Cornell Cooperative Extension

Eastern NY Commercial Horticulture Program

QUARTERLY HIGHLIGHTS

April—June 2019

Implementing a Bitter Pit Prediction Program for Honeycrisp in New York State to Increase Producer Profitability

Daniel Donahue, CCE Eastern NY Commercial Horticulture

Bitter pit (BP) disorder in the Honeycrisp (HC) is financially devastating to NYS apple producers. A single dark sunken lesion visible on the fruit surface is sufficient to cull the apple, with an 80%+ value loss. Survey results in ENY orchards showed that BP incidence ranged between 23.4% in 2016, 13.6% in 2017, and 27.1% in 2018. Estimated per acre losses to the producer can range from 1,170-\$12,000/acre, a minimum 2.3 million to the NYS industry.

Research by two groups at Cornell, Donahue and Watkins, funded by the NYS ARDP, have produced results with great benefits for NYS HC producers. The 1st is the original finding of Donahue that a PGR, Apogee TM, applied at pink, can reduce BP approximately 50%. 2nd is the development of a BP prediction model based on pre-harvest peel mineral analysis and other horticultural factors, that has the potential to identify blocks with a high BP risk. 3rd is the development of a nonmineral "passive" BP prediction model by Watkins that is simple to implement, with only a labor commitment and no lab analysis fees. There are positives and negatives to each model, but offer choice to the producer.



We have a state-wide team of research, extension, and industry professionals interested in encouraging producer adoption of these new BP management technologies, along with a modest amount of supporting applied research. By reducing the incidence of bitter pit, and providing tools to assist producers and marketers in pre-harvest identification of problem BP blocks, producers will see a significant reduction in storage losses. Our project will result in a direct benefit to the NYS apple industry of at least 1 million dollars annually, perhaps more.

Untreated Honeycrisp apples exhibiting bitter pit. Photo: growingproduce.com/fruits/apples-pears/easebitter-pit-by-boosting-calcium/

Expanding Entomopathogenic Nematode Bio-control Research for Vegetable Pest Management

Teresa Rusinek, CCE ENYCHP

Initially our research with Entomopathogenic Nematode (EPN) biocontrols focused on suppression of wireworms in root crop production. In collaboration with Cornell University Entomologist Professor Elson Shields, ENYCHP specialists Teresa Rusinek and Charles Bornt initiated a study earlier this season to determine if EPNs can also suppress Colorado Potato Beetles (CPB). CPBs are a major pest of nightshade crops, especially potato and eggplants and are notorious for quickly building resistance to insecticides.

Using the same plots inoculated with EPNs for the wireworm study in 2017, we erected tents over the same plots. Potatoes were planted within the tent areas earlier in the season before CPB emerged naturally. One hundred CPB larvae were introduced into each of the twelve tents onto the potato plants. The purpose of the tents is to contain the CPB. We are now monitoring in each tent for surviving CPB adults.



Professor Elson Shields, Teresa Rusinek, and Chuck Bornt at EPN biocontrol study site. Photo: Teresa Rusinek.



Chuck gently places CPB larvae onto established potatoes within the tent plots. The CPB larvae will grow and eventually fall to the ground to pupate. It is the pupal stage in the soil that will be susceptible to EPN. Surviving pupa will emerge as adults. Photo: Teresa Rusinek.

ENYCHP Specialists Now Trained for On-Farm Readiness Review

Elisabeth Hodgdon, CCE ENYCHP

In May, ENYCHP specialists Elisabeth Hodgdon, Laura McDermott, and Crystal Stewart attended a food safety On-Farm Readiness Review training in Albany sponsored by the Produce Safety Alliance and New York State Department of Agriculture and Markets (NYSDAM). On-Farm Readiness Reviews are voluntary educational mock inspections to assist growers with compliance with the Food Safety Modernization Act (FSMA) Produce Safety Rule (PSR). With official inspections on the horizon this year for the largest produce farms, growers are signing up for OFRRs and prioritizing food safety updates on their operations. During an OFRR, a NYSDAM staff member and trained CCE educator tour the farm and engage in a conversation with the grower about various aspects of food safety, including worker hygiene and training, manure handling, and water testing. On-Farm Readiness Reviews are excellent opportunities for CCE educators to interact with growers and provide individualized recommendations and resources for food safety practices that are both logistically and economically feasible for farms.

Apple Thinning with Computer Models and New Materials

Michael Basedow, CCE ENYCHP

Thinning the apple crop each spring is perhaps one of the most difficult decisions an orchardist must make every year, and has one of the biggest impacts on the orchard's bottom line for the season. If a growers leaves too much fruit on the tree, they will have to either spend many hours thinning apples out by hand, or harvest many small fruit and reduce their return bloom the following spring. If they take too many off, they will significantly reduce their yield, and will likely have storage issues in the fruit that remain on the trees. Many of our new varieties are considered very difficult to thin, and many have a habit of going biennial, where they will produce many fruit one year, and very few the next, making proper thinning even more important.

While we have determined "ideal" crop loads for various combinations of variety, rootstock, and tree age, achieving that level using chemical thinning is very difficult. Most chemical thinners available are based on plant hormones. These materials are very weather dependent, having a narrow temperature range where their activity is predictable. Not only are we concerned with weather the day of application, but also in the few days before and after that application, how stressful the winter was for those trees, how much fruit was produced by the tree the previous season, and many other variables.

To give us more thinning options, this spring we worked closely with local orchards in the Champlain Valley to fine tune their thinning using new models and thinning materials. We worked closely with a cooperating orchard to implement the pollen tube growth model, which uses a computer model to determine the optimal spray timing for ammonium thiosulfate (ATS), a spray material that burns the pollen tubes of flowers that have not yet been pollinated. This caustic mode of action is less temperature dependent compared to hormone-based thinners. To successfully implement this tool, we helped the grower:

- 1. Determine their desired crop load.
- 2. Calculate the average length of the flower styles of each variety being studied.
- 3. Decide when to start the model, which began as soon as enough flowers had opened on the trees to meet their desired crop load.
- 4. Interpret the model to determine when to spray the trees with the ATS, which was sprayed twice during the bloom period.

While it is still a long way until harvest, the growers have already been very pleased with the differences in fruit growth between the ATS thinned trees versus the hormone-thinned trees. While skeptical at first, one orchard manager on the farm has already decided he would like to trial the pollen tube growth model on a larger scale next year, as he feels he is already seeing substantial positive differences in his crop between the two treatments.

There are still many barriers to successfully thinning with this new material and model, but we plan to repeat our studies next spring with more growers to better understand its feasibility in Eastern New York.

Block Blocks (3)		F	or NY1	
For NY1	Honeycrisp	Peru, NY	11.33 mm	3 ∠ 8
third blossom thinning model to 0%. The mod	g spray is needed in the Block, it should b del will keep running until July 1. If a frost	e applied when the pollen tube length is killed the king bloom, the later blooming	between 50 and 60% of the style length. I flowers may be the ones you want to ke	Entering this spray date rese ep to set the crop. Therefore
y warrant waiting until	reaching the 100% fertilization threshold	before applying the subsequent bloom t	hinning spray.	
				100
5%				
5%				
5% 0%				
5%				

The pollen tube growth model output on the NEWA webpage, showing the growth of the pollen tubes from when we launched the model through when the pollen tubes grew the full length of the style.

Sweet Potatoes Continue to Gain Popularity with ENY Growers

Charles Bornt, CCE ENYCHP

According to the 2007 US Census of Agriculture, there were 19 farms in NYS growing sweet potatoes. In 2012 that number rose to 46 farms and most recently the 2017 Ag Census, reports 129 farms producing sweet potatoes in NY. CCE ENYCHP continues to work with local sweet potato growers and in 2019 embarked on two research trials. The first is a strait forward variety trial evaluating 15 varieties including 2 experimental lines from LSU at two locations: Samascott Orchards, Columbia County and the other at Morgiewicz Produce in Orange County (muck soils). These trials were both planted on June 7, 2019.

One of the challenges identified by growers over the years is acquiring high quality slips for planting. Nearly all the slips that are purchased by growers in NY are produced in North Carolina from two growers in the same region. The slips themselves are usually of good quality, but it's what happens after they get cut. On average, it takes 3-5 days to have them shipped from North Carolina add to that probably another day or two depending on weather, for growers to actually get them planted. Once packed they immediately start to produce heat, which then degrades the overall

plant quality. Slips start to become "slimy" as leaves and stems start to breakdown. If the weather does not cooperate (too cold or wet etc.), slips may be held for 10 days or more and the higher the breakdown rates. Even though the cost of the slips is relatively inexpensive (\$15 -\$20 per 1000 plants), shipping is the major cost. One of the major slip suppliers mentioned above no longer ships slips and only offers local pickup. There is also one more reason why producing slips locally would be advantageous. In years when southern states or other major sweet potato production areas suffer from extreme weather events such as flooding during planting, these southern slip produces will cancel all orders that are not local growers. This leaves growers in NY and other minor states with no slips or drastically reduced overall slip orders. This has happened at least 2 times out of the last 5 years. So in May of 2019, sweet potato roots (Covington variety) were purchased from Jones Farm in NC and planted in ³/₄ bushel plastic totes and placed in the greenhouse on heat mats at Samascott Farms to evaluate how long and how many slips we could produce locally instead of relying on southern slips. On June 12, 2019 we collected 81 slips from one tote to plant in the same field as our variety trial. The results will be shared with growers during the winter meetings and newsletters.





Sweet Potato roots being placed in plastic totes. Photo: Charles Bornt



Sweet potato slips growing in the greenhouse about 2 weeks after roots were planted; just about ready to cut and plant outside. Photo: Charles Bornt

Sweet potato slips just cut from the bins and ready for field planting. Photo: Charles Bornt

April—June 2019

672 Phone Consults 364 E-mail Consults 492 Farm Visits 22 Field Meetings 629 Field Meeting Attendees 10 Webinars/Distance Learning 115 Participants in Distance Learning Daily, personalized, farm-specific vineyard peort addressing weather and pestsdelivered to 130 farms for a total of 7800 reports



The Eastern NY Commercial Horticulture Program is a Cornell Cooperative Extension partnership between Cornell University and the CCE associations in Albany, Clinton, Columbia, Dutchess, Essex, Fulton, Greene, Orange, Montgomery, Putnam, Rensselaer, Saratoga, Schenectady, Schoharie, Ulster, Warren, & Washington.

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