Farmers with susceptible vine crops may see symptoms of downy mildew by the end of the week. Scout your fields and put down protective sprays ASAP.

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# VEGEdge

YOUR TRUSTED SOURCE FOR RESEARCH-BASED KNOWLEDGE

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Cornell Cooperative Extension
Cornell Vegetable Program


Cultivating beets. *Photo: J. Kikkert*

## Downy Mildew and Other Disease Issues in Vine Crops

*Robert Hadad, CCE Cornell Vegetable Program*

Typically we have already had to deal with downy mildew (DM) in cucumbers by now. DM is the big killer of our cucumber crops and to some extent, cantaloupe as well. Summer squash/zucchini and winter squash might get it. Watermelon generally not. The disease has come out of the Michigan and Canadian region by the beginning of July. Spores are blown into WNY on the prevailing westerly winds. This season might be a little different.

DM is tracked starting in early January where it shows up in the southern vegetable production areas of Florida and Gulf Coast. The disease follows the winds and moves up the coast. By early spring it is up around the SC-NC region. By May it could be up into NJ and PA, eventually into Long Island an then New England by mid-summer. Easterly winds could drive it across NY in August. Presently, the disease has run this course. DM has been in two areas of

Top of leaf view of downy mildew. *Photo: D. Telenko, CCE CVP*

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**VegEdge** newsletter is exclusively for enrollees in the Cornell Vegetable Program, a Cornell Cooperative Extension regional agriculture team, serving 13 counties in Western New York.

The newsletter is a service to our enrollees and is intended for educational purposes, strengthening the relationship between our enrollees, the Cornell Vegetable Program team, and Cornell University.

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**Help us serve you better by telling us what you think. Email us at *cce-cvp@cornell.edu* or write to us at Cornell Vegetable Program, 480 North Main Street, Canandaigua, NY 14424.**

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north central PA for a couple of weeks. The dry conditions had minimized the spread. With the rains, there is a strong chance of DM taking off. The winds for the last four days have come mostly out of the south and southeast.

Our prediction is that spores could have been carried up into NY. The DM projection models out of NC State have issued warnings for our region. **Farmers with susceptible vine crops from Onondaga County west to Genesee and Orleans might see symptoms of the disease on cucumbers and melons by the end of the week.**

Scout your fields as soon as you can walk them and begin to put down protective sprays as soon as you can get a tractor in the field. Follow the chemical recommendations as listed in the Vegetable Guidelines or check out the chart online: http://vegetablemdonline.ppath.cornell.edu/NewsArticles/Cucurbit%20Fungicide%20List%202018-NY.pdf

Conventional fungicides considered the best choices to alternate among this season are Ranman, Omega, Zing! or Gavel, and Curzate (follow with another fungicide about 5 days later). Forum could also be included in the program. Revus is another fungicide to consider for crops other than cucumber. Presidio and Previcur Flex are no longer recommended because of suspected resistance.

More on organic fungicides from Meg McGrath is found at our website with the article, **Efficacy Of Organic Fungicides for Vegetable Diseases**

Downy mildew in cucumber. Symptoms on leaf surface showing yellow angular lesions. *Photo: D. Telenko, CVP*

Downy mildew sporulation on underside of leaf. *Photo: D. Telenko, CCE CVP*

The weather will also make other plant diseases more likely to occur. Bacterial spot, anthracnose, and angular leaf spot might become problematic. Keep up with the protective sprays and if you aren't using a copper product, please add that to your program. This will help with the bacterial diseases.

## Time to Protect Onions from Downy Mildew

*Christy Hoepting, CCE Cornell Vegetable Program*

Downy mildew (DM) can be an extremely aggressive leaf disease of onion, especially when favorable conditions are unrelenting (Fig. 1). It is a sporadic disease, favored by cool temperatures (less than 72˚F) and wet conditions, especially when there is heavy dew at night time. Spores are produced at night and are easily blown long distances in moist air. They can germinate on onion tissue in 1.5 to 7 hours when temperatures are 50 to 54˚F. High daytime temperatures (> 74˚F) and short or interrupted periods of humidity at night can prevent sporulation. Generally, downy mildew is not a concern in onions until mid-August through September once the heat wave of summertime passes and when cool nights and heavy dews are common. However, it is only prudent to protect the crop now as we close out July and move into August.

Figure 2 illustrates the relative performance of several fungicides in an on-farm small-plot field trial that was conducted in 2015. The trial was started after DM was first detected at this site (Fig. 3). Figure 2 shows only the number of new lesions per plant that occurred since the trial was started. Old lesions (Fig. 4) that were present before the trial was started were not included. Consequently, these results represent the ability of a fungicide to prevent new DM infections. Disease pressure at this site was moderate to severe with 15 DM infection sites per plant in the untreated control.

**Figure 1.** Severe outbreak of downy mildew in onion. *Photo: C. Hoepting, CCE CVP*

Best control (75% compared to untreated) was provided by Orondis (FRAC US15)and Ridomil Gold Bravo (FRAC 4), which was not significantly different than Reason (FRAC 11), Hoepting program (FRAC 4, 11, M3), Quadris Top (FRAC 11) and Luna Tranquility (FRAC 7,9) + mancozeb (FRAC M3). Note, that there was no significant difference between Luna Tranquility + mancozeb and mancozeb alone, and that Luna Tranquility does not have activity on DM. **Mancozeb alone provided 55% control. Any fungi-**

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**cide that will get you "half way there" may serve as an effective protectant.** Once DM is known to occur or risk is high, then we double up on DM fungicides to include a fungicide with curative activity such as Ridomil Gold products or Orondis with a protectant. Mancozeb is the most commonly used protectant for DM, because it is the most affordable. However, **if an SLB fungicide is a premix with an active ingredient that has activity on DM, then this may serve as the DM protectant.** This would include the FRAC 11 in Merivon and Quadris Top and FRAC 33 in Viathon. Some growers will still add some mancozeb to these fungicides for added DM protection.

**Orondis Opti/Ultra is a new fungicide with excellent activity on DM available in New York** for the first time this growing season. It performs best when applied before onset of DM and has at least a 2-week residual within the plant. It has a maximum use rate of 33% of total fungicide sprays or 4 applications. With most conventional muck onion fields getting 7-9 total fungicide applications per year, 2-3 applications of Orondis may be made. **The first application of Orondis product may go on within the next couple of weeks** with second application going on 2 weeks later. For more information on onion fungicides, consult the Cornell Onion Fungicide Cheat Sheet at https://rvpadmin.cce.cornell.edu/uploads/doc_689.pdf

**Figure 3.** First detection of downy mildew: gray fuzzy sporulation in elongated patches without any necrotic spotting, most often on middle-aged leaves. *Photo: C. Hoepting, CCE CVP*

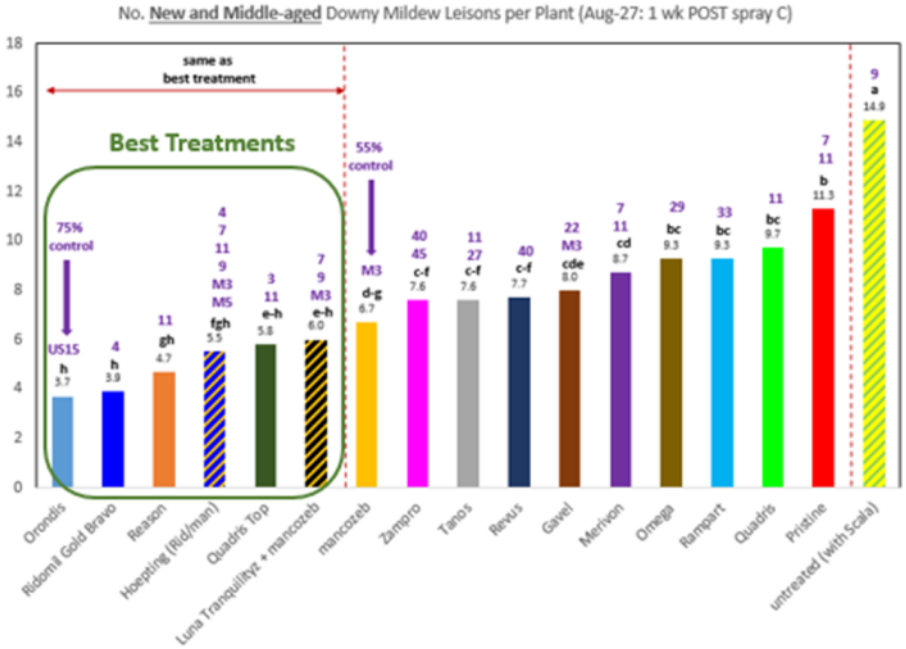


**Figure 2.** Relative performance of fungicides for prevention of downy mildew infection sites. Typically, highest labeled rates were evaluated except for Luna Tranquility (16 fl oz). Hoepting program: week 1&2: Ridomil Gold Bravo 2.5 pt + mancozeb 3 lb (double up on DM fungicides) + Scala 18 fl oz (for SLB); week 3; Merivon 9 fl oz (for SLB and DM) + mancozeb 3 lb (double up on DM). Columns with the same letter are not significantly different, Fisher's Protected LSD test, p<0.05. **Purple letters** above columns indicate FRAC groups of treatment. Hoepting, 2015.

**Onion fungicides with activity on DM:**

- FRAC US15 (Orondis)
- 4 (Ridomil Gold products)
- M3 (mancozeb)
- FRAC 11 (Quadris Top, Merivon, Reason, Tanos)
- FRAC 33 (Rampart, Viathon)
- FRAC 40 (Revus, Zampro)
- FRAC 45 (Zampro)

**Figure 4.** Old downy mildew lesions; Extensive invasion by Stemphylium leaf blight, at least 3 weeks old. *Photo: C. Hoepting, CCE CVP*

# Increased Risk for White Mold in Beans

*Julie Kikkert, CCE Cornell Vegetable Program, and Sarah Pethybridge, Cornell*

Akin to a flush of germinating weeds after a rain, resting structures of the fungus that causes white mold in beans (*Sclerotinia sclerotiorum*) have likely "awakened" with this week's rain and cooler temperatures. These resting structures, called sclerotia, are hardened masses of the fungus which can survive for long periods of time in the soil. If you have ever had a crop with white mold in a field, it is likely that there are sclerotia buried in the ground, that may come to the surface with tillage or planting equipment. Under conducive environmental conditions, sclerotia at or near the soil surface form fruiting structures called apothecia. Although these tan, cup-shaped structures may sometimes be observed beneath the bean canopy, most people will never see them as they are very small, blend in with the soil, and often appear for only short periods of time (see photo). Mature apothecia release ascospores into the air, which are transported by wind and infect dying flowers leading to white mold (see photo).

In vitro production of apothecia on sterile sand and ascospore discharge of Sclerotinia sclerotiorum. (Courtesy H.R. Dillard).
*Photos by J. Ogrodnick, Cornell*

**What is the Risk for White Mold Infection?**

Up until this week, non-irrigated beans were at pretty low risk for infection. However, the risk for later planted beans is much higher, so make sure to consider the following when deciding to treat beans with a fungicide:

1. **Soil Moisture.** For germination of sclerotia to occur, the soil must be cool (40 to 60°F) and moist for 7 to 10 days prior to bean flowering. Often the soil under the canopy remains cool and moist throughout the day compared to bare ground.
2. **Crop Stage.** Spores only infect dying flowers. Growth of the fungus may subsequently spread from the flowers to pods and foliage.
3. **Environmental Conditions.** Infection requires extended periods (40 hours) of high humidity or foliage wetness and temperatures less than 85°F. The period when morning dews are common is usually high risk.
4. **Canopy Density.** In recent multivariate data analysis of risk factors, canopy density (i.e. ground cover) was that single most important variable). Dense plant canopies and other factors that reduce air flow increase the risk of white mold. Fields with trees around the borders, valleys where humidity and fog persist also carry more risk.
5. **Field History.** If susceptible vegetables, dry beans, soybeans, sunflowers, etc. have been grown in the field and had white mold, then it is likely that inoculum is present in sufficient quantity to cause disease. Sclerotia can survive for many years in the soil. It only takes one germinating sclerotia per row meter of beans to start an infection. Rotation with non-host crops such as grains for 4 to 5 years is recommended.

**Management Options for Snap and Dry Beans**

If you've decided that field history and environmental conditions warrant a fungicide application, there are several labeled products (see the 2018 Cornell Vegetable Guidelines). The sprays need to be applied to protect the flowers and timing is critical as no products will cure an infection after it has started.

**Dry Beans**: 1 open flower/plant in 10% of the plants; a second application may be considered 10 to 14 days later.

**Snap beans**: 1 open flower/plant in 10% of the plants; a second application may be considered at 100% bloom (this may happen within a day or two in some varieties in warm weather). Our recent research has focused on the products Endura, Topsin 4.5 FL, and Omega 500F. Each of these products is highly efficacious when applied at optimal timing and there was no significant difference in the disease control between the products. In further teasing out the optimal application timings, our research has shown that the optimal timing of Topsin 4.5 FL is at 10% bloom, and that this product is not effective when applied at 100% bloom. Furthermore, there is no benefit to a second application. Conversely, disease control with Omega 500F was not related to timing (10% or 100% bloom) and there was no benefit from a second application even when applied at 100% bloom. For growers who were not able to put on a spray at 10%, then Omega 500F would be the choice product to use. Timing of the other possible fungicides was not tested. Results of these studies can be found in the Proceedings of the 2017 Empire Expo at http://www.hort.cornell.edu/expo/2017proceedings.php.

**Options for Organic Beans**

Strategies include good crop rotation, manipulation of plant densities to improve air flow, maintaining good weed control, and selection of varieties that have a more open canopy. We have conducted extensive testing of OMRI listed products in our trials at Geneva. To date, the most efficacious and reliable product from year to year is Double Nickel (*Bacillus amyloliquefaciens* strain D747). Both the LC and 55 formulations are equally effective. While labeled at the rate of 1 to 2 quart/acre, there was no benefit of the higher rate, and thus 1 quart/acre is recommended. We continue to test additional products, including those under development and expect new registrations of efficacious products in the future.

# Leafminers in Onion: Native vs. Invasive Species

*Christy Hoepting, CCE Cornell Vegetable Program*

**New Invasive species.** Recently, a new invasive species of leafminer has occurred in North America. This is the Allium leafminor (*Phytomyza gymnostoma* Loew), which originated in Polland and Germany and was first detected in North America in Lancaster, PA in December 2015. As of last Fall 2017, Allium leafminer is known to be widespread throughout PA, New Jersey and Maryland, and in New York, it has been confirmed in Orange, Dutchess, Ulster, Columbia, Sullivan, Schoharie, Suffolk and Tompkins counties. All Alliums are host to the Allium leafminer including onion, garlic, leeks and chives. The larvae mine the leaves towards the bulb where they pupate, causing the leaves to become wavy and distorted (Fig. 1) and marketable portions of the plant to be unmarketable due to contamination with pupa (Fig. 2). Excessive mining may lend itself for secondary bacterial disease problems. In some cases, Allium leafminer has resulted in complete crop loss.

**Figure 1.** Wavy, curled and distorted leaves caused by mining of new invasive species, Allium leafminer in onion. *Photo: L. Donovall*

**Native species.** Another kind of leafminor, most likely the American serpentine leafminer (*Liriomyza trifolii*) has been present in onion this season. The larvae of this species mine between upper and lower leaf surfaces, creating winding, whitish tunnels that initially are narrow but then widen as the larvae grow (Fig. 3). Excessive mining renders leaves unmarketable, reduces photosynthetic capacity, and provides easy access for disease organisms. Larvae are yellow and about 0.25 inch long. Sometimes you can see them inside their mines and pick them out (Fig. 4). The larvae will exit their mines (Fig. 5) and drop to the soil to pupate. Sometimes, you can spot the adults which are tiny 1/8$^{th}$ inch gray-black flies with yellow markings (Fig. 6).

**Figure 2.** Pupal contamination of Allium leafminer in leek. *Photo: T. Rusinek, ENY Commercial Horticulture Program*

It is important to note that **any leafminers that are detected in onion at this time are not the new invasive species, Allium leafminer.** Instead, they are the native Liriomyza species of leafminer. The first generation of Allium leafminer occurs in late March through early May. The pupa of this first generation undergo diapause or aestivation, which lasts throughout the summer. The adults of the second generation do not emerge until September/October.

**Figure 3.** Winding, whitish tunnels that initially are narrow and then widen as the larvae grow of native species of leafminer (Liriomyza) in onion. *Photo: C. Hoepting, CVP*

**Look for Invasive Allium leafminer in the fall.** Adult females (tiny flies) make repeated punctures in leaf tissue with their ovipositor, and both females and males feed on the plant exudates. Leaf punctures arranged in a linear pattern towards the distal end of leaves may be the first sign of damage (Fig. 7). Leaf mines are most evident in species with thin leaves such as chives (Fig. 8). In species with larger leaves, it is often necessary to peel back the leaves to find the insect (Fig. 2). Leeks tend to be the preferred Allium host in the fall, since onions and garlic are already harvested. Organic and market garden production systems tend to be most at risk, perhaps due to insecticidal control in conventional systems.

**In conventional systems, several insecticides used to control onion thrips also have activity on leafminer (both native and invasive species)** including Agri-Mek, Exirel, Minecto Pro and Radiant. Organic growers may use Entrust and/or row covers.

*continued on next page*

**Figure 4.** Yellow 0.25 inch long larvae of native species of leafminor (Liriomyza) inside mines in onion leaf (left) and picked out (right). *Photos: C. Hoepting, CVP*

**Figure 7.** Diagnostic egg-laying puncture wounds of invasive Allium leafminer: tiny dots in a straight row longitudinally along an allium leaf.
*Photo: Dept. of Entomology, Penn State*

**Figure 5.** Larvae of native species of leafminer (Liriomyza) exiting mine to drop to the soil to pupate. *Photo: C. Hoepting, CVP*

**Figure 6.** Adult leafminers are tiny flies, this gray-black fly with yellow markings spotted resting on an onion leaf.
*Photo: C. Hoepting, CVP*

**Figure 8.** Leaf mines caused by invasive Allium leafminer in scallions. Note, that they are narrower and less winding than mines of native leafminers. *Photo: T. Rusinek*

# WNY Sweet Corn Trap Network Report, 7/24/18

*Marion Zuefle, NYS IPM Program; http://sweetcorn.nysipm.cornell.edu*

Thirty-four of 38 sites reported this week. European corn borer (ECB)-E was caught at 11 sites and ECB-Z was caught at 7 sites. Corn earworm was caught at 16 sites with 11 sites high enough to be on a 4, 5, or 6 day spray schedule (see table below). Fall armyworm (FAW) was caught at 8 sites and Western bean cutworm (WBC) continues to increase, with 28 sites reporting catches with the highest catch in Pavilion at 164.

WBC trap catches will most likely peak over the next two weeks. According to data from the University of Nebraska, 50% of WBC emerge when the accumulated degree-days (base 50) reach 1422 (see chart below). It is also recommended that scouting begins when cumulative trap catches reach 100 moths, however egg masses have been found when trap catches are in the single digits. The threshold for fresh market sweet corn is only 1%. It is important to scout late whorl and early tassel-emergence fields as these are most at risk. After hatching larvae will spend a few days feeding on the tassel before moving down to the ear. Most insecticide sprays used to control ECB will also control WBC.

**Average corn earworm catch and recommended spray interval**

| Per Day | Per Five Days | Per Week | Days Between Sprays |
|---|---|---|---|
| **<0.2** | <1.0 | <1.4 | No Spray (for CEW) |
| **0.2-0.5** | 1.0-2.5 | 1.4-3.5 | 6 days |
| **0.5-1.0** | 2.5-5.0 | 3.5-7.0 | 5 days |
| **1-13** | 5-65 | 7-91 | 4 days |
| **over 13** | over 65 | over 91 | 3 days |

Add one day to the recommended spray interval if daily maximum temperatures are less than 80°F for the previous 2-3 days.

| **Degree-day accumulations in relation to percent moth emergence (beginning May 1, base 50°F)** | |
|---|---|
| **Accumulated Degree-days** | **% Moth Emergence** |
| 1319 | 25% |
| 1422 | 50% |
| 1536 | 75% |

Percent WBC moth emergence based on degree day accumulation, data from University of Nebraska

**WNY Pheromone Trap Catches: July 24, 2018**

| Location | ECB-E | ECB-Z | CEW | FAW | WBC | DD to Date |
|---|---|---|---|---|---|---|
| Baldwinsville (Onondaga) | 0 | 0 | 4 | 0 | 41 | 1470 |
| Batavia (Genesee) | 0 | 17 | 0 | 0 | 12 | 1471 |
| Bellona (Yates) | 0 | 0 | 1 | 1 | 50 | 1511 |
| Eden (Erie) | 1 | 0 | 0 | 0 | 56 | 1425 |
| Farmington (Ontario) | 1 | 1 | 0 | 0 | 4 | 1392 |
| Geneva (Ontario) | 17 | 0 | 0 | 0 | 0 | 1455 |
| Hamlin (Monroe) | NA | NA | NA | NA | NA | 1361 |
| Kennedy (Chautauqua) | 0 | 0 | 0 | 0 | 23 | 1291 |
| Pavilion | 0 | 0 | 0 | 2 | 164 | 1174 |
| Penn Yan (Yates) | 0 | 0 | 0 | 1 | 12 | 1498 |
| Ransomville (Niagara) | 0 | 0 | 5 | 1 | 15 | 1510 |
| Seneca Castle (Ontario) | 1 | 0 | 0 | 1 | 6 | 1393 |
| Williamson (Wayne) | NA | NA | NA | NA | NA | 1313 |

ECB - European Corn Borer
CEW - Corn Earworm
FAW - Fall Armyworm
WBC - Western Bean Cutworm
NA - not available
DD - Degree Day (mod. base 50F) accumulation

## CROP INSIGHTS

Finally, rain has returned to the area! Be on the lookout for the return of diseases following this week of moisture. – *EB*

**CUCURBITS (CUCUMBERS, MELONS, and OTHER VINES)**
Downy mildew is expected to arrive in the area in the next week or so. See cover article. – *EB*

**DRY BEANS**
It is time to start scouting for Western Bean Cutworm (WBC) in dry beans. The peak flight is usually the last week of July to the first week of August. Both the trap reports and scouting corn in fields near dry beans can help determine the risk. Trap catches increased dramatically this week and the Riga site just north of Bergen was over the scouting threshold of 100 moths, triggering scouting in nearby corn. Three egg masses were found in the corn. It is difficult to scout dry beans for egg masses or caterpillars since the caterpillars move to the soil during the daytime. Dry bean pod scouting should begin 7 to 10 days after peak emergence, in those fields that have accumulated over 100-150 moths per trap, near fields with high trap counts, or where WBC has been found in bean pods/seeds in recent years. A spray is recommended if dry bean pod damage is found. In addition, to the WBC traps listed in the sweet corn report, the following dry bean trap sites are being monitored this year (project funded by the NYS Dry Bean Endowment). – *JK*

WBC egg mass on corn leaf.
*Photo: J. Kikkert, CCE CVP*

| Location | Number of WBC moths |
|---|---|
| Caledonia | 30 |
| Chili | 54 |
| Groveland | 76 |
| Riga | 146 |
| Stafford | 83 |

**ONIONS**
Finally some rain, as onions are bulbing. Nothing can be done to prevent heat units from wracking up and it looks like the crop will finish earlier this year. Thrips pressure is especially high in Elba with lot's of movement out of early transplants as they mature and influxes from harvest of hay and wheat. Not too many fields got much of a ride with the "momentum of Movento" this year. Double applications of Movento followed by Agri-Mek or Minecto Pro have finally resulted in knockdown of thrips populations. Between Radiant and Exirel still left to go, growers should be able to finish the season without running out of effective product. Botrytis leaf blight is generally on the decrease, while Stemphylium leaf blight is steadily on the increase. Ideally, FRAC 7 fungicides for SLB should be going on now, if they have not already. See July 5 issue of VegEdge for more info on SLB. All fields should also have a protectant fungicide for downy mildew at this time; in addition to mancozeb, some SLB fungicide may also serve as DM protectants – see article, page 3. Not much movement this week for bacterial diseases, but Iris yellow spot virus (IYSV) increased and we are seeing "more than usual" leafminer. Note, that any leafminer observed at this time is not the new invasive species, Allium leafminer, as this species is not active during the summer, but rather a native Liriomyza species – see article, page 6. – *CH*

*Fresh Market Onion* – Seeing some purple blotch in the Southern Tier. Stemphyllium remains the larger concern, it is often gaining a foothold by chasing rot and other diseases. – *EB*

**PROCESSING CROPS**
Pea harvest is finishing up. The heat and dry conditions over the past month have taken a toll on yields of both peas and snap beans. Irrigation has been helpful, but pod set in hot conditions was still reduced. This week has brought a weather shift with rain and high humidity for the past several days. While that is certainly beneficial, it brings on a higher risk of plant disease development. See the general article on white mold. All later planted beans should have a protective fungicide spray (s) for white and gray mold as it will likely remain moist under the plant canopy. If you miss the spray at 10% bloom, then the recommended product to use is Omega. For sweet corn growers, keep an eye on trap catches as insect activity has increased this week (see separate report, page 7). – *JK*

**SWEET CORN**
There have been some cases of two-spotted spidermite on corn. If you feel that they warrant treatment, Comite and Agrimek are two options that may perform better than bifenthrin. – *EB*

**TOMATO, PEPPER, EGGPLANT**
Some mild early blight this week adds to on-going speck/spot issues. – *EB*

# What Weed is That?! Horsenettle!

*Amy Celentano, CCE Cornell Vegetable Program; ed. E. Buck, CCE CVP*

Horsenettle (*Solanum carolinense*) is a perennial weed, native to the USA, belonging to the nightshade family, which includes potatoes, tomatoes and eggplants. The stems can grow 1 to 4 feet tall and are covered with prickly hairs about 1/8 inch long as well as sharp spines ¼ to ½ inch long. Leaves are darker green on top and lighter green below and kind of resemble miniature eggplant foliage. The leaves also bear spines on both the upper and lower surface, usually along the main veins. Frequently horsenettle is confused with other nightshades until it is touched. This is definitely not a plant you want to grab unexpectedly. Horsenettle is more commonly a problem in pastures than vegetables fields, but it has been present in several vegetable locations scouted lately.

Horsenettle blossoms from May to September, and most of the flowers bloom about thirty days after the plant has emerged. The flowers are star-shaped and 1 inch across, with five petals which may be blue, violet or white. The male and female flower parts form a yellow cone-like cluster in the center of each bloom. Fruits form about thirty days after flowering and look like tiny tomatoes, only 3/8-3/4 inch diameter. They start out green and ripen to yellow, becoming wrinkled after drying. Inside, there is bad smelling pulp surrounding about 85 seeds. One plant can have as many as 100 fruits. The seeds require an overwintering period to wash off the pulp around the seeds, and temperatures between 68-86°F are necessary for germination. Seeds generally fall close to the parent plant because birds don't like the fruits, and they are too heavy to become airborne. Seeds can be spread by grazing animals, but livestock tend to avoid horsenettle.

Photo: Derek Doeffinger, Life in the Finger Lakes

**And if the prickly, vigorous, difficult-to-control aspects of horsenettle aren't enough to convince you this is a nuisance weed, horsenettle is a lovely host for a myriad of vegetable diseases and pests:**

- leafspot of tomatoes
- verticillium wilt
- mosaic virus of tomatoes and potatoes
- flea beetles
- Colorado potato beetle
- potato stalk borer
- onion thrips
- red spider mites
- potato psyllid

Horsenettle plant (left) and leaf spines running along the leaf midveins (right). *Photos: Michigan State University Diagnostic Services.*

Additional photos are available at https://oak.ppws.vt.edu/~flessner/weedguide/solca.htm

Seedlings do occur in fields, and can emerge from a depth of 4 inches. Seedlings can be recognized early on by their cotyledons (seed leaves) that grow to about ½ inch long by ¼ inch wide. The cotyledons are oval shaped with tiny hairs along the margins and are glossy green on top and light green on the lower surface. The first true leaves exhibit the same color difference between the upper and lower surfaces, and the upper surface is hairy with smooth margins.

Typically horsenettle emerges as a vigorous shoot arising from overwintering rhizomes. Though the rhizomes may look like roots, they actually are stems that each contain many buds. The root and rhizome system can be extensive; taproots have been recorded growing as deep as 8 feet, while rhizomes in the upper 18 inches can extend 4 feet out from the main plant.

All in all, this is one weed best left off the vegetable farm.

# Late Blight Risk Update

*John Gibbons, CCE Cornell Vegetable Program*

There have been no new late blight confirmations this past week. We will continue to watch the national occurrence map to track late blight movement.

Scout field twice a week. See the table for the Blight Units (BU) accumulation from around the region. The trigger in the Decision Support System (DSS) forecast for applying a fungicide is 30 BU's if the variety is susceptible. All tomato and potato growers, conventional and organic, should be applying a protectant fungicides and monitoring the DSS to determine spray intervals. While there have been no new late blight occurrences, the weather has become more favorable for late blight development. This week only Kendall, Knowlesville, and Elba have not reached the 30 BU's needed to trigger a spray. They were very close. Monitor your fields closely. With the weather change new finds will probably start trickling in. You can monitor late blight development at the following web address: https://usablight.org/map.

**Late Blight Risk Chart, 7/24/18**

| Location[1] | Blight Units[1] 7/18-7/24 | Blight Units[2] 7/25-7/27 | Location[1] | Blight Units[1] 7/18-7/24 | Blight Units[2] 7/25-7/27 |
|---|---|---|---|---|---|
| Albion | 28 | 18 | Lodi | NA | NA |
| Baldwinsville | 11 | 19 | Lyndonville | 13 | 21 |
| Bergen | 18 | 16 | Medina | 19 | 16 |
| Buffalo | 15 | 17 | Niagara Falls | 17 | 17 |
| Ceres | 30 | 21 | Penn Yan | 29 | 18 |
| Elba | 13 | 16 | Rochester | 23 | 18 |
| Fairville | 15 | 19 | Sodus | 17 | 19 |
| Farmington | 22 | 20 | Versailles | 25 | 21 |
| Gainesville | NA | NA | Volney | 12 | 18 |
| Geneva | 13 | 18 | Wellsville | 34 | 21 |
| Kendall | 13 | 16 | Williamson | 19 | 19 |
| Knowlesville | 11 | 16 | | | |

[1] Past week Simcast Blight Units (BU)
[2] Three day predicted Simcast Blight Units (BUs)

# Upcoming Events

*view all Cornell Vegetable Program upcoming events at CVP.CCE.CORNELL.EDU*

## Finger Lakes Produce Auction Grower Twilight Meeting

**July 27, 2018 | 6:00 PM - 8:00 PM**
**5351 Jessop Rd, Dundee, NY 14837**

This course will demonstrate pest management in fresh market vegetables in both field and greenhouse (high tunnel) vegetables, primarily for those growing for wholesale auction. A hands-on demonstration of weed, insect and disease identification in vegetables including management options. FREE! Contact Judson Reid at 585-313-8912 for more info.

## Chautauqua Produce Auction Growers Meeting

**August 14, 2018 | 6:30 PM**
**Andy E. Yoder farm, 2051 Rt 62, Frewsburg, NY 14738**

This course will demonstrate pest management in fresh market vegetables in both field and greenhouse (high tunnel) vegetables, primarily for those growing for wholesale auction. A crop walk will provide a hands-on demonstration of weed, insect and disease identification in vegetables including management options. FREE! Contact Judson Reid at 585-313-8912 for more info.

## Urban Farm Twilight Meeting

**August 22, 2018 | 6:00 PM - 8:00 PM**
**GroundWork Market Garden, 1698 Genesee St, Buffalo, NY**

The Cornell Vegetable Program and CCE Erie have been working together on an organic vegetable trial to monitor diseases. During this workshop, the audience will visit the on-farm research plots and explore the results collected from the trial. Participants will be guided by Judson Reid through a hands-on demonstration of how to scout for weeds, insects and diseases on urban farms. Participants will engage in peer-based learning. FREE to attend! Please RSVP to Megan Burley, Farm Business Management Educator, phone (716) 652-5400 x138 or email msb347@cornell.edu.

## 3rd Annual Organic Vegetable Pest Management Field Day

**August 23, 2018 | 4:00 PM - 7:00 PM**
**Cornell Lake Erie Research and Extension Lab, 6592 W Main Rd, Portland, NY 14769**

This program will focus on results from research trials, showcasing cultural techniques, effective varieties and treatments for organic production. We will highlight the current disease issues in the 2018 growing season, their detection and spread based on this season's climate conditions, and management tools available to reduce impacts on yield. In addition to viewing the results of the research plots, sessions will be offered on pest identification and control options by CVP team members. Regional equipment dealers and industry representatives will be invited to display equipment and new technology. To see the full agenda, visit https://cvp.cce.cornell.edu/event.php?id=979 FREE to attend; pre-registration requested! For more information, contact Elizabeth Buck at 585-406-3419.

## Genesee Valley Produce Auction Growers Meeting

**August 24, 2018 | 1:00 PM - 3:00 PM**
**David Hostetler farm, 10228 Briar Hill Rd, Dalton, NY 14836**

This course will demonstrate pest management in fresh market vegetables in both field and greenhouse (high tunnel) vegetables, primarily for those growing for wholesale auction. A crop walk will provide a hands-on demonstration of weed, insect and disease identification in vegetables including management options. FREE! Contact Judson Reid at 585-313-8912 for more info.

## No-Till and Never-Till Soil Health Workshop

**August 28, 2018 | 12:00 noon - 5:30 PM**
**Branton Farm, 8538 Route 237, Stafford, NY 14143**

The Western New York Soil Health Alliance will be holding a Soil Health Workshop on August 28, 2018 focusing on No-Till practices and benefits. Frank Gibbs, a certified Soil Scientist who formed a Wetland and Soil Consulting Service in 2012 after working for 36 years for USDA in Ohio will be digging underground to look at a section of field that has NEVER had any tillage and will compare it to an adjacent area with a history of tillage practices. James J Hoorman, a NRCS Soil Health Specialist for Ohio & Michigan, will be sharing information on the problem of slugs and voles in the higher residue farming practices. DEC and CCA credits will be offered. Pre-registration fee is $15; $25 at the door. Red Osier food truck will be onsite for purchase of roast beef sandwiches from 12:00-4:00 PM. For more information, visit http://www.wnysoilhealth.com and click on the Events tab.

# Weather Charts

*John Gibbons, CCE Cornell Vegetable Program*

### Weekly Weather Summary: 7/17 - 7/23/18

| Location** | Rainfall (inch) | | Temp (°F) | |
|---|---|---|---|---|
| | Week | Month July | Max | Min |
| Albion | 1.28 | 1.30 | 92 | 54 |
| Baldwinsville | 0.06 | 0.19 | 87 | 51 |
| Bergen | 1.08 | 1.14 | 89 | 47 |
| Buffalo* | 1.05 | 1.38 | 90 | 57 |
| Burt | 1.26 | 1.31 | 89 | 49 |
| Ceres | 1.49 | 4.61 | 84 | 50 |
| Fairville | 0.97 | 1.48 | 87 | 47 |
| Farmington | 1.05 | 1.10 | 87 | 46 |
| Gainesville | 1.76 | 2.63 | 83 | 48 |
| Geneva | 1.31 | 2.46 | 86 | 49 |
| Lodi | 0.13 | 0.93 | 88 | 48 |
| Niagara Falls* | 1.29 | 1.45 | 90 | 59 |
| Ovid | 1.30 | 2.14 | 86 | 50 |
| Penn Yan* | 1.96 | 2.27 | 85 | 54 |
| Phelps | 1.16 | 1.29 | 89 | 47 |
| Portland | 1.17 | 2.70 | 85 | 58 |
| Rochester* | 1.28 | 1.86 | 90 | 54 |
| Silver Creek | 1.58 | 2.43 | 87 | 59 |
| Sodus | 0.69 | NA | 87 | 46 |
| Versailles | NA | NA | 87 | 51 |
| Volney | 0.63 | 1.29 | 87 | 49 |
| Williamson | 0.84 | 2.04 | 86 | 50 |

### Accumulated Growing Degree Days (AGDD)
### Base 50°F: April 1 - July 23, 2018

| Location | 2018 | 2017 | 2016 |
|---|---|---|---|
| Albion | 1502 | 1312 | 1382 |
| Baldwinsville | 1566 | 1410 | 1402 |
| Bergen | 1412 | 1281 | 1248 |
| Buffalo | 1572 | 1349 | 1405 |
| Ceres | 1302 | 1197 | 1070 |
| Elba | 1421 | 1262 | 1001 |
| Fairville | 1361 | 1254 | 1215 |
| Farmington | 1404 | 1254 | 1260 |
| Gainesville | 1178 | 1249 | 957 |
| Geneva | 1446 | 1324 | 1313 |
| Lodi | 1572 | 1470 | 1452 |
| Niagara Falls | 1623 | 1481 | 1506 |
| Ovid | 1492 | 1405 | 1379 |
| Penn Yan | 1511 | 1415 | 1408 |
| Phelps | 1327 | 1330 | 1292 |
| Portland | 1490 | 1394 | 1305 |
| Rochester | 1606 | 1409 | 1420 |
| Silver Creek | 1385 | 1355 | 1259 |
| Sodus | 1351 | 1320 | 1177 |
| Versailles | 1438 | 1346 | 1230 |
| Volney | 1370 | 1240 | NA |
| Williamson | 1324 | 1290 | 1202 |

* Airport stations

** Data from other station/airport sites is at: http://newa.cornell.edu/ Weather Data, Daily Summary and Degree Days.

Cornell Cooperative Extension
Cornell Vegetable Program

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# VEGEdge

YOUR TRUSTED SOURCE FOR RESEARCH-BASED KNOWLEDGE

VEGEdge

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VegEdge is the award-winning newsletter produced by the Cornell Vegetable Program. It provides readers with information on upcoming meetings, pesticide updates, pest management strategies, cultural practices, marketing ideas and research results from Cornell and Cornell Cooperative Extension. VegEdge is produced every few weeks, with frequency increasing leading up to and during the growing season.

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Cornell Cooperative Extension
Cornell Vegetable Program

For more information about our program, email cce-cvp@cornell.edu or visit us at CVP.CCE.CORNELL.EDU