Cornell Cooperative Extension

Eastern NY Commercial Horticulture Program

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Tree Fruit New



Recommendations for Harvest Management Plant Growth Regulators in Eastern New York for 2018 Dan Donahue & Mike Basedow, CCE ENYCHP

In 2018 there are 3 materials which are registered for control of pre-harvest drop in apples: NAA, ReTain and Harvista:

- NAA provides modest drop control because it inhibits abscission, however fruit softening and reduced storage life are likely if warm weather follows application or if harvest is delayed until ripening has been substantially advanced.
- **ReTain** is a plant growth regulator which inhibits ethylene production in the fruit and reduces pre-harvest drop. It also reduces fruit cracking and fruit greasiness, but it delays the development of fruit red color about 1 week. Application rates and timings vary by variety. Applied at varying timings (2-4 weeks pre-harvest) and rates (1/3 to 1 pouch/A) ReTain provides different levels of control of preharvest drop and fruit maturity. Its performance is improved when combined with NAA since the two products work synergistically to reduce fruit drop while the ReTain suppresses the increased production of ethylene triggered by the NAA.
- **Harvista** is a newer class of drop control chemical for foliar application, which inhibits the action of ethylene in the fruit and reduces fruit drop. The AgroFresh Company provides very specific, on-site recommendations for the timing of Harvista recommendations to its customers.

Recent Harvest Management PGR Strategies, Still Under Testing

- **Delaying Honeycrisp Harvest:** Single pouch/acre rate of ReTain, 24 days pre-first pick will significantly delay Honeycrisp harvest.
 - o Potential to delay harvest 2.5 to 4 weeks.
 - o If you wait long enough, color will eventually develop.
 - o Pre-harvest drop was not excessive at 13% in our 2016 Hudson Valley

Table of Contents

Recommendations for Harvest Management Plant Growth Regulators......1 PGR Field Day Review......3 Cornell AgriTech......5 20 Minute Ag Manager Webinar.....5



continued on next page

VOLUME 6, ISSUE 5

PAGE 2

trial, and was not reduced by the ReTain treatment.

- A second, full pouch treatment 10 days prior 0 to first pick did not have any measurable beneficial effects.
- Serious soft scald developed in the ReTain 0 treated fruit when rated after 90 days in refrigerated storage in our 2016 trial. If you try using ReTain on Honeycrisp in this manner, and the fruit is stored, monitor the stored fruit on a weekly basis for soft scald. Until you gain some storage experience with this program, we can't recommend controlled atmosphere storage.

"Stacking" Harvista on top of an earlier ReTain application:

o Several growers in the Hudson Valley have tried this out on McIntosh and Honeycrisp in the last two years.

o We have no independent university research results to report on this strategy.

o Certainly expensive, does it pay off? Need to see some hard data before it can be recommended. If you try it, leave an unsprayed control and contact your CCE-ENYCHP fruit specialist to help with evaluation.

McIntosh Harvest Management PGR Recommendations Gala Recommendations for Eastern New York State for Eastern New York State

- NAA: NAA requires 1-2 days to come into effect and will provide a degree of drop control for a period of 7-10 days, although drop control is not always reliable. In the case where you may need 3-4 days of drop control and long-term storage is not planned, NAA can be useful. However, since NAA stimulates ripening and can provide unreliable drop control when applied alone, in general the use of NAA alone is not recommended.
- **ReTain Timing:** ReTain can be applied 2-4 weeks before anticipated normal harvest. In general, apply ReTain at 3 weeks before harvest in cool years and at 4 weeks before harvest in hot years. Growers in the Hudson Valley commonly apply ReTain 4 weeks before the estimated first harvest date, with good success. The long-range weather forecast through mid -September for both the Hudson and Champlain

Valley's predicts warmer that average temperatures for the period.

- **ReTain Application Rates:** One pouch of ReTain per acre will give the best drop control but will delay color development by 7-10 days. A ½ pouch of ReTain will also work and has a less negative effect on fruit color but the control of fruit drop will wear off sooner, perhaps too soon.
- **ReTain + NAA:** Dr. Terence Robinson's research in the last several years has shown the best combination of drop control with the least negative effect on fruit color is achieved by splitting a full rate of ReTain into 2 sprays of 1/2 rate of ReTain each time and including 10ppm NAA in both sprays. Application of the first 1/2pouch of ReTain per acre + 10 ppm NAA (4oz/100 gal) should be made 3 weeks before normal harvest. The second application of 1/2 pouch of ReTain per acre + 10 ppm NAA is timed for one week before normal (untreated) harvest.
- **Surfactants:** It is critical to include an organosilicone surfactant with ReTain especially when combined with NAA. The organosilicone surfactant, such as Silwet (12 oz. /100 gallons), improves the uptake of ReTain better than other surfactants thus ensuring that sufficient ReTain is absorbed by the leaf to suppress the stimulatory effect of NAA on ethylene production.

- Effects of ReTain on Gala:
 - Fruit will remain on the tree an additional 7-14 0 days.
 - Improved fruit size as fruit will increase in size 0 approximately 1% per day
 - Reduced stem end cracking and greasiness in 0 2nd & 3rd picks.
 - Aspects of fruit maturity are delayed, and fruit 0 appear to ripen more evenly on the tree. As a result, it is sometimes possible to reduce the number of picks necessary down to one or two.
- ReTain Rates: Apply a ½ pouch of Retain per acre. The 1–2 pouch rates of Retain are almost never recommended since Retain at higher rates has a very strong negative effect on Gala color development. Our trial in 2016 showed that Gala treated with these high

VOLUME 6, ISSUE 5

rates will eventually color if harvest is delayed 2.5-3 weeks.

- **ReTain Timing:** Apply 2-3 weeks before expected first • harvest.
- Surfactants: It is critical to include an organosilicone • surfactant with ReTain. The organosilicone surfactant, such as Silwet (12 oz. /100 gallons), improves the uptake of ReTain better than other surfactants.

Honeycrisp Recommendations for Eastern New York • State

- Honeycrisp is a low ethylene producing variety that • has very uneven ripening but can have significant preharvest drop in some years. The use of retain is recommend in blocks that have had a pre-harvest drop problem in the past.
- ReTain Timing: Apply three weeks before expected • harvest.
- **ReTain Rates:** Apply 1/3 of a pouch/acre rate of • Retain on Honeycrisp. Champlain Valley growers may want to consider a ¼ pouch rate and avoid blocks with a history of soft scald.
- Surfactants: It is critical to include an organosilicone

surfactant with ReTain. The organosilicone surfactant, such as Silwet (12 oz. /100 gallons), improves the uptake of ReTain better than other surfactants.

Harvista Observations and Recommendations

- Pre-Harvest Fruit Drop Control.
- Safe delay of harvest for additional color and fruit size development.
- Maintenance of fruit firmness before and/or after harvest (storage benefits are short term).
- Slowed starch conversion.
- Delayed and reduced incidence of water core. •
- Greater consistency in maturity for improved storage performance.
- Fewer pick dates required for multiple-pick varieties
- Recent research has demonstrated a reduction in Soft Scald in Honeycrisp.

Harvista Timing & Rates: The general timing range is 3-14 days pre-harvest. Please contact AgroFresh technical support for specific guidance.

Plant Growth Regulator Field Day Review Mike Basedow, CCE ENYCHP

Near the end of the June, I attended the summer PGR meeting and orchard tour that was held in Geneva, where Dr. Poliana Francescatto reviewed some of her recent work with PGR's. After a detailed discussion of floral bud induction and initiation indoors, we headed out to the research orchard to view a handful of her current field trials. In this article, we will review some of the key takeaways from that tour.

Take away #1: Adjust Honeycrisp crop load early to maximize return bloom.

Poliana has found Honeycrisp initiates flowers earlier than other popular varieties. This initiation is the first visible sign that a bud is going to be a fruit bud, rather than a vegetative bud the following growing season. In Gala, initiation of the following season's flowers begins about 70 days following full bloom, with its peak around 85 days. In Honeycrisp, 95% of initiation is completed within 45-60 days after full bloom. Poliana explained how Honeycrisp's early initiation may play a considerable role in the

cultivar's tendency for biennial bearing. While return bloom sprays have been used inconsistently to reduce biennial bearing in Honeycrisp, Poliana recommended regular and early thinning of Honeycrisp with NAA, followed by low weekly doses of NAA up to 40 days after full bloom to insure adequate return bloom the following season.

Take away #2: Using the Carbohydrate Model as One Tool in the Toolbox.

The apple carbohydrate thinning model was developed by Dr. Alan Lakso and Dr. Terrence Robinson to model carbohydrate supply and demand using NEWA weather data and user entered field variables. Dr. Lakso was present at the meeting, and reminded growers that the model cannot always account for unique field circumstances, and that the grower ultimately knows their block history best. A few growers shared how they like to use the model. One grower explained how he will apply a thinning treatment and then use the model to look back

VOLUME 6, ISSUE

also heavily variety dependent. Leaf drop can also occur

Take away #4: Strategies for Thinning without Carbaryl

include carbaryl, as some retailers do not accept fruit

she showed very promising results using different

combinations of 6-BA, NAA and NAD. So far, these combinations have had comparable thinning results to

Poliana is also investigating thinning programs that do not

treated with it. We visited a block of NY1 and NY2 where

trees thinned with carbaryl. We have seen similar thinning

responses with these combinations in Honeycrisp at an on-

farm trial in the Champlain Valley. In that trial, trees also

using ACC, but it may be reduced if applied with or

following an application of 6-BA.

three days to determine how effective the sprays might have been. This helps him determine if he needs to go back in with another treatment when the next thinning window approaches. The carbohydrate model can be used to determine daily carbohydrate stress during your thinning windows, but carbohydrate stress provides only part of the picture. Consider all of the additional chemical, physiological, and environmental variables that can impact your thinning each year when you develop your thinning program next May.

Take away #3: New Thinning Products

Poliana showed the group a few of her experiments with new thinning products. While not currently registered for

thinning in the United States, Metamitron is a sugar beet herbicide that is already being used as a thinner in Europe. She finds the greatest thinning effect from Metamitron occurs when fruit is between 8-12mm, and when there is a large carbohydrate deficit. However, tree status prior to the application plays a



Two trees of Crimson Gala on M.9 treated with differing rates and spray timings of Metamitron, a sugar beet herbicide currently approved for fruit thinning in Europe.

significant role on the thinning responses. For instance, the carry-over effects of severe drought stress in 2016 explained a lot of the thinning responses seen in 2017.

Poliana also discussed thinning with ACC, an ethylene precursor. She finds ACC works best at the 18-20mm stage, but also works at the 8-12mm stage. The level of thinning from ACC is very dependent on temperatures at and following the application, and the thinning response is received combinations of 6-BA, NAA, and NAD. Applications were made at bloom, petal fall, and 10-12mm. Poliana has developed carbaryl free thinning recommendations for many varieties, and discussed these recommendations at our petal fall meetings this past May.

For more information on Poliana's trials, review her recent article in the spring 2018 NYFQ.

Cornell Cooperative Extension Eastern NY Commercial Horticulture Program

New York State Agricultural Experiment Station has changed its name to Cornell AgriTech.

Dear valued supporter,

Today the New York State Agricultural Experiment Station is embarking on an exciting journey under the new name, Cornell AgriTech. Agriculture and food are multi-billion-dollar industries for the New York state economy, underscoring the value of clarifying to our stakeholders our identity, purpose and collaboration potential. Cornell AgriTech's expertise, research, education and extension efforts contribute to the growth of agriculture and food industries in New York state.

The name Cornell AgriTech solidifies the vital connection we have with Cornell University, the Cornell College of Agriculture and Life Sciences and our purpose driven connection to food and agricultural science. Through our new name, we are committed to furthering over one hundred and thirty years of scientific discovery and innovation that deliver practical solutions for farmers and businesses.

New techniques and new technologies are critical to the advancement of food and agriculture industries and Cornell AgriTech is at the forefront of these innovations. Cornell AgriTech is reimaging the future of food and agriculture systems through interdisciplinary collaborations and by educating the best up-and-coming minds in our fields, so that they can lead the next wave of breakthroughs.

We are propelling our new name and identity to continue growing a healthier population, economy and environment for New York state and the world. I invite you to grow with us.

Sincerely,

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20 Minute Ag Manager Webinars:

Cornell **AgriTech**

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To register, go to <u>https://tinyurl.com/y9gfqbmx</u>. Registering once gives you access to the series.

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