

November 2019

THE PRODUCE PAGES

Serving the fruit and
vegetable growers of
Eastern New York

Feature Farm Story

South Dominion Vineyard in Cambridge, NY

Dr. Jim Meyers, CCE ENYCHP

The Upper Hudson Wine Trail will add a new destination next fall when South Dominion Vineyard opens its new tasting room in Cambridge, NY. South Dominion Farm/Winery lives on a plot of land that has been farmed in various ways for over 250 years (Pic 2).

Originally part of a 700-acre lot of mature forest within the Cambridge Patent (established in 1761), the trees were partially cleared between 1761 and 1782. Farmers were offered an extraordinarily low rent (5 shillings per year plus one ear of corn grown on the property) as an incentive to clear the land. During that time, the oldest of the buildings on the property was built – the circa 1766 log cabin that will

become the new tasting room (Pic 1).

In 1782, Reverend William Waite purchased 450 acres of the plot and developed it as a livestock pasture, cropland, and built the circa 1790 scribe rule post and beam barn that is still there today (Photo 3). In 1827, Waite subdivided his 450 acres into six 75-acre parcels which he gave to his sons (he had 11 children) although one son was denied any land for having fought with the British during the revolution. In 1975, one of the 75-acre parcels was subdivided into South Dominion Vineyard's current 20.39-acre footprint.

(Continued on page 3)



Picture 1: Log cabin tasting facility at South Dominion Vineyard (circa 1766). Photo: J. Meyers

Cornell Cooperative Extension
Eastern NY Commercial Horticulture Program



The Produce Pages

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Serving the Educational and Research Needs of the Commercial Small Fruit, Vegetable and Tree Fruit Industries in Albany, Clinton, Columbia, Dutchess, Essex, Fulton, Greene, Montgomery, Orange, Putnam, Rensselaer, Saratoga, Schoharie, Schenectady, Ulster, Warren and Washington Counties

(Continued from cover)

Today, the property is being developed as a farm/winery by Dana Cooper. Cooper, who purchased the property twenty years ago, knew that he wanted to farm the property after retiring (he prefers to be outdoors), but did not have any concrete plans at the time. He ultimately chose wine grape production because it satisfied multiple personal goals including working with people and intellectual stimulation. Cooper has a meticulous data-driven approach to viticulture that seeks to optimize vine performance and fruit quality. “Maximizing yields with optimal fruit chemistry is a difficult challenge, particularly when working with relatively new cultivars in a region that has little history growing wine grapes”, he said.

As with all vineyards in the Upper Hudson Valley, the low winter temperature at South Dominion Vineyard preclude planting the European cultivars that are familiar to most wine consumers. Thus, Cooper has planted several cold-hardy cultivars including Marquette, Frontenac, and St. Croix (all reds); and La Crescent, Louise Swenson, and Itasca (all whites).

When asked what he is most optimistic about, Cooper replied “The dream is to make a world class red blend. I think we can do it”. Asked about what most concerns him, Cooper responded with “Spotted Lanternfly”. Spotted Lanternfly is an



Picture 2: Aerial view of vines at South Dominion Vineyard. Photo: J. Meyers

invasive species that was first found in Pennsylvania in 2014 and has since spread to 14 counties in that state. It is highly destructive to grapevines and there is concern about it migrating to New York.

Cooper’s priorities for the next two years are to “Get my pruning practices optimized so my yields are where I want them to be, my vines are healthy, and the fruit is coming off of the vine with optimal sugar and acid levels”.

The tasting room at South Dominion Vineyard is scheduled to open in August of 2020.



Picture 3: Open bay pole barn (left, circa 1958) and post and beam barn (right, circa 1790) at South Dominion Vineyard. Photo: J. Meyers

Managing Wireworms in Root Crop Production

Teresa Rusinek, CCE ENYCHP

Wireworms are an increasing problem in root crop vegetable production. Some of this increase can be attributed to the adoption of grass-based cover crop and small grain rotations for soil building. The adult stage of the wireworm, known as click beetles, prefers grassy fields for egg laying June through August. Growers with grassy fields during this period have seen high levels of wireworm damage in subsequent years when susceptible crops are grown. Wireworms have a large host range that includes seeds of bean and

corn, various root crops such as sweet potato, carrots, beets, and bulbing crops like garlic. Damage to crops may be evident for several years after a field is taken out of a grass-based cover crop, as it can take up to five years for the wireworm to complete its lifecycle in the soil and emerge as an adult click beetle.

In conventional vegetable production there are a few insecticides that can be applied prior to, or at planting, on select vegetable crops to reduce wireworm damage. In organic production however, growers must rely on cultural tactics to reduced damage. The lack of any “rescue” options in organic production spurred the investigation of entomopathogenic nematodes (EPNs) as a potential biocontrol agent in the suppression of wireworm infestations. Dr. Elson Shields and Tony Testa from the Cornell University Dept of Entomology have isolated a complex of New York native EPNs that inhabit shallow and deep profiles of the soil, are cold tolerant, persist in the soil for years and have proven successful for limiting other highly-destructive insects. In 2017, Eastern NY Commercial Horticulture Program vegetable production specialists began a research and



ENYCHP specialists designed and built a 50-gallon gravity fed nematode applicator to make it easier for growers to apply nematodes themselves. The applicator will be available for growers to loan out. A grower cooperator is preparing the applicator to deliver insect killing nematodes to the field. The applicator can be mounted on a pallet and moved through the field using a tractor with forks or on the back of a pick-up.

Photos: T. Rusinek

demonstration project with Shields and Testa to determine if EPNs are a viable biocontrol agent for wireworm management. Results from trials at multiple farm locations in Eastern NY growing sweet potatoes have shown significant reduction (36%, 80%) in wireworm damage in EPN treated plots when compared to untreated plots.

One of the most practical ways to manage wireworms is to keep grasses out of fields, particularly June through August. However, this tactic does not necessarily work with growers’ soil health or crop rotation goals. Treating soils with EPNs can provide a reasonable level of wireworm suppression and can be combined with cultural and chemical control strategies to produce marketable root crops in fields with known wireworm pressure.

If you have any questions about entomopathogenic nematodes or wireworm management, please feel free to contact Teresa Rusinek or Charles Bornt.

Daikon radish sampled from EPN treated portion of field (left photo) have significantly less wireworm, grub, and flea beetle larvae damage than untreated (center). The nematodes arrive in wax worm hosts and need to be rinsed out through a strainer into the tank water (far right).



2019 Northern New York Trapping Review

Mike Basedow, CCE ENYCHP

Throughout the 2019 growing season, we once again maintained an IPM trapping network ranging from Clinton to Saratoga County, monitoring oriental fruit moth (OFM), codling moth (CM), obliquebanded leafroller (OBLR), and apple maggot (AM). As harvest winds down, I thought I would summarize the seasonal trends we saw, and also highlight what we observed in the second year of tracking pests underneath the hail netting.

2019 Compared to the Five Year Average

We now have five years of trapping data accumulated for the Champlain Valley and Capital Region. Compared to the five year average, we had fewer pest captures in the Champlain Valley across the four key pest species we have been monitoring (Table 1). In the Capital Region, we had above average captures for OFM and CM, and very low captures for OBLR and AM.

Trap Captures 5 Year Averages						
OFM						
	2015	2016	2017	2018	2019	Average
CV	16	75	47	26	7	34
Capital	38	-	81	50	35	51
CM						
	2015	2016	2017	2018	2019	Average
CV	8	28	29	24	14	20
Capital	34	-	51	50	51	47
OBLR						
	2015	2016	2017	2018	2019	Average
CV	107	76	30	29	6	49
Capital	103	-	21	22	17	41
AM						
	2015	2016	2017	2018	2019	Average
CV	19	111	6	450	79	133
Capital	240	-	25	153	3	105

Total cumulative trap captures per season, averaged per site.

Netting for Pest Exclusion

We ran our hail net exclusion trials in commercial orchards in Clinton and Essex counties for the second season. Our results from year one were promising, so we decided to repeat the study to see if there were similar patterns in pest reduction under the netting. Traps were placed in rows that were later covered with DrapeNet hail netting, and duplicate traps were placed in nearby uncovered rows. Trees were covered with nets shortly after fruit thinning, occurring in the second to third week of June in most of our trial sites.

This season we began catching OFM on May 10 in Essex County, and on May 21 in Clinton County (Graph 1). This year, netting was installed after the first generation flight peaked. Captures were relatively light in both treatments throughout the early summer, but we began to catch higher numbers of moths in our uncovered sites as the summer progressed. We never caught more than one moth



Trees under the netting at one of our trial sites. Photo: M. Basedow

per trap per week under the netting this season, compared to a high of six moths in one of our uncovered traps. We did not notice any statistical differences between the netted and uncovered captures this season. From a practical point of view, the first generation flight occurred prior to netting installation, so there is unlikely to be much benefit for OFM management unless the netting is installed earlier in the season.

This season codling moth began flying before nets went up, as we had our first CM capture on June 4 in Peru (Graph 2). Statistically, fewer codling moth were caught in traps under the netting compared to our uncovered traps. Our highest count from our netted sites recorded this season was one moth per trap per week, compared to a high of eight in one of our uncovered sites. While we had statistically fewer captures throughout the season, from a practical standpoint again netting was not installed until after petal fall, so egg laying could still occur and fruitlets would still require additional protection.

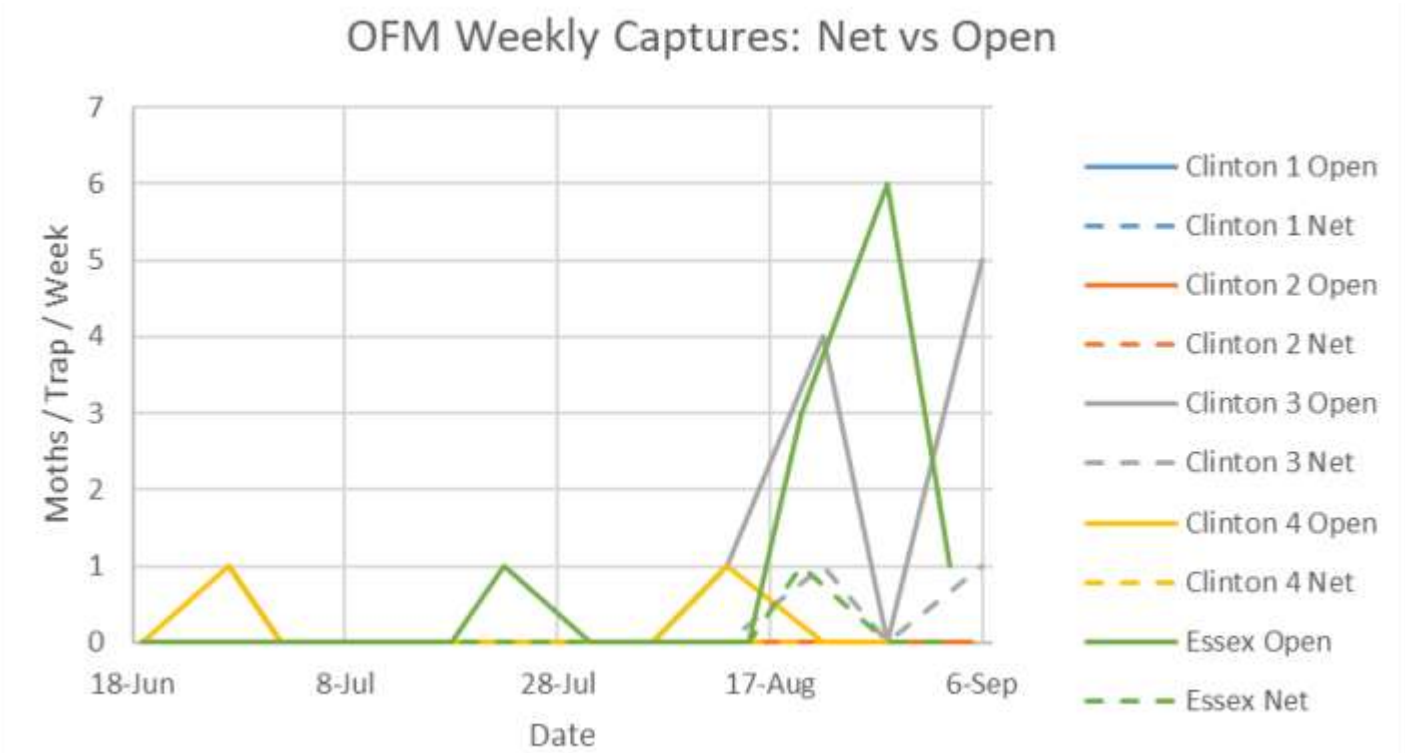
Our first OBLR capture in Clinton and Essex counties both occurred the week of June 25th, so netting was installed prior to the first generation flight (Graph 3). Overall we caught very few OBLR this season compared to 2018, regardless of the traps being under netting or uncovered. Statistically speaking, traps under the netting caught fewer OBLR. Our netted sites never recorded more than one moth per trap per week, but only once did we find more than two moths per site from any of the uncovered sites. Our colleagues in Quebec have also looked at netting for insect exclusion, and they have found OBLR can be potentially problematic in netted orchards, since OBLR can complete their life cycle entirely within the tree canopy. So, if there are OBLR present before the netting is established, it may be possible for them to become further established under the protection of the nets (Chouinard et al., 2017).

Total apple maggot captures were much fewer than last season in the Champlain Valley. Our first captures occurred on the week of July 2nd in Clinton and Essex County (Graph 4). Statistically fewer AM

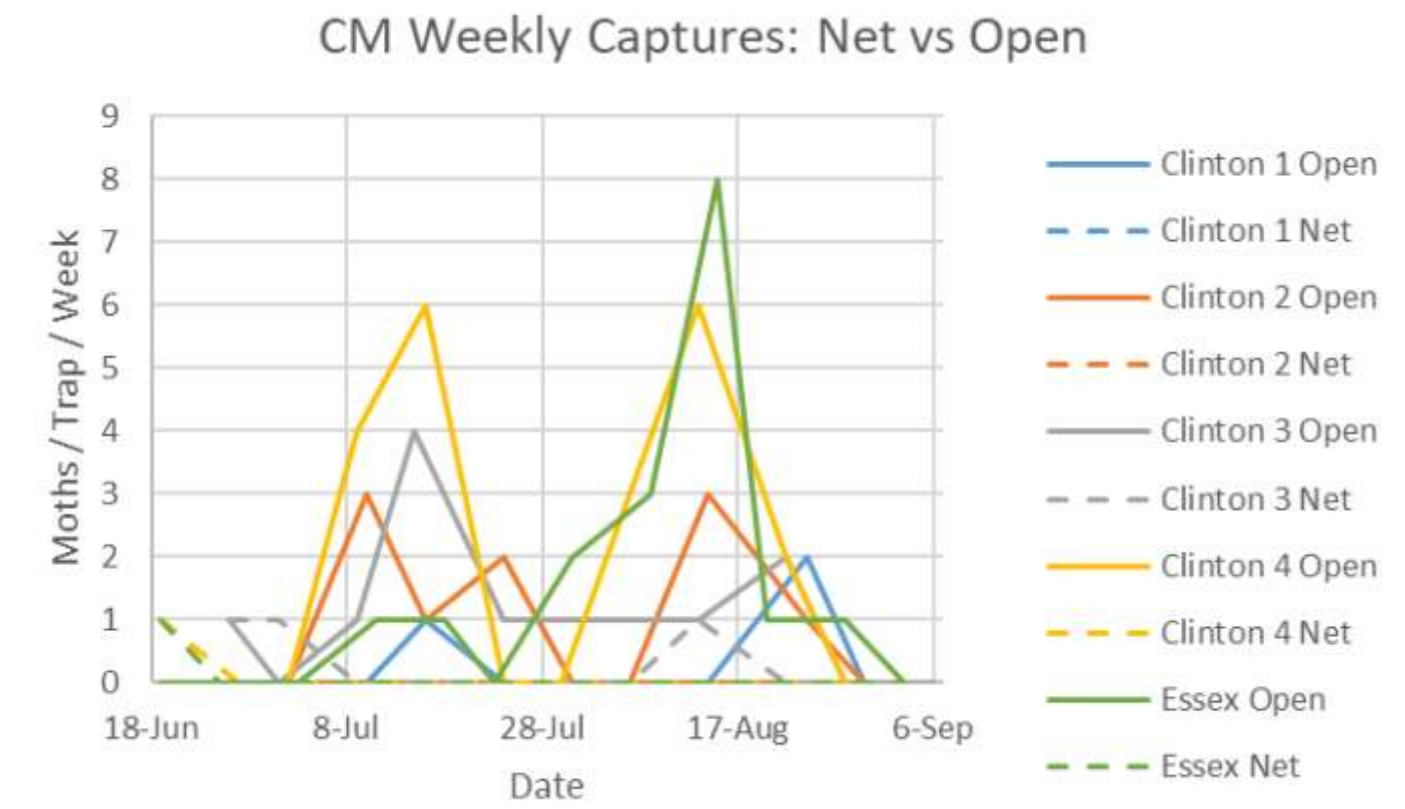
(Continued on page 6)

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were trapped under the netting than from uncovered sites. The highest numbers we saw under the nets were five adults per site per week, whereas we recorded up to 31 adults per site per week in the uncovered traps late in the season.

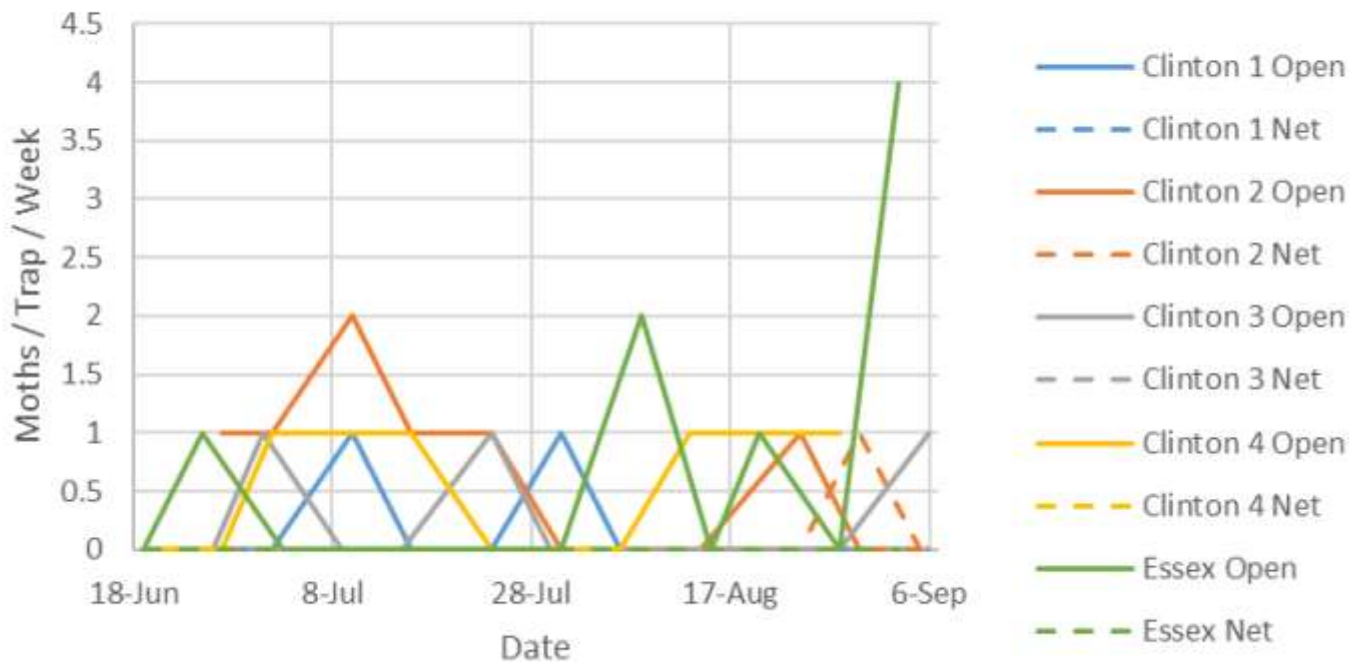


Graph 1: Weekly trap captures of OFM from netted (dashed lines) and uncovered (solid lines) trapping sites.



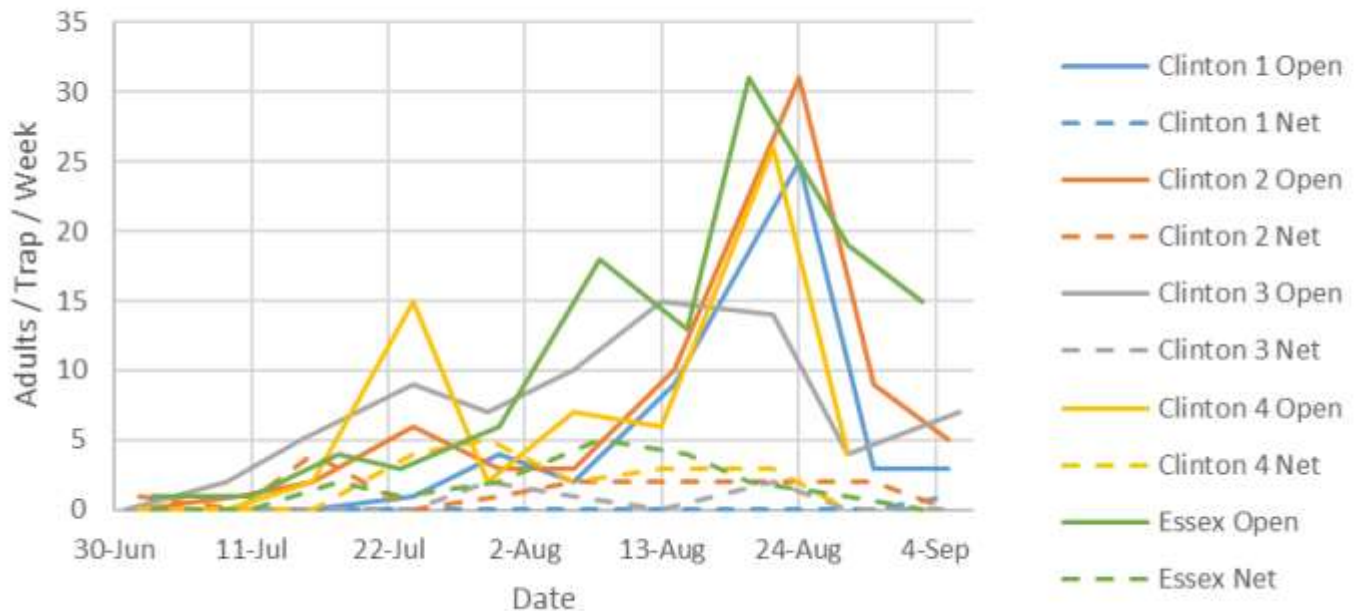
Graph 2: Weekly trap captures of CM from netted (dashed lines) and uncovered (solid lines) trapping sites.

OBLR Weekly Captures: Net vs Open



Graph 3: Weekly trap captures of OBLR from netted (dashed lines) and uncovered (solid lines) trapping sites.

AM Weekly Captures: Net vs Open



Graph 4: Weekly trap captures of AM from netted (dashed lines) and uncovered (solid lines) trapping sites.

While we may have found some significant differences in our statistical models, it is important to recognize that the netting reduced, but did not eliminate, all pests within the netting. We once again had very low pest pressure in the Champlain Valley, so expect your mileage to vary in blocks with increased pest pressure. Timing for when to hang the nettings is also a key question. To get the most out of the netting for exclusion purposes, netting would likely need to be installed prior to the first flight of your key pests in the spring. This can complicate orchard tasks like pruning and thinning, and should also be taken into consideration. While netting can be an additional element of an integrated pest management program, we will likely still need to rely on additional control methods to produce clean fruit in commercial settings.

Further Reading: [Chouinard, G., J. Veilleux, F. Pelletier, M. Larose, V. Phillion, and D. Cormier. 2017. Impact of exclusion netting row covers on arthropod presence and crop damage to 'Honeycrisp' apple trees in North America: A five-year study. Crop Protection. 98: 248-257.](#)

Lessons Learned From Our First Season of On-Farm Readiness Reviews

Elisabeth Hodgdon, CCE ENYCHP

As growers harvest the last of their crops from fields this November, the New York State Department of Agriculture and Markets is wrapping up the last of their food safety On-Farm Readiness Reviews for the season. 2019 was the first year of official inspections for the Food Safety Modernization Act (FSMA) and the Produce Safety Rule, a law signed by President Obama in 2011. Aiming to reduce the incidence of foodborne pathogens in fresh produce, the law imposes testing of irrigation water, timing of manure application in relation to harvest, worker training and hygiene, sanitation practices, and much more. For many farms not subject to third party audits, the Produce Safety Rule will be the first inspection of its kind for their operations. To help growers prepare for inspections, state agriculture agencies in cooperation with university extension have been conducting OFRR's, walking around farms and providing advice for how farms can improve to meet the new regulations.

This year in NYS, OFRR's were prioritized for the largest farms selling over \$500,000 in fresh produce. With a staggered inspection timeline, the largest farms in this category were due for official inspection this year. In 2020, farms in the next tier, selling between \$250,000 and \$500,000 ("small farms") worth of fresh produce, will be inspected. These small farms will be eligible for OFRR's next year during the growing season to prepare for inspection.

This past season, members of our team had the opportunity to accompany NYSDAM on several OFRR's in our Eastern NY region. While NYSDAM assumes a regulatory (but educational) role during OFRR's, the position of extension during the visits is to assist with compliance by identifying areas for food safety improvement on the farm in addition to technical assistance and resources to help the grower. After my last OFRR of 2019 a few weeks ago (in addition to my non-OFRR farm visits), I've had some time to reflect on the most common areas for improvement that I've observed. Here are my "top three":

Worker training

In many ways, workers are at the forefront of food safety on a farm. Workers make countless small decisions each day as to which fruit or vegetable to pick. Workers are constantly contacting the product being sold, and their health and hygiene has a direct impact on food quality and contamination. Keep in mind that anyone working with the produce is considered a worker, which can also include the farm owner, supervisors, and family members.

On farms, we often observed small but important pieces of information and protocols that were lacking in worker trainings. For example, workers must not wear hand jewelry (rings) that are very porous, ornate, and difficult to clean. Produce that has dropped on the ground must not be harvested. Workers must wash hands after eating or drinking, and



cannot eat or drink while handling produce. To support regular hand washing habits, porta-potties and restrooms should be serviced regularly and always have hand soap and paper towels. Fostering healthy worker habits helps make sure that pathogens don't make their way into the food system.

To support worker training efforts, cooperative extension can provide resources such as signage, videos, and hands-on demonstrations. One suggestion we often give is to include a "five minute food safety" segment at field crew meetings. Quick reminders and setting a good example can go a long way in reinforcing healthy behaviors.

Record keeping

I find that there are usually two types of growers when it comes to record keeping: those who dread it, and those who embrace the task and enjoy using technology to maximize its potential. While it seems there are many requirements within the Produce Safety Rule, there are relatively few mandatory records. A list of required records can be found on the Cornell Produce Safety Alliance website (see "For Further Information" below). The PSA also provides templates for these records, so that growers don't need to reinvent the wheel for each of these requirements. I recommend something simple and low tech, such as a clipboard and chart with a pencil on a string at key places on the farm. For example, one record that we consistently found missing on farms was a record of cleaning and sanitizing food contact surfaces. A clipboard for these records could be kept in the wash/pack shed for ease of use. With the right templates and placement, record keeping doesn't have to be burdensome, and doesn't require electronic devices.

Sanitation

The last of my "top three" issues on farms is sanitation in wash/pack areas. In some operations, we've seen standing water puddles, sometimes from equipment and other times from dripping within a cooler. While water on the floor is unavoidable, especially in spaces where produce is washed, drains and water on the floor are excellent habitats for *Listeria*. Extra attention should be made to keep surfaces clean and dry, inhospitable to pathogens.

Additionally, misuse of sanitizer comes up during visits. The "glug glug" method of measuring out a sanitizer should never be used. Rather, treat sanitizers as you would a pesticide on the farm. They must be stored properly and used in accordance with the label. A sanitizer must be labeled for washing fruits and vegetables in order to be used for that purpose.

Conclusion

The National Association of State Departments of Agriculture (NASDA) conducted a survey of OFRR results this past year to determine the main areas of improvement on farms. Overall, their findings in the Northeast were similar to observations in our region. Many of the large farms we visited were nearly ready for inspection. All in all, most of the farms receiving OFRR's this year in the Northeast either already meet the requirements or require minor improvements for compliance (92%). Relatively few farms surveyed so far have required significant monetary investments (14%). The role of cooperative extension is to assist growers with problem-solving to minimize time and cost associated with making food safety improvements.

In preparation for next year's OFRR's and inspections, we encourage "small" and "very small" farms in particular to take a Produce Safety Alliance Grower Training Course to learn about the Produce Safety Rule and earn their certificate for compliance. Consider earning your certificate sooner rather than later as numerous courses are going to be offered around the region in the next year. Stay tuned for more details regarding the ENYCHP's next course, held on Tuesday, Feb. 25 at our annual winter conference in Albany. We hope to see you there.

For Further Information:

Records Required by the FSMA Produce Safety Rule. K. Woods, D. Pahl, D. Stoeckel, B. Fick, G. Wall, and E.A. Bihn. Cornell Produce Safety Alliance: <https://producesafetyalliance.cornell.edu/sites/producesafetyalliance.cornell.edu/files/shared/documents/Records-Required-by-the-FSMA-PSR.pdf>

Northeast Center to Advance Food Safety webinar from Oct. 24, 2019, where Meredith Melendez (Rutgers University) presents results from NASDA's survey of OFRR's: https://www.youtube.com/watch?v=7fTWmIBb5_g#action=share

Want to schedule an OFRR in 2020?

Contact Steve Schirmer from NYSDAM at
(315) 487-0852 or
steve.schirmer@agriculture.ny.gov

Controlling Blueberry Cankers Using Dormant Sprays

Laura McDermott, CCE ENYCHP

Canker Disease Increasing

There are several canker diseases found throughout New York State on highbush blueberries. The two most significant in eastern NY seem to be *Phomopsis* canker/twig blight (*Phomopsis vacinii*) and *Fusicoccum* canker (*Fusicoccum putrefaciens*). These cankers have become a significant problem in eastern NY during the last 5 years. As our winters become less severe, more spores survive on infected canes. If growers do not spray dormant protective sprays, they are inviting more infection.

Phomopsis canker first appears as a twig infection of one year old stems (Figure 1). This is the symptom that we may not be seeing adequately as it can look very similar to winter kill. But the lesion is frequently more grayish brown than the darker withered look of winter kill. Single canes or whole section of plants wilt or die back (Figure 2). Circular lesions, gray and flat in appearance form around fruit buds, producing fungal fruiting bodies called pycnidia (Figure 3). Under favorable weather conditions, the pycnidia produce fungal spores throughout the growing season. The fungus enters the flower buds and moves into the stem. Infected stems wilt and die, or young stems die back from the canker.

Fusicoccum canker appears as individual stems exhibit ‘flagging’ or wilting during the summer (Figure 4). Dark red or brown infected areas form at the base of canes, become covered with pycnidia (Figure 5). Older dead canes develop the sexual fruiting bodies (apothecia) (Figure 6). Both *Fusicoccum* and *Phomopsis* canker can appear separately; however in some cases these cankers may occur simultaneously.

Symptoms of *Phomopsis* and *Fusicoccum* canker are most evident during the summer months. However, the infection period begins much earlier at bud swell. Spores are spread by splashing rain and infect flower buds. Winter and mechanical damage also increase susceptibility to the fungi. This is why dormant sprays are so important for control. Applying lime sulfur or copper hydroxides have shown some control of cankers. Growers should not rely solely on bloom fungicide applications to control these diseases, although bloom fungicides should be used in concert with dormant materials.

Dormant Sprays Can Help Control Canker

Lime sulfur control canker diseases on blueberries and also anthracnose. It is frequently used in raspberries to control anthracnose, spur and cane blight. Diseases that overwinter as lesions on the plant are excellent targets for control with dormant sprays. Applying a late fall (after leaf drop) or early spring dormant spray will help insure that spores from last year’s infection don’t reinfest new growth. The dormant spray material burns the overwintering lesions, killing or damaging the fungal spores before they are released.

Lime sulfur is not actually lime and sulfur, but rather a caustic chemical material known as calcium polysulfide. This material is formed by boiling slaked lime with sulfur. It is corrosive, makes a mess of your sprayer and doesn’t smell great. Several reasons growers are less enthusiastic about using it. But, as lime sulfur breaks down, it releases sulfur which controls the fungi by burning the exposed cankers. When lime sulfur is applied before growth begins – during true dormancy, oil can be added to increase sulfur penetration into infected tissues. Once green tissue appears, oil should not be mixed with lime sulfur. It is generally recommended to not use oil within a week of a sulfur spray when green tissue is exposed. Lime sulfur rates should be reduced when green tissue is exposed. Recommended rates vary for different products with dormant rates in the 10 to 12 pounds per 100 gals of water to 5 or 6 pounds when green tissue is exposed.

Lime sulfur is one of the oldest fungicides (and acts as an insecticide as well) that we have, but since it’s very caustic and dangerous to the applicator it’s listed as a Restricted Use pesticide in NYS. Additional confusion persists around the organic status of lime sulfur formulations. Most of the formulations that are listed in the Cornell Berry Guidelines are OMRI approved, but because of the way products are made and then repackaged under a different label they don’t always have the specific OMRI designation on the label. For instance, Millers Lime Sulfur is made by a company by the name of Tessenderlo and then sold through Millers. Tessenderlo has the OMRI certificate, but it’s not indicated on the Miller label. If you are unsure of product status, check with your certifier for confirmation.

Sulforix is a commercial formulation of lime sulfur that is somewhat more penetrating than regular lime sulfur. It can be used as a dormant spray to burn overwintering fungal lesions, but it can also be used during the growing season in some crops, especially in the prebloom period.

Michigan trials revealed that the use of a dormant lime sulfur could reduce *phomopsis* twig blight infections by half. Two applications, one in fall and one in spring, were slightly better than a single application in either fall or spring. Similar reductions were seen in anthracnose fruit rot and botrytis fruit rot at harvest due to dormant sprays. Spring dormant sprays of lime sulfur or Sulforix also reduced mummy berry shoot strikes. It appears that the lime sulfur inhibits germination of the mummies and mushroom formation.

Bordeaux mixture is copper sulfate with lime that is described by the ratio of copper sulfate to lime in 100 gallons of water. This material is

a common dormant spray in tree fruit production. The lime is added to the copper to reduce the phytotoxicity. Copper rates are reduced and lime rates are increased as more green tissue appears in the spring. Cuprofix is one formulation that is commonly used and does do a reasonable job controlling canker diseases.

All of these dormant season sprays are caustic. They control disease by chemically burning it out. So they will cause phytotoxicity if not used according to label directions. Air temperature and sun will further complicate things, so if you are applying these sprays for the first time, follow all the label directions. It's often advisable to treat a smaller area or use lesser rates until you feel confident avoiding any phytotoxicity issues.

Information for this article was from Mark Longstroth, Michigan State University Extension and Dr. Kerik Cox, Cornell University.



Figure 1: Phomopsis twig infection on one year old canes.



Figure 2: Phomopsis canker causes single canes or whole sections of plant to die back.



Figure 3: Slight depression and discoloration with pynida that produces spores that can cause Phomopsis re-infections throughout the season.



Figure 4: Fusicoccum canker causes similar cane flagging in mid-summer.



Figure 5: perfect example of lesion surrounding bud.



Figure 6: More frequently the lesions are much more difficult to detect.

All photos from 'Blueberry Disease Fast Facts: Canker Diseases' :
<https://cpb-us-e1.wpmucdn.com/blogs.cornell.edu/dist/0/7265/files/2017/01/BB-canker-fast-fact-26ibmk6.pdf>



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Cornell Cooperative Extension

Eastern NY Commercial Horticulture Program

2019 ANNUAL REPORT

Serving the educational and research needs of the commercial small fruit, vegetable, and tree fruit industries in Albany, Clinton, Columbia, Dutchess, Essex, Fulton, Greene, Montgomery, Orange, Putnam, Rensselaer, Saratoga, Schoharie, Schenectady, Ulster, Warren, and Washington counties.



PROGRAM HIGHLIGHTS



New Technology in Soil Moisture Sensing

With funding from a Specialty Crop Block Grant and an ENYCHP Challenge Grant, Ethan Grundberg and Chuck Bornt were able to purchase an Irrrometer IrroMesh wireless soil moisture and temperature sensor system. Each node, mounted atop a 10-foot length of conduit, can support up to 3 soil moisture sensors, a soil temperature sensor, and a rain gauge. The nodes then communicate via radio signal to a central base station. When equipped with a cellular modem, the base station can transmit data from up to 12 nodes to the cloud every hour making the data viewable through the web portal shown below. The system is currently deployed in a reduced tillage kabocha squash trial in Orange County. More soil moisture sensing systems will be investigated in 2020 to inform

growers of newer technologies for improving irrigation management on the farm.

Entomopathogenic Nematodes (EPN) Expand Bio-Control of Vegetable Pests

Perennial EPN bio-controls have provided control of alfalfa and strawberry root pests and are now being examined to suppress wireworms and Colorado Potato beetles (CPB) in vegetable crops. In collaboration with Cornell Entomologist Elson Shields, ENYCHP specialist Teresa Rusinek and Charles Bornt are using the same plots inoculated with EPNs for the wireworm study in 2017 to monitor for long-term control for Colorado Potato Beetle. EPN's have been shown to control certain species of white grubs (in particular Japanese Beetle larvae) that have reduced the quality of sweet potatoes and Irish potatoes while a significant reduction in white grub feeding on Daikon radish was anecdotally observed. EPN's may have the potential to control Seed Corn Maggot in organic and conventional production systems, which would continue to benefit local farmers. To date, nematodes have been applied on eight fruit and vegetable farms throughout Eastern New York. ENYCHP specialists advise growers on raising their own nematodes and on application techniques.



Food Safety Recommendations for Eastern NY Farms

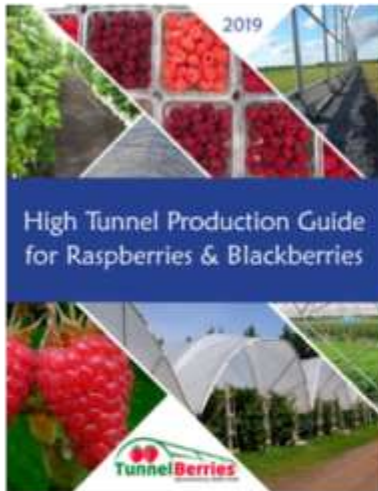
This growing season marked the first official inspections for farms subject to the Produce Safety Rule under the federal Food Safety Modernization Act (FSMA), signed into law by President Obama in 2011. Farms selling fresh produce are required to meet specifications for numerous activities involving growing, harvesting, and storing produce, including worker training, soil amendment application, and irrigation water testing. ENYCHP specialists offered three trainings throughout the region this year, to help growers earn certificates for FSMA compliance on their farms. ENYCHP collaborated with University of Vermont Extension to host a post-harvest workshop, where growers worked on plans to update their wash/pack areas with food safety in mind. Several ENYCHP specialists are now trained to assist the New York State Department of Agriculture and Markets to with On-Farm Readiness Reviews (OFRRs). During OFRRs, farms

receive personalized recommendations for improvements for their farm's food safety, and are excellent opportunities to prepare for upcoming inspections.

Bitter Pit Prediction Helps Increase Producer Profitability

Bitter pit (BP) disorder of Honeycrisp (HC) is financially devastating to NYS apple producers. Estimated per acre losses can range from 1,170-\$12,000/acre, a minimum 2.3 million to the NYS industry. Research has produced results with great benefits for NYS HC producers. The 1st is that a plant growth regulator, 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 non-mineral "passive" BP prediction model that is simple to implement, with only a labor commitment and no lab analysis fees. ENYCHP tree fruit educator Dan Donahue has taken a leadership role in the research. The entire state-wide team of research, extension, and industry professionals encourage producer adoption of these new BP management technologies. 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.





Protected Culture Offers Options for Berry Growers

Tunnel production offers growers the opportunity to produce crops under a 'protected' environment. High tunnels are used by vegetable farmers to improve crop quality, lengthen the season and manage weather related risk. Now berry growers have access to low and high tunnel information due in part to work by ENYCHP staff.

A Specialty Crop Research Initiative (SCRI) brought faculty and extension staff from seven states to conduct field research and develop outreach material [High Tunnel Production Guide for Raspberries and Blackberries](#) that is now available on the [Tunnelberries website](#). The research focused on analyzing different plastic covering treatments, different pruning and wintering treatments, the use of exclusion netting in a tunnel, and the comparison of berry crop budgets. ENYCHP staff are also involved with ongoing research in low tunnel strawberry production and actively assist with research that is being conducted by the Cornell berry faculty team to protect New York state's \$20 million berry industry.

Apple Thinning with Computer Models and New Materials

Thinning the apple crop is one of the most difficult tasks an orchardist undertakes each year, with profound implications on profitability. If too much fruit is left on the tree, labor intensive hand thinning will be required to encourage apples to size. Too heavy a crop will also result in a smaller bloom the following spring. If thinning is too aggressive, total yield could be dramatically reduced.

Ideal crop loads for various combinations of variety, rootstock, and tree age, are difficult to achieve with chemical thinners based on plant hormones. The narrow temperature range where these thinners act predictably make it hard to know how well each application "worked", and if continued thinning is needed. To help make thinning a more precise process, Mike Basedow worked with Champlain Valley orchards to fine tune the process using new models and thinning materials. The pollen tube growth model and the fruit growth rate model, are two predictive tools that help quantify the art of thinning decision-making. Participating growers were happy with their fruit yield and quality at harvest (see photo below), and look forward to adding more precision to their thinning.



Research Supports the Growing Garlic Industry

Garlic production continues to increase in New York State, and our team plays key role in making successful growth possible. We are currently involved in several grant-funded garlic projects led by Crystal Stewart-Courtens on disease management and post-harvest handling for long-term storage. The opportunity to partner with UVM Ag Engineer Chris Callahan in an attempt to optimize drying and storing of garlic and other alliums promises exciting synergy.

On-farm research is paired with outreach activities including our annual presence at the Hudson Valley Garlic Festival, a bi-annual Garlic School, and intensive workshops at NOFA-NY. This year over 500 garlic growers were supported with new information that helps them improve the quality of their garlic and, by extension, farm profitability.

New Vineyard in Westport Promises to Expand Adoption of Champlain Valley Wines

A recent vineyard planting in Essex County is the largest expansion of grapevines in the Champlain Valley since the creation of the Champlain Valley American Viticultural Area (AVA). Rolling Hills Farm in Westport, NY planted 12,000 vines including six cold hardy cultivars. The new planting covers approximately 20 acres and the farm has long range plans for as many as 100 acres in total. While the creation of the Champlain Valley AVA draws attention of wine consumers, wines are not currently being produced in quantities large enough to export out of the region. Rolling Hills is seeking to change that. ENYCHP worked with Rolling Hills during the planning phase, providing guidance on site evaluation, site preparation, cultural practices, and ongoing operations, including the integration of specialized drones and aerial imagery into farm operations.



PROGRAM HIGHLIGHTS CONT.



ENYCH Partners with Ag Workforce Development to Improve Farm Management Skills

Liz Higgins and Ethan Grundberg of ENYCH along with partners from Cornell's Ag Workforce Program, Small Farms Program, the Farmworker Program and the CCE LOFT team, offered management training to over 50 farm owners and managers in NYS as part of a USDA grant. Participants learned communication skills; how to hire, train and motivate employees; and how to improve the work environment to get employees off to a good start. Farm management skill training is particularly timely given the high costs of employees and increasingly tight ag labor market. Participants recommended offering the training annually to farm managers.

Sweet Potatoes Gain Popularity with ENY Growers

CCE ENYCHP has worked with the growing number of sweet potato growers for the past decade. Numbers have increased over seven times to a 2017 Census high of just under 150 growers. This season ENYCHP specialists conducted a variety trial at two different locations with different soil types. The varieties are from across the country and the evaluation will help growers better understand the differences in performance in our colder climate. Another barrier to sweet potato production is acquisition of high-quality slips for planting. A study evaluating sweet potato root propagation using simple heat mats in greenhouses may inspire local growers to try propagation themselves to reduce dependence on southern slip growers.

2019 Collaborators

NY Apple Research and Development Program
NYS Dept of Agriculture and Markets
NE Sustainable Agriculture Research & Education
NY and NE Integrated Pest Management
University of Vermont
New York Farm Viability Institute
US Dept of Agriculture
Michigan State University
Northeast Organic Farmers Association-NY
National Institute of Food & Agriculture
NYS Dept of Environmental Conservation
New York Apple Association
Northern NY Ag Development Program
NY Center for Agricultural Medicine & Health
Cornell Farmworker Program
Hudson Valley Farm Hub
NYS Berry Growers Association
US Dept of Labor
Grow NYC
NYS Dept of Labor
New York State Vegetable Growers Association
CCE Associations and Regional programs
New World Foundation
Cornell Institute on Climate Smart Solutions
University of Maine
Louisiana State University
University of Rhode Island
Produce Safety Alliance
Hudson Valley Research Laboratory
Cornell Agricultural Workforce Development Program
Cornell Small Farms Program
Glynwood
Orange County Vegetable Growers Association
Onion Research and Development Program
Garlic Seed Foundation
Pennsylvania Dept of Agriculture
Poughkeepsie Farm Project
Northeast Center to Advance Food Safety

STAFF

ENYCHP Specialists

Charles Bornt, Vegetables

Ethan Grundberg, Vegetables

Elisabeth Hodgdon, Vegetables

Teresa Rusinek, Vegetables

Crystal Stewart-Courtens, Vegetables

Maire Ullrich, Vegetables/Hemp

Laura McDermott, Small Fruit

Michael Basedow, Tree Fruit

Daniel Donahue, Tree Fruit

James Meyers, Viticulture/Grapes

Liz Higgins, Business

Technicians

Sarah Eve Elone

Natasha Field

Andy Galimberti

Nate Mengaziol

Sarah Tobin

Administrative Staff

Chelsea Truehart

Marcie Vohnoutka

2018 OPERATING BUDGET



Supporting County Association Shares: \$539,030.00

ENYCHP Grants & Funds¹: \$446,807.00

Cornell University Federal Funds²: \$186,000.00

Harvest New York³: \$15,000.00

¹ Includes funds from reserve accounts, grants, donations, program revenue, Ag & Markets, money market investment interest, Cornell Dept.

² USDA National Institute of Food and Agriculture Smith Lever Funds

³ New York State Funds

Cornell Cooperative Extension
Eastern NY Commercial Horticulture Program

Cornell Cooperative Extension is an employer and educator recognized for valuing AA/EEO, Protected Veterans, and Individuals with Disabilities, and provides equal program and employment opportunities.

Upcoming Events

Tarping for Reduced Tillage Workshop

November 2-19, 2019—Times Vary

4 Locations - Northport, ME; Springvale, ME; Canandaigua, NY; Voorheesville, NY
The Cornell Small Farms Program is excited to announce a series of workshops on tarping for reduced tillage in small-scale vegetable systems. More information: <https://smallfarms.cornell.edu/2019/10/join-our-tarping-for-reduced-tillage-workshop-series/>

Winter Greens High Tunnel Tour

November 13, 2019—9:30am-4:00pm

Willsboro, NY

Join us for a tour of overwintered high tunnel greens; stopping at the Willsboro Research Farm and the Intervale Community Farm in Burlington, VT. Register: bit.ly/wintergreentour

Learn About Using the H-2A Program on Small Farms

November 18, 2019—1:30pm-4:00pm

Schenectady, NY

Learn from US DOL H-2A staff and a CSA vegetable farmer about what it takes to use the program. More information: enych.cce.cornell.edu/event.php?id=1268

On-Farm Grain Storage Management Workshop

November 20, 2019—11am-3pm

Kinderhook Creek Farm, Stephentown, NY

The grain is in storage, but the management of it continues. Bring your grain moisture meter and compare it to a known grain sample. Register here: tinyurl.com/OnFarmGrainStorage

Understanding Farm Taxes and the Schedule F for Beginners

December 4, 2019—10:00am-12:30pm

Cobleskill, NY

Presentation by Bonnie Collins, a CPA and Extension Ag Program Team Leader for CCE Oneida County with years of farm tax experience. Register: enych.cce.cornell.edu/event.php?id=1267

Reduced Tillage on Muck Soils: Results from Two Years of Squash Trials

December 5, 2019—10:15am-1:00pm

Pine Island, NY

ENYCH Vegetable Specialists Ethan Grundberg and Chuck Bornt will discuss results from two years of trialing different cover crop and tillage combinations on muck soil to suppress weeds and harvest cleaner squash. Register: enych.cce.cornell.edu/event.php?id=1273

Produce Safety Alliance Grower Training

December 9, 2019—8:00am-5:00pm

Manchester, NH

This training satisfies the FSMA Produce Safety Rule requirement for covered farms that 'at least one supervisor or responsible party' completes food safety training recognized as adequate by the FDA. Register here: https://us-elevate.elluciancloud.com/app/uvn/f?p=WEB_CATALOGUE:HOME::::RP,1:P1_SEARCH_VALUE:07-08

New England Fruit & Vegetable Conference

December 10-12, 2019

Manchester, NH

This 3-day meeting has become a major event for diversified growers. Check out the conference program and register here: <https://newenglandvfc.org/registration>

Great Lakes EXPO

December 10-12, 2019

Grand Rapids, MI

Another great conference! Register and review program at glexpo.com

2020 Empire State Producers Expo

Jan 13, 2020 Becker Forum, Jan 14-16 2020 Empire State Producers Expo

Oncenter, Syracuse, NY <http://nysvga.org/expo/information/>

2020 Eastern NY Fruit and Vegetable Conference at the Desmond in Albany, NY
February 25—26, 2020—Save the Date!!



Cornell Cooperative Extension
Eastern NY Commercial Horticulture Program

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