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Tomato Spotted Wilt Virus in Tomatoes and Peppers

Judson Reid, Cornell Cooperative Extension, Cornell Vegetable Program

Tomato Spotted Wilt Virus (TSWV) has been confirmed in tomatoes and peppers in the CVP region this week. This disease is spread by Western Flower Thrips, a common pest of ornamentals.

Symptoms

The symptoms vary from species to species, and even plant to plant, but there are some key indicators of TSWV that make field diagnosis possible. On tomatoes and peppers dark brown to purple spots will occur, often on newer foliage. Ring spots are particularly diagnostic of TSWV but will not be present on all affected plants. Infected plants often stop growing all together and appear to suffer from multiple nutrient deficiencies. Fruit from these plants is unmarketable, with poor color and more ringspots.

Management

Once TSWV is inside a plant, it can't be removed and generally results in crop failure. Since treatment isn't an option, we must focus on prevention.



Severe stunting is common with TSWV. A healthy plant next to an infected plant is characteristic of the feeding activity of the virus vector, Western Flower Thrips. Photo by Judson Reid, CCE

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: **CCE Cornell Vegetable Program** 480 North Main Street, Canandaigua, NY 14224 Email: cce-cvp@cornell.edu Web address: cvp.cce.cornell.edu

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The next issue of VegEdge newsletter will be produced on July 6, 2022.

Accumulated Growing Degree Days, 6/27/22

Emma van der Heide, CCE Cornell Vegetable Program

Accumulated Growing Degree Days (AGDD) Base 50°F: April 1 - June 27, 2022

Location**	2022	2021	2020
Albion	883	869	735
Appleton	817	810	674
Arkport	724	704	625
Bergen	844	808	720
Brocton	860	855	747
Buffalo*	857	898	725
Ceres	697	705	608
Elba	797	772	695
Fairville	813	783	705
Farmington	824	820	728
Fulton*	792	774	732
Geneva	849	847	751
Hammondsport	816	792	713
Hanover	853	834	741
Jamestown	728	734	625
Lodi	945	756	771
Lyndonville	737	822	725
Niagara Falls*	901	843	718
Penn Yan*	879	893	773
Rochester*	861	849	743
Romulus	866	860	785
Sodus	893	874	689
Versailles	833	796	730
Waterport	798	790	698
Williamson	795	764	684
* Airport stations			

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

Thrips management in transplant greenhouses is step one in TSWV control. The disease depends on these insects for transmission. TSWV has many ornamental hosts, and the combination of vegetable transplants with flowers explains where thrips acquire the disease before passing it on to tomatoes and peppers. Many sources advise against combining the two crop categories, but this isn't practical for diverse growers in our region. Instead, the use of biocontrols, or effective pesticide rotations, are critical to keep thrips numbers low.

There are TSWV resistant (or tolerant) varieties now available. For tomatoes options include Mountain Majesty, Primo Red, and Fletcher. For peppers, Declaration, Magico, and Heritage are resistant. TSWV is a severe problem in the southeast US so much work there has focused on reducing weed hosts and field level thrips transmission. Research in Georgia indicates that reflective silver mulch can decrease field levels of TSWV, however in New York, we suspect most infections occur within the greenhouse. An excellent <u>resource for further reading on</u> <u>TSWV</u> is available from the RAMP project managed by the University of Georgia: https://tswv. caes.uga.edu/usda-ramp-project.html



Ringspots are key indicators of viral infection, although they vary in color. Here they are a lighter yellow on greenhouse tomatoes. Purple or brown is more common. *Photo by Judson Reid, CCE Cornell Vegetable Program*



Ringspots and nutrient deficiencies are apparent on newer foliage of pepper plants infected with tomato spotted wilt virus. *Photo by Judson Reid, CCE Cornell Vegetable Program*



Feeding damage by Western Flower Thrips with small tan patches on a lower leaf of this infected tomato.*Photo by Judson Reid, CCE Cornell Vegetable Program*



Ringspots here are fainter in shape, but darker in color. A causal glance might lead one to think of nutrient deficiency. *Photo by Judson Reid, CCE Cornell Vegetable Program*



In this image we can observe clear, dark ring spots caused by TSWV with associated necrosis. Not all infected plants will demonstrate these symptoms immediately. *Photo by Judson Reid, CCE Cornell Vegetable Program*

Slim Pickings for Fungicides to Control Stemphylium Leaf Blight of Onion in 2022

Christy Hoepting, Cornell Cooperative Extension, Cornell Vegetable Program

Below are the highlights of 2021 Cornell research on Stemphylium leaf blight (SLB) from both the lab and the field. For the 2022 growing season, there are slim pickings for fungicide options for SLB control in onion due to SLB developing resistance to FRAC 2, 3, 7, 9 and 11 groups. FRAC 3 + 3 (and possibly FRAC 3 + 3 + 3) is the most effective treatment available for SLB control, which at best will only provide good control, as opposed to very good or excellent. FRAC P07 is key to keeping onion foliage healthy/preventing leaf dieback, which is why Viathon (FRAC 3c + P07) has been outperforming its FRAC 3 peers (Quadris Top and Inspire Super) for plant health. Similarly, and FRAC 2 (e.g. Rovral) also has some utility to prevent excessive leaf dieback/keep onion foliage green (especially in Elba), and can be used in a tank mix with FRAC 7 premix products (Luna Tranquility, Miravis Prime) to rotate with FRAC 3 + 3 applications. Ideally, we do not want to use more than 2 applications per season of FRAC 3 fungicides, no more than 3 apps per season at the most. No more than 2 apps per FRAC before rotating to another class. FRAC 3 apps should be a tank mix of two FRAC 3 products each used at the highest labeled rate. Following these rules, we can come up with a 5-week fungicide program (consisting of 3 apps of FRAC 3 and 2 apps of FRAC 7) that should prevent excessive leaf dieback so that the crop will lodge properly and not experience a yield reduction (see example program in Table 1).

The updated onion fungicide cheat sheets for 2022 will be uploaded to the CVP website next week. Hardcopies were distributed at the onion twilight meeting and at muck donut hour. There will also be more articles in future issues of VegEdge. For more information or questions, contact Christy Hoepting at 585-721-6953, <u>cah59@cornell.edu</u>.

2021 Research Highlights

- SLB is developing resistance to FRAC 3 fungicides.
- Of the SLB isolates collected from commercial muck onion fields from Elba, Wayne and Oswego in August 2021:
 - 33% of the SLB isolates were insensitive (fungicides even at high rates may not control them) to tebuconazole (Viathon, Luna Experience) with the remainder being moderately insensitive (high fungicide rates may control them). Compare to 100% that were insensitive in Orange Co.
 - 50-60% of the SLB isolates were sensitive (normal rates of fungicides should control them) to difenaconazole (Quadris Top, Inspire Super) with the remainder moderately insensitive. In Oswego, 5% were insensitive. Compare to 92% moderately insensitive and 8% insensitive in Orange Co.
 - 86-95% of the isolates were moderately insensitive with the remainder insensitive to propiconazole (Tilt). Compare to 67% moderately insensitive and 33% insensitive in Orange Co.
- There was very little change in the proportion of isolates in each category between 2020 and 2021, which may suggest that current fungicide use in Elba, Wayne and Oswego are delaying further development of fungicide resistance.
 - The fact that much higher levels of SLB fungicide resistance were detected in Orange County suggest that it is entirely
 possible to lose FRAC 3 completely. Judicious use of FRAC 3 fungicides is imperative.
- In 2021, only 11-27% of 20 onion fungicide spray programs in Elba, Wayne and Oswego exceeded 3 applications of FRAC 3. Of the total FRAC 3 applications, 47-68% of them were FRAC 3 + 3.
- Cross-resistance among the three FARC 3 active ingredients difenaconazole, propiconazole and tebuconazole has been confirmed.
- SLB isolates that were insensitive to FRAC 3 fungicides did not test positive for the target site gene mutation that confers resistance to FRAC 3. This means that SLB is overcoming FRAC 3 fungicides in another way. For example, moderately insensitive isolates and insensitive isolates may be producing more of the proteins that FRAC 3 fungicides attack or have enhanced ability to detoxify FRAC 3 fungicide toxins.
 - This means that SLB development to resistance of FRAC 3 is gradual and that use of increased fungicide rate (or FRAC 3 + 3 tank mixes) will work to control at least the moderately insensitive isolates. Eventually, we will select for the insensitive isolates and the rate or number of FRAC 3 products in a tank mix to achieve control will increase.
- In field trials, top performing treatments were FRAC 3 + 3 + P07. FRAC 3 alone did not adequately control SLB target spots or keep onion foliage green.
- FRAC P07 in Viathon, Reveille and Rampart when used in a tank mix with FRAC 3 or FRAC 7 + 12 or 9 compensated for poor SLB control with improved plant health. Use of FRAC P07 was key to preventing excessive leaf dieback and keeping onion foliage green.
- FRAC 7 premixes (e.g. Luna Tranquility and Miravis Prime) used in a tank mix with Rovral also adequately kept onion foliage healthy in 2021 field trials.

 Novel FRAC 19 fungicide Oso showed some activity on SLB in field trials in 2020 and 2021. The 6.5 fl oz rate resulted in poorfair efficacy on SLB target spots and SLB spore colonization of necrotic leaf tips. It has no activity on BLB halos, BLB necrotic spots or downy mildew and does not prevent leaf dieback. It is being trialed this year at its higher rate. It could have a fit earlier in the season to help reduce SLB spore production.

					Relative Disease Control ²				
Week	Crop Stage	Insecticide for Thrips	Product and Rate/A	FRAC ¹ Groups	BLB halos	BLB necrotic spots	SLB target spots	Leaf dieback	DM Activity
1	4-5 leaf	none	Manzate Max 0.8 qt (= mancozeb 1 lb)	М3	VG	None	None	None	Yes
2	5-6 leaf	Movento	Manzate Max 2.4 qt	M3	VG	None	None	None	Yes
3	early bulb swell	Movento	Manzate Max 2.4 qt	M3	VG	None	None	None	Yes
4	0.5-1" bulb, gtt ³	None	Bravo 3 pt	M5	VG	F-P	None-P	None	None
			Viathon 3 pt + Tilt 8 fl oz	3c + P07, 3a	None	E	G	E-VG	Yes
5	1-1.5" bulb,	None	+ Scala 18 fl oz (Elba)	9a	G	Р	Some	None	No
			or Rovral 1 pt (Oswego)	2	G	Fail	None	G-F	No
			Miravis Prime 11.8 fl oz	7(4) + 12	VG-E	F?	F?	VG-G	No
6	1-1.5" bulb, tipburn	Radiant	+ Rovral 1 pt	2					No
			+ Reveille 4 pt	P07	None	?	?	G	Yes
	1 5-2" bulb		Cevya 5 fl oz	3d	None	VG-E?	VG	VG	No
7	tipburn,	Radiant	+ Inspire Super 20 fl oz	3b + 9b	None				No
	lodging start		+ Reveille 4 pt	P07	None	None	?	G	Yes
	2-2.5" bulb		Luna Tranquility 16 fl oz	7(1) + 9a	VG-G	VG	F?	VG-E	No
8	tipburn,	Exirel	+ Rovral 1.5 pt	2					No
	30% lodging		+ Reveille 4 pt	P07	None	?	?	?	Yes
	1-3" bulb		Viathon 3 pt	3c + P07					Yes
9	tipburn,	Exirel	+ Tilt 8 fl oz	3a	Р	VG-E	G-VG?	E-VG	No
	50% lodging		+ Quadris Top 14 fl oz	3b + 11					Yes

Table 1. Example spray program for leaf diseases in onion, 2022.

FRAC: Fungicide Resistance Action Committee mode of action groups. Fungicides belonging to the same FRAC group are subject to cross resistance. Numbers in brackets (e.g. 7(1), 7(2), etc.) indicates different active ingredients belonging to different sub-classes within a FRAC group.
 Numbers followed by letters (e.g. 3a, 3b, 3c, etc.) indicates different active ingredients within the same sub-class of a FRAC group.
 BLB: Botrytis leaf blight. SLB: Stemphylium leaf blight. DM: downy mildew. Relative performance is based mostly on the results of on-farm fungicide trials in muck-grown onions in 2021 (Hoepting et al.).

E: Excellent. VG: Very Good. G: Good. F: Fair. P: Poor. ?: Data on relative performance has not been collected in NY and/or is estimated based on what is known about the components in the tank mix.

3 gtt: leaves are green to their tips (no tipburn).

USDA Announces Assistance for On-Farm Food Safety Expenses for Specialty Crop Growers

USDA Farm Service Agency

Agriculture Secretary Tom Vilsack announced that the U.S. Department of Agriculture (USDA) plans to provide up to \$200 million in assistance for specialty crop producers who incur eligible on-farm food safety program expenses to obtain or renew a food safety certification in calendar years 2022 or 2023. USDA's new Food Safety Certification for Specialty Crops (FSCSC) program will help to offset costs for specialty crop producers to comply with regulatory requirements and market-driven food safety certification requirements, which is part of USDA's broader effort to transform the food system to create a more level playing field for small and medium producers and a more balanced, equitable economy for everyone working in food and agriculture.



Specialty crop operations can apply for assistance for eligible expenses related to a 2022 food safety certificate issued on or after June 21, 2022, beginning June 27, 2022.

Program Details

FSCSC will assist specialty crop operations that incurred eligible on-farm food safety certification and related expenses related to obtaining or renewing a food safety certification in calendar years 2022 and 2023. For each year, FSCSC covers a percentage of the specialty crop operation's cost of obtaining or renewing their certification, as well as a portion of their related expenses.

To be eligible for FSCSC, the applicant must be a specialty crop operation; meet the definition of a small business or very small business; and have paid eligible expenses related to the 2022 (issued on or after June 21, 2022) or 2023 certification.

Specialty crop operations may receive assistance for the following costs:

- Developing a food safety plan for first-time food safety certification
- Maintaining or updating an existing food safety plan
- Food safety certification
- Certification upload fees
- Microbiological testing for products, soil amendments and water
- Training

FSCSC payments are calculated separately for each category of eligible costs. A higher payment rate has been set for socially disadvantaged, limited resource, beginning and veteran farmers and ranchers. Details about the payment rates and limitations can be found at <u>farmers.gov/food-safety</u>.

Applying for Assistance

The FSCSC application period for 2022 is June 27, 2022, through January 31, 2023, and the application period for 2023 will be announced at a later date. FSA will issue payments at the time of application approval for 2022 and after the application period ends for 2023. If calculated payments exceed the amount of available funding, payments will be prorated.

Interested specialty crop producers can apply by completing the FSA-888, Food Safety Certification for Specialty Crops Program (FSCSC) application. The application, along with other required documents, can be submitted to the FSA office at any USDA Service Center nationwide by mail, fax, hand delivery or via electronic means. Producers can visit <u>farmers.gov/service-locator</u> to find their local FSA office. Specialty crop producers can also call 877-508-8364 to speak to a USDA employee ready to assist.

Producers can visit <u>farmers.gov/food-safety</u> for additional program details, eligibility information, and forms needed to apply. [Or contact the Cornell Vegetable Program's Food Safety Specialist, Robert Hadad, at 585-739-4065, <u>rgh26@cornell.edu</u>. ed. A. Ochterski, CCE CVP.]

More On Cleaning Food Contact Surfaces – Detergents

Robert Hadad, Cornell Cooperative Extension, Cornell Vegetable Program

How do you effectively clean food contact surfaces? Have good tools. Use a detergent. Follow up with a sanitizer. I know what you're saying: "Wait, what?! Detergents? Aren't sanitizers enough?" No they aren't.

Let's think of it this way. When washing dishes, do you just rinse them under water and pour bleach on them? Or do you rinse, scrub with a detergent, rinse again, then dry? A detergent helps lift of stuck on vegetative material and vegetable oils.

Not all detergents are created equal. What you should use for cleaning tools, harvest bins, table surfaces, dunk tanks, sinks, wash equipment, is a product that is unscented and free from dyes. The reason for "free and clear" type of products is in case the final rinsing doesn't get all the soap off. It also would be nice to use a product that is "low suds". A lot of suds makes it harder and takes longer to remove the residual soap. Products can be found in grocery stores, building material box stores, and some of the supply catalogs and online sites. If you are not sure if a product covers what you need, contact the manufacturer.

If you are adhering to the FSMA produce safety regulations, three sections pertain to cleaning:

§112.116(b) [food packaging]: If you reuse food-packing material, you must take adequate steps to ensure that food contact surfaces are clean, such as by cleaning food-packing containers or using a clean liner.

§112.123(d)1 [equipment and tools]: You must inspect, maintain, and clean and, when necessary and appropriate, sanitize all food contact surfaces of equipment and tools used in covered activities as frequently as reasonably necessary to protect against contamination of covered produce.

§112.123(d)2 [equipment and tools]: You must maintain and clean all non-food-contact surfaces of equipment and tools subject to this subpart used during harvesting, packing, and holding as frequently as reasonably necessary to protect against contamination of covered produce.

Remember, the detergents you want to use are dish and kitchen types, NOT LAUNDRY detergent.

The USDA National Organic Program allows for the use of detergents not OMRI approved but growers need to list the brands being used and they must rinse off the products thoroughly.



For more information on cleaning and sanitizing, wash/pack facility issues, the soon-to-be required agricultural water self-assessments, AND the forthcoming traceability requirements, contact Robert Hadad at 585-739-4065, rgh26@cornell.edu. We are available for calls, Zoom conversations, or in-person farm visits to go over all of your food safety issues.

Flea Beetle Life Cycle and Control in Cole Crops

Elizabeth Buck, Cornell Cooperative Extension, Cornell Vegetable Program Flea beetles are a persistent and perennial problem in cole crops. Two types tend to feed on cole crops: the shiny, blackish-blue <u>cruicifer flea beetle</u> and the <u>striped</u> <u>flea beetle</u>, which has two orange bands on the outer edge of its back. Both species overwinter as adults and begin their annual life cycle feeding on weeds. While the striped flea beetle will feed on many types of plants, including crops and weedy hosts, the crucifer flea beetle prefers brassica crops, brassica family weeds, and sweet alyssum (an ornamental brassica flower that can be used to attract beneficials). Adults can fly well and will transition from weeds to cole crops, where they commence feeding and egg laying. Eggs are laid in the soil near plants or on wounded roots. Larvae hatch and spend a number of weeks feeding on the roots before pupating and emerging as adults to feed on the foliage. The long larval period is why there is a second flush of adult activity in late July or early August.

Concern for Crop

Flea beetle damage is unsightly. Luckily, many cole crops can tolerate feeding damage for a portion of their development. Small seedlings and transplants are at greatest risk from flea beetles, as they cannot recover well from lost foliage. The threshold for control in the seedling stage is 1 flea beetle per plant. Young plants should be scouted several times a week if they are placed out during periods of flea beetle activity. The first generation is the primary concern for young plants.

Older plants with at least 5-6 true leaves can compensate for foliage lost to minor feeding damage. Tolerance to moderate feeding pressure increasing as the plant grows, which reduces the need to treat. Damage tolerance at this stage depends more on whether you are raising a heading or leafy green cole crop, since consumer acceptability of holey salad and cooking greens tends not to be very high. In heading cole crops, reducing flea beetle feeding becomes more important as the head forms. Flea beetles will cause scarring on cabbage heads and kohlrabi, chew through Brussels sprouts, and damage the curd of cauliflower and broccoli. The second generation is the main concern for heading plants.

Controlling Flea Beetles

Flea beetles are good flyers and overwinter in weeds and brassica crop residue. Culturally (preventatively), you can help cut down on flea beetles by:

- Thoroughly working down cole crop residues
- Establishing good rotations that put some distance between cole crop fields
- · Controlling weeds around field margins, particularly brassica weeds
- Making a particular effort to control brassica weeds this season in next year's planned cole crops field(s).
- Working down germinated winter annual brassica weeds in next year's cole crops fields during the fall.
- Using row cover or insect netting to exclude flea beetles before they arrive, and only in areas where they are unlikely to emerge

There are many chemical control options for flea beetles. **Systemic insecticides**, like Admire (imidicloprid), can **offer longer windows of control**, but it is important to note that **control is reduced feeding damage** and may not appear as a reduction in the number of adults on the crop.



Flea beetles and feeding damage on cabbage. Photo by Christy Hoepting, CCE Cornell Vegetable Program

Reactive Controls, Organic

- Entrust, applied with Nu-Film P (best control)
- Pyganic (moderate control)
- Surround, applied with Nu-Film P (can have good control, leaves residue)

Neem, azadirechtin, and plant oil products have limited effect on flea beetles.

Reactive Controls, Conventional

- Pyrethriods, Group 3A (many labeled)
- Neonics, Group 4A (specific label language designating use for soil or foliar applications only)
- Exirel, Group 28
- Sevin XLR Plus, Group 1A (a carbamate class insecticide)

Nearly all the registered conventional insecticides that treat flea beetle are restricted use materials. PHIs range from 0-7 days. Rotating chemistry classes is especially important since adults are long lived and there are two generations per year!

CR P Insights

Observations from the Field and Research-Based Recommendations

BEETS

Make sure you know which pathogen (or non-pathogen) you are dealing with before deciding to treat beet fields with fungicides. Refer to the article "Spot the Differences on Table Beet Leaves!" on page 6 of the June 30, 2021 issue of VegEdge and/ or contact Julie Kikkert for assistance. – JK

DRY BEANS

Earlier planted dry bean fields are starting to see good growth. Seed treatments should continue to control early pressure from leafhoppers and aphids. – ML

ONIONS

The onion crop is beautiful! (See cover photo. You know what they say about what is at the end of the rainbow...this beautiful field of onions in Elba could be gold!) Despite conditions being drier than ideal, the crops is growing vigorously. Disease, insect and weed pressure is low and the leaves are green to their tips. <u>Botrytis leaf blight</u> (BLB) halos are all that we are finding at the moment. Movement of BLB halos has been variable over the past week, ranging from no change in both sprayed and non-sprayed fields, to having increased in sprayed fields.

Most fields have either had their first Movento/Senstar or will get it this week for <u>onion thrips</u>, timed to crop stage (early bulb swell) rather than spray threshold (0.6-1.0 thrips per leaf). There is no point in applying Movento/Senstar past 1" bulb stage, as its efficacy drops dramatically. Thrips counts generally increased slightly since last week, although influxes were observed on the periphery of the Elba muck. As wheat is drying down, temperatures are up and there is little rain in the forecast, numbers are expected to continue to increase over the next week. If your thrips counts increased after your first application of Movento, go ahead with the second application and you should see the numbers drop following the second application. Sometimes it takes a week to see the effect of Movento.

As onions are rapidly outgrowing herbicide injury and several fields are now being irrigated, we are starting to see <u>Stemphylium leaf blight</u> (SLB) invade the necrotic tissue caused by herbicide injury (Fig. 1). I am completely torn as to whether this is cause for concern. When SLB invades necrotic tissue caused by herbicide injury, it appears to be behaving as a secondary pathogen that is perfectly content to stay in the necrotic tissue and then it disappears when the leaf sloughs off. However, I cannot see whether its spores are attacking healthy leaves and I have not trialed the effect of herbicide injury on the development and spread on SLB (next year for sure!). With SLB having developed resistance to FRAC 2, 3, 7, 9 and 11, the SLB fungicide program is so lean (see article on page 4) that I am very hesitant to "waste" one of



Figure 1. Stemphylium leaf blight (SLB) is just starting to invade necrotic leaf tissue caused by herbicide injury (left), which is more common in fields that have gotten rain or irrigation. In most fields, the necrotic tissue caused by herbicide injury is quite clean (right). *Photos: C. Hoepting, CCE CVP*

the precious SLB fungicide sprays on SLB that is only secondary. To date, the vast majority of onion growers have only been using multi-site mode of action fungicides mancozeb and Bravo for BLB halos. It is important to plan ahead for your SLB fungicide program, because first SLB spray could be right around the corner, and we definitely want to save some of the best sprays for later in the season (see article). – CH

PEAS

Heat and drought stress may appear on peas where leaves and tendrils turn papery white because the plant cannot keep up with transpiration and the tissues have died. Plants with weakened root systems will be the first to succumb. – JK

PEPPERS

High heat and wet conditions under plastic have been causing plant losses in the field. <u>Pythium and Rhizoctonia rots</u> are a couple of the culprits. Degregation of the stems near the soil line eventually destroys the plant's vascular system: water will no longer able to be taken up by the plant and wilting occurs, followed typically by death. In fields where this is a persistent problem, one option is to add RootShield WP or similar Trichoderma beneficial soil additives to create a soil ecosystem that reduces the disease organisms. Other products include Orondis Gold and Previcure Flex. Read labels carefully for directions for use.

POTATOES

Colorado potato beetle (CPB) adults are still laying eggs in some potatoes while larvae have begun feeding in many fields. Insecticides applied to seed or in furrow should help control this first generation of beetles, though if you are experiencing resistance or heavy insect pressure on your farm a foliar spray may be needed. Scout fields where there is a history of heavy CPB pressure or where potatoes were planted nearby last year. A foliar spray may be needed if you surpass 200 small larvae or 75 large larvae per 50 vines (check 5 vines at 10 locations throughout the field). – ML



CPB larvae feeding on potato flowers. *Photo: Margie Lund, CCE CVP*

Simcast forecasting indicates that Fulton has reached the 30 blight units (BU) needed to trigger a spray for late blight this week, though Brant, Fairville, Farmington, Geneva, Hammondsport, Penn Yan, and Rochester have exceeded the Fungicide Units needed to indicate fungicide weathering and loss of residue and need for a new application. 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 June 22. Because weather conditions can vary depending on topography and altitude, the recent disease information and disease forecasts will be most accurate very close to the weather station used. 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. Information for other weather stations can be found at: https://newa.cornell.edu/all-weather-data-query. On a national level, late blight has only been reported in Florida so far this year. - ML

SNAP BEANS

Japanese beetles have appeared in our area this past week. High populations of Japanese beetles and <u>Mexican bean beetles</u> can defoliate fresh market beans. They are generally not a major problem in processing beans. <u>Potato leaf hoppers</u> (PLH) are present across the region and any snap bean fields should be scouted regularly. In non-Cruiser (an insecticide seed treatment) treated fields, during pre-bloom, treat when more than one nymph per trifoliate leaf is found or when the number of adults exceeds 100 per 20 sweeps with a sweep net. On newly emerging beans, lower densities of leafhoppers than those mentioned above may be damaging. Fields with Cruiser insecticide treated seeds generally do not need a foliar treatment before bloom, but one may be needed after bloom if the pressure is high. For more information on PLH, including organic management options see the article on page 3 of the June 23, 2021 issue of VegEdge. Snap beans are sensitive to herbicides which may cause stunting or poor growth, and leaves may spot, yellow or curl. Possible causes are carry-over herbicides from previous crops, unusual weather during the current year affecting pre-emergence herbicides, or from post-emergent products used on the current field or from field drift. These situations can be difficult to diagnose. – JK

SWEET CORN

<u>Japanese beetles</u> have arrived. If the populations build up to high levels, they may clip the silks of corn and prevent pollination and hence kernel development.

VINE CROPS

Weather damage is widespread on watermelons, winter squash and cantaloupes this week. Symptoms vary, but include darker brown spots on foliage, often along margins, without any associated yellow, white or black spots. We've observed the damage on a variety of farms with different practices and disease pressure. What do all these farms have in common? Rough weather. Recent daily highs approaching 90°F, followed by nights below 50°F and high winds are to blame.



Brown, broken leaves from temperature swings and winds (left). Nutrient deficiency-like symptoms on this honey-nut squash are caused by harsh weather conditions. *Photos: Judson Reid, Cornell Vegetable Program*

Late Blight Risk Chart, 6/29/22

Location	Blight Units 6/22-6/281	Blight Units 6/29-7/1 ²
Albion	0	5
Arkport	5	5
Baldwinsville	0	5
Bergen	0	5
Brant	16	16
Buffalo	6	12
Burt	-	-
Ceres	28	29
Dansville	11	21
Elba	0	5
Fairville	17	22
Farmington	23	24
Fulton	31	43
Geneva	12	12
Hammondsport	12	12
Knowlesville	0	5
Lyndonville	5	5
Medina	8	8
Niagara Falls	0	6
Penn Yan	18	29
Rochester	13	24
Sodus	22	29
Versailles	24	29
Wellsville	17	22
Williamson	10	10

Calculated using a May 26 crop emergence date, last fungicide application June 22, cultivar Reba 1 Past week Simcast Blight Units (BU)

2 Three-day predicted Simcast Blight Units (BU)

Upcoming Events

Orleans Fresh Market Vegetable Meeting

July 6, 2022 (Wednesday) | Arrive at 5:45 pm to sign up for DEC credits; 6:00 pm - 8:00 pm Curvin Martin Farm, 12829 Eagle Harbor-Knowlesville Rd, Albion NY 14411

Produce walk will feature peer-to-peer learning. All attendees should wear long pants. Free to attend. 2.0 DEC credits requested in categories 1a and 23. Contact Elizabeth Buck for more information: 585-406-3419, <u>emb273@cornell.edu</u>

Chautauqua Vegetable Grower Meeting

July 12, 2022 (Tuesday) | Arrive at 6:15 pm to sign up for DEC credits; 6:30 pm - 8:30 pm Hidden Valley Produce, 324 Warren Rd, Frewsburg, NY 14738

Fresh market field walk. All attendees should wear long pants. Free to attend. 2.0 DEC credits requested in categories 1a and 23. Contact Elizabeth Buck for more information: 585-406-3419, emb273@cornell.edu

Eden Valley Twilight Meeting

July 13, 2022 (Wednesday) | 5:15 pm dinner; meeting 6:00 - 8:00 pm Agle's Farm Market, 7952 Gowanda State Rd, Eden, NY 14057

Topics include laser scarecrows, tar spot control, disease management in cucurbits, optimizing your spray tank water, and cabbage maggot control debrief. 1.5 DEC credits requested in categories 1a, 10, and 23. Arrive by 5:45 to sign up for DEC credits.

Dinner cost is only \$5—thanks to the generous support of BASF. Pay for dinner the day of the event with cash. **Pre-registra**tion for dinner <u>required</u> by NOON on July 8th to Elizabeth Buck: 585-406-3419, <u>emb273@cornell.edu</u>. The meeting is free to attend.

Vegetable Pest and Cultural Management Field Meetings for Auction Growers July 19, 2022 (Tuesday) – *notice the new date for this meeting* | 6:00 pm - 8:00 pm

L. Stoltzfus Farm, 4825 Rt 414, Romulus, NY 14541 (Seneca County)

July 22, 2022 (Friday) | 7:00 pm - 9:00 pm Ray Hoover Farm, 4341 Rt 14A, Rock Stream, NY 14878 (Schuyler County)

July 26, 2022 (Tuesday) | 7:00 pm - 9:00 pm L. Weaver Farm, 3396 Depew Rd, Canandaigua, NY 14424 (Ontario County)

These courses 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 such as inter-row cover crops, grafting and where appropriate, spray options will be used to educate growers. Judson Reid, Senior Extension Associate with the Cornell Vegetable Program, along with CCE staff will instruct participants and facilitate peer-based learning. Details on each topic will focus on field observations at these farms.

Free to attend. DEC recertification credits will be offered (2.0 credits in categories 10, 1a, 23; 1.75 credits in category 24). For more information, contact Judson Reid at 585-313-8912.

Niagara County Twilight Meeting

July 28, 2022 (Thursday) Rickard Nursery Growers and Harris Farm Market, Gasport, NY 14067

Topics include fresh market field walk on pest and disease management, laser scarecrows, powdery mildew management, phytophthora mitigation. More information will be available soon. Contact Elizabeth Buck for more information: 585-406-3419, emb273@cornell.edu

NY Sweet Corn Trap Report, 6/28/22

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

Statewide, 13 sites reported corn earworm (CEW) catches this week with 10 sites high enough to be on a 4, 5, or 6 day spray schedule (see table below). Fall armyworm (FAW) was caught at one site in Ontatio County and Western bean cutworm (WBC) was caught at two sites: Ontario and Orleans countes.

Fields are in both the tassel emergence and silking stage. The thresholds when scouting differ for these two stages of corn. For pre-silking corn the threshold is 15% infested plants. For silking corn the threshold drops to 5% infested plants. To help you scout your fields please view the video titled <u>How to Scout Fresh Market Sweet</u> Corn. This video will show you how and when to scout sweet corn using the Sweet Corn Scouting form (pdf).

European corn borer (bivoltine) development estimated using a modified base 50F degree day calculation

Development Stage	Accumulated Degree Days				
First Generation					
First spring moths	374				
First eggs	450				
Peak spring moths	631				
First generation treatment period	800-1000				
Second Generation					
First summer moths	1400				
First eggs	1450				
First egg hatch	1550				
Peak summer moths	1733				
Second generation treatment period	1550-2100				

Average Corn Earworm Catch					
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 80F for the previous 2-3 days.

WNY Pheromone Trap Catches: June 28, 2022

Location	ECB-E	ECB-Z	ECB Hybrid	CEW	FAW	WBC	DD to Date
Batavia (Genesee)	0	0	NA	0	0	0	902
Bellona (Yates)	NA	NA	NA	NA	NA	NA	922
Collins (Erie)	NA	NA	NA	NA	NA	NA	846
Eden (Erie)	0	0	NA	12	0	0	895
Farmington (Ontario)	0	0	NA	8	1	3	926
Geneva (Ontario)	0	1	0	1	0	0	915
Hamlin (Monroe)	NA	NA	NA	NA	NA	NA	855
Leroy (Genesee)	1	0	NA	8	0	0	898
Lyndonville (Orleans)	0	0	NA	1	0	1	849
Oswego (Oswego)	0	0	NA	0	0	0	773
Panama (Chautauqua)	NA	NA	NA	NA	NA	NA	778
Penn Yan (Yates)	0	0	0	0	0	0	889
Portville (Cattaraugus)	0	0	NA	1	0	0	814
Ransomville (Niagara)	0	0	NA	3	0	0	914
Seneca Castle (Ontario)	0	0	0	4	0	0	878
Williamson (Wayne)	NA	NA	NA	NA	NA	NA	778

ECB: European Corn Borer; CEW: Corn Earworm; FAW: Fall Armyworm; WBC: Western Bean Cutworm; DD: Degree Days; NA: not available

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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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Cornell Cooperative Extension Cornell Vegetable Program

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