

2017- Double Applications of ReTain® to provide longer fruit drop control compared to the standard single application ReTain

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ReTain is a powerful harvest management tool. More than just a stop drop, it can let you schedule and time your harvest of selected cultivars to where it is best for you to pick fruit of high quality.

Many of the growers I consult with have PYO as a big part of their marketing operation. Customers want Gala and Honeycrisp, but often do not show up for PYO at your farm to the end of September or early October for their **perceived time of 'Apple Season'**. **Of course this is way late** normally for either Gala or Honeycrisp for PYO for most.

Secondly often early September has been very hot, with high temperatures delaying red color on standard Gala strains and Honeycrisp.

For both of the above reasons using double ReTain on some of your acreage may be the answer. Delaying maturity of Gala, Honeycrisp, Macs, Cortland, early Fuji's, **Jonagolds, etc. will put this in a** later ripening window for PYO customers and allow the fruit to hang longer increasing size and yield while having the potential for more red color as it should be cooler in late September, early October.

What are the Characteristics of ReTain?

- Dose Dependent
 - The more applied, the more impact.
- Time Dependent
 - 30 DBH is the maximum impact.
- Variety Sensitive
 - Gala, Honeycrisp, Jonagold
- Cropload Dependent

Phil Schwallier, MSU has conducted 2 trials in Michigan in 2015 and 2016, and I conducted 2 trials in Pennsylvania in 2016.

The following are some conclusions, facts, guidance from Phil on how to use. Followed by my experiments with photos.

What are other reasons for multiple or split applications of ReTain?

- Good planning will eliminate multiple applications.
 - Choose harvest window and make application 30 to 21 DBH.
- When is multiple applications needed.
 1. Planning to delay harvest 30 days (1+1).
 2. Labor shortage or behind schedule.
 3. Realize a under treated mistake on first application.
 4. Want to delay harvest more than planned.
- An 2nd application of ¼ to ½ rate will delay harvest additional 7 to 14 days.

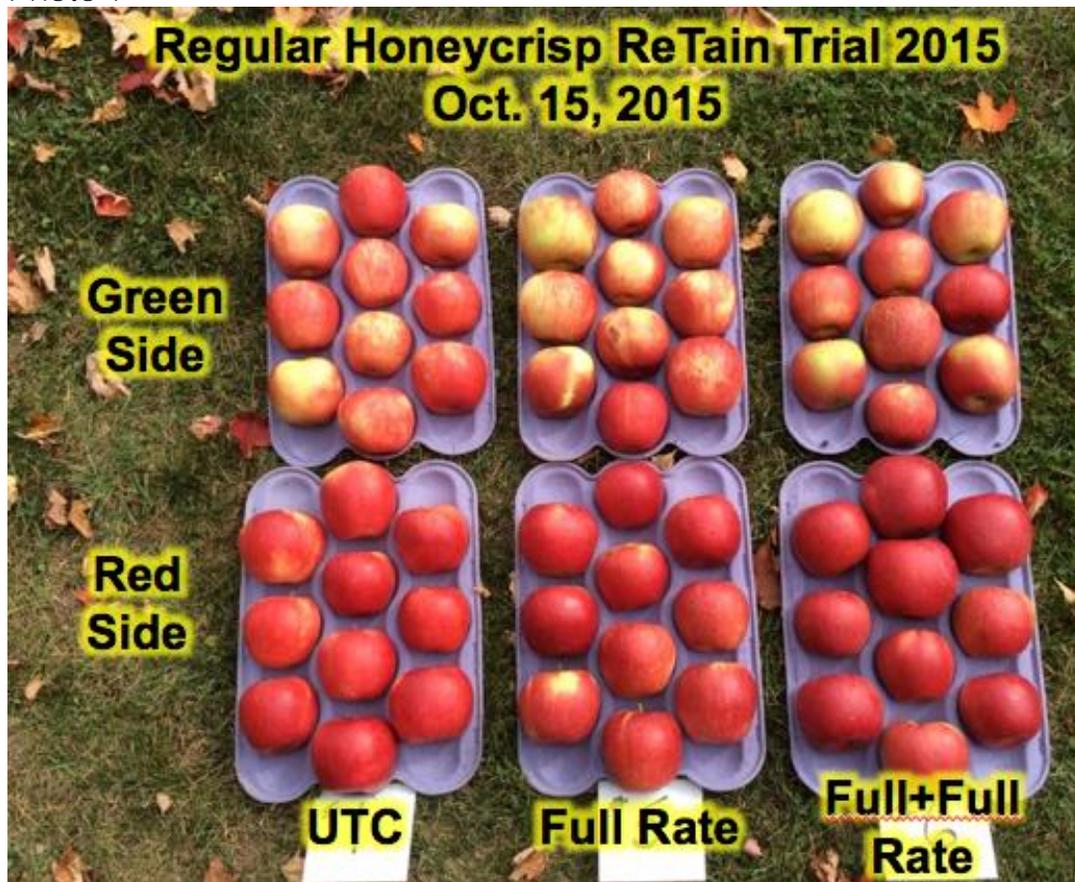
Benefits

- More harvestable quality fruit
- Improve fruit **quality** and quantity.
- Increase **size** and **color**.
 - Fruit will hang 30 extra days or more.
- One pick.
- Spread harvest out evenly.
- Improve storage quality.
- **Stop drop.**
- Cracking, Greasiness, Watercore

Risks and Impacts

- Not without risks.
- Do not apply **high rates** to **heavy croploads**.
- Fruit will hang **30+** extra days, open for hail, winds, pests, etc.
- Watch for longer pest risk, increase spray needs?
- Concentrating production into fewer varieties.
- 2 year results, need a couple more years to validate results.
- Storage disorders??, look good so far.
- Climate is a major factor?

Photo 1

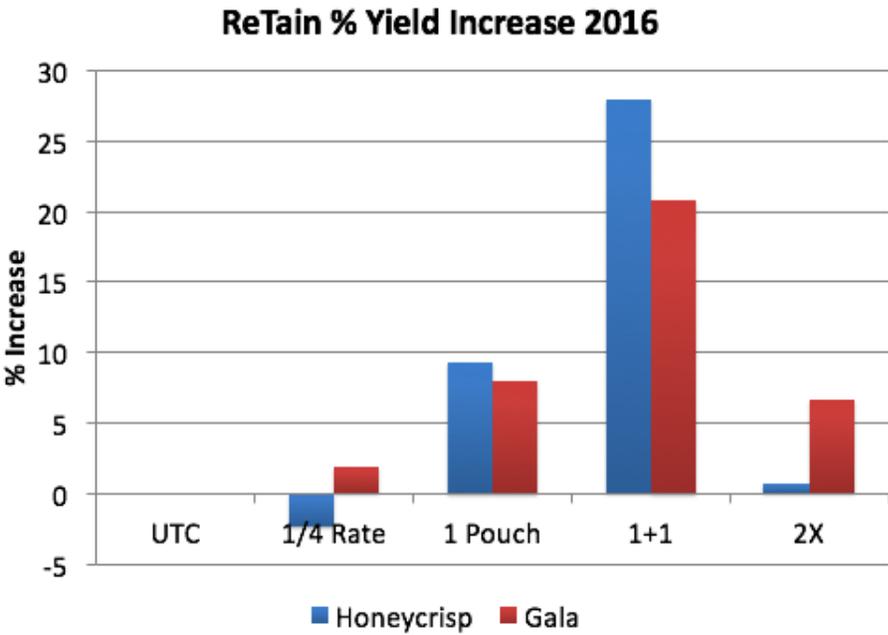


Michigan HoneyCrisp ReTain Maturity Delay 2015 and 2016

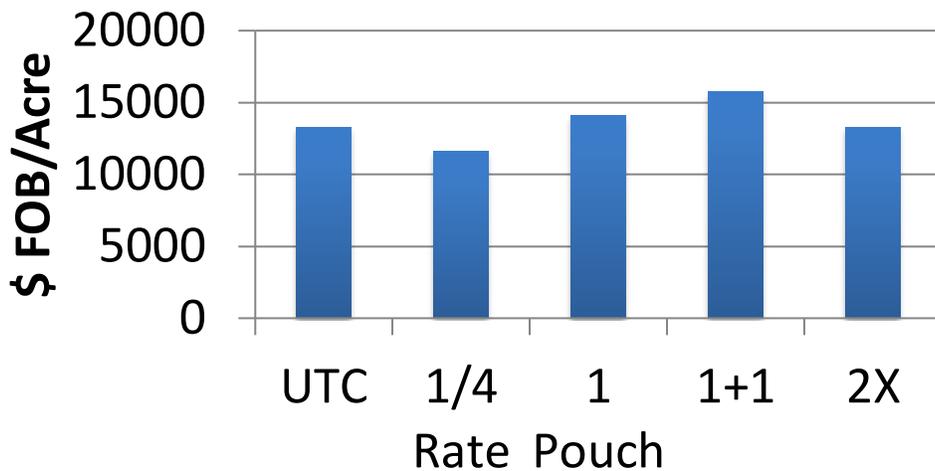
Honeycrisp ReTain Maturity Delay				
Rate	2015	2016	Harvest Date 2015	Harvest Date 2016
Predicted			9-14	9-10
UTC	0	0	9-17	9-15
1/4 Rate	7	5	9-24	9-20
Full Rate	17	19	10-4	10-3
1+1	27	30	10-15	10-15
2X Rate		22		10-7

Michigan Average Fruit Weight Gain in 2015-2016

AFW ReTain Gain (g)					
Rate	Honeycrisp		Gala		Average
	2015	2016	2015	2016	
1/4 Rate	10	20	10	10	12.5
Full Rate	30	30	20	30	28
1+1	50	100	50	40	60
2X Rate		40		30	35



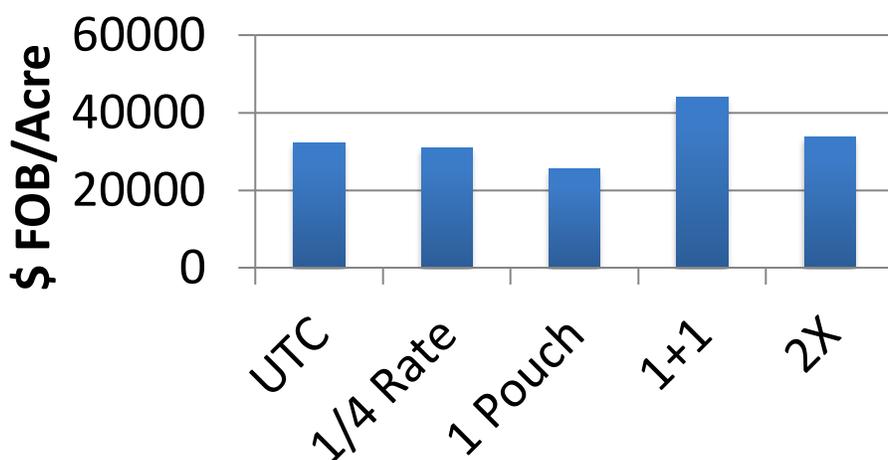
Gala \$ Value/Acre @Prime Maturity 2016



In Michigan in 2016 double ReTain (1+1) increase FOB returns by per acre \$2,500 and Honeycrisp by \$11,000 per acre with Double ReTain applications.

Note in 2016 in Michigan temperatures were warm all thought September. Phil S. indicated he did not get the expected red color increase on Honeycrisp in 2016 for this reason but did of course get the increase in fruit size

Honeycrisp \$ Value/Acre @Prime Maturity 2016



ReTain is currently \$240-\$270 per pouch or \$480 to \$540 per acre with a double application depending on quantity and your supplier. The increase in fruit size and yield more than offsets the investment in the harvest management tool ReTain.

2016 Gala and Jonagold Trial-Heller Orchard, Wapwallopen, Pennsylvania

Treatments

UTC

½ Rate ReTain -28 days PHI

Full Rate ReTain- 1 pouch- 28 days PHI

Double ReTain- 28 days PHI and 7 days PHI

Photos –Buckeye Gala –Tested 9/5/16- treated 28 days PHI- **Heller's Orchard**
Wapwallopen, PA

Photos 2-4

Untreated Control-UTC

½ ReTain

Single ReTain



The UTC on left should have been harvested approximately August 28- it was overripe on 9/5 when tested.

Note the Double ReTain photo below was from fruit sampled 9/20 - 15 days after the photos above that were on fruit sampled 9/5

Photo 5- Buckeye Gala –Double ReTain (1+1) Tested 9/20/16- treated 28 days + 7 days before anticipated harvest



Photo 6-Buckeye Gala –on tree 9/24/16- treated 28 days PHI



Photo 7- Buckeye Gala harvested 9/28/16- 23 days later than UTC harvest but really 28 days from when UTC was ripe.



Conclusion: In 2016- Buckeye Gala, treated with the double rate of ReTain (2 pouches plus organosilicate surfactant) delayed Gala Ripening and held on the tree up to 30 days. It could have been picked at 21 days, thus giving tremendous flexibility to the harvest date for PYO or direct market sales. Fruit developed excellent color and had no drop. Photos 5, 6, 7.

This Gala fruit harvested on 9/28 was also treated with SmartFresh and stored until January and February in good condition in regular cold storage until sale.

Suggestions for trial at your orchard:

Consider double ReTain on any cultivar you wish to delay maturity and enhance red color.

Cultivars we have worked with: Galas, Honeycrisp, Jonagold, Corland. I would also consider on Macs and Early Fuji's as well. Treat a portion of these to experiment for yourself.

To calculate timing double pouch (1+1): for early season varieties, such as Gala, McIntosh, start by estimating when you would normally expect to begin harvesting the variety if no ReTain or ethephon were used. Then count back 4 weeks and mark the calendar from that date through the next 7 days. This is your application window for that early season variety (as close as possible to the 28 days). Watch for good spray conditions and a 6-hour drying time within that week and apply the material at the first opportunity. Then mark you calendar for 7 days before anticipated harvest to make the **7-day application, don't** miss the second application!