

Cornell University
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Eastern New York Commercial Horticulture

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Berry News

Spring Berry “To Do” List

All Berries: Spotted Wing *Drosophila* traps have been deployed throughout the region. Individual SWD have been caught in traps in Saratoga and Albany counties. Despite our understanding that strawberries are less attractive to SWD, North Carolina growers see SWD as an annual threat to their crop and treat accordingly. So keep looking for signs of infestation and follow cultural recommendations like picking hard and clean, keeping weeds down, cleaning culls from the field. Observe a cold chain always. Consider exclusion netting as a way to manage this insect. Spaying strawberries and all ripening berry fruit may be the only way to guarantee that the fruit is clean. In the last edition of this newsletter, we included a list of insecticides that can be used on SWD. This list is also posted at: https://rvpadmin.cce.cornell.edu/uploads/doc_578.pdf

Blueberries

- Blueberry fruit set looks very strong throughout the region. Berries are sizing well and in a few cases a bit of color is actually showing.
- Concern about mummyberry is high, but I haven't seen any significant infections at this point.
- Continue monitoring for cranberry and cherry fruitworm. So far this pest hasn't been found to be causing major damage locally, but it shouldn't be dismissed.

Strawberries

- Picking is in full swing across the region. This season started out looking very promising, but the combination of intensely hot weather two weeks ago and the severity of downpours in some areas has resulted in spotty performance. Early varieties also seem to have had serious problems overwintering – in some areas exhibiting almost no flowers or fruit.
- Sun scald has caused serious damage in a few plantings. This is very discouraging because there is so little a grower can do to prevent it. Using a Phosphoric acid treatment (ProPhyte) may help prevent secondary fruit rot and it will also be helpful on leather rot.
- Fruit rot is surprisingly not a huge problem thus far. Some pathologists suggest that sporulation is inhibited by falling rain...certainly an abundant commodity recently.

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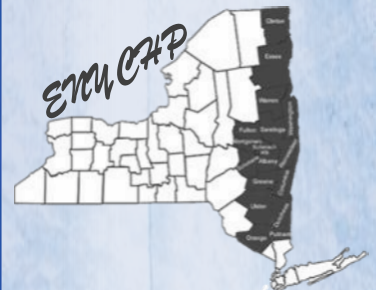
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- Leaf spot is a huge problem on most farms. Normally leaf spot can be controlled by mowing and burying leaves at renovation, but the pressure is much higher this year. A spray program that rotates labelled products like Captan, Copper, Rally, Cabrio, Pristine and Mettle is appropriate. Allowing leaf spot inoculum to build up in a planting will really impact how well the plant overwinters.

Brambles:

- Floricane brambles have set fruit and in many places fruit is coloring. The strawberry season will overlap with the bramble season more than ever this year. Cane growth looks good and fruit set also is strong.
- Orange rust on black raspberries has been reported in



Strawberry with Sun Scald. Photo : LGM

a few locations. This disease is a problem for black and purple raspberries but doesn't affect red raspberries.

- Spider mites were found in high tunnel raspberries this week. Routine scouting is needed to stay ahead of these pests as they will inevitably be a problem in high tunnels. Spikes in heat make them a field issue as well. Predators really help, so release them throughout the season for sustainable control.

Welcome Jim Meyers, ENCYP Viticulture Specialist



Jim has been working with wine grapes for 10 years, first as a Viticulture Ph.D. student at Cornell then as a Research Associate. Prior to coming to Cornell, Jim studied Chemistry and Biology (B.S. West Chester University of Pennsylvania), Computer Science (M.S. Brown University), and had a successful career as software technology entrepreneur. This background is reflected in his viticultural research which has focused on computational tools for mapping canopy and vineyard variability, quantifying relationships between variability and fruit chemistry, and optimizing efficiency of vineyard operations. As an Extension Associate, Jim will continue some of these research activities while also looking for new projects that provide targeted benefits to appellations in Eastern New York. Jim will kick off his new appointment by visiting growers at their vineyards to gather first hand knowledge of the sites and to discuss vineyard operations, goals, and challenges. Building a complete catalog of vineyards in a territory that runs 300 miles along the Route 9 corridor may take a little while, but Jim feels that the effort will lay a solid foundation for future program activities while also clearly differentiating the needs of each appellation.



Use of Tarps for Weed Control and Reduced Tillage

Brian Caldwell, Cornell University



Photo of blueberries with weed mat acting as semi-permanent "tarp". L. McDermott

Based on farmer suggestions, Cornell and the University of Maine are studying the use of removable impermeable tarps in organic vegetable production. The basic idea is to cover several beds at a time with 6-mil black plastic (silage) tarps for several weeks, then remove and plant.

We used tarps without tillage in

organic permanent bed experiments at Freeville, NY and Monmouth, Maine. Results so far have been promising. In 2015, tarps were put out in mid-April and removed in early June before planting cabbage. In 2016, tarps were deployed over winter, and removed in late May before planting winter squash. The tarp/no-till treatment was compared with varying tillage intensities from full-depth and shallow rototilling to no-till. Three surface mulch treatments (straw mulch, a 1.5-inch layer of compost, and bareground) were also compared within each tillage treatment.

In both years, tarping improved the performance of no-till production, especially with bareground no-till. Tarps created weed-free planting conditions without soil disturbance and reduced labor for hand weeding by 70% in 2015 and 80% in 2016, when compared to no-till without tarps. Spring soil temperatures increased under tarps. After removal, plant-available soil nitrogen in bareground, tarped treatments was over four times greater than tilled soils in 2016. Crop yields with no-till tarping were similar to or greater than the tilled systems.

Another experiment is underway to look at the effects of various lengths of tarping time on weeds and crop growth. Tarping may be a valuable tool for small-scale organic farmers to minimize tillage while improving planting conditions, weed control and crop productivity. For more information see the webinar at:

<http://smallfarms.cornell.edu/projects/reduced-tillage/reduced-tillage-webinars/>

Questions? Contact Brian Caldwell at bac11@cornell.edu. This research has been supported by the USDA OREI grant # 2014-51300-22244

Source: Vermont Vegetable and Berry News, June 20, 2017. Dr. Vern Grubinger compiles this newsletter. He made these comments which I totally agree with: "I am seeing an explosion of farms using weed mat between crop beds. The combination of tarping before planting then applying weed mats after planting could be a good way to reduce tillage and maintain season-long weed control."

Strawberry Leaf Diseases

Michael A. Ellis, Ohio State University

Fungal diseases of the leaf may occur as soon as the first leaves unfold in early spring and continue until dormancy in the late fall. On highly susceptible varieties, these diseases can cause significant economic damage. The primary damage from leaf diseases is a loss of vigor through reduced leaf area. If outbreaks of these leaf diseases become significant, the plants will become weakened resulting in increased susceptibility to root diseases and winter injury.

The three major leaf diseases that are caused by fungi have a similar disease cycle and are controlled in a similar manner. Leaf spot, leaf scorch, and leaf blight are the

most common leaf diseases and they all overwinter in infected dead or living leaves. They all produce spores that spread the disease by causing new infections during moist, warm conditions.

Leaf Spot

Leaf spot is caused by the fungus, *Mycosphaerella fragariae*. Symptoms of leaf spot first appear as circular, deep purple spots on the upper leaf surface. These spots enlarge and the centers turn grayish to white on older leaves and light brown on young leaves. A definite reddish purple to rusty brown border surrounds the spots. On fruit, superficial black spots may form under moist

weather conditions.

The spots form on ripe berries around groups of seeds. The spots are about 1/4 inch in diameter, and there are usually only one or two spots per fruit. However, some fruits may be more severely infected.

The fungus overwinters as spores in lesions on leaves. The fungus infects the plant and produces more spores in spots on the upper and lower leaf surface that spread the disease during early summer. These spores are spread by splashing rain. Middle-aged leaves are most susceptible. Lesions also develop on stems, petioles and runners.

Leaf Scorch

Leaf scorch is caused by the fungus *Diplocarpon earliana*. Symptoms of leaf scorch consist of numerous small, irregular, purplish spots or “blotches” that develop on the upper surface of leaves. The centers of the blotches become brownish. Blotches may coalesce until they nearly cover the leaflet, which then appears purplish to reddish to brown.

The fungus overwinters on infected leaves. The fungus produces spore forming structures in the spring on both surfaces of dead leaves. These structures produce spores abundantly in midsummer. In the presence of free water these spores can germinate and infect the plant within 24 hours. Older and middle-aged leaves are infected more easily than young ones.

Leaf Blight

Leaf blight is caused by the fungus, *Phomopsis obscurans*. Symptoms of leaf blight infections begin as one to several circular reddish-purple spots on a leaflet. Spots enlarge to V-shaped lesions with a light brown inner zone and dark brown outer zone. Lesions follow major veins progressing inward. The whole leaflet may turn brown. In severe cases, stolons, fruit trusses and petioles may become infected which may girdle and kill the stem.

The fungus overwinters as mycelium or fruiting structures on the old leaves that remain

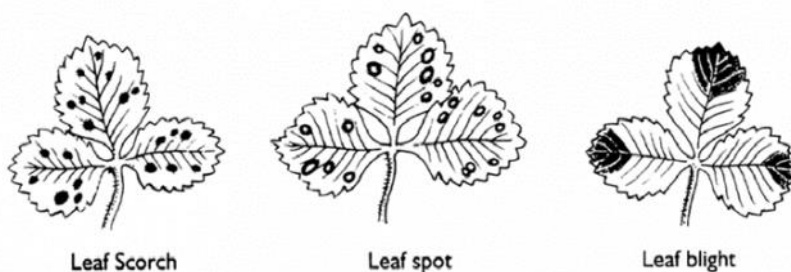


Figure 1. Typical symptoms of leaf scorch, spot, and blight on strawberry leaves.

attached to the plant. Spores are spread by rain splash early in the spring. Leaf blight is most destructive to older leaves in the late summer. Petioles, calyxes and fruit may also be infected earlier in the season.

Leaf spot and leaf scorch are controlled most effectively by the use of resistant varieties. The following Junebearing varieties are reported to be resistant to both leaf spot and leaf scorch: Allstar; Canoga; Cardinal; Delite; Earliglow; Honeoye; Jewell; Lester; Midway and Redchief. The ever bearing varieties, Tribute and Tristar, are reported to be tolerant to leaf spot and leaf scorch. There are no varieties with reported resistance to leaf blight. These cultural practices should help reduce infection:

- Remove the older and infected leaves from runner plants before setting.
- Take care in spacing runner plants in matted-row culture.
- Plant in light, well-drained soil in a location exposed to all-day sun and good air circulation.
- Control weeds in the planting. Weeds reduce air circulation and increase drying time for leaves. (Leaves stay wet longer in weedy plantings.)
- Removing infected leaves after harvest (during renovation) is helpful in reducing inoculum and controlling all the leaf diseases.

If leaf diseases are a problem in the planting, fungicides will aid in control. However, the emphasis on control of leaf diseases should be placed on the use of resistant varieties.



Fig 2. Strawberry leaf spot.



Fig 3. Strawberry leaf scorch.



Fig 4. Strawberry leaf blight.

Strawberry Harvest & Storage/Shipping Considerations

Craig Kahlke, CCE Lake Ontario Fruit Team

With the “new norm” of hot/cool/ dry/wet ever- changing weather patterns, strawberry harvest is underway with a slow start to the season. Thus now is a good time to discuss handling of the fruit associated with harvest and post-harvest activities. Strawberries are among the most perishable of all fruits, and thus it is critical that marketing channels are open before harvest starts (so yes, this article is a bit late!). Strawberries are extremely susceptible to bruising, and rough handling at harvest and during any time thereafter will encourage fungal growth and decay. It is critical that personnel be trained in the careful picking and handling of fruit. In addition, fruit quality declines as the season progresses, so the highest quality fruit will be earliest in the season. With varying degrees of ripeness in single plantings, it is also extremely important that the fruit is harvested as near peak ripeness as possible.

Worker Hygiene

From a food safety standpoint, strawberries, raspberries, and blackberries are considered high risk. One reason is because often the last person to touch the fruit prior to it being eaten by the consumer is the picker, as postharvest on-farm washing soon after harvest reduces shelf-life considerably in soft berries. Therefore, proper worker hygiene training is critical. Workers should ALWAYS wash their hands before entering the fields, and before/after eating and during breaks, prior to re-entry into fields. This should be an enforceable rule. Workers should be trained in proper hand-washing techniques, and always use soap and potable water, with single-use paper towels. There should be no smoking or eating in the fields, and there should also be designated areas for breaks/lunches (these can be on the edges of harvest fields but not between the rows). We’re aware most of you have been drilled on this with your GAP audits and FSMA compliance looming. For more information and to order proper worker hygiene training materials, please go to <http://www.gaps.cornell.edu>, and click on GAPs Educational Materials.

Strawberries Destined for Direct Markets

Since most strawberry markets in the Northeast are consumed very close to the farms in which they are produced, many growers lack and may not need the cooling



methods and storage facilities used by long-distance shippers such as those employed by the production areas in California and Florida. Direct market channels are ideal for many growers in the Northeast, as fruit loss is further accentuated from shipping from the farm to wholesalers, and from the wholesalers to retail markets. By bypassing wholesale shipping, fruit loss due to bruising and fungal decay can be reduced by an average of 20%. For optimum quality, it is critical that direct market fruit is harvested at or very near peak ripeness. Top quality strawberries should be fully ripe, with a uniform red color, be firm, flavorful, and show no signs of decay or disease.

Temperature is the single most important factor affecting shelf life of strawberries.

If cooling down to the recommended 32 F is an issue for growers, research shows that strawberries held at 50F storage at high humidity will benefit storage life greatly as compared to room temperature storage. In addition, strawberries at 50F tend to retain their color and glossy appearance better than berries stored at 32F. Many direct-market local growers claim approximately 90% of their strawberries are consumed the day they are harvested, thus in these cases, it is very critical that the berries be at peak ripeness. The berries are most often harvested in morning only when field heat is low, are usually then shipped out to markets on refrigerated trucks the same morning, reach the retail shelves by afternoon, and are bought and consumed within a day or two.

Strawberries Destined for Long-Distance Markets

For strawberries that are being transported beyond local markets, there are two factors that impact on maximum shelf life potential. First, the fruit will hold up better if they are harvested at the white tip stage, rather than fully ripe. Second, cooling is critical. As soon as harvest occurs, it is imperative that field heat is removed from the fruit. It is recommended that cooling is started within an hour of harvest. Ideally, 32F forced-air cooling with high humidity (90-95% RH) is recommended. Refrigeration without forced air can also be used; however, shelf-life will be shortened. Proper forced-air cooling removes field heat from fruit in 20-90 minutes, while simple refrigeration without forced air can take about 9 hours. Proper ventilation around, below, and above the fruit is essential for removing field heat quickly. It is estimated that for each hour delayed in cooling the fruit results in reducing shelf life of fruit by one day.

Following field heat removal, shipping on refrigerated trucks to market destinations is essential. If cold storage will be limited at market destination, as stated in the section on direct marketing, research shows 50F storage at high humidity will benefit storage life greatly as compared to room temperature storage. If all precautions are taken from harvest to cooling to storage, shelf life from harvest to market and on the consumer's table can be up to 10-14 days maximum for strawberries, but likely averages more like seven days in the Northeast. For growers interested in exploring the potential of longer distance markets, including more information on how to set up an inexpensive forced-air cooling system for berries and many other types of perishable produce, please contact Craig Kahlke at 585-735-5448, or email at cjk37@cornell.edu.

Source: Fruit Notes Volume 17 Issue 9

Cornell's Climate Smart Farming

With increasing heavy precipitation events, short-term drought, shifting growing seasons, and higher temperatures, climate change is having a significant impact on agriculture in the Northeast. These forces can wreak havoc on any farm, but there are ways to guard against them and even take advantage of some, which is what the Cornell Climate Smart Farming (CSF) Program is focused on. Cornell CSF gives farmers in New York and the Northeast the tools and information needed to respond to extreme weather, climate change, and climate variability, while maintaining their bottom line. The CSF website (climatesmartfarming.org) is the main portal for the free online decision tools, resources, and other CSF-specific information used by farmers, extension, and consultants to achieve this goal.

The CSF tools, in particular, combine weather and climate data at any location (by address, zip code, etc.) in the Northeast, and are updated daily to give users accurate short-term projections. The CSF tools currently available on the site (see picture) were developed in collaboration with the Northeast Regional Climate Center, and include



a Growing Degree Day (GDD) Calculator, Apple and Grape Freeze Risk Tools, and a Water Deficit Calculator. Additional tools for extreme events such as heat stress are also planned.

The tools were particularly useful during recent extreme events, such as the 2016 summer drought and the 2017 spring freezes. Farmers at Empire Farm Days in Seneca Falls, NY remarked at the accuracy of the Water Deficit Calculator in capturing plant stress conditions on their farm in 2016, and enjoyed seeing the tool's 3-day forecast, especially as critical harvest periods approached.

Fishkill Farms Manager, Mark Doyle, also commented on the freeze tools, which give a 6-day forecast, stating that: "Along with other factors, I will be looking at this tool to understand the weather situation in front of me and the freeze risk facing our apple trees."

The CSF tools can also be used in combination with other tools such as those from the Network for Environment and Weather Applications (NEWA). For example, the CSF GDD calculator provides climatological data on GDD as well as a 6-day forecast that can be useful for seeing pest development and determining best management practices, especially when combined with NEWA's pest management tools. The CSF site provides easy access to other tools as well, such as those from NEWA, the US Drought Monitor,

seasonal forecasts, and greenhouse gas accounting tools. In addition to Decision Tools, the website also provides contact information for the Cornell CSF Extension Team in New York, resources and best management practices such as the [USDA Adaptation Resources for Agriculture](#), an online forum for farmer-to-farmer interaction, and a multimedia section with videos featuring farmers who have made changes on their farm to increase resiliency and energy efficiency.

Feel free to check out the tools and resources, or contact one of the CSF Extension team members for help in using the tools at cicss@cornell.edu.

FYI:

Oregon State University offers on-line blueberry production course

Learn the fundamentals of blueberry plant physiology and growth, species and types grown and cultivar adaptation, planting establishment, production systems, and important pests to develop successful new plantings or improve the yield and production efficiency of existing planting in this online, instructor-led certificate program offered by Professional and Continuing Education at Oregon State University.

Within a collaborative, research- and experience-based curriculum and interaction with the instructor and peers through a discussion board, you will finish the course with a comprehensive knowledge of blueberry. The target audience for this course is growers of small- to large-sized conventional or organic farms, crew leaders, farm managers, advisors, packers, shippers, and consultants.

The course is designed such that those new or well-versed in blueberry production will benefit. You will access 3 to 4 hours of lectures per week in this 6-week course. A new set of lectures will be available each week.

In addition to completing the course and interacting with peers and the instructors on a discussion board, you will need to complete one or more quizzes per week to receive your certificate of completion.

<https://pace.oregonstate.edu/catalog/online-blueberry-physiology-production-systems-management>



Calendar of Events

Ag Business Tuesdays this Summer – free farm business technical assistance.

The Cornell Cooperative Extension Eastern NY Commercial Hort Team, in collaboration with CCE County offices, is offering free farm business technical assistance appointments this summer on Tuesdays at various locations in our service region.

Topics for consultations can include: labor regulations and management, risk management (insurance and best practices), land use regulations and zoning, other food-regulations (labels, processing), personal finance and farm transition planning, tax and other grant and incentive programs, bookkeeping and recordkeeping, pricing products and market channel assessment, contract terms and negotiation, and loan programs and financing decisions. At your appointment we can either help to answer your questions or help direct you to the right resources.

Planned locations for June, and July 2017

- **June 27 CCE Essex County, Westport NY**
- **July 11 CCE Clinton County, Plattsburg NY**
- **July 25 CCE Warren County, Warrensburg NY**

Appointments are in 1.5-hour increments starting at 9:00 am. In some cases, early morning or early evening appointments may be available. Pre-registration in advance is required - we cannot accommodate walk-ins. If you can't physically come to the office, we can also schedule an appointment by phone or a video conference.

To register go to: <http://bit.ly/2oyaGpM> or call (518) 949-3722 and leave your name, preferred date and preferred time and the best way to reach you. Liz will also be doing farm visits in the counties on the following Wednesday. If you would like a farm visit, contact her directly at emh56@cornell.edu.

July 11, 5-7 pm - VVBGA On-Farm Workshop - Strawberry Production at Four Corners Farm, 306 Doe Hill Road Newbury VT

The Gray family grows about 50 acres of fresh produce including 10 acres of strawberries. They use innovative plasticulture techniques, grow their own straw mulch, rotate with cover crops for soil health, and have tried many varieties and production systems over the years. Currently they have 11 different varieties in production. This workshop is free.

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