



AgroFresh^{Inc.}

Nancy Brill

**Technical Account Manager
Mid-Atlantic and Southern region**

Our Eastern Commercial Team



Keith Culver
Commercial Manager



Ken Silsby
Technical Consultant



Heidi Davey

Chelsea Van Acker

Brittany Buchanan

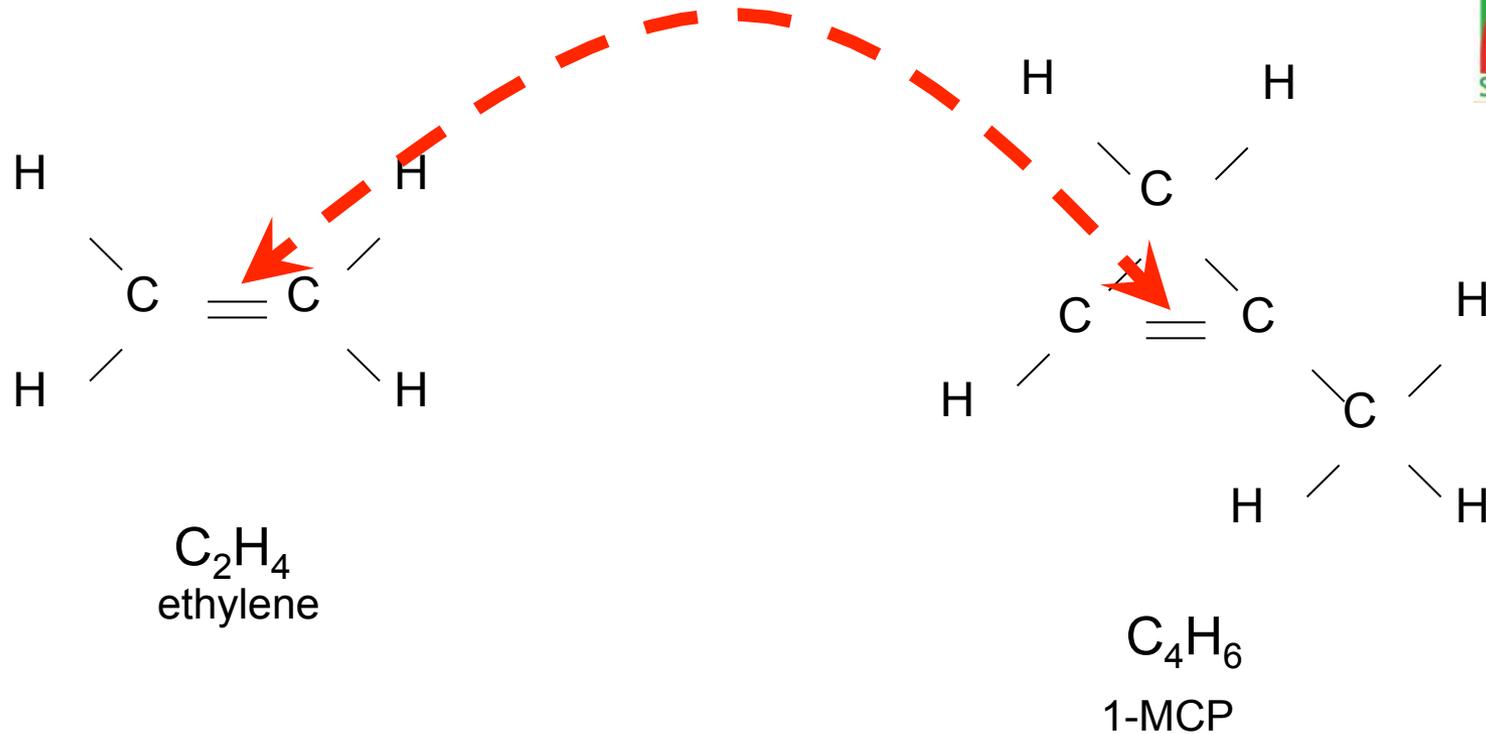
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Integrated Apple Quality Management

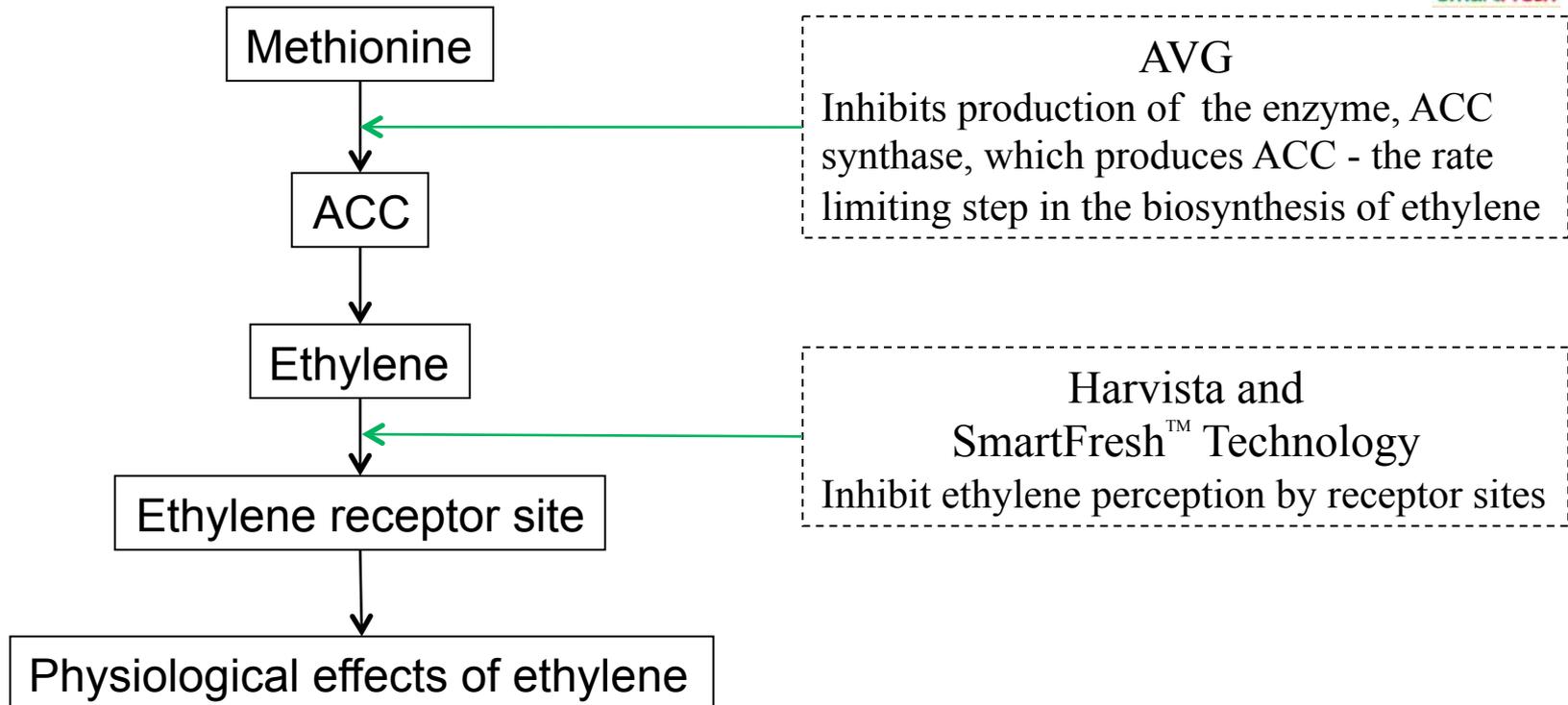
	Harvista	SmartFresh
What	1-MCP	1-MCP
How	Sprayed in the orchard	“fumigation” in storage
When	“Real time” - Starch test and/ or calendar	Up to 5 days after storing each pick
Why	Superior fruit quality from field to storage to packing to consumer	

How Does Harvista™ and SmartFresh™ Work?



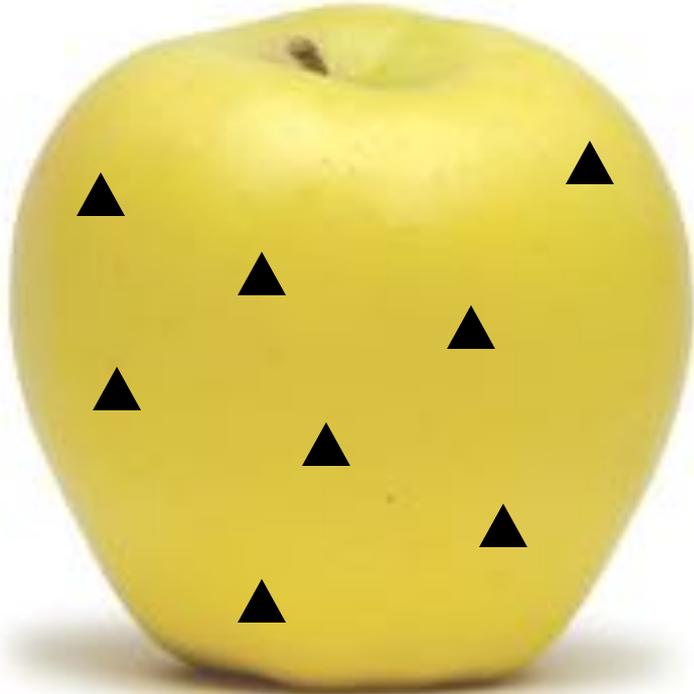
To an ethylene receptor, the 1-MCP molecule is similar to ethylene, *but more attractive*.

Ethylene Biosynthesis



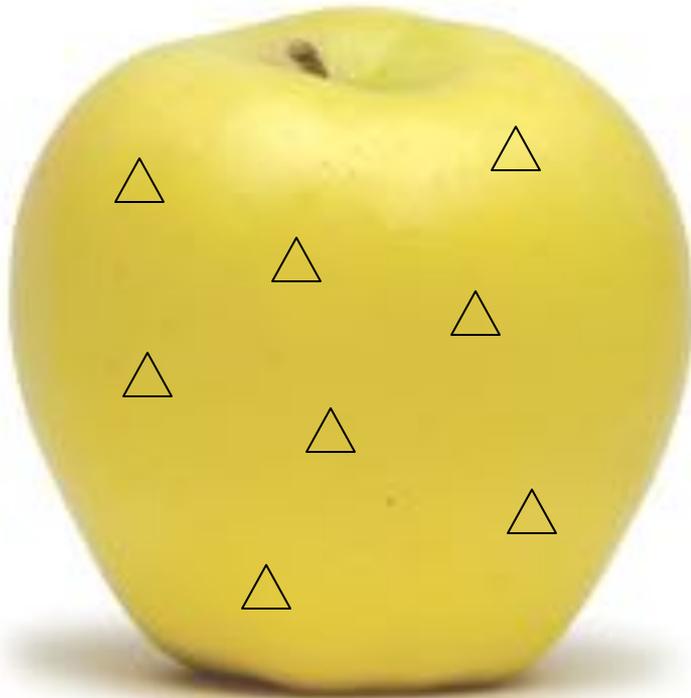
“Real time” because mode of action allows application close to harvest

How Does Harvista™ and SmartFresh™ Technology Work?



- 1-MCP outcompetes ethylene for receptor sites at the cellular level and disables them.
- Since treated apples no longer respond to ethylene, storage and shelf life are preserved.
- It also inhibits storage scald.

How Does SmartFresh™ Technology Work?



- Eventually, fruit will produce new ethylene receptor sites
- Restoring ethylene perception and slowed ripening response.
- However, benefits continue after storage removal.

Safety Profile

- Highest regulatory safety class in the U.S. and E.U.
- Biodegrades in hours
- No residual trace
- Nontoxic
- Ultra-low dosage: 1 part/million





Harvista

Harvista™ Trials Pennsylvania, 2015

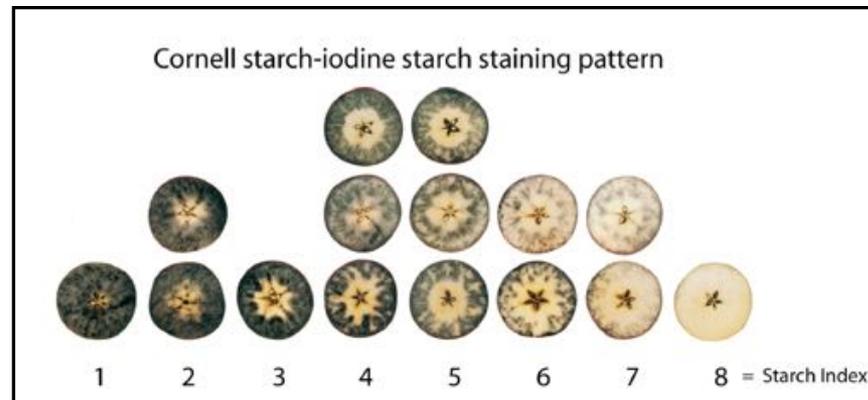
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How is Harvista Applied

- Starch testing – iodine stains the starch



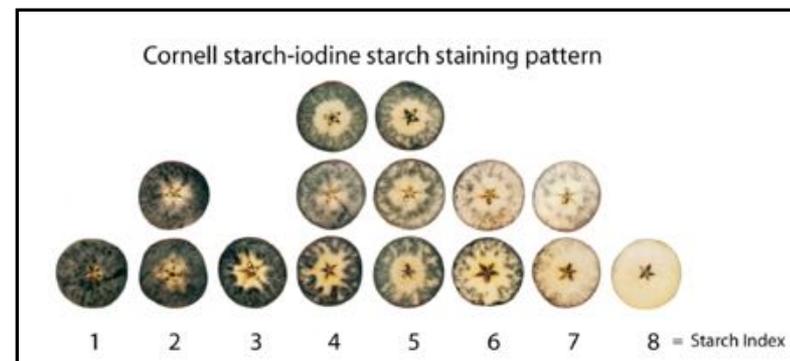
How is Harvista Applied

- Harvista Use Recommendation Guide



APPLE VARIETY	OPTIMUM AVERAGE STARCH INDEX AT APPLICATION*
Gingergold	1.0 - 2.0
Gala	1.5 - 3.5
McIntosh	3.0 - 4.0
Honeycrisp	5.0 - 6.0
Spartan	1.5 - 2.5
Macoun	2.0 - 3.5
Empire	2.5 - 3.5
Jonagold	5.5 - 7.0
Red Delicious	1.5 - 3.0
Golden Delicious	3.0 - 5.0
Idared	2.5 - 4.5
Fuji	2.5 - 4.5

* Starch Index scale of 1 to 8 (Generic Starch-Iodine Index for Apples, Cornell Cooperative Extension InfoBull 221).



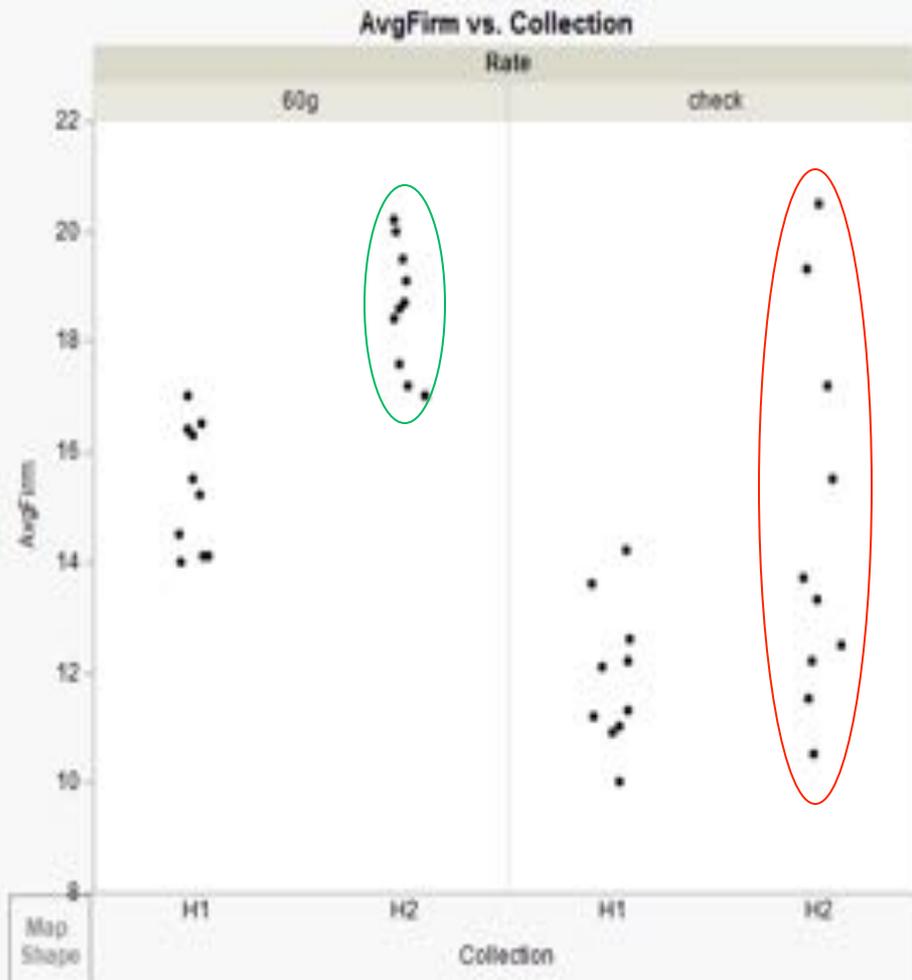
How is Harvista Applied



How is Harvista Applied



Why is Harvista Important?



Buckeye Gala

- Scatter plot of apple firmness
- Application date: 8/21/15
- Harvest 1 (H1): 9/3/15
- Harvest 2 (H2): 9/10/15
- Untreated apples become increasingly variable with harvest delays
 - > Advanced apples are susceptible to storage problems!
- Harvista maintains firmness and consistency!

Buckeye Gala – Starch Test



Harvista



Untreated Control

Why is Harvista Important?

- Buckeye Gala, sprayed with Harvista on 8/25/15; day of photo = 9/16



Harvista



AVG



Control

- Grower 1, Application date = 8/21, photo 13 days later



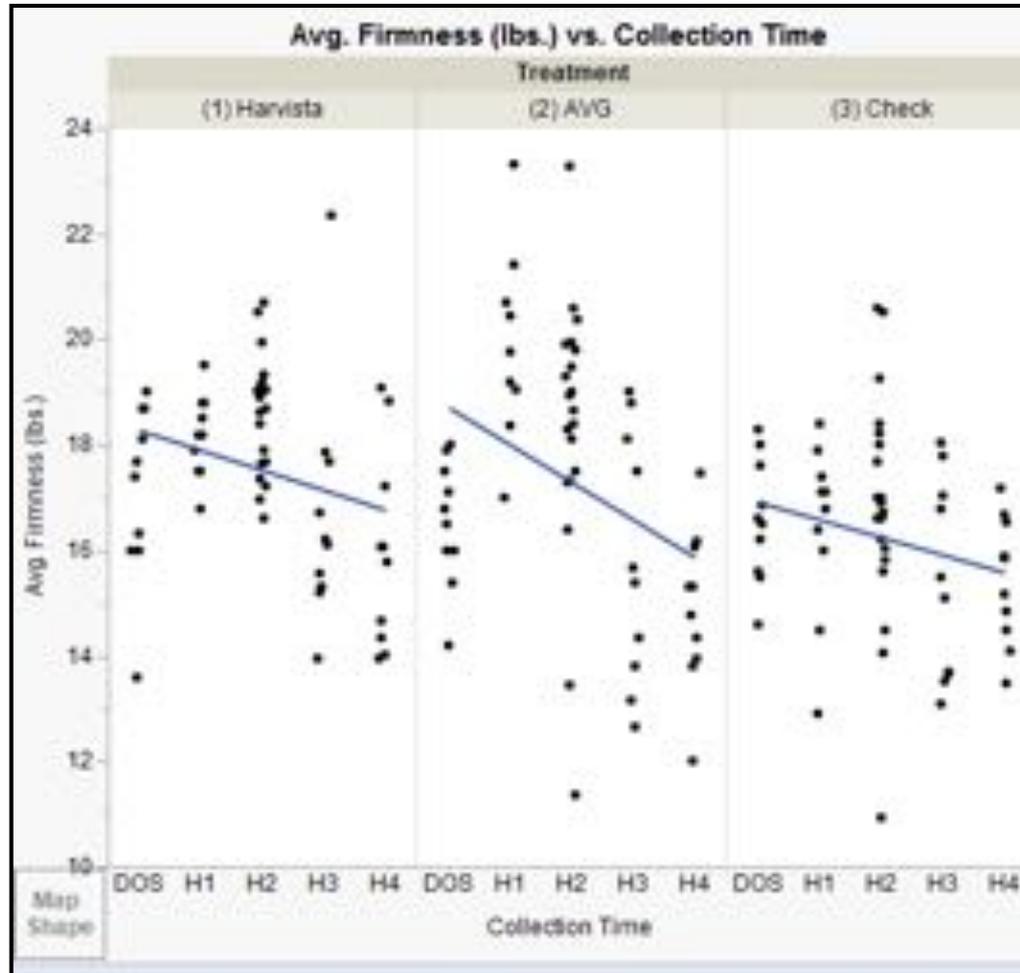
- Grower 2, Application date = 8/18, photo 17 days later



Harvista

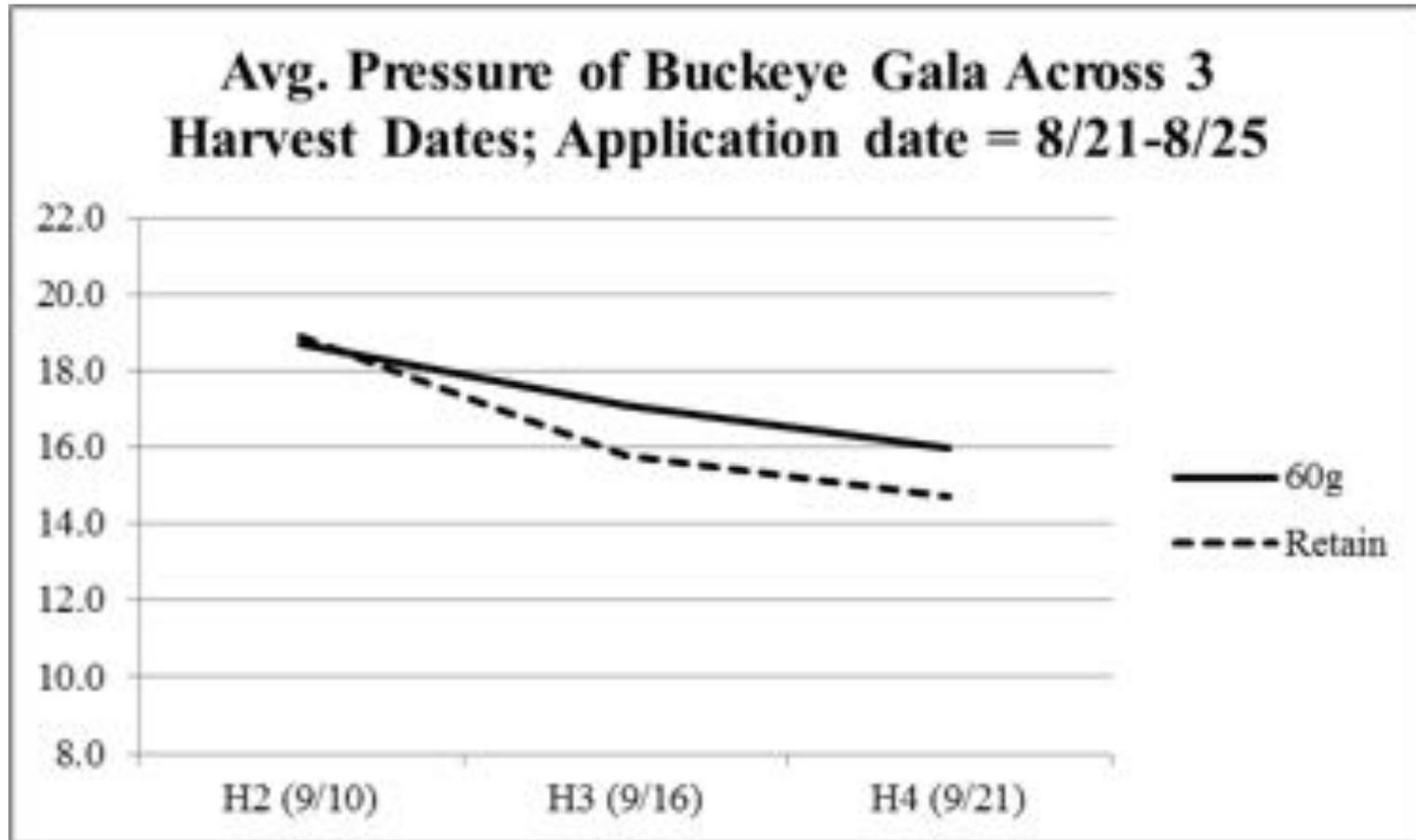
Check

Buckeye Gala Firmness



Harvista improved firmness and consistency

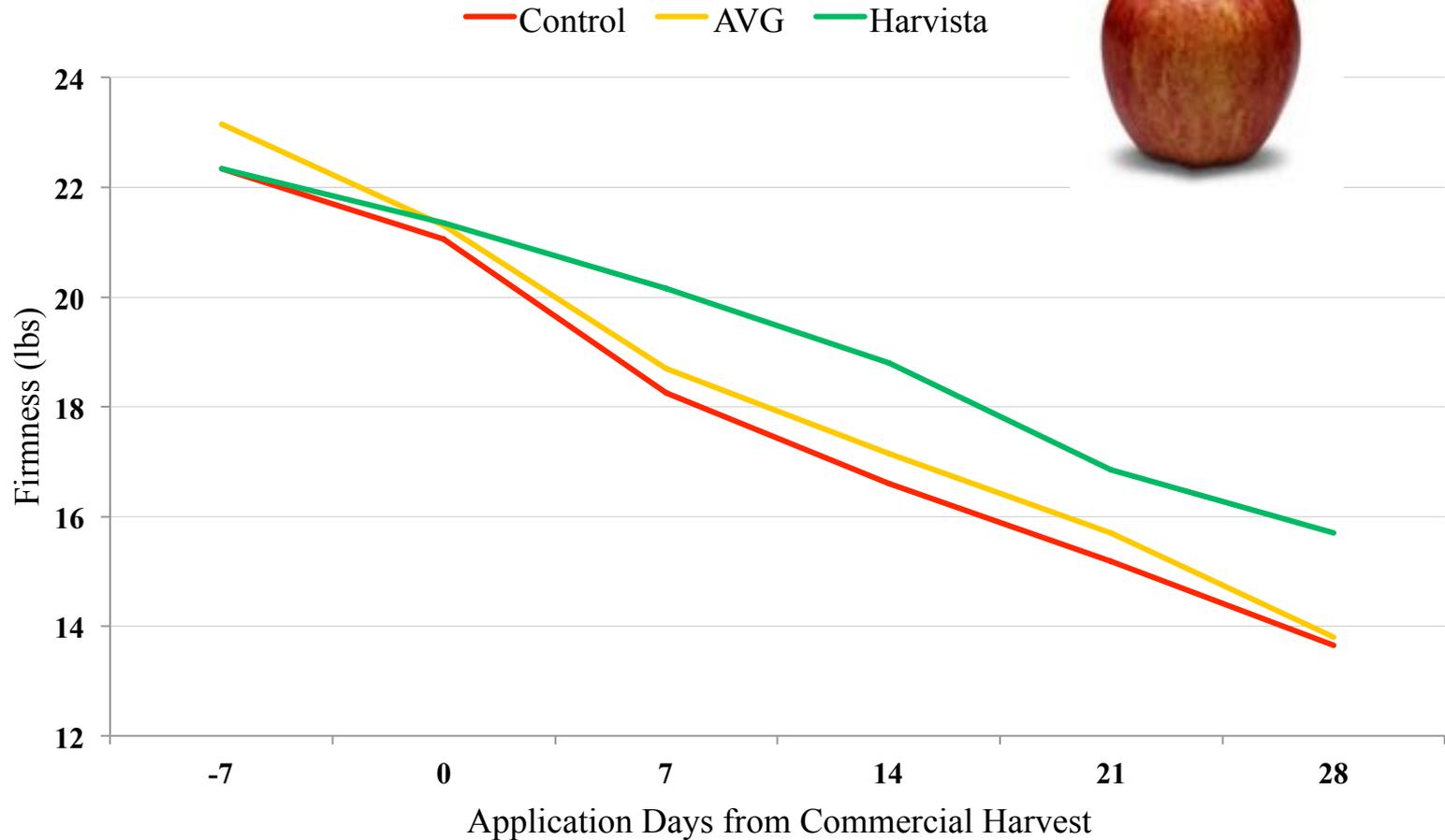
Adams County Gala



Why is Harvista Important?



Harvista – Gala Firmness Response



Honeycrisp – color

Application date = 8/27; orchard photos are H1



Sampling of apples
on 8/25



AgroFresh 60 g Harvista

Control

Honeycrisp - color

Honeycrisp

- Application date = 9/8
- Harvest on 9/28

Grower remarks,
“Still crispy with flavor.”



Honeycrisp



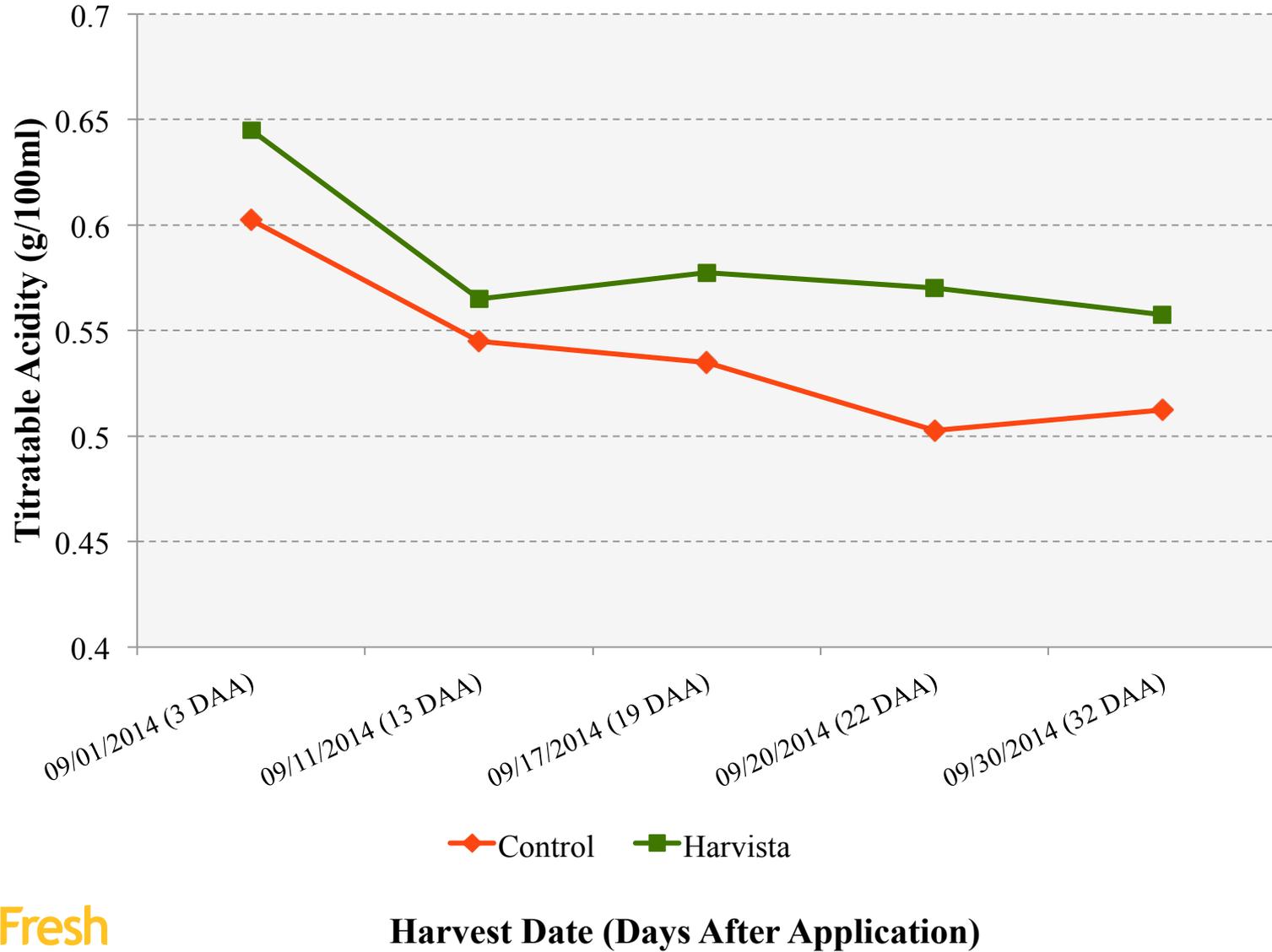
Harvista applied 8/31.
Photo on 9/28 across
all treatments.

Honeycrisp - starch

Application date = 8/31; photo taken on 9/28

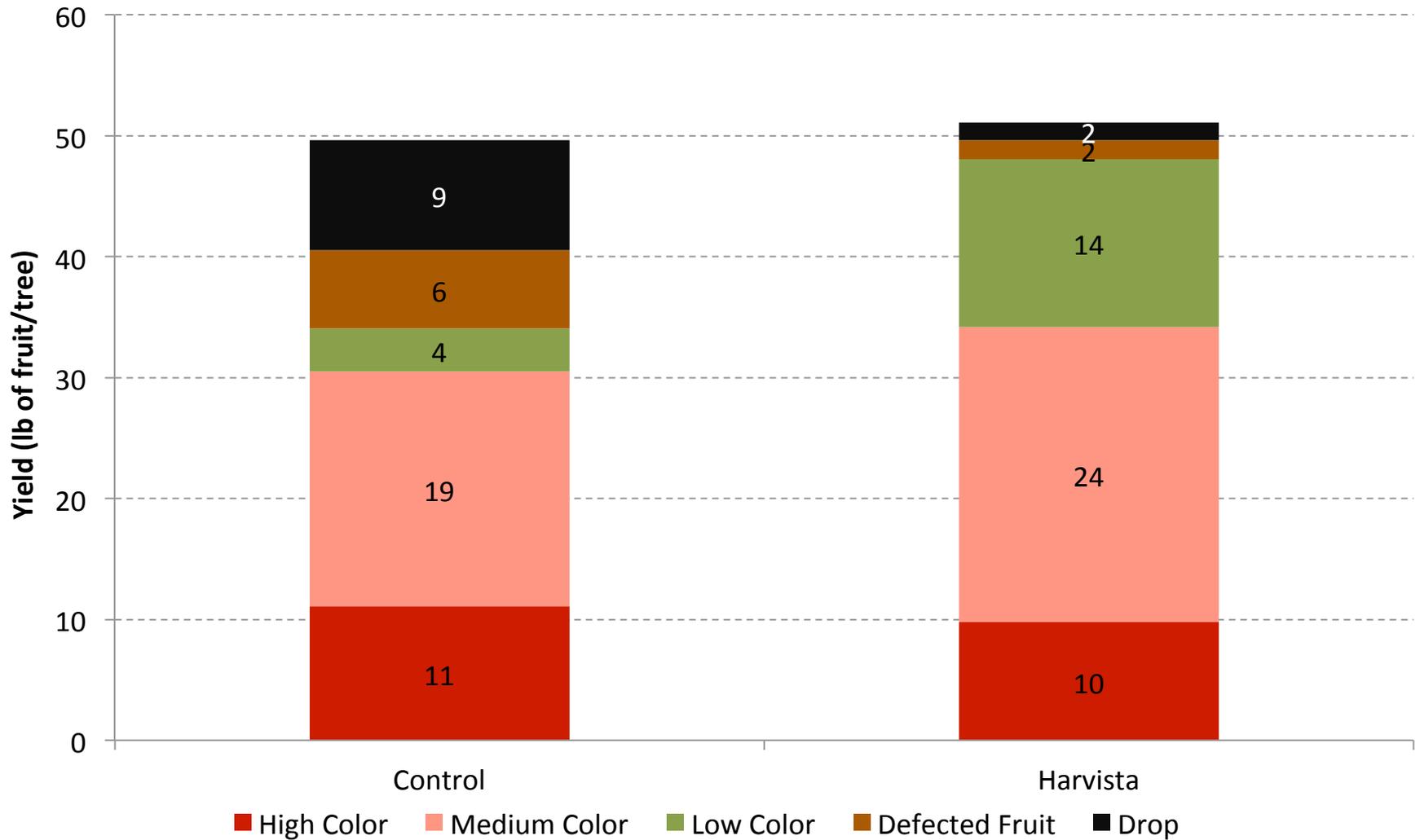


Harvista Effects on Honeycrisp Acidity





Honeycrisp – Yield per Category, all harvest dates combined

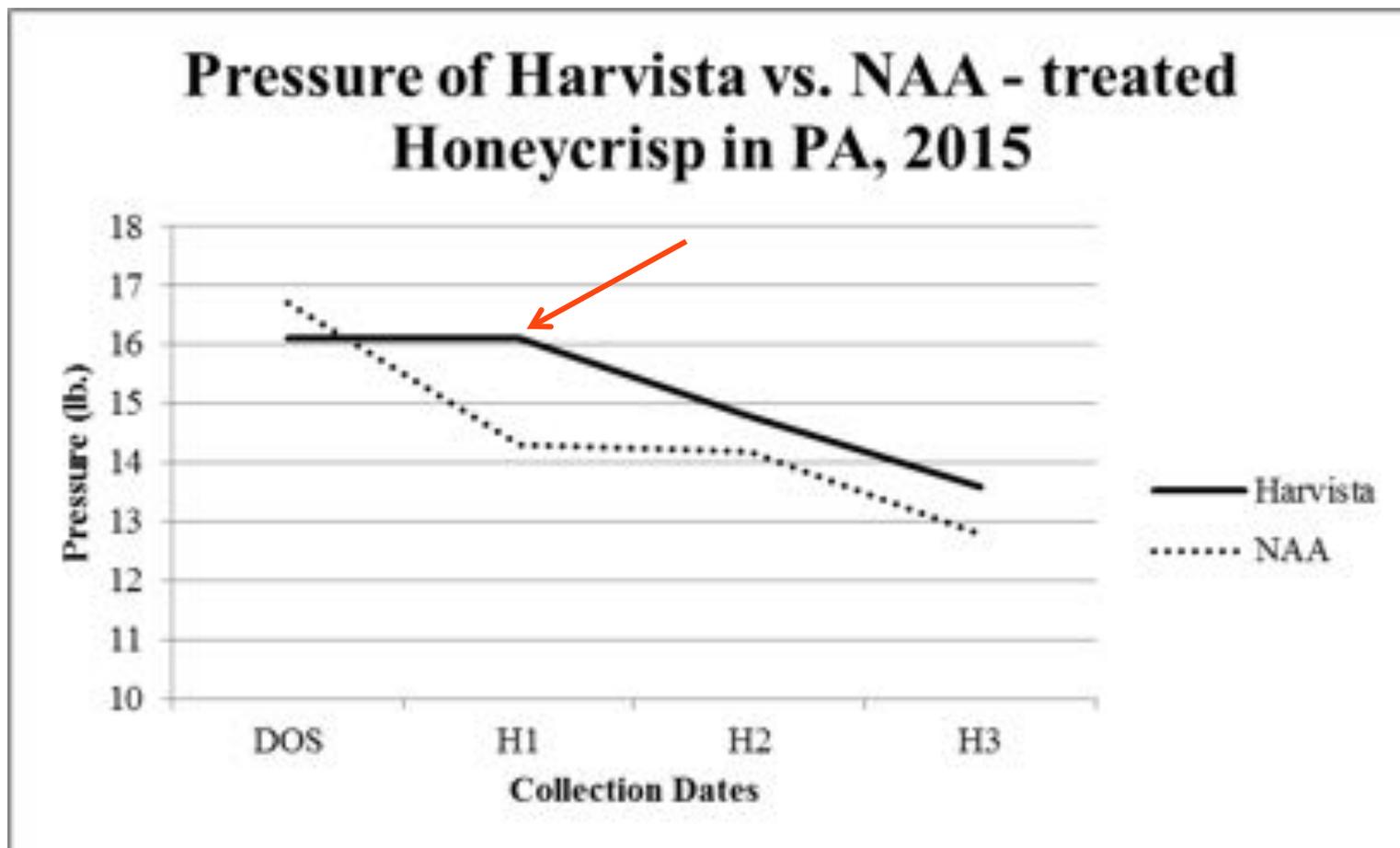


Harvista Drop Control

Photo taken after second pick.



Harvista – Drop Control without Sacrificing Firmness



Conclusions

- Honeycrisp:
 - > Coloring depends on grower cultural practices and weather
 - Application timing is very farm-dependent
 - No need to lower rates
 - Why? Results in less starch retention
 - Therefore, adjust application timing
 - 60g rate applied around first week in September
 - Expect Extra-fancy coloring after 3 - 4 weeks
- Fuji watercore management, to be continued



How is SmartFresh™ Applied



Figure 4. The Adjustable Apple Test (<http://theblaworks.com/>) has a four by six footprint and can hold a bin of fruit at a time. The tent is raised or lowered to minimize dead space and maintain the active ingredient at an effective level for the duration of the 24-hour treatment period. It is easily set up on a pallet base with a water bladder.

Fruit Notes, Volume 78, Summer, 2013

Shipping container



What does one part per *million* look like?

1 million pennies...

is about the size
of a refrigerator

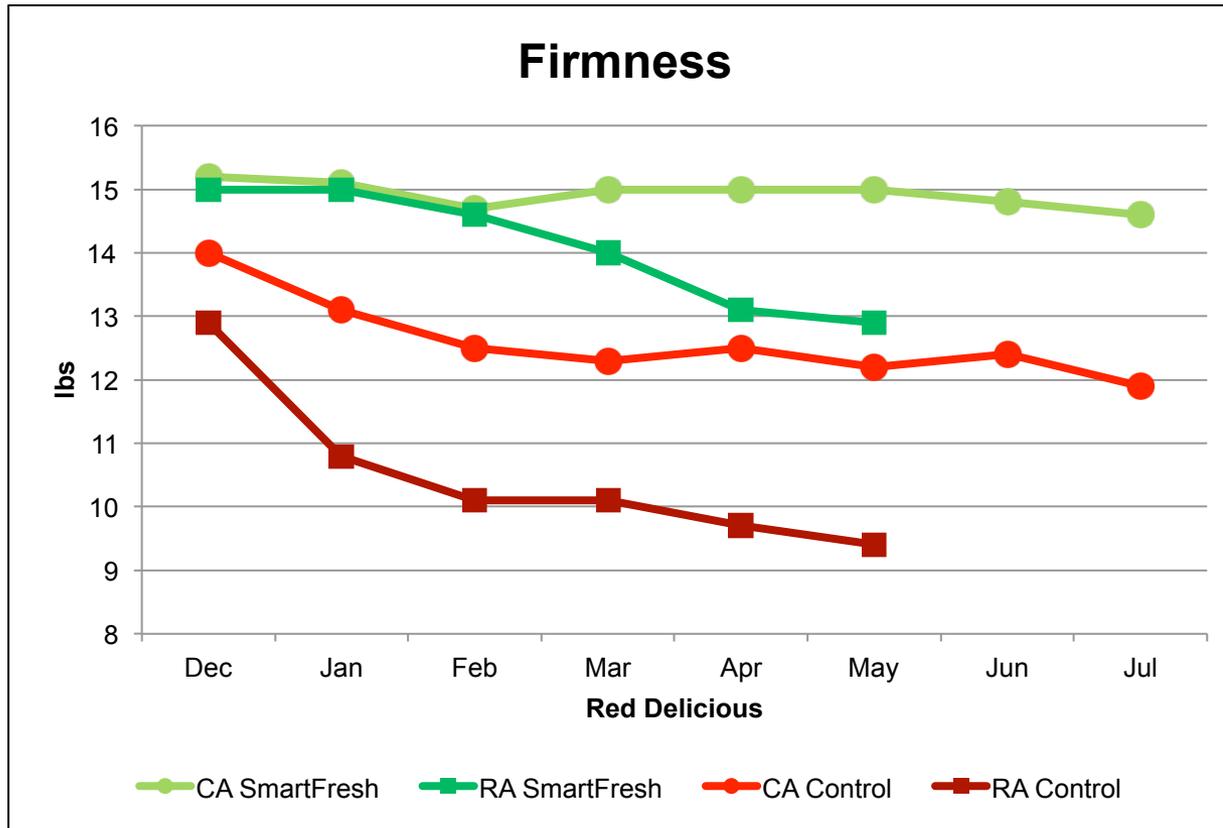


...or if stacked, would be *one mile* high.

and SmartFresh would be
the *ONLY* wheat penny



SmartFresh™ Technology Maintains Firmness



- **SmartFresh + CA** maintained firmness at near harvest firmness for 8 to 10 months
- **SmartFresh + RA** was as good as or better than CA for 6 to 8 months

* Source: Internal AgroFresh data

SmartFresh and Harvista Benefits

- Maintains firmness (pressure is consistently higher in trials!)
- Slows starch hydrolysis
- Color and flavor are maintained
- Controls greasiness
- Manages stem crack when it's a "stem crack" year
- Drop control
- Facilitates harvest management
- Improves storage life, operating ease, and sales flexibility
 - Fewer pick dates
 - Extended pick dates
 - Fruit maintains higher quality between packing and consumption
- Inhibits storage scald
- Additional testing is planned for 2016

Contact Information

- Nancy Brill
- nbrill@agrofresh.com
- 484-387-6950
- @DrNancyLBrill
- NancyLBrill
- LinkedIn

