Cornell Cooperative Extension | Cornell Vegetable Program

VEGEdge

YOUR TRUSTED SOURCE FOR RESEARCH-BASED KNOWLEDGE

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Spinach Leaf Disorders

Julie Kikkert, Cornell Cooperative Extension, Cornell Vegetable Program

The lush green leaves of a spinach crop can easily be ruined by any number of biotic or abiotic factors. Below I list many of the common ailments grouped by the general symptoms. Please see the websites listed for each disorder and/or the 2020 Cornell Vegetable Guidelines for more information and management strategies.

SPECKS, SPOTS AND BLOTCHES (NO FUZZ)

Leaf spots are a common issue in spinach and can be caused by a variety of factors. These can be difficult to diagnose. Often a sample needs to be collected and observed using a microscope. When diagnosing a problem, make sure to: 1) note what symptoms are on the upper and/or lower leaf surfaces, 2) determine if a certain age leaf is affected, and 3) look for patterns in the field.

Abiotic leaf spots on spinach are commonly caused by pesticides or fertilizers, but may also be due to water and weather. According to Richard Smith, Univ. of California, "spinach leaves are quite sensitive to chemicals and will readily respond to them by developing chlorotic or tan colored necrotic areas. The size and distribution of the lesions can often provide clues as to the cause of the issue. Having some background information about recent spray applications in the vicinity of the field helps piece together how and when

Leaf blotch on spinach leaf that was determined to contain Cladosporium, Stemphylium and Alternaria. *Photo: J. Kikkert, CVP*

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About VegEdge

VegEdge newsletter is exclusively for enrollees in the Cornell Vegetable Program, a Cornell Cooperative Extension partnership between Cornell University and CCE Associations in 14 counties.

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.

We're interested in your comments. Contact us at:
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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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the incident occurred. Spotting on the weeds also provides confirmation of the cause of the incident. Distortion of the leaves occurs when the necrosis occurs early in the development cycle of the leaf; in this situation, the expanding young leaf continues to develop around the dead lesion and results in distorted growth. Chemical issues can also cause a sub-lethal response in spinach leaves which results in chlorotic lesions." Review additional information and photos or by contact our office for a print out.

"Insects, such as leafminers, frequently cause spots on spinach leaves. Female leafminers stipple spinach leaves by puncturing the leaf surface with their ovipositors and then feeding on plant sap that exudes from the holes. The stippled areas often occur in clusters and have a characteristic look due to the broken epidermal cells in the center of the stipple." (Richard Smith, Univ. California).

Diseases that cause spots on spinach in New York include Anthracnose, Cladosporium leaf spot, and Stemphylium leaf spot. These are often difficult to diagnose except by a trained eye and a microscope. In addition, more than one pathogen may be present in a leaf spot or blotch.

Anthracnose is favored by wet conditions and cool temperatures, with fall plantings being more susceptible. Symptoms of this disease are small, round water-soaked spots on leaves. The spots develop into larger yellow or tan areas with distinct margins that coalesce to form brown lesions that become thin and dry like paper. Tiny black fruiting bodies on diseased tissue distinguish this pathogen from other leaf spot pathogens.

Cladosporium leaf spot is characterized by round, tan leaf spots that rarely exceed 0.25 inch in diameter. Dark green spores and mycelium later develop in the centers of these spots. The presence of dark green sporulation distinguishes Cladosporium leaf spot from other leaf spot diseases. Cladosporium is known to be seedborne.

Stemphylium leaf spot is considered uncommon. It was first detected in western NY in 2017 and on Long Island in June 2019. It is favored by prolonged periods of leaf wetness when temperatures are moderate (64-75°F). Symptoms are light gray to tan leaf spots ranging in size from 1/16th to ½ inch with larger spots being irregular in shape. Older spots often dry up and become papery. Stemphylium is seedborne, so it is important to purchase seed from a reputable dealer as a first step in disease management.

YELLOW SPOTS/BLOTCHES WITH FUZZ OR BLISTERS ON UNDERSIDE OF LEAF

The Spinach Dowy Mildew (DM) factsheet was recently updated and is available online or by contacting our office. This disease has been observed on farms in the Northeast since 2014. Growers should inspect their spinach crop routinely. Upper leaf surfaces will be yellow. Flipping over the leaf will reveal the characteristic purplish-gray, fuzzy growth of the pathogen. Early morning is the best time to see the spores because they are produced overnight and then dispersed during the day. Please see the factsheet for photos and detailed measures for control which include resistant varieties, cultural practices, and fungicides.

White Rust is a concern all season, and is favored by warm (72°F), sunny days followed by cool nights with dew. Symptoms are small yellow spots on the upper leaf surface and white blister-like pustules most commonly on the lower leaf surfaces and petioles. The pustules release spores that can infect other leaves.

Yellowing, Stunting, Mosaic Symptoms

Cucumber Mosaic Virus (CMV) has caused severe crop loss in several fields each year in western, NY for the past decade. Aphids acquire and transmit CMV when they feed, even briefly, moving the virus quickly from infected to uninfected plants as the aphids migrate through the weeds and fields. Weedy areas adjacent to fields are of great concern as a source of CMV. Infested aphids usually do not colonize spinach. Infected plants show severe stunting, leaf curling, and mosaic symptoms on the leaves. Resistant varieties are the best management tool. It is not possible to control CMV by managing aphids because they transmit the virus very quickly. CMV can be seedborne.

Severe symptoms of CMV in spinach. *Photo: J. Kikkert, CCE Cornell Vegetable Program*

Late Blight Warning

Elizabeth Buck, Cornell Cooperative Extension, Cornell Vegetable Program

A) Late blight on tomato foliage initially causes dark, smeared looking lesions that collapse tissue and progress to a more browned look.
B) On the underside of a leaves, late blight will produce millions of air-borne, white spores under humid conditions, both on green tissue surrounding the lesions and on the brown/gray lesion itself.
C) Late blight puts dark, greasy smears on fruit (typically around the shoulders) and on stems of tomatoes.
D) Late blight in a tomato field quickly causes many smeared, gray to dark brown lesions surrounded by collapsing pale green tissue to occur on foliage. Lesions tips can curl and dry as they age while the disease progresses to newer tissue.
Photos: E. Buck, CCE Cornell Vegetable Program

LATE BLIGHT IS IN SOUTHWESTERN NEW YORK

Late blight is present in Chautauqua County and is strongly suspected (awaiting confirmation) in Cattaraugus County. Given the current weather patterns, there is real risk that late blight has already travelled on the storm fronts to new places. Now is the time to be very on top of your tomato and potato crop health – scout your fields twice weekly and start spraying for late blight!

Disease spots are often dark gray to brown in color and have a smeared look. Lesions may or may not have a ring of pale green tissue around them. They are often irregular in shape and size, and often become as large as a quarter. Leaf spots will often have small fuzzy white spores on the underside of the leaf in wet and humid conditions. **Symptoms progress quickly and are often first found in areas where airflow is poor, such as near weedy patches, hedgerows, in low-spots, or where the canopy is dense.** Late blight will put dark brown to black smears on plant stems. Tomato fruit may also develop large, greasy-looking, brown, gray, or black smears on the upper part of the fruit. Late blight does not resemble yellowing leaves with lots of small black specks that are worse lower in the canopy.

Potatoes will exhibit similar foliar and stem lesions. In potatoes the disease can have a darker presentation and more quickly kill foliage. **Late blight can and will infect potato tubers. Infected volunteer potato tubers carry the disease over from one year to the next.** Because of this, any potatoes which are close to maturity should now be mown off and the vines thoroughly killed to prevent late blight infection. Tubers should be left in the ground for 3 weeks. Tubers cannot be infected if there are no vines above ground, and the waiting period allows infected tubers to start showing disease symptoms.

Late blight is much more easily prevented by regular (weekly) applications of chlorothalonil, which goes by product names like Bravo, Echo, and other generics. **Chlorothalonil must be applied before disease presence**, and will slow the on-set of symptom development. Unfortunately, it is likely that many farms in the area have already been exposed and chlorothalonil alone will be insufficient. Therefore, growers should have at least 1 effective treatment material on-hand.

Late blight is difficult to stop once it establishes in a canopy, and is best treated quickly. A table of registered materials and usage/efficacy notes are listed on the next page. Materials can be used inside high tunnels so long as there is not a greenhouse use prohibition statement on the label.

If you suspect that you have late blight, please give us a call immediately. We need to track the disease to help protect other farms by knowing where it has moved to and helping you to get your outbreak to stop sporulating.

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Reference chart of fungicides used for late blight control. ***All rates, REI and PHI entries are for tomato. Check label for potato and cucurbit rates, REI and PHI.*** *For fungicides with systemic, translaminar, or contact activity on late blight, each mode of action (FRAC) group is a different color.* ***Systemic is best and is listed first.*** *Products that have only protectant activity are in white. Products with two effective systemic, translaminar, or contact modes of action sport two colors. When rotating fungicides, pick a product with a different FRAC (color) group.* ***Group 11 are not that great for late blight but are better than nothing and must be mixed with a protectant.*** *Additional fungicides not listed in this table may be available for use against late blight in potatoes.* ***Materials listed with an R for potential Resistance to that disease should be used only when no other options are available.***
**** = Restricted use pesticide***

Conversions for small area plantings: 1 fl oz = 2 tbsp or 6 tsp. 1 fl oz = 29.6 mL 1 oz = 28.35 g

Fungicides for Late Blight Control

Name	FRAC Group	Activity Type	Tomato				Potato LB use?	Early blight use?	Cucurbit downy mildew use?
			REI hr	PHI days	Late Blight Rate/A	Late Blight Rate/1000 ft²			
***Presidio**	43	Systemic	12	**2**	3-4 fl oz	2 – 2.7 mL	N	N	Y, R
Ridomil Gold Bravo SC	4 + M5	Systemic + protectant	48	**5**	2.5 pt	1.1 fl oz = 32.5 mL	Y, R	Y, R	Y, R
***Previcur Flex**	28	Systemic + protectant	12	**5**	0.7-1.5 pt	0.3 - 0.66 fl oz =8.9 - 19.5 mL	Y	Y	Y, R
Orondis Opti	U15+M5	Systemic + protectant	12	**7**	1.75 – 2.5 pt	0.8 - 1.1 fl oz =22.7- 32.5 mL	Y	Y	Y
Orondis Ultra	U15+40	Systemic + translaminar	4	**1**	5.5 – 8.0 fl oz	3.7 – 5.4 mL	Y	Y	Y
Zampro	40 + 45	Systemic + translaminar	12	**4**	14 fl oz	0.32 fl oz = 9.5 mL	Y	N	Y
Revus Top	40 + 3	Translaminar	12	**1**	5.5-7 fl oz	3.7 – 4.8 mL	Y	Y	Y, R
Forum	40	Translaminar	12	**4**	6.0 fl oz	4.1 mL	Y	N	Y, R
Cabrio	11	Translaminar	12	**0**	8-16 oz	5.4 – 10.9 mL	N	Y	Y, R
Quadris F or OLP	11	Translaminar	4	**0**	6.2 fl oz	4.2 mL	Y	Y	Y, R
***Reason 500 SC**	11	Translaminar	12	**14**	4.0- 8.2 fl oz	2.7 – 5.6 mL	Y	Y	Y, R
Flint	11	Translaminar	12	**3**	2-4 oz	1.4 - 2.7 mL	Y	Y	Y, R
Tanos 50 DF	11 + 27	Translaminar	12	**3**	6-8 oz	4.1 – 5.4 mL	Y	Y	Y
Curzate 60 DF	27	Translaminar	12	**3**	3.2-5 oz	2.2 - 3.4 mL	Y	N	Y, R
Ariston	27 + M3	Translaminar + protectant	12	**3**	1.9-3.0 pt	0.8 - 1.3 fl oz =24.8 - 39 mL	Y	Y	Y
***Gavel 75 DF**	22 + M3	Contact + protectant	48	**5**	1.5-2 lb	0.55 - 0.73 oz =15.6 - 20.8 g	Y	Y	Y
***Zing!**	22 + M5	Contact + protectant	12	**5**	36 fl oz	0.83 fl oz =24.4 mL	Y	Y	Y
ProPhyt or OLP	33	Contact	4	**0**	4 pt	1.76 fl oz = 52 mL	Y	N	Y
Ranman 400 SC	21	Contact	12	**0**	2.1-2.75 fl oz	1.4 – 1.9 mL	Y	N	Y
***Dithane DF Rainshield**	M3	Protectant	24	**5**	1.5 lb	0.55 oz =15.6 g	Y	Y	Y
ManKocide	M3 + M1	Protectant	48	**5**	1-3 lb	0.37 - 1.1 oz =10.4 - 31.2 g	Y	Y	Y
Copper (example used is **Champ**)	M1	Protectant	48	**0**	1.3 pt	0.57 fl oz =16.9 mL	Y	Y	Y
Bravo Weather Stik or OLP	M5	Protectant	12	**0**	1.375–2.75 pt	0.61 0 1.21 fl oz =18 - 35.8 mL	Y	Y	Y

High Tunnel Winter Cover Cropping – How to Get Started

Caitlin Tucker, Cornell Cooperative Extension, Cornell Vegetable Program

In the August 19 issue of VegEdge we introduced winter cover cropping in high tunnel tomato systems as a way to grow your own nitrogen reserves, improve soil health, and in turn, improve tomato yields and quality. As we enter into the 3rd year of our trial, we wanted to share some suggestions to help ensure your success if you choose to cover crop this Fall/Winter.

CHOOSE A SPECIES SUITABLE FOR YOUR HIGH TUNNEL'S NEEDS

It may be helpful to pull out your recent soil test results. Consider drainage, organic matter, soil nutrients, nitrogen, etc. Because this crop will be growing in cold, overcast NYS winters, choose a cold-hardy species. In our trials, we selected Austrian Field pea, a relatively cold-hardy species that will also fix nitrogen. We chose triticale for its nitrogen scavenging properties and biomass production. Consider reviewing the cover crop guide for NYS growers at http://covercrop.org/ for benefits of different cover crop species.

PROMOTE QUICK, UNIFORM GERMINATION

This crop won't be exposed to precipitation falling from the sky, so you'll need to make sure it's watered in well. The faster it germinates, the more time it has to grow before deep freezing temperatures! In our research, we've found a sprinkler set-up works well for ensuring wide, uniform coverage. Our cover crops were watered in over the course of a single day, but you should factor in your soil type and drainage when watering your cover crop in. Once established, the cover crop did not need additional irrigation.

PLANT EARLY

As mentioned in our previous article, planting a cover crop after the tomato season has ended requires a quick-turnaround. This may require more effort, but consider the benefits of planting earlier than later in the Fall. In our trials, we planted our cover crops in the second and fourth weeks of October. Below is a graph of the biomass produced by the plots over the course of the winter. You'll note that the late planting only had one month of biomass production compared to three months for the early planting. By late March, when the cover crops were terminated, the early planting produced anywhere from 1.5 to 3 times more biomass than the late planting. Depending on the treatment, this translated to anywhere from 17-56 less pounds of nitrogen being added to the soil. This suggests that as fall tomato prices drop, and yield comes slowly, an early-planted cover crop is of considerable value.

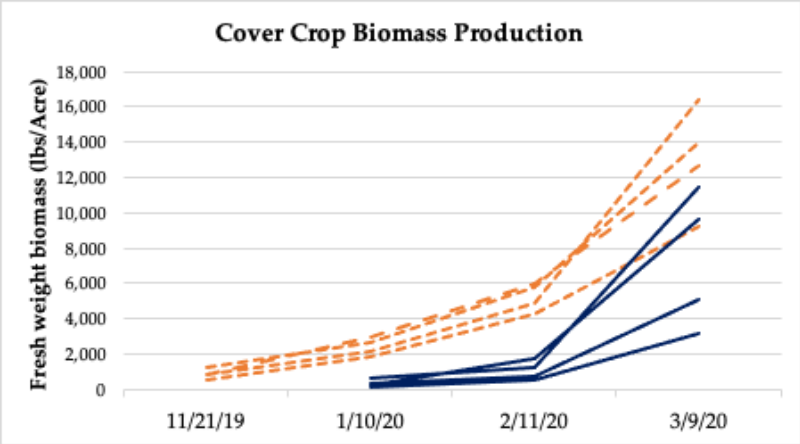

Figure 1: ORANGE dashed lines represent cover crop treatments in the early October planting. Solid BLUE lines represent treatments in the later October planting. Significant biomass production did not occur in the late planting until mid-February, one month later than the early planting.

INOCULATE LEGUMES

Nitrogen fixation is often associated with legume cover crops, but is done entirely by a group of bacteria called Rhizobacteria that live in nodules on legume roots. They have a mutually beneficial relationship - the plant provides food, water, and shelter, and in return, the bacteria pay rent in the form of fixing atmospheric nitrogen into ammonia, a form readily used by plants. Here are some things you need to know about that relationship to ensure successful nitrogen fixation:

- While rhizobia are naturally present in the soil, high tunnel soils that have not had legumes present for many years, may have very low populations of rhizobia.
- Your legume seed may need to be inoculated with the bacteria to jumpstart this symbiotic relationship.
- Different species of legumes require specific species of rhizobia. Check with your seed supplier to ensure you're buying the correct inoculant for your legume.
- Break open one of the nodules on the root of your legume cover crop. If there is a pink hue inside, that's leghemoglobin, a protein that carries oxygen to the bacteria. Congrats! That means the bacteria are alive and well and nitrogen fixation is occurring.
- Too much nitrogen in the soil can cause the rhizobia to be lazy. It's much easier for the plant to take up N from the soil than trade for fixed N. Keep this in mind if you typically apply fertilizer in the Fall!

MAXIMIZE BIOMASS PRODUCTION

Plant growth will be slow over the winter months. One way to boost biomass production is by overlaying your cover crops with row-cover. This lightweight material will create a slightly warmer microclimate underneath that will help promote plant growth. We used an Agribon AG-19 row cover that has 85% light transmission in our trials.

TERMINATE EARLY

Regardless of when you plant your cover crop, termination should occur ~ 2 weeks prior to planting tomatoes. This will give the residue plenty of time to break down and return the nitrogen and nutrients to the soil, rather than being tied up when your young transplants are in need of nutrition. ●

NY Sweet Corn Trap Network Report, 9/1/2020

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

Statewide, 31 sites reported this week. Two of the sites had European corn borer (ECB)-E and one site had ECB-Z. Twenty-six sites reported corn earworm (CEW) with twenty-five high enough to be on a 3, 4, 5 or 6 day spray interval (see table in previous issue of VegEdge). Fall armyworm (FAW) was caught at twenty-two sites and Western bean cutworm (WBC) was caught at fourteen sites. The hybrid ECB moth was not caught at any of the six reporting sites. Both FAW and CEW increased over the last week while WBC and ECB remain low.

It is important to correctly identify the larval pests in your corn so that management practices can be altered when needed. For photos, review the Sweet Corn Larval Pest Identification fact sheet (also available in Spanish, Identificación de Plagas de Larvas de Maíz Dulce).

WNY Pheromone Trap Catches: September 1, 2020

Location	ECB-E	ECB-Z	ECB Hybrid	CEW	FAW	WBC	DD to Date
Batavia (Genesee)	0	0	NA	9	3	0	2209
Bellona (Yates)	0	0	0	13	14	0	2260
Brockport (Monroe)	0	0	NA	5	1	1	2210
Eden (Erie)	0	0	NA	24	114	2	2222
Farmington (Ontario)	0	0	0	19	3	0	2321
Geneva (Ontario)	0	0	0	119	0	0	2263
Hamlin (Monroe)	0	0	NA	12	5	8	2233
Kennedy (Chautauqua)	NA	NA	NA	NA	NA	NA	2083
Leroy (Genesee)	0	0	NA	74	21	0	2206
Lyndonville (Orleans)	0	0	NA	38	13	3	2172
Oswego (Oswego)	0	0	NA	10	0	4	2082
Panama (Chautauqua)	0	0	NA	10	3	0	1939
Penn Yan (Yates)	0	4	0	16	6	0	2187
Portville (Cattaraugus)	NA	NA	NA	NA	NA	NA	1932
Ransomville (Niagara)	0	0	NA	14	27	2	2286
Seneca Castle (Ontario)	0	0	0	2	5	0	2217
Williamson (Wayne)	NA	NA	NA	NA	NA	NA	2102

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

Brassica White Rust

Robert Hadad, Cornell Cooperative Extension, Cornell Vegetable Program

This disease is not often seen but can pop up unexpectedly. I haven't seen it in NY but have in other states, especially on horseradish and mustards. The photo below was taken in WNY in the last week on mustard. White rust can be introduced through contaminated weeds or infected seed, white rust can become established in fields. It shows up with wet conditions. In our region, white rust seems to affect radish and mustards predominately. However, the disease can attack any crucifer vegetable especially Chinese cabbage, horseradish, turnips, and broccoli.

White rust (*Albugo candida*) can spread easily once established. It twists and distorts leaves reducing the marketability. Radishes can be hit hard. The leaves and roots can be affected ruining the tops when selling bunches or making ugly roots that will have to be culled out. Mustard greens can be hit hard too, especially Indian or Red Indian mustard.

SYMPTOMS

Symptoms begin somewhat unnoticeably with light chlorotic (light green to yellowish) spots on the upper leaves. With enough moisture present whitish pustules form and new ones will begin to show up on leaf and flower stems. The pustules will pop releasing chalky dust-like spores and spread. Leaves can become distorted or twisted. Eventually leaves will die off. With more chlorosis spots. Roots can also become infected causing malformation resembling club root. Flower stalks that are infected can produce flowers that are also distorted resembling a stag horn appearance.

CONDITIONS FOR DISEASE DEVELOPMENT

The disease requires cool and wet conditions. Seeing this summer is a surprise but if there was a period of cool nights and with heavy irrigation, the environment was right for an outbreak. Heavy dews also can provide enough moisture for white rust to get started.

Albugo is a water mold scientifically referred to as an oomycete rather than a fungus. Like Phytophthora, the oospores can survive in the soil for many years or stick to seeds and spread that way. A short duration of cooler temperatures, 55- 64°F, with enough moisture can revive the disease. Some of the spores, when exposed to moisture, can develop into zoospores which are capable of "swimming" on the water film, settling on a spot on the leaf, then germinate and infect. When the pustules rupture, the spores are spread by wind, rain, or insects. The disease will spread in a confined area but with breezy conditions, can move out wider into fields.

CONTROL

Hot-water treated seeds if available through the seed companies or through a Cooperative Extension office that provides this service can reduce the disease from being introduce assuming white rust isn't in neighboring farms. After brassica crops are harvested, incorporate debris into the soil quickly. Be sure to keep weeds under control especially the cruciferous ones like wild radish, shepherds purse etc. In NY, there may not be labeled fungicides for this disease. If you see any brassicas with the yellowing spots or white pustules, rogue out and destroy if possible. Long rotations out of brassicas can help some.

CROP INSIGHTS

BEETS
Harvest is progressing as fast as the processing plants can take product. Continue to manage Cercospora leaf spot in fields that have a long time until harvest. We have had some moderate to severe CLS risk this past week based on temperature and relative humidity data. - JK

CARROTS
As harvest ramps up in September, keep an eye on leaf spot diseases in fields that still have a long time until harvest. - JK

COLE CROPS
Alternaria keeps on popping up. I believe the dry weather was helping to hold both alternaria and downy mildew at bay. Now that it is more ideal weather conditions spraying would be wise. See Christy's article from 8/19/20 for more info. - EB

CORRECTION to Fungicide "Cheat Sheet" for Control of Alternaria Leaf Spot and Head Rot in Broccoli – Luna Experience and Viathon are not labeled in broccoli or cabbage. Instead, Luna Experience and Viathon with active ingredient tebuconazole (+ fluopyram in Luna Experience) are labeled on other Cole crops, specifically Brassica leafy greens including broccoli raab, Chinese cabbage (Bok Choy), collards, kale, mizuna, etc. An updated version of this Fungicide Cheat Sheet is available on the CVP website.

Figure 1. First sign of Alternaria leaf spot on broccoli head shows up as a tiny black spot (left) that soon enlarges and becomes sunken (right). It can be also be associated with yellow/brown beading. *Photos: C. Hoepting, CVP*

Be on the lookout for the diseases of fall, Alternaria leaf spot (ALS) and downy mildew (DM). It is especially economically damaging when these diseases cause unsightly and unmarketable black spots (and subsequently rot) on the head. Ideally, lower frame canopy leaves should be kept clean in order to keep disease pressure low. If you notice ALS/DM lesions on lower frame leaves, do your best to keep the upper leaves and head portions of the plant clean/protected with an effective fungicide program – see Fungicide "Cheat Sheet". Early symptoms of ALS head rot can be very subtle – inspect heads for tiny sunken black spots (Fig. 1). See tips for distinguishing ALS and DM lesions on foliage, page 10. Disk up crop residue as soon as harvest is complete to reduce buildup of inoculum. - CH

CUCURBITS
Remember those squash vine borers we had in July? Yeah, they're back. Well, actually their kids are. Normally we should only have 1 generation a summer. We've had so many heat units since squash vine borer's first flight that some areas have managed to push into a second generation. Here's the really unfortunate part: the second generation tends to go directly after the fruit. Eggs are still laid near the base of the vines, but this time of year the hatch coincides with "meh" quality vines and the caterpillars go for a little walk to find a better home/food source. They'll usually drill into fruit on the belly side. Of course fruit wounds tend to beget nasty secondary rots. Not much to do once they're in the fruit. Keep an eye out for the large, red bodied, clear winged adult moths that look like weird bees in fields of winter squash and pumpkins. Not all areas will experience a second flight, but most areas have had at least as many heat units as have accumulated in one problematic region. - EB

Isn't that a cute squash vine borer acting all shy after being cut out of his nice Delicata home? Uh, NO! *Photos: E. Buck, CVP*

DRY BEANS
Western bean cutworm (WBC) numbers were at or near zero at all trap locations this week. Fields where beans aren't yet dry should still be scouted for WBC damage. For more information and counts, visit http://sweetcorn.nysipm.cornell.edu and scroll down to the Dry Bean Western Bean Cutworm Alert and read previous issues of VegEdge for scouting tips.

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ONIONS

Figure 1. Left – On Aug 11, this variety of red onions had weak roots (short, thin, pink/brown). Right – After last week's rain, on Aug 31 new roots sprouted (arrows). Hopefully, this will help the bulbs make more size. *Photos: C. Hoepting, CVP*

Lot's of variability from field to field in how the crop finished this year. Fields range from: lodging perfectly with beautiful green tops to dying standing up; from lodging earlier than expected to hanging on longer than expected; and from sizing up nicely to not sizing up enough. In some fields, green foliage succumbed to excessive leaf dieback rather quickly within the past couple of weeks. Although not known for certain, it was likely a result of a complex among heat stress, thrips, pink root, IYSV and variety. It appears that last week's rains will help the crop to put on more bulb size. To my amazement, new roots sprouted this week in some fields that had been struggling with poor roots during the past month (Fig. 1). Hopefully, this will be the difference between small and medium bulbs or between medium and jumbo-sized bulbs, particularly where foliage still has some green. **Bit by bit:** Pulling is just beginning for the main season crop as growers are waiting just a few days more for the bulbs to take in just a bit more green foliage in order to make just a bit more bulb size. - CH

Onion and Potato Twilight Meeting (in-person) in Wayne Co. this Thurs, Sept 3, 6:00pm to 8:00pm. John Williams Warehouse. **2.0 DEC credits. FREE.** Onion program will include: 1) post-emergent weed control of big weeds in little onions; 2) Fresh research results of 2020 fungicide trial evaluation for Botrytis leaf blight; and; 3) Fresh research results of 2020 "hammer" insecticide onion thrips trial. Pre-registration much appreciated (Margie Lund: 607-377-9109; mel296@cornell.edu). COVID rules must be followed (no food, bring your own chair and water, wear face mask) – For more info: https://cvp.cce.cornell.edu/event.php?id=1456

POTATOES

Late blight was reported in Chautauqua County on 8/27 on potato and tomato. The clonal lineage was US-23. Now that vine killing is ongoing it is important to keep vines protected until there is no green tissue left. Consider killing vines early in fields where potatoes are ready. On a national level, over the past 2 weeks late blight has been reported in Tennessee and Georgia, as well as Ontario, Canada, with sample analysis underway to determine clonal lineage. These add to past confirmations in FL, AL, NC, WI, and British Columbia, Canada. **If you find or suspect you have late blight on your farm, please contact a CVP specialist.**

This week, all stations passed the 30 Blight Unit (BU) threshold for triggering a late blight spray through the forecast period 9/04/20, except Albion, Burt, and Hammondsport which were under 30 BUs. Conditions overall have been very favorable for late blight development with longer nights and longer dew periods. The chart assumes a susceptible potato variety, a spray date of August 26, and an application of chlorothalonil.

New Late Blight Risk Chart, 9/01/20

Location	Blight Units[1] 8/26-9/01	Blight Units[2] 9/02-9/03	Location	Blight Units[1] 8/26-9/01	Blight Units[2] 9/02-9/03
Albion	15	14	Hammondsport	15	13
Arkport	27	21	Knowlesville	23	14
Baldwinsville	17	14	Lyndonville	17	19
Bergen	20	18	Medina	23	20
Buffalo	20	14	Niagara Falls	20	14
Burt	11	13	Penn Yan	27	20
Ceres	35	21	Rochester	32	20
Elba	22	14	Sodus	NA	NA
Fairville	22	18	Versailles	26	21
Farmington	24	19	Wellsville	48	21
Fulton	28	20	Williamson	24	14
Geneva	23	13			

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

SNAP BEANS

The weather has been conducive for white mold! There is little to be done once the disease takes hold in a field and there are some areas with quite bad pressure. Late plantings of beans should be treated at 10% and full bloom. Many fungicide options are available to treat. Topsin 70 WP, Endura, and Double Nickle all can provide satisfactory control and none of those require a spray license. Good weed control helps more than you'd think, as a drier canopy really reduces white mold severity. - EB

SWEET CORN

Fun fact – Southern corn rootworm beetles and spotted cucumber beetles are the exact same insect! I've had no trouble finding them in sweet corn fields of late, particularly corn fields that are green silk or younger. Also commonly seeing feeding damage in pre-tassel corn from both western bean cutworm and fall army worm. - EB

TOMATOES

There is late blight confirmed in Chautauqua and strongly suspected (aka confirmation pending) in Cattaraugus counties.

Tips for Distinguishing ALS and DM Lesions on Cole Crop Leaves

Christy Hoepting, Cornell Cooperative Extension, Cornell Vegetable Program

Head rot caused by Alternaria leaf spot (ALS) and downy mildew (DM) in broccoli and cauliflower both appear as black sunken spots that can be accompanied by bacterial rots. Visually, it can be tricky to distinguish the cause of head rot. Looking at the lesions caused by these diseases that appear on the leaves may provide a clue as to which disease(s) is causing the head rot.

On the top side of the leaf, both ALS (left) and DM (right) may appear as brown necrotic spots surrounded by yellow borders. For both diseases: Yellow borders may be less defined, and spots may range in size from a few milimeters to over an inch.

ALTERNARIA LEAF SPOT (ALS)


Figure 1.

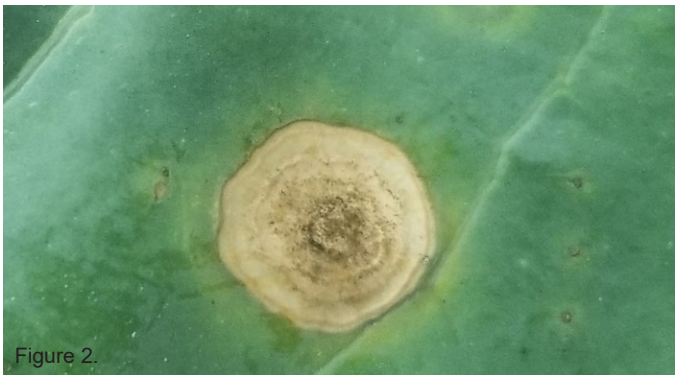
Figure 2.

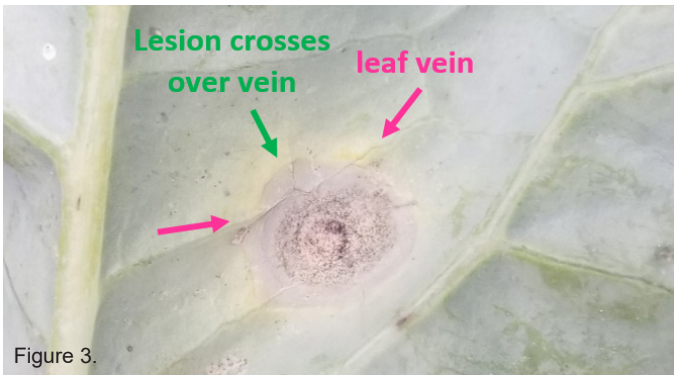

Figure 3.

- Brown (Fig. 1)
- Circular, often with concentric rings of black spores (= target spots) (Fig. 2)
- Not bound be leaf venation
- Lesions on underside of leaf appear similar to above-leaf lesions
- Lesions on underside of leaf not bound by leaf venation (arrows) (Fig. 3)

DOWNY MILDEW (DM)


Figure 4.


Figure 5.

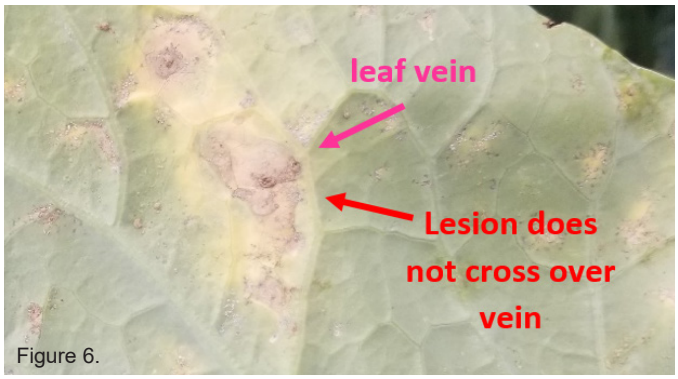

Figure 6.

- Yellow initially becoming tan and necrotic with age (Fig. 4)
- Angular
- Bound by leaf venation
- Look for white sporulation on underside of leaf (Fig. 5)
- Lesions on underside of leaf are bound by leaf venation (arrow) (Fig. 6) ●

Weather Charts

John Gibbons, CCE Cornell Vegetable Program

WEEKLY WEATHER SUMMARY: 8/25/20 - 8/31/2020

	Rainfall (inch)		Temperature (°F)	
Location**	Week	Month August	Max	Min
Albion	1.71	3.29	85	51
Arkport	0.84	1.15	85	51
Bergen	1.29	2.30	83	53
Brocton	1.26	2.87	81	56
Buffalo*	0.50	2.10	84	61
Burt	0.70	3.40	82	53
Ceres	0.45	2.21	85	49
Elba	1.17	1.83	82	49
Fairville	1.29	3.36	82	48
Farmington	1.49	2.58	80	47
Fulton*	0.98	2.84	81	51
Geneva	1.22	1.75	83	50
Hammondsport	2.06	2.85	82	50
Hanover	1.28	2.26	80	55
Lodi	1.35	2.11	85	52
Niagara Falls*	0.14	2.28	84	57
Penn Yan*	2.01	2.99	83	52
Rochester*	0.72	2.70	82	51
Sodus	1.74	3.50	82	NA
South Bristol	3.80	4.26	82	50
Varick	1.59	3.09	84	52
Versailles	1.26	2.61	81	52
Williamson	2.13	4.26	83	50

ACCUMULATED GROWING DEGREE DAYS (AGDD) BASE 50°F: APRIL 1 - AUGUST 31, 2020

Location**	2020	2019	2018
Albion	2276	2036	2388
Arkport	1987	1818	2307
Bergen	2212	1952	2266
Brocton	2188	1995	NA
Buffalo*	2377	2066	2456
Burt	2149	1876	2226
Ceres	1916	1882	2084
Elba	2112	1865	2245
Fairville	2170	1873	2208
Farmington	2181	1890	2249
Fulton*	NA	1885	2280
Geneva	2252	1997	2304
Hammondsport	2186	1894	2194
Hanover	2168	1978	NA
Lodi	2311	2637	2346
Niagara Falls*	2270	1977	2500
Penn Yan*	2346	2089	2387
Rochester*	2260	2158	2525
Sodus	NA	1831	2187
South Bristol	2141	1872	2199
Varick	2376	2100	2383
Versailles	2110	1939	2274
Williamson	2124	1818	2162

*Airport stations
** For other locations: http://newa.cornell.edu

Cornell Cooperative Extension
Cornell Vegetable Program

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VEGEdge

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VegEdge is the highly regarded 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 University 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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