on prediction

CA STORAGE RECOMMENDATIONS

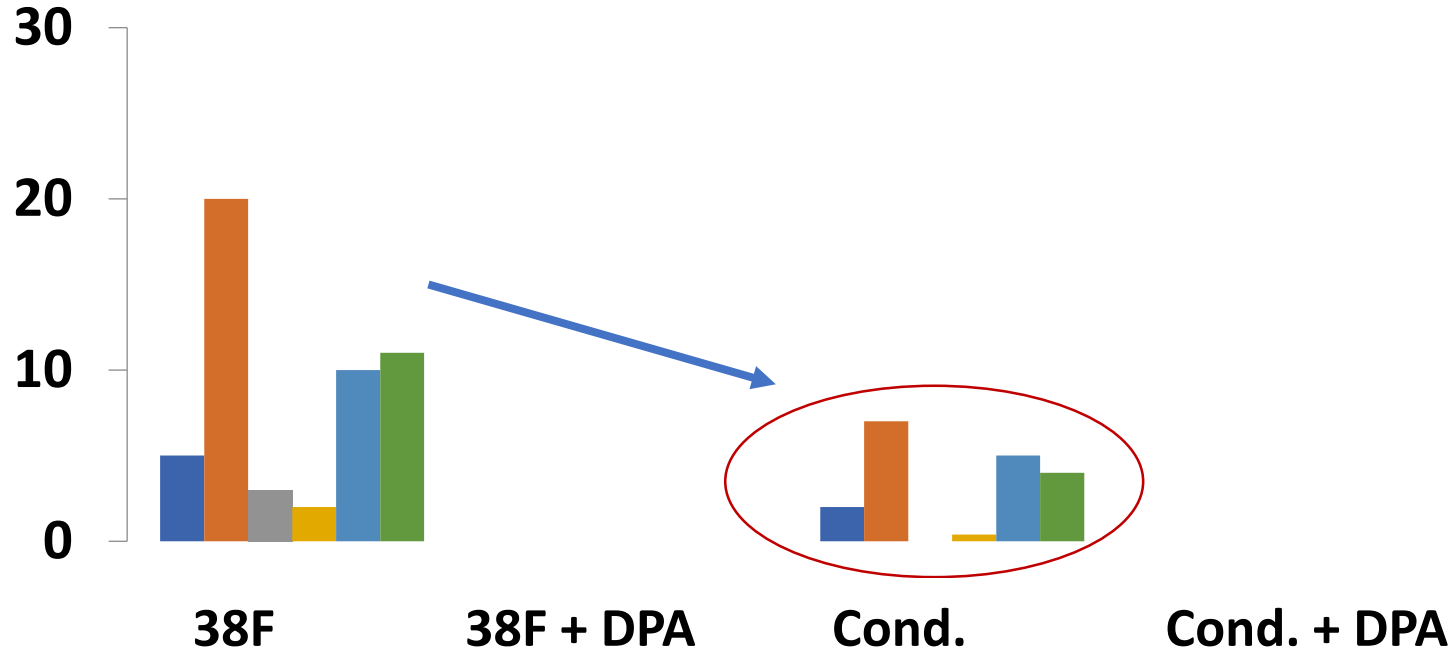


Carbon dioxide injury

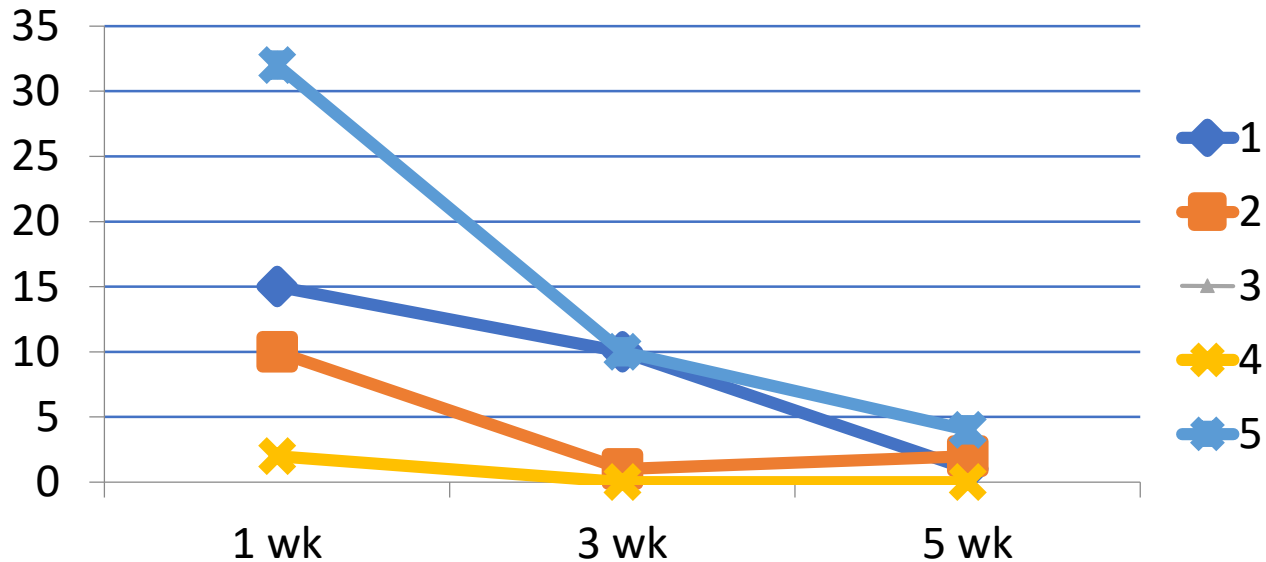


- Highly sensitive to carbon dioxide injury
- Like all carbon dioxide injury, fruit sensitivity decreases with delayed CA or DPA treatment
- Increased by PGRs
- Sometimes increased by 1-MCP

CO₂ injury (%)

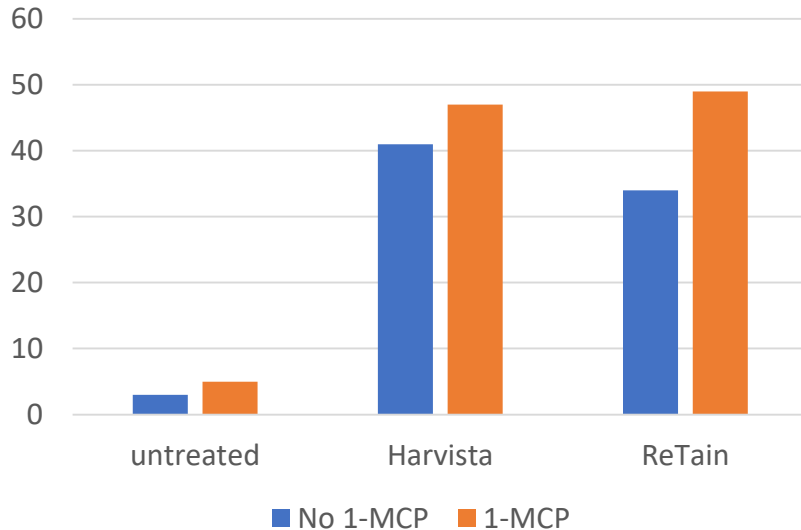


CO₂ injury (%) after CA (3%/3%) storage - 1, 3 and 5 week delay



Negligible soft scald, little effect on bitter pit, small increase in greasiness.
Quality as judged by firmness, acidity, SSC is not compromised

Carbon dioxide injury (%)



Western NY trial

- Untreated
- Harvista – 1 week before harvest
- ReTain – half rate 2 weeks before harvest

3%/3% O₂/CO₂ AT 38F after conditioning; 6 months

Recommendations for CA storage of Honeycrisp

Conditioned at 50F for 7 d

Wide range of atmospheres – 1.5-4.5% oxygen; 1.5-3.0% carbon dioxide

38F storage temperature

In addition!!!

Three methods of control must be applied to prevent carbon dioxide injury

- 1. Diphenylamine (DPA)**
- 2. Delayed CA (4-5 weeks)**
- 3. Very low CO₂ levels in storage, especially first month**



Take home messages

- Recommendations for Honeycrisp for air and CA storage are available.
- The effects of PGRs and postharvest 1-MCP can be important, and careful, e.g. avoid ReTain or Harvista in a bitter pit susceptible block.

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Thank you