

# On-Farm Trialing: Key to Understanding Local Variety Performance

Crystal Stewart—ENYCHP

Every year growers graciously provide space and support for us to do variety trialing on their farms, allowing us to share real-world information about how varieties perform here in Eastern New York. These opportunities to grow alongside our growers can also help us to better understand the practices being used to produce various crops, which in turn helps us provide more relevant advice to everyone.

One of our trials this year, a head lettuce variety trial, is at a farm which has hosted various extension research projects throughout the years, but which also conducts many independent variety trials. Pleasant Valley Farm in Argyle (Washington County) has independently trialed everything from overwintering onions to spinach to cherry tomatoes (the winner was Sungold, if you want to skip to the end).



The keys to success for on farm trialing are relatively simple, but all quite important:

- 1. Choose a number of varieties you can reasonably assess (that number varies widely, and is quite personal. Start small—5 varieties is a nice adventure. 20 is a compost pile, if you aren't careful. Once you have mastered your trialing, the number of varieties you can include is endless. You can ask Sandy about that at the NOFA conference in our on-farm trialing session this winter!
- 2. Know what information is important to you. Do you care about weight, visual quality, taste, disease resistance? Pick a couple of qualities and stick to those, with room for notes about interesting features.

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- 3. Record your observations. No really. You'll be happy about these notes later.
- 4. Make sure to compare your new varieties against your current varieties, all in the same planting. This helps control for the variation from any given season.
- 5. Plant just a little bit of each new variety, just to get the sense of them. Keep trialing low-risk. Then if you hate something, you can just disc it in.
- 6. Have fun. Throw in a few really unusual varieties now and then, and invite the crew (and your friendly neighborhood vegetable specialist) to rate with you. Or taste test at the farmers' market.

This winter, why not pick out a handful of small seed packets to throw in the mix, and do your own on-farm research? Maybe you will discover a new favorite.

# Tomato Anthracnose Amy Ivy, ENYCHP

Late summer is the time to find tomato anthracnose in high tunnels and field grown crops. It causes the fruit to rot rather dramatically especially as harvest continues, but does not affect the leaves. It's caused one of the many species of the fungus Colletotrichum. The infection can happen while the fruit is green, but the symptoms don't become obvious until the fruit is ripe. The first symptoms are flattened areas on the fruit about a quarter to half inch across which gradually increase in size. The centers of the spots will then turn dark as spores begin to form and eventually the fruit rots. It is usually worse on the lower fruits but will move up the plant in field plantings as spores splash from infected lesions. But even in high tunnels where rain splash is not an issue, spores can be carried on wind currents and I've seen considerable crop loss where the plants were left untended. Removing all affected fruit before the fruit rots will help reduce the amount of inoculum produced. Harvesting fruit before symptoms

appear helps but the disease can still develop after harvest if the fruit was infected, even under dry storage conditions.

There are no resistant varieties. The fungus overwinters in plant debris so disease management includes rotating all Solanceous crops away from an infested site for 3-4 years, using drip irrigation to reduce water splashing,







Right: For comparison, here is typical stinkbug feeding injury. The skin is scarred and the damage is light in color, and the spots are not flattened as they are with anthracnose.

trellising plants to keep foliage off the ground and improve air circulation, and covering the soil with mulch to serve as a barrier between the soil and plants. There are several spray options for field production which should be applied to the first green fruit in the year following an infestation.

For more information and photo of this disease at different stages of development visit <a href="http://blogs.cornell.edu/livegpath/gallery/tomato/anthracnose-ontomatoes/">http://blogs.cornell.edu/livegpath/gallery/tomato/anthracnose-ontomatoes/</a>

Top: The earliest stage of anthracnose, just a flattened spot on ripe fruit

Middle: A little later, the centers of the spots are getting dark with the fungus

Bottom: Even later, these spots are now producing spores to spread the disease. Try to remove the fruit before they get to this point!



### Gold Fleck on Tomatoes

Teresa Rusinek, ENYCHP

Here is another disorder of tomato that may appear in your fields or high tunnel. Unfortunately, there is no gold in tomato gold fleck. It's actually a deposit of calcium oxalate under the skin of mature tomato fruit. Though this disorder has been reported for some time, southern production areas have noticed a sharp increase of gold fleck since the late 90's and growers in our region have noticed more of it as well.

What causes it? In reviewing the literature, it appears that there are several situations that may result in gold fleck. Often the cause is a combination of environmental conditions where day temperatures are over 88 F and night temps over 68 F with high humidity. Studies conducted at University of Florida in the early 70's found that cultivar genetics play a role in the expression of gold fleck. Nutrient balance may also play a role as excessive levels of calcium and phosphorous have induced symptoms. Thrips and/ or mite feeding damage, which is common in high tunnel production, can also result in a gold flecking as well as a rough skin.

Because gold fleck weakens the fruit peel, the quality and shelf life of fruit may be affected, especially if there is a lot of flecking as in the picture to the right.



To minimize the occurrence of this disorder, provide a balanced nutritional program, especially between **potassium** and **calcium**, keep high tunnels well vented, avoid direct sunlight on fruit which will encourage flecking and watch for cultivars that are less susceptible to flecking.

For more information see: <a href="https://extension.udel.edu/">https://extension.udel.edu/</a> weeklycropupdate/?p=8553

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Team on Facebook for
information on our events,
research, and agricultural
updates!





## Introducing Soule Ouattara!

Many of you have already seen Soule Ouattara scouting onion fields in Orange County this summer. Soule started working as a field technician in the lower Hudson Valley in July and will be focusing on monitoring allium leafminer in the region this fall. Soule is new to the agricultural world, but had experience with policy reform related to cocoa price regulation and taxation in his home country, the Ivory Coast (Cote d'Ivoire) known as the

world largest cocoa producer with roughly 40% of the global supply. He will be using his extensive experience with data analysis and visualization to help assess the degree and extent of the new invasive pest while working with extension. Soule can be reached by email at <a href="mailto:so393@cornell.edu">so393@cornell.edu</a> and may be contacting you to arrange a time to scout your fall alliums for signs of ALM damage.



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## Tips for Harvesting and Curing Sweet Potatoes

Chuck Bornt, ENYCHP

Though this season was a lot cooler compared to last year, I'm sure some of you are either thinking about harvesting sweet potatoes or have actually started to harvest them. Sweet potatoes can be dug at any time roots reach a marketable size. However, sweet potatoes do not reach their full potential flavor until they have been dug and properly cured – so digging them is only half of the work! If you are an Irish potato grower, remember that sweet potatoes are nothing like your standard Irish potatoes. In fact, they have very little in common. Sweet potatoes are much more delicate and require more attention when harvesting and storing.

#### Keys to sweet potato harvesting:

- 1. Do not let the roots get exposed to cold temperatures (less than 50°F), especially soil temperatures. Sweet potato vines can be hit with a light frost, but when roots are exposed to prolonged colder temperatures, they can form an internal white ring of tissue which really decreases the quality of the root. The roots will not store as long or taste as good. That is also why we recommend storing sweet potato roots at or around 55°F.
- 2. Mowing or cutting the vines will help make the harvest go easier, but it will not help "set" the skins or "toughen up" the skins as it does with regular Irish potatoes. You can mow and dig sweet potatoes the same day and the skins would be no different than if you cut the vines two weeks prior to harvesting.
- 3. If you are using a mechanical digger such as a potato digger to harvest your roots, make sure you run the chain as slow as possible and carry as much dirt up the chain as possible to reduce the amount of bouncing that occurs. The sweet potato has a thin, delicate skin that is easily broken. Any cuts, bruises, or skin abrasions will reduce quality and storability significantly. It might even be worth taking the shakers off of your digger to reduce the amount of bouncing of the roots on the rods. The longer the chain, the more dirt that can sift down through the rods exposing the roots which can then allow workers to pull the roots off the digger before they are put back on the ground. This would eliminate one more potential bruising opportunity.
- 4. What should you put the roots in? I get this question a

- lot and if possible when picking up your sweet potatoes, use some kind of slotted crate or small bin that will allow air to flow through them. Instruct your workers to gently place them in these containers. If picking up with buckets and dumping into bins, reduce the distance the roots have to fall as much as possible. This again will help reduce cuts and bruises.
- 5. Do not wash your roots until you are ready to go to market with them! Remove as much dirt as possible when digging, keep them dry and place directly into the harvest containers. These containers should then be taken an area to cure.
- 6. You need to cure them after harvest for several reasons. First, curing allows any cuts, abrasions or bruises to heal which allows for better storability of roots. Second, curing is when the roots develop their flavors and starches are converted into sugars which give sweet potatoes their sweetness.
- 7. Ideal curing conditions are a temperature of 85°F with 90% humidity for 5-7 days. At this time of year empty greenhouses can be an excellent place to cure sweet potatoes, but there are a couple of things that need to be done. First, floors of the greenhouse should be watered several times a day in order to keep the humidity levels at 90%. Second, make sure fans are set for 85°F and the heater is turned on and set to keep the greenhouse as close to 85°F night.

Once your sweet potatoes are cured, store as close to 55 - 60°F as possible, but no lower, and maintain a high humidity. If done properly, sweet potatoes should easily store into February and even into April if conditions are right.



## Identifying Potato Tuber Diseases

Susan Scheufele, U Mass Extension

Potato harvest is underway for some early processing varieties and will be beginning soon for fresh eating, direct-market sales. There are many diseases that affect potato tubers so as you begin to sort through your potato harvest this year, take a moment to check for disease symptoms. Proper identification will help you decide which tubers will store well and which should be sold as tablestock, and will give you a better idea of which soilborne diseases are present in your fields, improving your future crop rotations.

Common Scab (Streptomyces spp.) produces tan to dark brown, circular or irregular lesions which are rough in texture. Scab may be superficial (russet scab), slightly raised (erumpent scab), or sunken (pitted scab). The type of lesion is dependent on potato cultivar, tuber maturity at infection, organic matter content of soil, strain of the pathogen, and the environment. Common scab is controlled or greatly suppressed at soil pH levels of 5.2 or lower, though a closely related but less common species of Streptomyces known as acid scab can survive down to 4.0.

**Early blight** (*Alternaria solani*) usually affects potato foliage but tuber infections can also occur. Tuber lesions are dark, sunken, and circular often bordered by purple to gray raised tissue. The underlying flesh is dry, leathery, and brown. Lesions can increase in size during storage and tubers become shriveled.

**Fusarium Dry Rot** (*Fusarium* spp.) causes internal light to dark brown or black dry rot of the potato tuber. The rot may develop at an injury site such as a bruise or cut. The pathogen penetrates the tuber, often rotting out the center. Extensive rotting causes the tissue to shrink and collapse, usually leaving a dark sunken area on the outside of the tuber and internal cavities.

**Black Dot** (*Colletotrichum coccodes*) On potato foliage symptoms are nearly indistinguishable from early blight and on tubers it produces tiny black sclerotia (fungal resting structures). Symptoms on tubers can be easily mistaken for silver scurf.

**Silver Scurf** (*Helminthosporium solani*) affects only tuber periderm (skin). Lesions are initiated at the stolon end as small pale brown spots which may be difficult to detect at harvest but will continue to develop in storage. In storage, lesions may darken and the skin may slough off

and many small circular lesions may coalesce to form large affected areas. Tubers may also become dried out and wrinkled due to excessive moisture loss in storage.

Black Scurf and Rhizoctonia Canker (Rhizoctonia solani) Black scurf is purely cosmetic and does not reduce yield, even in storage. Irregular, black hard masses on the tuber surface are overwintering structures (sclerotia) of the fungus. Presence of these sclerotia may be minimized by harvesting tubers soon after vine-kill and skin set. While the sclerotia themselves do not cause damage, they allow the pathogen to survive in the soil and serve as evidence of its presence. In cool, wet soils, R. solani can cause dark, sunken lesions on underground sprouts and stolons. These lesions can cut off the supply of nutrients, killing tubers, or can reduce the transfer of starches to the tubers, reducing their size. Cankers can also form on the tubers themselves, usually at the stolon or in lenticels. Cankers on tubers which can be small and superficial but may be large, sunken and necrotic.

Pink Rot (Phytophthora erythroseptica) and Pythium Leak (Pythium spp.) Pink rot infections start at the stolon end and result in rotten and discolored periderm with a clear delineation between healthy and diseased tissue. When exposed to air, tuber flesh turns pink and then brownblack. Pythium spp. that cause leak infections invade tubers through harvest wounds and continue to develop in transit and storage. Infections result in internal watery, gray or brown rot with well-defined red-brown lines delineating healthy and diseased tissue.

Late Blight (*Phytophthora infestans*) affects potato foliage and tubers. Foliar symptoms start with brown to black, water soaked lesions on leaves and stems which produce visible white sporulation at the lesion margins under humid conditions. Whole plants and fields may collapse rapidly. Tuber infection is initiated by sporangia from foliage being washed down into the soil and usually begins in wounds, eyes, or lenticels. Lesions are copper brown, red or purplish and white sporulation may occur on tuber surfaces in storage or cull piles. Infected tubers are susceptible to infection by soft rot bacteria which can turn entire bins of potatoes in storage into a smelly, rotten mass.

**Potato Virus Y** can cause necrotic ring spots on tubers, depending on which strain of the virus is present, which potato variety is grown, and the time of infection.

Affected tubers have roughened rings of darker brown or reddened skin. Necrosis beneath the rings may extend into the tuber flesh. Necrotic symptoms in tubers often increase after storage. Potato varieties vary in their susceptibility to PVY and the symptoms they exhibit on foliage and on tubers; Yukon Gold is particularly susceptible to tuber necrosis.

#### **Physiological Disorders**

**Black Heart** is caused by lack of oxygen during storage which causes the tissue to die from the inside out and turn black. The condition is not reversible but if you notice it quickly and correct your storage conditions you can prevent the whole crop from being affected.

Brown Center and Hollow Heart are internal physiological disorders of potato which often occur together. Brown center is an area of dead pith cells which turn brown, while hollow heart is a star- or lens-shaped hollow area in the center of the tuber. These disorders make freshmarket tubers unattractive and can reduce repeat sales. Severe hollow heart negatively impacts the quality of chip-processing potatoes and can result in shipments not

making grade. Both disorders are related to stress, and occur at a higher incidence when growing conditions abruptly change during the season. Brown center and hollow heart likely form during tuber initiation but could also form during tuber bulking. If the disorder occurs during the early part of the season, then it is most often preceded by brown center and forms in the stem-end of the tuber, while late-forming hollow heart usually occurs near the bud-end with no brown center symptoms occurring. Conditions such as when soil temperatures are less than 56°F for 5-8 straight days, or when available soil moisture is greater than 80% cause brown center to start forming. Incidence of brown center and hollow heart also increases with periods of stress caused by high or low soil moisture, especially if heavy rains occur suddenly after a dry spell. Large tubers are more prone to develop the disorder, so using closer spacing and making sure not to have too many skips in the row can reduce incidence of brown center and hollow heart. There are also differences in the susceptibility of potato varieties: 'Atlantic', a widely grown potato for chip processing, is relatively susceptible to both disorders. In 'Russet Burbank', susceptibility to both brown center and hollow heart is highest soon after tuber initiation when the tubers are small.

### Diagnosing and Managing Verticillum Wilt in Eggplant Ethan Grundberg, ENYCHP

Many eggplant growers around the region began to notice Verticillium wilt symptoms in their fields over the past couple of weeks. Since Verticillium wilt infects the plant's vascular system and restricts the movement of water and nutrients, the associated leaf scorching and plant wilt symptoms are usually more pronounced during warm weather and in dry soils. Even though there is nothing that can be done to cure currently infested crops, it is important to scout and record where Verticillium is present on the farm to inform a long-term management strategy.

There are two common soil-borne fungal pathogens, *Verticillium albo-atrium* and *Verticillium dahlia*, that cause Verticillium wilt in over 200 different plant species. Once the pathogens are established in a field, they can survive for up to 15 years as microslerotia in the soil and can continue to reproduce on a wide range of host weed species that includes velvet leaf, horse nettle, pigweed, and lambs-quarters. The Verticillium species can be spread from field to field on equipment carrying soil, so care must be taken to work fields with known infestations last and to sanitize equipment afterward.

On eggplant, the first noticeable symptom of Verticillium wilt is a discoloration on the edges of lower leaves accompanied by slight wilting. As the infection progresses and the vascular system clogging becomes more severe, the discoloration can progress into more severe leaf scorching. These leaf symptoms are often only observed on one half of the leaf or plant, with one side visibly wilted and necrotic and the other side seemingly healthy. Cutting the main stem of the plant just above the soil line will reveal a darkened center (the clogged vascular tissue). Though affected plants may be able to survive, the loss in foliage often leads to secondary issues like sun scald on the fruit.

Management options for Verticillium wilt are limited, but there are some strategies that can be combined to maintain production in infested fields.

- Rotate infested fields into broccoli, corn, wheat, and/ or barley for at least two years. These plants are not hosts and can reduce the level of inoculum while yielding a cash crop.
- Plant high isothiocyanate (ITC) concentration biofumigant mustards, such as the variety Caliente, incorporate the residue, and pack the soil. High ITC

biofumigants can suppress *Verticillium* species, even as microsclerotia

 If you don't have the equipment or time for growing a biofumigant crop, Isagro USA sells a product called Dominus that is 96% ITC and can be used in a similar





manner to a biofumigant crop (see label for details). Research at Cal Poly in 2014 in strawberries showed that Dominus improved plant survival and yield as well as conventional soil fumigants Pic-Clor 60 and Tri-Con 50/50 in *Verticillium* infested fields (see <a href="http://">http://</a>

<u>cesantabarbara.ucanr.edu/files/225196.pdf</u> for more information).

• When rotating back into a cash crop that is susceptible to Verticillium wilt, promoting robust root growth early in the season by increasing fertilization levels and, depending upon the crop and soil type, using root stimulant products containing kinetin and/or Indole-3-butyric acid (IBA) rooting hormone can help plants produce a crop, even if infested.

**Left:** Typical marginal leaf scorching and discoloration from Verticillium wilt **Right:** Severe Verticillium wilt causing almost complete collapse of eggplant

### Value Added Producer Grants are Open for Applications - proposals due in January!

For those of you who don't breathlessly follow the soap opera that is ag appropriations and the farm bill, one key grant program for farmers, The Value Added Producer Grant (VAPG) program, has funding this year (FY2017) but its future is uncertain as there currently is no mandatory funding for the program in 2018. If you have been toying with the idea of applying for the VAPG, I would advise throwing your hat in the ring this year. The good news is that applications are due by **January 31, 2018**, not in July as in past years.

The Value-Added Producer Grant helps agricultural producers enter into value-added activities related to the processing and/or marketing of new products. Now in its 17<sup>th</sup> year, the program has had its ups and downs, and is currently funded at \$18 million. The goals of this program are to generate new products, create and expand marketing opportunities, and increase producer income. Applicants may receive priority if they are a beginning farmer or rancher, a socially-disadvantaged farmer or rancher, a small or medium-sized farm or ranch structured as a family farm, a farmer or rancher cooperative, or are proposing a mid-tier value chain. Grants are awarded through a national competition.

If this is a grant program that you think you might be interested in learning more about, Liz Higgins of the ENYCH team, who has experience with the VAPG, will offer two introductory webinars on the program on **September 18**<sup>th</sup>. The first one will be at **12:00pm to about 1:00pm** and the second will be in the evening from **6:00pm-7:00pm**. We will record the webinar and make it available. To register, e-mail <a href="mailto:emh56@cornell.edu">emh56@cornell.edu</a> the following information and she will send you the link to the webinar —

- Name(s) of participants planning to attend the webinar
- Farm Name (if applicable)
- County where you or your farm are located (preferably the farm)
- Best phone # to reach you at before or during the webinar (if there is a technical glitch). Please indicate if it is a cell so that we can send a group text, if need be.

You can see the request for proposals and other information about the program at USDA's website: <a href="https://www.rd.usda.gov/programs-services/value-added-producer-grants">https://www.rd.usda.gov/programs-services/value-added-producer-grants</a>. One key tip is to look at what projects have been funded in the past as this will give you some idea about what is a viable VAPG project.

# COVER CROPS AND SOIL HEALTH FIELD DAY



Join us for a day of cover crop and soil health presentations, field tours, and a farmer panel! This field day is presented by USDA-NRCS, Cornell Cooperative Extension ENYCHP, SARE & SUNY Cobleskill.

### Topics to include:

- Understanding Soil Health, Soil Health Demos Aaron Ristow, Cornell
- Soil Health Field Evaluation and test pit Olga Vargas, NRCS
- "Life Underground?": A discussion of beneficial soildwelling invertebrates
   Carmen Greenwood, SUNY Cobleskill
- Cover Crop Selection and Management Thomas Bjorkman, Cornell
- Twenty Different Cover Crop Species and Mixes Demonstration Plots
   Paul Salon, NRCS
- Seven Inter-seeding demonstration plots John Wallace, Cornell
- Farmer Panel TBA

For More Information Please Contact:

Chuck Bornt, CCE ENY CHP: 518-859-6213

### Date: Thursday, October 12

Registration: 9:30

Presentations: 10:00 - 11:30Lunch: 11:30 - 12:00

Field Tour

& Stations: 12:00 - 2:00 Farmer Panel: 2:00 - 2:30

**Location:** Schoharie Valley Farms

495 N. Main Street Schoharie, NY 12157

\*The pavilion at the little league fields

**Cost:** \$10/ person (Includes Lunch) Pre-registration is encouraged.

### Registration online at:

https://enych.cce.cornell.edu/ event.php?id=821

Or call Abby at (518) 746-2553 to register by phone







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Willsie Equipment Hydraweeder

Directions: From Pulaski Hwy, turn onto Big Island Rd, pass Cavallaro Farms, continue around the bend and over the bridge crossing Quaker Creek, then look for the signs on the right just past the red barn before reaching Round Hill Rd.



Register at <a href="https://enych.cce.cornell.edu/event.php?id=826">https://enych.cce.cornell.edu/event.php?id=826</a> or call Abby 518-746-2553 Contact Ethan Grundberg at <a href="mailto:eg572@cornell.edu">eg572@cornell.edu</a> or 617-455-1893 for more information

# High Tunnel Field Meeting



Date: Wednesday, September 13

Time: 5:00pm-7:00pm

**Location: Poughkeepsie Farm Project** 

51 Vassar Farm Lane Poughkeepsie, NY 12603

Cost: \$15/ person

\$25/ farm (2 or more people)

**Registration online at:** 

https://www.nofany.org/events-news/events/2017-on-

farm-field-days

Join us for a discussion of ongoing high tunnel fertility management for summer tomato crops, high tunnel soil health, as well as other summer high tunnel crop options including cucumbers and basil. In addition there will be an update on allium leafminer and tomato leaf mold.

Light refreshments will be provided. Pre-registration is encouraged.

Program Presented by: CCE ENYCHP, NOFA-NY, Farm Viability Institute

## **Sweet Corn Pheromone Trapping Network 8/23 - 9/5**

County	Corn Earworm	European Corn Borer-Z (Iowa)	European Corn Borer-E (NY)	Fall Armyworm	Western Bean Cutworm
Orange	0	0	0	95	2
Columbia	13	0	0	139	3
Greene	1	0	0	40	1
Albany	12	10	na	18	na
Fulton	0	0	0	10	1
Saratoga	1	1	0	1	23
N. Rensselaer	0	0	0	4	0
S. Clinton	0	0	0	0	0
C. Clinton	1	0	0	19	7

# **Vegetable Specialists**

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