Cornell Cooperative Extension | Cornell Vegetable Program

VEGEdge

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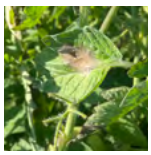

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Late Blight Arrives in the Cornell Vegetable Program Region, 2023

Judson Reid, Cornell Cooperative Extension, Cornell Vegetable Program

We regret to announce the arrival of late blight to the Cornell Vegetable Program region this week. Samples were collected August 1 from symptomatic tomato plants in Yates County. Under microscopy, AgriTech Plant Pathologist Chris Smart confirmed diagnostic sporangia on the same day. The outbreak likely began several days prior with storms moving from known affected areas in Ontario, Canada into New York. The initial Ontario, Canada case was officially reported on potato on July 18. Yates County is in the center of the Finger Lakes region and it is very likely there are unreported cases to the west (and soon, if not already, to the east).

Late blight is caused by the water mold *Phytothphora infestans*. This organism is distinct from fungi, which is important to understand for prevention and control measures. *P. infestans,* as a water mold, requires free standing water to infect susceptible tissue. Once an outbreak begins, water soaked spots spread rapidly throughout the canopy, with fruit showing large spots as well. On the foliage the spots are larger than other diseases, and under high humidity will produce white sporulation. The disease spreads rapidly and is a complete blight if left untreated.

Late blight does not overwinter outdoors in NYS (in the absence of a host such as a live plant or potato tuber), so its arrival each year differs depending on neighboring regions and weather conditions. Also variable is the strain or 'genotype'. Different genotypes vary in their relative severity to tomatoes and potatoes, as well as

Late blight infection often start high in the canopy as spores are dropped by rain. *Photo: Caroline Boutard Hunt, CCE Yates County*

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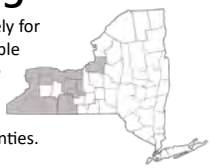
About VegEdge



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.

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The next issue of VegEdge newsletter will be produced on August 9, 2023.

Accumulated Growing Degree Days, 7/31/23

Julie Kikkert, CCE Cornell Vegetable Program

Accumulated Growing Degree Days (AGDD)
Base 50°F: April 1 - July 31, 2023

Location**	2023	2022	2021
Albion	1519	1594	1662
Appleton	1434	1518	1501
Arkport	1261	1376	1304
Bergen	1424	1546	1498
Brocton	1425	1563	1545
Buffalo*	1540	1601	1636
Ceres	1231	1292	1351
Elba	1378	1459	1423
Fairville	1413	1491	1435
Farmington	1449	1500	1486
Fulton*	1450	1475	1440
Geneva	offline	1570	1535
Hammondsport	1386	1499	1447
Hanover	1385	1543	1523
Jamestown	1244	1346	1342
Lodi	1585	1724	1261
Lyndonville	1469	1444	1509
Niagara Falls*	1602	1673	1585
Penn Yan*	1495	1624	1617
Rochester*	1493	1596	1549
Romulus	1560	1619	1586
Sodus	1563	1633	1565
Versailles	1363	NA	NA
Waterport	1436	1511	1485
Williamson	1367	1471	1421

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

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response to fungicides. Therefore, it is important early in an outbreak to identify genotype. In 2023, after confirmation in NYS, late blight samples will be sent to North Carolina State for genotyping. We ask that vegetable farmers promptly report when late blight is found to local Extension educators or IPM specialists who can provide further support. The tracking of the disease also helps with mapping spread, which can be followed online at https://usablight.org/map/ USAblight.org also has other great resources to understand and manage this disease.

Tomato growers in the region are highly encouraged to look at Late Blight Severity Units in this newsletter (see the Potato section in CROP Insights) and prepare to protect their crops with materials specific to *P. infestans*. Again, as this isn't a fungus, most fungicides will not provide adequate control. Additionally, resistance to fungicides is found in some genotypes.

From Cornell Recommends:

> "Late blight genotypes identified as US8P(t) and US11T&P are insensitive to mefenoxam, so other fungicides need to be selected for control. The mefenoxam containing fungicides (Ridomil Gold Bravo, Ridomil Gold Copper and Ridomil Gold MZ WG) are highly effective for US22T&P, US23T&P, and US24P(t), and should be considered because of the systemic MOA for mefenoxam. Other fungicides with systemic or systemic/translaminar activity include *Previcur Flex and *Presidio SC. Other translaminar products to consider include Revus, Revus Top, Forum, Curzate and Tanos. Strobilurin products (Group 11) are labeled for late blight and can be considered as long as they are tank-mixed with product also effective for early blight and Septoria leaf spot. Consider Quadris Opti or Quadris Top or Cabrio, Flint or *†Reason if tank-mixed. Consider the following as contact fungicides (Ranman, *Gavel, *Zoxium) as you would chlorothalonil and mancozeb."
> * denotes restricted use material.

As we are approaching the first full swing of field harvest, we'll highlight here some low pre-harvest interval products. Orondis Ultra has a 0 day PHI and presents two active ingredients. No more than two consecutive applications are allowed, with a max of 4 per season. Orondis Ultra may not be applied to crops that have had a soil treatment of Orondis Gold. Ranman has a 0 day PHI and Revus Top has 1 day PHI. These three materials are non-restricted use and do not overlap active ingredients, creating a broad spectrum rotation for late blight.

For organic growers, copper based fungicides may delay infections, particularly if Severity Values are low. However, copper is unlikely to prevent infection if the outbreak is widespread. More effective are cultural controls (available to all types of growers!) that keep the foliage dry. This includes stake and weave trellis in the field, and high tunnels or greenhouses that can eliminate free standing water on the foliage. In field settings, avoiding shade and low air-movement pockets can reduce the infection period.

There are an increasing list of late blight resistant tomatoes including Iron Lady, Defiant, Mtn Merit and Plum regal.

Key Points for Late Blight Management

- Plant resistant varieties
- Keep foliage dry with trellis and tunnels
- Stay informed by following VegEdge and USAblight.org
- Rotate through effective crop protectants
- Destroy potato cull piles

Thanks to CCE Yates Ag Educator Caroline Boutard Hunt for field collection and diagnosis, and the Cornell Vegetable Program's Lori Koenick for support in sample handling.

Late blight produces larger leaf spots than other diseases. These spots may be olive colored to brown depending on humidity. *Photo: Caroline Boutard Hunt, CCE Yates County*

For comparison, compare the large late blight lesions on the left, to the smaller early blight lesions on the right. Late blight is also much more damaging to tomato fruit. *Photo: Caroline Boutard Hunt, CCE Yates County*

CROP Insights

Observations from the Field and Research-Based Recommendations

GENERAL

Two spotted spider mites are active on many crops—tomato, eggplant, beans, cucumbers, watermelon and more. Feeding damage starts as tiny whitish dots giving leaves a stippled appearance (Fig. 1). Flip over the leaf to see the two spotted spider mites. These tiny pests are barely visible with the naked eye, a 10x or 20x lens can be very helpful to see them. The adult mite is yellow to dark green with 2 dark spots. More severe damage gives leaves a bronzed or bleached appearance and you can see webbing. – LK

Figure 1. Tiny whitish dots giving tomato leaves a stippled appearance caused by Two Spotted Spider Mite. *Photo: Lori Koenick, CCE*

Mite populations that are high enough to be easily seen in the canopy are likely too high to be effectively and quickly controlled using beneficials. A good strategy is to knock the population down then follow up with a beneficial release, particularly in high tunnel settings. Many mite control products are only effective on adults; be sure to read the label and understand if your treatment material is a contact product or has residual and will also control juveniles as they hatch. Contact type products like horticultural oils and horticultural soaps need to be reapplied 5-7 days later (follow label) to effectively treat emerging juveniles. – EB

Japanese beetles are happily feeding on numerous crops. – LK

BEETS

Common scab was identified in a field of fresh market beets. The symptoms range from superficial russeting to deep pitting (Fig. 2). Scab is caused by a bacterium (Streptomyces sp.). That means that **a fungicide such as Quadris is not effective.** Potatoes, carrots, beets, turnips, radishes and related crops are all hosts. The disease is worse on sandier soil and under dry conditions due to the fluctuations in soil moisture content. **Crop rotation is the best method of management.** Plant non-hosts such as sweet corn, cabbage, grain crops, alfalfa. Avoid red clover. Manure can make scab worse because spores can pass through the cow into the manure and the field if the animals have eaten infected vegetable waste.

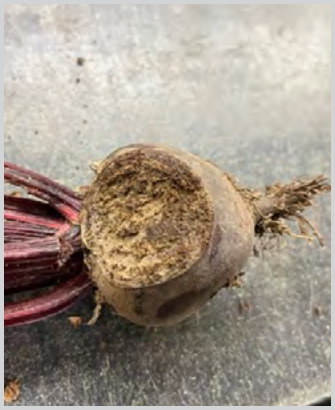

Figure 2. Deep pitting on beet root is a symptom of common scab. *Photo: Eric Branch, Cornell*

Cercospora leaf spot (CLS) is widespread in the region. A period of moderate to high risk of infection was achieved last weekend according to the CLS Decision Support System (DSS) at most weather stations (Table 1). The CLS DSS is available for free at https://newa.cornell.edu/beet-cercospora-leaf-spot and has the option of displaying a graph for the season. Fungicide applications are generally only warranted if disease is present in the field, there is moderate or high risk based on the weather conditions, and the field has a significant time until harvest by top-pulling machines or the beets are being sold with the tops on (bunching beets). – JK

CARROTS

We're looking for samples of leaf diseases in carrots for a research project and we'd love to have yours! Please give us a call if you start seeing any foliar spots in your crop. – JK

COLE CROPS

Seeing swede midge damage on cole crops on urban farms. The larvae of this pesky microscopic fly feed at the growing point of plants. This can cause the growing tip of the plant to become distorted. Damage can look like multi-stemmed plants or multiple heads, or no heads at all. Young leaves can become swollen, crinkled or crumpled and brown scarring is commonly seen on the leaf petioles or stems (Fig. 3, next page). We are also seeing swede midge feeding leading to secondary bacterial soft rot at the growing point (Fig. 4, next page). What a mushy smelly mess! – LK

Table 1. Cercospora Leaf Spot 2-Day Risk
Risk of Cercospora leaf spot on table beet from July 30 to August 4 using a forecasting model. Risk classification of CLS is based on cumulative 2-days/risk, and the forecast is based on weather data from Network for Environmental and Weather Applications (NEWA) models.

	achieved			forecast		
Location	July 30	July 31	Aug 1	Aug 2	Aug 3	Aug 4
Albion	**6**	0	0	0	0	2
Bergen	**5**	0	0	0	0	2
Elba	**6**	0	0	0	0	2
Geneva	**5**	0	0	0	0	1
Lyndonville	**9**	**5**	2	0	0	0
Medina	**5**	0	0	0	0	2
Sodus	0	0	0	0	0	2
Sodus (Lake)	2	0	0	0	0	2
Waterport	**5**	0	0	0	0	2

Low ≤ 3; Moderate 4 to 6; High ≥ 7.
Data from newa.cornell.edu accessed 9:00 am on 8/2/2023.

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Figure 3. Brown scarring on collards leaf petiole is a common sign of swede midge feeding. *Photo: Lori Koenick, CCE*

Figure 4. Bacterial soft rot beginning to show at growing point of kale as a result of swede midge feeding. *Photo: Lori Koenick, CCE*

CUCUMBERS

Downy mildew is present in many counties and it would be wise to assume that it is in yours as well. So far only seeing on cukes, cantaloupes are the next most susceptible crop. Downy is an oomycete, not a true fungus, and is therefore not well controlled by most general purpose fungicides. It is best to use an oomycete specific material (see Veg Guidelines), many of which are also labelled for use against late blight. – EB

DRY BEANS

Mexican bean beetles are still present in many fields along with Japanese beetles. Both will feed on foliage. Japanese beetles can cause large amounts of defoliation but are typically not present in numbers high enough to cause concerning levels of damage, while Mexican bean beetles will defoliate full plants and feed on pods if left unchecked. Treatment should be considered when there is 40% defoliation pre-bloom, or >15% defoliation during pod-fill.

Western Bean Cutworm Report

Western bean cutworm numbers are likely at peak this week. Scouting is recommended in all dry bean fields starting 7-10 days after peak flight regardless of cumulative moth numbers (Table 2). To scout for WBC, inspect 50 plants per field (10 stops, 5 plants per stop), looking at all pods present on the plant for holes. WBC chew directly into the pod and eat the seed. It can be difficult to scout dry beans for egg masses or caterpillars, since the caterpillars move from the pods to the soil during the daytime, so looking for signs of damage is the best strategy. European corn borer damage (ECB) may be similar to WBC, but an ECB larva would likely still be present in the pod when inspected. If damage into the pod and seed is found with no larva present, it is possible this is WBC. A spray is recommended if dry bean pod damage is found.

Table 2. Western bean cutworm adult moth numbers by date for each dry bean trap location.

Dry Bean Location	July 3	July 10	July 17	July 26	Aug 2	Cumulative Moths
Avoca Hill (Steuben Co.)	2	5	8	47	78	**140**
Avoca Valley (Steuben Co.)	1	0	12	58	58	**129**
Avon (Livingston Co.)	0	1	6	23	22	**52**
Caledonia (Livingston Co.)	1	0	8	46	68	**123**
Churchville (Monroe Co.)	0	1	11	30	42	**84**
LeRoy (Genesee Co.)	1	0	31	83	112	**227**
Penfield (Monroe Co.)	0	3	11	51	60	**125**
Penn Yan (Yates Co.)	0	1	2	19	--	**22**
Scottsville (Monroe Co.)	0	0	6	6	18	**12**
Wayland Hill (Steuben Co.)	0	1	11	47	78	**137**
Wayland Valley (Steuben Co.)	3	4	14	30	50	**101**
Wyoming Hill (Wyoming Co.)	0	2	24	72	73	**171**
Wyoming Valley (Wyoming Co.)	0	1	18	41	28	**88**

ONIONS

Goodbye July! You had more rainfall than normal and slightly cooler temperatures, which was very good for onion bulbing! The onion crop is bulbing nicely with a large and healthy leaf canopies, except for in some wet spots where too much rain fell and drainage is not as good. Hello August! We are entering into the home stretch of the pesticide spray programs. With our lofty goal of not applying more than two applications of FRAC 3 fungicides for resistance management of Stemphylium leaf blight (SLB), spray decisions have been trickier than ever this year. Several growers have made at least their first application of double FRAC 3-product tank mix with Tilt or Viathon or both, and from what we can tell from the scouting program, it appears that Viathon + Tilt has resulted in adequate disease control in Elba, at least in Elba. For example, we had a field where 52% of the plants that we scouted had fresh target spots on green tissue (an indication of primary SLB) and after an application of Viathon + Tilt, the SLB was mostly secondary as the SLB target spots from the previous week dried up when the leaves died back. No signs of new fresh primary lesions were an indication that the SLB disease had not progressed (and that Viathon + Tilt worked**). For more information on distinguishing between primary and secondary SLB, see article on page 9.** Since there are no longer any best treatments for SLB due to fungicide resistance, many growers have been relying on tank mixes of average or weaker-performing fungicides belonging to multiple FRAC groups to piece together a treatment that works, such as Miravis Prime + Rovral + Bravo + Rampart. Onion thrips generally remained low this week, in part from all the rain.

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However, pressure can spike at this time of year as thrips can migrate in big numbers into an onion field from another onion field that is being pulled/harvested or from a nearby hayfield, etc. So make sure that you are scouting for thrips every week before you make your spray decisions. Botrytis necrotic spots continue to increase, which typically respond to the same fungicides that are most effective on SLB. In trials, BLB necrotic spots continue to increase even with fungicides that have activity on them, just not nearly to the extent that they do in the untreated plots. If you can count the number of BLB necrotic spots on an onion plant, the severity is minor. – CH

Seeing some gorgeous fresh sweet onions into the market. Well done! Monitor longer varieties (dry bulb storage, late plantings sweets) for bacterial issues and presence/progression of Stemphylium leaf blight. Both can ruin what has otherwise been a good looking crop. – EB

PEPPERS

Seeing many cases of stink bug damage in peppers. Stink bug feeding leaves small, unripening scars on the fruit and can sometimes cause dimpling. Looks similar to tarnished plant bug feeding Robert wrote about last week. Many products that will treat stink bugs also treat tarnished plant bug and corn borers (check your specific label). Many of the stink bug options are pyrethroids, the organic option in that chemistry class being PyGanic. Overuse of pyrethroids (synthetic, especially) can flare up aphid and two-spotted spider mite (TSSM) issues by killing beneficials. Scout your fields and treat judiciously rather than on calendar schedules. If also dealing with aphids/TSSM, consider using Leverage 360 or other product that is premix of a pyrethroid and a neonicotinoid. The neonic will provide residual control of aphids and TSSM. – EB

POTATOES

Late blight has been confirmed in Yates County NY this week, as well as confirmed in Ontario, Canada in the past few weeks. With continued wet weather throughout Western NY and confirmed late blight close by, it is important to continue to be consistent with your fungicide programs this year. See cover article for more information.

Early blight and grey mold are appearing in many potato fields. Continued rain events in the area can encourage the spread of both diseases, so staying on top of fungicide applications is important for slowing the spread of both early blight and grey mold. – ML

Most locations have reached the 30 blight units (BU) needed to trigger a spray for late blight, or will by the end of the week. If the weather station closest to you has not yet reached 30 BU and the forecast indicates that it will in the next 2-3 days, a spray is still recommended. The chart assumes use of a susceptible potato variety Reba, and an application of chlorothalonil on July 26. For locations that are not close to a weather station, forecast information should only be used as a **general indication** of how favorable weather has been for late blight. Forecast BUs are subject to changes as the weather forecast changes, so check forecasting tools regularly to see if disease forecasts have changed. – ML

Late Blight Risk Chart, 8/2/23

Location	Blight Units 7/26-8/1[1]	Predicted Blight Units 8/2-8/4[2]
Albion	34	39
Arkport	36	41
Baldwinsville	21	27
Bergen	18	23
Brant	33	33
Buffalo	26	39
Burt	-	-
Ceres	36	39
Dansville	30	42
Elba	32	37
Fairville	44	44
Farmington	22	22
Fulton	35	54
Geneva	18	18
Hammondsport	19	24
Knowlesville	35	40
Lyndonville	34	40
Medina	21	26
Niagara Falls	22	41
Penn Yan	36	49
Rochester	38	57
Sodus	17	17
Versailles	25	25
Wellsville	41	58
Williamson	30	35

Calculated using a May 31 crop emergence date. Last fungicide application July 26 on susceptible cultivar Reba. Numbers in red indicate locations that have or will surpass the 30 BUs needed to trigger a fungicide application.

1 Past week Simcast Blight Units (BU)

2 Three-day predicted Simcast Blight Units (BU)

SQUASH

Squash bugs and squash vine borer are still active in vine crops. It is common to see all life stages in the field right now. Their eggs look similar, they are reddish orange brown and around 1mm. The difference is where you find them- squash bug eggs are typically laid in organized clusters on the undersides of leaves (Fig. 5) and squash vine borer eggs are typically laid singly on stems and at the base of the plant. After hatching, they differences are more apparent. Squash bug nymphs move quick and can be a startling site when you turn over a leaf (see pic). They start green and turn to gray as they molt. Adult squash bugs look like an elongated stink bug. Squash vine borer larvae are whitish with a brown head and burrow into the stem soon after hatching. The adult medium-sized moths are quite striking with a dark wings and bright orange body. They can be seen flying around during the day. Both pests can be seen with the naked eye at all life stages and are great candidates for squishing parties in small scale plantings! – LK

Figure 5. Squash bug eggs hatching into nymphs on underside of a squash leaf. *Photo: Lori Koenick, CCE*

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SWEET CORN

August is the time to prioritize scouting for leaf diseases in corn https://www.vegetables.cornell.edu/pest-management/disease-factsheets/sweet-corn-diseases-and-control-measures/ . Our WNY field crops colleagues are reporting frequent occurrence of Gray Leaf Spot (GLS) in field corn this past week. Symptoms begin as rectangular lesions that start on the bottom leaves of the plant. The sharp parallel edges and opacity of mature lesions are diagnostic. GLS can severely impact yield. Susceptibility varies among hybrids. Infection is favored by prolonged periods of dew, fog and cloudy weather. The pathogen overwinters on crop debris. Fall burial of crop residues and crop rotations are important. For photos and more information see https://cals.cornell.edu/field-crops/corn/diseases-corn/gray-leaf-spot – JK.

TOMATOES

Late blight is the big story. See separate Late Blight notice and LB Severity Values in this edition of VegEdge. **Please report any suspicious cases so we can help craft a management plan and track the geographical spread of the disease!** Seeing Septoria and bacterial canker take off in fields with known histories, some early blight as well. – EB

WATERMELON

Anthracnose is common this summer. See article below.

Anthracnose in Cucurbits

Elizabeth Buck, Cornell Cooperative Extension, Cornell Vegetable Program

Anthracnose (an-thrack-nohs) is common in vine crops this year. Watermelon, cantaloupe and other melons are most susceptible. Cucumbers, summer and winter squash, and pumpkins also get anthracnose. Unfortunately, anthracnose has different looks on different vine crop types so it is not always an easy diagnosis. Anthracnose does well in warm, wet conditions. This past month has been nothing if not wet, and we've had plenty of days in the 80s to fuel infections.

Symptoms

On cucumber, lesions present initially as water soaked, yellowish circular areas and progress to round, coin sized tan spots that eventually deteriorate and fall out of the leaf with age. age. Lesions may have water soaked or pale leading edge. Cucumber fruit can develop nasty sunken lesions that render fruit unmarketable. With time and favorable environmental conditions, those sunken lesions can darken to almost black and will sometimes produce salmon-colored spores.

Progressed anthracnose lesions in cucumber are coalescing which gives an irregular appearance. Note the paler brown coloration and water soaked leading edge. *Photo: Lori Koenick, CCE Cornell Vegetable Program*

In watermelons anthracnose can cause crop loss. Foliar symptoms begin as small, yellow spots with water soaked edges before quickly becoming dark (nearly black) lesions. Diffuse spots grow in size and may coalesce (grow together). As the canopy begins to collapse, foliar symptoms can present as lighter, brown grayish areas covering large portions of the leaf. Fruit infections are possible and are dark sunken spots or can appear to be underdeveloping portions of the fruit initially mistaken for blossom end rot or underpollination on young watermelon. Symptoms are similar **in cantaloupe,** but overall less dark black and more dark brown.

Foliage of squashes and pumpkins are less susceptible to anthracnose and tend to survive infection. Anthracnose begins similarly to cucumber but produces large, dark, dry lesions on the foliage. Lesions may not always appear to be circular and could instead be oblong as they grow together. Large-leaved cucurbits tend to fold over and break at the lesions as the disease progresses and foliage moves in the breeze. Lesions also fall out of the leaves with age.

Fruit issues in squashes and pumpkins are of greater concern. Anthracnose causes sunken lesions in soft rind squash (zucchini, yellow, patty pan, some delicata) similar to cucumbers. Anthracnose is a major fruit quality issue in storage squash and can be a problem on pumpkins. It may not appear on fruit until close to or post harvest. Fruit symptoms are darkened, sometimes sunken, blackish lesions. Spores may be black or salmon colored. More on late-season spray strategies for protecting fruit from anthracnose and other diseases next week.

Gummy stem blight can be easily confused for anthracnose. Of note, gummy is far more aggressive on vines than anthracnose. Gummy will cause scarring and sunken or cracked lesions that will be tan to reddish on the vines. Vine lesions and fruit attachments may exude a reddish sap, but that's not always visible. Gummy lesions on foliage tend to start near leaf margins and, especially in watermelon, are more brown or tan than the dark anthracnose.

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Treatment

Anthracnose should be taken seriously, especially when putting fruit at risk. The very low treatment threshold reflects the disease's potential for economic impact: treat at first sight.

Biopesticides and Organic

Labelled **biopesticide products include** Actinovate, Regalia, and Serifel. **Efficacy data** for these specific products in the Northeast against anthracnose **isn't readily available**. Generally speaking the first two products upregulate plant defenses and work best when applied prior to plant disease presence. All biopesticides produce best results when used early, when disease pressure is low.

Certain **neem products** may have anthracnose on the label but their **efficacy is** similarly **unknown**. A better approach is to use copper. **Copper is rated as the most effective organic treatment and has short PHIs**. Numerous coppers are labeled and should be applied at the high rate. Copper will be better at reducing spread to as-of-yet uninfected plants and fruit than it will be at stopping or curing anthracnose infections. It can make an appreciable difference when disease pressure is low.

Several **potassium bicarbonate products** (MilStop and others) are labelled. These **materials act as surface sterilants and essentially burn off spores, thereby reducing inoculum and spread**. Labelled **agricultural use hydrogen peroxide and peroxyacetic acid** products like Oxidate work in the same way. They are generally not curative for anthracnose. If labelled for such applications, their surface sterilizing properties may be useful for storage fruit coming out of the field, IF LABELLED.

Conventional

Chlorothalonil (Bravo and generics) and mancozeb (Manzate and generics) are more **effective preventative options** than copper. Bravo has a 0 day PHI and is more attractive than Manzate's 5 day PHI. There are pollinator health concerns with chlorothalonil, especially when mixed with certain insecticides. Mancozeb is rated as low risk for bees and may be an appropriate choice in flowering crops that are infrequently harvested. Copper can be an appropriate protective material in heavily flowering, frequently harvested crop if disease pressure is low.

Anthracnose is one of those diseases that can still be effectively treated with **strobilurin class (group 11) fungicides**. These are attractive because they tend to have short (often 0 day) PHIs and there are many options that do not require a spray license. Most products containing a group 11 active ingredient prohibit consecutive applications and must be rotated with a non-group 11 material to prevent resistance development. **Rotating sprays is a solid idea even for the chemistries that don't require it on the label.** Those that do include Cabrio (11, pyraclostrobin), Pristine (11+7, pyraclostrobin + boscalid), various versions and premixes of Quadris (11, azoxystrobin), and Tanos (11 + 27, famoxadone + cymoxanil).

Tanos is an interesting material because it has translaminar activity and is particularly good on alternaria. Therefore, it is an excellent choice for melons. It does have a 3 day PHI and may not be as suited to yellow and zucchini. **Inspire Super** and its generic VanGo Esq (3+9, difenoconazole + cyprodinil) is another effective, unrestricted use material. Inspire Super has a 7 day PHI and offers protection against a broader range of diseases, making it a solid choice for pumpkins and hard squashes.

Restricted use **Aprovia Top** is another product containing difenoconazole and shouldn't be rotated with Inspire Super or its generic. It is a premix with a group 7 chemistry. Aprovia Top has a short, 0 day PHI and is a good choice if you are combatting or concerned about a range of diseases including powdery mildew, gummy stem blight/black rot, alternaria, and plectosporium.

Cultural Practices This Year

Right now you can work to increase airflow and reduce canopy moisture. Mostly that means cleaning up weeds, especially by hedgerows. Avoid overhead irrigation if you can. Nothing to be done about these heavy frequent rains except to encourage drainage (better soil health and less compaction helps).

Cooler temperatures can allow you a chance to catch up on spraying but will not stop disease on their own. Anthracnose can rock and roll and ruin your crop straight through to October. Disc in infected plantings as soon as you finish picking to reduce inoculum on your farm and promote breakdown of crop debris. Anthracnose will survive on crop debris in the soil.

Progressed anthracnose symptoms on watermelon foliage. Note how dark the lesions are. *Photo: Meg McGrath, Cornell*

Next Year

Rotate away from currently infected fields for at least two seasons. Try to place next year's field distant and/or generally upwind of the current planting. There are resistant varieties of cukes and pickles. You should plan to plant at least a portion of your crop to resistant varieties in the year following an anthracnose infection. Also check with your seed provider to ensure that their seed source was verified to be free of anthracnose. Don't save seed yourself from anthracnose infected plantings.

Identifying the Primary Stage of Stemphylium Leaf Blight in Onion

Christy Hoepting, Cornell Cooperative Extension, Cornell Vegetable Program

Stemphylium leaf blight (SLB) of onion may behave as a secondary or primary pathogen. When it is behaving as a secondary pathogen, it is colonizing necrotic leaf tissue and appears to be perfectly fine to inhabit such tissue with no intention of attacking the healthy tissue on the plant. When it is behaving as a primary pathogen, it is actively attacking healthy plant tissue, which could result in excessive leaf dieback and reduced bulb size/yield. This is what we want to prevent from happening by implementing an effective fungicide program. The degree to which SLB appears primary or secondary often changes from week to week and is important to take into consideration when making fungicide spray decisions and interpreting their effectiveness.

Secondary SLB

Causes of necrotic leaf tissue that is readily invaded by secondary SLB include herbicide injury and lesions of Iris yellow spot virus (IYSV) just to name a few (Fig. 1). Often these secondary SLB lesions are quite "showy" in colors of purples, pink and black and sometimes even with hues of orange (especially when on IYSV lesions). Goal herbicide often results in a necrotic bend in the leaf (old pig-tailing injury) and it is common to find secondary purple SLB target spots located in these bends. These SLB target spots can look like they are located directly on green tissue (which would indicate that SLB is primary), but upon closer inspection, you should be able to identify the necrotic tissue of the bend caused by the Goal injury. Anytime you see a leaf with a long stretch of necrotic tissue, look at the plant and the leaf and try to visualize which came first, the necrotic tissue or the SLB target spot. It can be tricky, but skills can be honed with practice.

Figure 1. Secondary target spots caused by Stemphylium leaf blight (SLB) that have attacked tissue that was already necrotic due to herbicide injury (left) and Iris yellow spot virus (IYSV, right). *Photos: Christy Hoepting, CCE Cornell Vegetable Program*

Primary SLB

"Fresh" SLB target spots located on green leaf tissue are a sure sign that the SLB disease is behaving as a primary disease by actively infecting green leaf tissue. When you look at the location of the SLB target spot on the leaf, it should be obvious that the SLB pathogen had attacked a healthy leaf (Fig. 2). This is especially true when the SLB target spots are located mid-leaf and surrounded by green tissue. Fresh SLB target spots are tan and sometimes purplish-pink in color.

Figure 2. "Fresh" primary target spots (pink arrows) caused by Stemphylium leaf blight located on green leaf tissue. *Photos: Sarah Caldwell, CCE Cornell Vegetable Program*

Other signs of primary SLB are that the surrounding leaf tissue of the target spot is water-soaked or has a greasy appearance (Fig. 3 left), dark or black spores are visible on the target spots and multiple SLB target spots are present per leaf (Fig. 3 right).

Figure 3. Indicators of primary SLB include a water-soaked or "greasy" appearance of the leaf tissue where the SLB target spot occurs (right), when SLB target spots have dark or black spores and there are multiple SLB target spots per leaf (left). *Photos: Christy Hoepting, CCE Cornell Vegetable Program*

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Old primary SLB target spots appear on necrotic tissue, but when you look at its location on the leaf, it is apparent that the SLB target spot had originally invaded green leaf tissue and that it was the disease that made the tissue necrotic (Fig. 4). Primary SLB target spots will appear "old" like this a week after they first appeared as "fresh". The SLB targets do not go away. They can go on to actively sporulate and become "showy" black and purple SLB target spots. Or, they can dry up as the infected leaf dies off. If the majority of SLB target spots in a field are old tan SLB target spots, this would be of less concern than "fresh" SLB target spots or SLB target spots that are actively sporulating.

Figure 4. An old primary SLB target spot. Although it now occurs on necrotic leaf tissue, upon inspection you can see that it originally occurred on green leaf tissue (e.g. roll the leaf around and the other side is still green). *Photo: Christy Hoepting, CCE*

Four Lined Plant Bugs

Robert Hadad, CCE Cornell Vegetable Program

Four lined plant bugs (4lpb) are a generalist feeder with a host range of over 250 species of plants. Most commonly seen on ornamentals like herbaceous perennials including daisy, liatris, and mums; mint and basil, flowering shrubs, berry crops, and flowering annuals. In vegetables, this pest can affect peppers, squash, and potatoes.

The plant bugs hatch from overwintered eggs in late spring. The nymphs feed on the upper surface of leaves for a month or so. The nymphs molt and the adults emerge and continue to feed on plant leaves through July.

A four line plant bug nymph. *Photo: University of Minnesota Extension*

Feeding damage comes from the method in which 4lpb feed. Their mouth arts are needle-like piercing the leaf surface and they suck chlorophyll. The holes become sunken whitish spots. Eventually the dead tissue drops out leaving small holes. With severe feeding damage, leaves will shrivel turning brown. Young leaves can wilt. With more and more holes on a leave, whole sections of the leaf can die off.

Management

Management is tough. Not very much directly labelled for this pest. Pyrethroids may be go-to items. In a tunnel, early releases of beneficial predatory insects like ladybird beetles might reduce nymphs early.

An adult four lined plant bug on sweet green peppers in a high tunnel. The plants were severly damaged, losing more than 50% of the leaf mass across the crop. *Photo: R. Woodbridge, CCE Niagara County*

Upcoming Events

Agronomic Weed Management and Cover Crop Field Session

August 15, 2023 (Tuesday) | 3:30 - 6:00 pm afternoon session; 6:00 dinner; 6:50 - 8:10 pm evening session
5701 Burton Rd, Orchard Park, NY 14127

DEC credits in CORE, 1a, 10, 21 and 23. Topics include:

- Emerging problem weed species
- Dealing with changing herbicide efficacy and the impact of erratic weather
- Managing spray water to improve herbicide efficacy
- Soil health practices
- Demo: Calibrating and using a dual seed box drill to establish cover crop
- Erie Soil & Water's soil health equipment lending program
- Field demo of various cover crops

For more information, contact Elizabeth Buck at 585-406-3419.

Chipping Potato Twilight Meeting

August 24, 2023 (Thursday) | 6:00 pm - 7:00pm with dinner to follow
Mahany Farms, 10046 NY-36, Dansville, NY 14437

Learn about updates in insect pest control in potatoes and view this year's chipping potato variety trial! 1.0 DEC credit available.

2023 Soil Health & Climate Resiliency Field Days

Join the New York Soil Health team and partner organizations at a soil health field day! The statewide event series takes place through September 2023. Register at https://fielddays.newyorksoilhealth.org

August 24, 2023 (Thursday) | 10:00 am - 3:00 pm
Martens Farm, 1443 Ridge Rd, Penn Yan, NY

Join leading organic grain farmers and researchers to discuss new ideas and tools for reducing tillage and improving soil health in organic grain rotations. Learn about organic no-till systems and discuss adaptive management strategies for improving resilience on the farm. The afternoon session will include equipment demos, a grain cleaning facility tour and the NY Soil Health Trailer demonstration. Registration required: $10. Lunch provided. CCA credits available. Register online or by call the CCE Yates County office at 315-536-5123.

August 31, 2023 (Thursday) | 9:00 am - 3:00 pm
Branton Farms, 6536 Main St, Stafford, NY 14143

Hear practical, field-tested results of advanced soil regenerative practices targeted to dairy, field and specialty crop farmers.

- Carbon Market and Biochar Research in New York
- Weed Management
- Minimal Disturbance Manure Drag Lining
- Research Updates from the Planting Green Field Trials
- Use of Biologicals from Pivot Bio

CCA credits available. FREE and lunch provided. Register by August 25. Read more information and register online or call Aaron Ristow, American Farmland Trust, at 315-748-5029.

Cornell Cooperative Extension
Cornell Vegetable Program

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VEGEdge
YOUR TRUSTED SOURCE FOR RESEARCH-BASED KNOWLEDGE

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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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