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Asparagus Post-Harvest Weed Clean-Up



6/30/2020



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NY Sweet Corn Trap Network Report,



### **Broad Spectrum Aphid Biocontrol**

Judson Reid, Cornell Cooperative Extension, Cornell Vegetable Program

We often see an increase in aphid numbers in field vegetable crops when hay fields are cut and small grains dry down in late June and early July. These pests also move into tunnels and greenhouses. Tomatoes are not aphids' favorite crop; they are more inclined and destructive towards peppers and greens. But in high numbers they can lead to problems with Sooty Mold on leaves and fruit, reduced vigor and virus transmission.

With bumble bees the preferred pollinator for tunnel tomatoes, control of aphids should be achieved without insecticides that would harm the hive. Biological control - the introduction of beneficial insects - is an option that does not threaten bee health. Parasitoid wasps are the oft cited biological control for aphids. The relationship between parasitoid wasp species and their aphid hosts is rather specific. This means that getting aphid species identification is essential to ensure that any introduced wasp will be effective. However, aphid identification is not easy and takes much time. There is another winged beneficial option.

The predatory gall midge Aphidoletes aphidimyza is a 'broad spectrum' aphid biocontrol. This tiny flies offer an advantage over parasitoid wasps as it preys on over 60 species of aphid! Unlike parasitoid wasps that lay eggs within the aphids themselves, A. aphidimyza lays up to 70 eggs within an aphid



Aphids reproduce quickly, spread viruses and reduce the overall vigor of the plant. Photo by Judson Reid, Cornell Vegetable Program

# 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

#### **Contributing Writers**

Elizabeth Buck Robert Hadad Christy Hoepting Esther Kibbe, CCE Harvest NY Margie Lund Julie Kikkert Judson Reid

#### Publishing Specialist/Distribution/Sponsors Angela Ochterski

VegEdge is published 25 times per year, parallel to the production schedule of Western New York growers. Enrollees in the Cornell Vegetable Program receive a complimentary electronic subscription to the newsletter. Print copies are available for an additional fee. You must be enrolled in the Cornell Vegetable Program to subscribe to the newsletter. For information about enrolling in our program, visit cvp. cce.cornell.edu. Cornell Cooperative Extension staff, Cornell faculty, and other states' Extension personnel may request to receive a complimentary electronic subscription to VegEdge by emailing Angela Ochterski at aep63@cornell.edu. Total readership varies but averages 700 readers.

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The next issue of VegEdge newsletter will be produced on July 8, 2020.

# **EC Mapping Research Opportunity**

Ali Nafchi, Cornell Cooperative Extension, Cornell Vegetable Program Precision agriculture can contribute to long-term sustainability of agriculture production, by applying more targeted use of inputs only where they are needed, and when they are needed. Since in- credible soil variations occur across production fields, **Establishing Management Zones** can help to address these variations.

**Soil electrical conductivity (EC)**, is the ability of a soil to transmit an electrical current. Research has shown that a soil electrical conductivity (EC) can be used successfully to quantify variations in soil texture and yield potential of production fields in most of the region. Once a map of management zones has been constructed for each field, the zones become the subunits for managing the field more precisely (usually 3-4 zones). The EC map needs to be constructed only one time (depending on the soil type and conditions, sometimes it is valid up to 7 years), since soil texture is static and the major factor affecting soil EC.

CVP team works with growers on existing technologies to provide knowledge about all stages of zone creation and philosophy of zone management. This will enable farmers to address the variations in their fields, and create management zones to assist them in optimizing crop inputs on their farm.

We are seeking opportunities to work with growers, interested in collaborating on using of Soil Electrical Conductivity Maps. (*Desirable: field size larger than 10 acres and started using precision Ag technologies*).

#### **Outcomes/Results**

- Identifying management zones, and generate prescription maps.
- Yield map analysis and improving generated maps.
- Research on feasibility of using Soil Survey instead of the EC data for creating management zone.
- Conduct demonstration fields and collect research data adopted for the region.
- Provide research-based knowledge to farmers about all stages of zone creation and philosophy of zone management.

Contact Ali Nafchi, at amn93cornell.edu or 585-313-6197, for more info.

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colony. The larvae hatch and directly attack live aphids. The larvae will eventually drop to the soil to pupate and remerge as adults. The adults are night fliers attracted to aphid colonies. The potential exists to establish an ongoing population of this beneficial in high tunnels.

Some keys to success with this biocontrol:

- Scout for aphids and release early in an outbreak.
- Keep nighttime temperatures above 60F.
- Place the bottle within the canopy for shade and relative humidity.
- Protect from ants.

If you have questions about how to identify aphids, which biocontrols to release or where to order; give us a call. We are happy to support your pursuit of crop and pollinator health!



Place the upright bottle of *A. aphidimyza* within the crop, with shade from the canopy. No need to empty the contents; the adults will emerge at night. *Photo by Judson Reid, CCE Cornell Vegetable Program* 



These aphid colonies leave behind honeydew which attracts *A. aphidimyza*. The beneficial then lays eggs in the colony which hatch out and attack live aphids. *Photo by Judson Reid, CVP* 



Sooty Mold is a black growth on the honey dew (excretion) of aphids. *Photo by Judson Reid, Cornell Vegetable Program* 



### July 1st Berry Update

Esther Kibbe, Cornell Cooperative Extension, Harvest NY

#### **STRAWBERRIES**

Rapidly moving through the harvest season, with late varieties now ripening. Some damage seen in fields due to heavy rains, but most seem to have avoided fruit rots. Potato leafhopper damage and presence easy to find. It's easy to ignore with everything going on, but this can stunt the plants and control measures should be taken. Also seeing some 2 spotted mites (bronzing leaves) and powdery mildew (curling leaves) in some fields. SWD larvae have been found in June strawberries already. Try to remove as much overripe fruit as possible, consider insecticide applications and be sure to renovate as soon as possible when fields finish picking, especially if you have other berry crops for the flies to attack.



Potato leafhoppers cause mottling and malformed leaves. Photo by E. Kibbe

#### BLUEBERRIES

Color developing on early and mid-season varieties, with ripe fruit on early varieties in early sites. With sustained catches in most traps, it is important to start spraying for SWD as the fruit starts to ripen (NOW!). Fruit seems to be sizing well and many fields have good crop loads. Many areas got rain over the weekend, but continue irrigating (if possible) to maximize fruit size and yields. SWD is the main concern now, but I did see some Plum Curculio damage in an organic field.

#### RASPBERRIES

Early varieties are starting to ripen. Fruit quality seems good, in spite of the dry conditions. Reports of damage from localized strong storms in some areas. Seeing some Phytophthora root rot symptoms on floricanes (leaves wilting, drying and dying from the edges in) as plants are stressed from drought and the ripening crop.

### **BLACK RASPBERRIES**

Berries are showing color, but not many ripe yet. Looks like it will be a great crop. igodot

# Meeting Update for 2020 Growing Season

The Cornell Vegetable Program is receiving many requests for a summer meeting schedule. Traditionally these meetings are held on a cooperating farm and feature peer learning, crop demonstrations and insights from Cornell specialists, often with pesticide license re-certification credits. They are great opportunities to hear research updates and learn from other farmers. They go by many names: Twilight, Field Walk, Coffee Pots, Muck Donut...We look forward to them as much as you do.

Due to COVID-19 pandemic guidance from NYSDAM, NYSDOH and Cornell University, we do not have dates for meetings right now. But keep reading, as we are working towards hosting meetings by the end of the growing season.

Most of the state, and all of the CVP region, is in Phase 4, the final phase of re-opening. However, there are still directives that limit certain activities, even in Phase 4 and beyond. Our field meetings fall under the NYSDAM "Interim Guidance for Local Agricultural Demonstrations and Exhibitions".

A few important points here are:

- Participants must come from the region in which the demonstration or exhibition will take place or a directly adjoining county located in an open region.
- Organizers must comply with all NY Forward, Phase One: Agriculture Guidance, including "Non-food Related Agriculture Summary Guidelines"
- Organizers must develop and implement a business safety plan.

- Demonstrations and exhibitions must be spaced out so that there are groups of no more than 10 people at any one time, including those conducting the demonstration or exhibition.
- Anytime individuals are in close proximity to each other, face masks must be worn by all individuals in accordance with NYS guidance.

Beyond State requirements for these meetings, we must also comply with Cornell University re-opening procedures which continue to evolve. Cornell Cooperative Extension is a complex system with county and state partners that also influence our meetings. Right now a group is working to develop a uniform guidance for field meetings that meet the approval of our College leadership. We will also need to work with DEC to obtain recertification credits for meetings we hope to set. Most importantly we need to work with farmers willing to host the meetings and respect our guidelines to prevent further spread of COVID-19.

Thanks for your patience during this uncertainty. We expect the situation to move, hopefully along with our health metrics, in the right direction. Watch VegEdge for updates.

### Asparagus Post-Harvest Weed Clean-Up

### Robert Hadad, Cornell Cooperative Extension, Cornell Vegetable Program

With the frequent crop harvests, wacky weather, and planting season in full swing, dealing with weeds in the asparagus beds seems to always be put off. After harvest and before the ferns get going, the time for putting down herbicides is very short. The herbicide action has to be able to last all summer.

It is important to read all chemical control product labels carefully. Many products can injure ferns. Shielded applications may be necessary. Some products may be applied only to small weeds or right after tillage before post-harvest emergence. Some of these products also work early in the season for pre-emergence of spears weed management. These products would provide some economic advantages.

Glyphosate can be used for established beds but all spears and ferns need to cut down or use a shielded spray to avoid fern contact. Works on broadleaf weeds in post-harvest situations.

Chateau SW, Callisto, Formula 40, and Sandea all can provide various species of weeds in the beds as well as some asparagus seedling control. Karmex provides residual weed suppression on ground where current weeds have been taken out by tillage for example. Metribuzin 75 is another product that works on weeds pre-spear emergence and post-harvest. It has a long residual effect as well.

Some post-harvest products may require soil moisture to provide longer residual action. Again, read the label and check your weather forecast. Presently, the next two weeks look hot and dry so irrigation might be necessary.

According to Chaudhari and Zandstra from Michigan State University, some asparagus beds that have been overrun with weeds may need more attention. If the ferns are present and the weed pressure is high, mowing may be needed before application of herbicides. They recommend cutting the bed down leaving 6-8" of weed stalks above the soil line. This allows for the some weed leaf area to be in contact with applied herbicide but takes out enough of the ferns to avoid permanent injury.



Excellent weed control in asparagus ferns. *Photo by Judson Reid, CCE Cornell Vegetable Program* 

# NY Sweet Corn Trap Network Report, 6/30/2020

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

Statewide, 27 sites reported this week with European corn borer (ECB)-E caught at 4 sites. ECB-Z was caught at 2 sites. Nine sites reported corn earworm (CEW) with all nine high enough to be on a 4, 5 or 6 day spray interval (see table at end of article). Fall armyworm (FAW) moths were caught at 2 sites and the first Western bean cutworm (WBC) was caught at the Williamson site this week. The hybrid ECB moths were caught at two sites, Penn Yan and Hurley.

Based on the accumulated degree days (base 86/50), most sites are still in the first generation treatment period for the bivoltine ECB (see table below) and are just beginning to accumulate enough degree days for the univoltine ECB to emerge.

# 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 Ge	eneration					
First summer moths	1400					
First eggs	1450					
First egg hatch	1550					
Peak summer moths	1733					
Second generation treatment period	1550-2100					

# Degree-day model (modified base 50F) for predicting moth emergence of univoltine European corn borers

Proportion of Moths Emerged	Accumulated Degree Days
10%	911
25%	986
50%	1,078
75%	1,177
90%	1,274

Degree-day model for univoltine ECB from North Dakota

European corn borer trap catches remain low this week. Scout tassel emergence stage fields for larvae and feeding damage in the emerging tassel. The treatment threshold at tassel emergence is 15% infested plants which drops to 5% when silking.

Larvae feeding in the whorl are protected from insecticide applications and mortality will not be as high as at tassel emergence, when larvae feeding in the emerging tassel are exposed to the spray. Larvae will leave the tassel as it opens up and no longer provides a moist, protected feeding environment, and move down the plant looking for protected places to feed. Insecticide applications need to be timed to kill larvae before they bore into a new feeding location where again they will be protected from sprays (see photos to determine correct timing).



Insecticide applications need to be timed to kill larvae before they bore into a new feeding location where again they will be protected from sprays. Left: tassel too early. Center: Well-timed. Right: Tassel too late.

The field I scouted today had very uneven tassel emergence. In fields with very uneven development, two applications may be necessary, one when approximately 25-50% of the tassels have emerged, and again after 75-100% of the tassels have emerged, if the field is still over threshold.



Sweet corn field with uneven tassel emergence. Left two rows have fully emerged tassels and are silking while the rows on the right still have the tassels within the whorl.

#### WNY Pheromone Trap Catches: June 30, 2020

Location	ECB-E	ECB-Z	ECB Hybrid	CEW	FAW	WBC	DD to Date
Batavia (Genesee)	1	0	NA	0	0	0	863
Bellona (Yates)	0	0	NA	0	1	0	883
Brockport (Monroe)	0	0	NA	0	0	0	897
Eden (Erie)	0	0	NA	3	1	0	876
Farmington (Ontario)	0	NA	0	0	0	0	910
Geneva (Ontario)	0	0	0	0	0	0	884
Hamlin (Monroe)	NA	NA	NA	NA	NA	NA	844
Kennedy (Chautauqua)	NA	NA	NA	NA	NA	NA	829
Leroy (Genesee)	1	0	NA	2	0	0	860
Lyndonville (Orleans)	0	0	NA	0	0	0	821
Oswego (Oswego)	0	0	NA	0	0	0	748
Panama (Chautauqua)	0	0	NA	0	0	0	754
Penn Yan (Yates)	0	0	1	0	0	0	851
Portville (Cattaraugus)	NA	NA	NA	NA	NA	NA	770
Ransomville (Niagara)	0	0	NA	0	0	0	900
Seneca Castle (Ontario)	0	0	0	0	0	0	854
Williamson (Wayne)	0	0	NA	0	0	1	775

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

Avera	ige Corn Earworm		
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.

#### GENERAL



After last week's heavy storms, I have seen pelting rain/wind/abrasion injury on many fields. The key characteristic to identifying this damage is that it will affect an entire (usually exposed) area of a field and most of the damage will be on the same, storm-facing side of nearly all the plants. Damage may look like bruising, necrotic, collapsed spotting without any yellow halos, or sandpapery abrasions.

#### ASPARAGUS

Asparagus beetle larvae are active. They will strip the ferns of their foliage and completely chew the outer layers off stems. This period of fern growth is critical for strengthening crowns for next year's harvest. Look for small dark gray eggs attached in vertical lines, cream to gray grubs, and beetles patterned in black, red, and pale yellow or white. Grub feeding causes the most damage. Since asparagus is currently in flower, pollinators are highly active. If spraying is not urgent (low pressure), consider waiting to control asparagus beetle. Narrower insecticide options are Radiant or Entrust, which are both spinosyn-type products. Perm-up, Sevin and Lannate are broader acting and higher environmental or applicator risk products. Bees can forage heavily in flowering asparagus, so choose an insecticide that is safer for pollinators while the field is in flower. - SVB & EB

Cercospora overwinters well in asparagus fields and can act as a defoliating blight. Weather has been too dry to see disease symptoms appearing yet, but disease development is likely to begin following periods of rain and higher humidity, like we had early last week. Protectant fungicides mancozeb and chlorothalonil can be used now to delay disease development in fields with known histories. Note that cholorthalonil is attractive to bees and has been shown to accumulate in hives – consider delaying application during flowering.





Asparagus beetle adults are found on the ferns and are red bodied with yellowish-white and black markings on their backs. *Photo: S. Vande Brake* 

Five cream-to-gray asparagus beetle larvae have completely defoliated this asparagus fern and are stripping the branches of their outer green layers. *Photo: E. Buck* 

#### BEETS

Cercospora leaf spot was confirmed in one field in Genesee Co., which means that it will be a risk for the remainder of the season. The incidence and spread will depend on weather. **See the general article on page 10**. If you need assistance with leaf spot identification or management, contact Julie. If you are looking for an organic option, Double Nickel + Cueva, and Lifegard have shown good results in our research trials. - JK

#### CARROTS

Black cutworms were above threshold in one location in the past week. Carrots should be scouted and managed for leaf diseases and leafhoppers which are a vector of Aster yellows. - JK

#### **COLE CROPS**

Worms generally seem well-controlled and we appear to be between generations for the flea beetles. White mold and wilts caused by soil-borne pathogens like fusarium are beginning to show up. Keep an eye out for swede midge damage as heads develop, particularly in organic and low-spray settings. - EB

#### **CUCURBITS**

Seeing some **phytophthora blight** taking down fruiting zucchini and yellow squash in fields with known histories of the disease. While the weather pattern has been relatively dry, remember that the moisture provided in crop irrigation can also prove sufficient to support Phytophthora Blight development. - EB

**Thrips** pressure is common in high tunnel cukes. Check flowers and undersides of leaves for thrips. Spinosad-type products (Entrust, Radiant) offer control. Not all pyrethroids can be used in a greenhouse or tunnel – check your label. Cucumber beetles are also continuing to feed and spread bacterial wilt. In tunnels, consider eliminating isolated plants showing bacterial wilt to prevent spread in the house.

#### DRY BEANS

Potato leaf hoppers continue to be a problem in some dry bean fields this week. In high numbers, PLH can lead to leaf mottling and curling, and eventually leaf death. Treatment should be considered if PLH are found at the following thresholds: 0.5 PLH/ plant at unifoliate stage, or 1 PLH/ trifoliate leaflet at later plant stages. - ML

#### GARLIC

Garlic scape anthracnose showing up in several fields in the area. - RH

### ONIONS

Everything looks good at this time of year with canopies filling out and onion leaves green to the tip reaching for the sky. Most direct seeded fields are in the 5-6 leaf stage this week while earliest transplants are bulbing. Rainfall has been variable across the region the past week with Oswego being the driest. Botrytis leaf bight (BLB) is generally being held in check with combination of fungicides (mancozeb 1 lb, Bravo 3 pt) and hot dry weather. Stemphylium leaf blight (SLB) is just starting to show up now as tan or blackish colonization of necrotic

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leaf tips, which we have taken to describing as "dirty tips" (Fig. 1). The only SLB target spot lesions that we have seen has been in transplants that are bulbing which have thick canopies (capturing more moisture/ humidity with less aeration) on the outer most leaves that are dying off. Or, on leaf tissue associated with wounding/torn leaf tissue from heavy rain/hail. Growers that have plantings in either of these categories may want to consider their first SLB fungicide spray (e.g. FRAC 3), aside from Bravo, especially if applying Movento for thrips anyway (do not co-apply Bravo with Movento as Bravo interferes with efficacy of Movento). See article on page 8 for Part II of 2020 onion fungicide recommendations.

Onion thrips (Fig. 2) have generally increased over the past week, but are being kept very well in check in fields that have already been treated with Movento. To not miss opportunity to use Movento, first application should be made at early bulb swell and second one a week later up to 1" bulbs. After 1" bulbs, efficacy of Movento decreases significantly. It is okay to use just one application of Movento if bulbs are too big by time of second application, and it is okay to apply Movento 10-14 days apart if first app went on really early (e.g. 4-leaf). Do not apply second Movento more than 3 weeks after first, or risk of increasing two generations to same mode of action increases. Note that thrips pressure can be MUCH higher along the edge of the field than in the middle of the field. Some growers like to make spray decisions including the edge effect, while others are more interested in the pressure of the majority of the field. Some growers spray field borders instead of whole field to knock down edge pressure. At any rate, scout well into your fields to get a handle on the actual thrips pressure. - CH

#### PEAS

Harvest of the fresh market and processing crop is continuing. Drought and heat will stress this crop which has a fragile, somewhat shallow root system. Peas are very sensitive to soil compaction which contributes to poor root structure and makes them more prone to



Figure 1. Left: Tan-colored target spot lesion of Stemphylium leaf blight. Right: Tan/blackish colonization of necrotic tipburn tissue, aka "dirty tips". *Photos: C. Hoepting* 



Figure 2. A new hatch of onion thrips nestled in the leaf axil of a young onion plant. Make sure you check several plants and scout plants well into the field before determining whether the field needs to be sprayed. Often only a few plants look like this while most have no thrips at all or only a few". *Photo: C. Hoepting* 

root rot. If your peas look yellow and stunted, it can be telling to take a shovel to the field and dig up some good vs. unhealthy plants for comparison of the root system. - JK

#### PEPPERS

I've seen several fields of peppers with suspected virus infections this week. It appears that the stress from cold nights a couple weeks ago followed by hot, dry weather has made the plants less able to fight the virus and thus symptoms have emerged. Isolated plants with blistered, badly misshapen, or mottled leaves should be removed from the field or well buried. Any plant showing necrotic ring spots or chevrons (V shaped markings) is also highly likely to be infected with a virus. Early on viruses are usually isolated to a few random plants or small patches of neighboring plants. Vectors like insects or handling can spread virus widely in a field. There is no treatment for virus. Known insect vectors should be controlled and plants should be maintained as stress-free as possible. It is helpful to get suspected virus cases tested to determine what the vectors of concern are, which other crops may be at risk, and whether fruit will be directly marred by the viral symptoms. - EB

#### POTATOES

Eggs laid by the first generation of Colorado potato beetles (CPB) in potatoes have been hatching this week, and small larvae are now feeding on plants. In some fields this may be mostly around the edges, but in others might continue into field centers. To monitor beetle numbers, check 30-50 plants per field, and consider management if any of the following thresholds are met: 25 adults/50 plants, 4 small larvae/plant, 1.5 large larvae/ plant, or 10% defoliation. In western NY, larvae as big as third and fourth instar were seen last week.

Simcast forecasting (see next page) indicates that many weather stations



Beneficial alert: This insect is a natural predator of Colorado potato beetles! A two-spotted stink bug is laying eggs on potato foliage. The red and black pattern with a distinctive black Y in the center of the back make this beneficial easy to recognize. *Photo: Will Printup* 

have reached or are close to reaching 30 blight units (BU) needed to trigger a spray for late blight. Stations that have exceeded the 30 BU threshold for the forecast period are Arkport, Buffalo, Ceres, Fulton, Lyndonville, Niagara Falls, Penn Yan, Rochester, Sodus, Versaille, and Wellsville. 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. All weather stations have exceeded the Fungicide Units, indicating fungicide weathering and loss of residue. The chart assumes use of a susceptible potato variety, and an application of chlorothalonil on June 24. 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

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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: <u>http://newa.cornell.edu/index.php?page=potato-diseases</u>. On a national level, no new late blight confirmations have been reported, and has still only been confirmed in FL and AL. No late blight has yet to be reported in NYS. - ML and JG

#### **SNAP BEANS**

Potato leaf hoppers continue to be a concern for any organic fields or others that did not have a Cruiser insecticide treatment. - JK

#### SWEET CORN

European Corn Borer is damaging plantings of fresh market sweet corn in several areas even if the trap catches are low. Look for holes that line up across several leaves and sawdust-like frass.

#### New Late Blight Risk Chart, 6/30/20

Location	Blight Units <sup>1</sup> 6/23-6/30	Blight Units <sup>2</sup> 7/01-7/03	Location	Blight Units <sup>1</sup> 6/23-6/30	Blight Units <sup>2</sup> 7/01-7/03
Albion	5	12	Hammondsport	0	11
Arkport	23	18	Knowlesville	10	11
Baldwinsville	0	11	Lyndonville	11	19
Bergen	5	11	Medina	11	11
Buffalo	30	10	Niagara Falls	35	11
Burt	0	16	Penn Yan	22	11
Ceres	36	20	Rochester	27	17
Elba	10	17	Sodus	17	18
Fairville	10	18	Versailles	23	17
Farmington	17	18	Wellsville	32	20
Fulton	32	18	Williamson	10	14
Geneva	5	12			

<sup>1</sup> Past week Simcast Blight Units (BU) <sup>2</sup> Three-day predicted Simcast Blight Units (BU)

Watch susceptible staged (whorl and to tassel) fields closely for damage and eggs so you can catch the narrow effective treatment windows. See the Sweet Corn Trap article, page 5. - SVB & EB

#### TOMATOES

Seeing a few cases of bacterial disease starting. White mold, botrytis, and spidermites are becoming problematic in some tunnels. For white mold, look for wilted plants, sections of the stem turned dry and tan, and fluffy white mold and black sclerotia growing inside the stem. Rarely fruit may be affected directly by the mold. Infected plants should be carefully removed to prevent sclerotia from establishing in the soil. - SVB & EB

### New Onion Fungicide Recommendations for 2020 Part II: Building a New Fungicide Resistance Management Program for Stemphylium Leaf Blight Piece-by-Piece

Christy Hoepting, Cornell Cooperative Extension, Cornell Vegetable Program

[See the June 24, 2020 issue of VegEdge for Part I: New Developments in Stemphylium Leaf Blight Fungicide Resistance, page 6.]

#### POOR PERFORMING FUNGICIDES HAVE IMPORTANT UTILITY FOR MANAGING SLB FUNGICIDE RESISTANCE

**FRAC M5 - Bravo (a.i. chlorothalonil).** In 2019 Elba trial and in 2018 Oswego trial, Bravo 3 pt fell into the "significantly better than nothing but not great" category along with Scala (FRAC 9b). Note that Bravo 1.5 pt + mancozeb 1 lb did not have any activity on SLB in 2019 Elba and Sodus trials. Since Bravo has a multi-site mode of action, theoretically, it could be used by itself just to have some coverage when pressure is low, or it could be co-applied with any other SLB fungicide to double-up on SLB FRAC groups in a week when insecticide is not being applied. Bravo is also one of the best fungicides for BLB.

**FRAC 29 - Omega (a.i. fluazinam).** In 2015 Elba field trial, Omega fell into "middle-of-the pack" category right beside Scala and Tilt. It is reportedly quite expensive. But, it is supposed to be very good on BLB, according to colleagues in Quebec and Georgia. It will be field trialed again in 2020. Omega could be co-applied with a lone FRAC 3 SLB fungicide such as Tilt or Viathon, especially when an insecticide is being used and BLB is of concern. It has a low risk rating for fungicide resistance.

**FRAC 22 - Gavel (a.i. zoxamide).** In 2015 and 2017 Elba field trials, Gavel fell into the "significantly better than nothing but not great category". Gavel is a premix with zoxamide and mancozeb. Similarly to Omega (although less expensive), it could be used as a "helping hand" to a lone FRAC 3 or Quadris Top + Tilt (which should be considered as a lone FRAC 3), or added to Bravo when SLB pressure is a bit higher than what Bravo could be expected to handle alone. The mancozeb component would also be a "free" protectant against downy mildew (DM). Zing! is another

zoxamide product, but with chlorothalonil instead of mancozeb, so not compatible when applying with insecticide. Zing! could be used instead of Bravo + Gavel if mancozeb is not needed for DM protection. FRAC 22 has low to medium risk for fungicide resistance, so number of apps should be limited to no more than three.

FRAC 44, 19 and P06 - Biologicals (various). In 2017 and 2019 Elba trials and in 2019 Sodus trial, Serifel and Double Nickel (both FRAC 44) and Oso (FRAC 19) failed to control SLB when used alone.Tank mixing them with Rovral or Tilt did not improve control beyond Rovral or Tilt alone. Lifegard, Actigard and Regalia (FRAC P06) activates the plant's defense system. Alone, Lifegard has not worked, except when applied very early for BLB halo lesion control (Elba 2019). In Sodus 2019, Lifegard alternated with SLB fungicides tended to be statistically the same as standard weekly SLB program, but numerically not as good. We also got one data point in 2019 Elba trial where Lifegard + Tilt 8 fl oz had statistically less SLB than either product alone, which was encouraging. FRAC P06 has a low risk for fungicide resistance and the possibility of using them in onion fungicide program is intriguing for fungicide resistance management. Best fit would be early as a protectant when SLB pressure is very low. For example, FRAC P06 products could be used during a "stretch week", especially if insecticides are being applied.

#### **USE HIGH FUNGICIDE RATES FOR FRAC 3**

**FRAC 3s.** In 2019 Elba trial, there was either no significant difference between Tilt 4 fl oz and 8 fl oz, and between Inspire Super 16 fl oz and 20 fl oz, or the higher rate was significantly *continued on next page* 

#### continued from page 8

better than the lower rate (depending on which variable you look at). Also, a low-rate premix of Inspire Super 16 fl oz + Tilt 4 fl oz was never better than Inspire Super 16 fl oz alone and was as good as Inspire Super 20 fl oz. Quadris Top 14 fl oz + Tilt 8 fl oz had significantly better SLB control than Quadris Top 14 fl oz + Tilt 4 fl oz. Because FRAC 3 fungicides have a relatively low fungicide resistance factor (e.g. 2x rate could kill mutated/resistant isolates), theoretically this means that increased rates would proportionately go a long way towards fending off fungicide resistance. The high rates could kill SLB isolates that are beginning to develop resistance that would otherwise survive the lower rates. **To be prudent, highest label rates should be used for most fungicides** (more exceptions with biologicals).

#### **USE LUNA TRANQUILITY 16 FL OZ**

We have decent evidence that Luna Tranquility 16 fl oz is effective. Do NOT use lower than 16 fl oz rates! Even though Luna Tranquility is labeled up to 27 fl oz, FRAC 7 fungicides have a comparatively high fungicide resistance factor (e.g. more than 10-times the normal rate is required to kill mutated/resistant isolates), which means that higher rates would likely be a waste of money. Higher rates of Luna Tranquility will be trialed in 2020.

#### START EARLY AND DO NOT SKIP A WEEK

In previous years, based on epidemiological studies and fungicide timing trial results, we recommended to start SLB fungicide spray program at 1" bulb, mid-July or first detection of SLB target lesions, whichever came first. In 2019, in an attempt to reduce fungicide use, particularly to not exceed more than 3 apps per FRAC, we encouraged growers to stretch their fungicide program 10-14 days if canopy had not yet closed in, foliage appeared clean and no insecticide sprays were needed. These strategies were effective for achieving economic control of SLB (e.g. disease kept in check and did not cause excessive leaf dieback). However, these practices could increase risk of SLB to develop resistance. Allowing a disease epidemic to be in progress before making a fungicide application may allow the fungus to go through multiple cycles and be at a high population at the time when the fungicide application is made. In turn, this increases the opportunities for the appearance of a fungicide resistant mutant.Skipping a week or increasing the spray interval could give SLB time to recover, including resistant isolates.

#### **EXAMPLE ONION FUNGICIDE SPRAY PROGRAM**

Here is an example fungicide program that does not use Scala, Rovral or Merivon due to SLB development of fungicide resistance, or Miravis Prime due to poor fungicide trial results and unknown FRAC 7 cross-resistance. The "2020 Fungicide Status for Control of SLB" Summary Sheet (see link above) lists the relative performance of fungicides for SLB, BLB and whether they have activity on DM. This example program uses 3 apps of FRAC 3 divided among 2 active ingredients (3a, 3c), a single app of FRAC 7(1) and 2 apps of FRAC 9 divided among two active ingredients (9a, 9b) with a total of 5 SLB FRAC groups, 8 active ingredients and 7 products, not including extra materials for DM. If BLB/SLB treatment does not have activity on DM, add mancozeb or other DM protectant.

- Bravo 3 pt used early before SLB disease symptoms appear under low pressure (weeks 1 & 2). Would be used at this timing anyway for BLB.
- During application of Movento (weeks 3 & 4), when Bravo cannot be co-applied, as onions are beginning to bulb, use SLB fungicides that have very good activity on BLB. Save best performing fungicides for August when SLB pressure is expected to be highest. In week 4, FRAC group 29, Omega is used, which is co-applied with Tilt (FRAC 3a). This combination should be very good on BLB. In this treatment, Tilt + mancozeb could be substituted for Viathon.
- After second app of Movento, typically, we get 1-2 weeks before another insecticide for thrips needs to be applied (weeks 5 & 6). In this example, the crop would have just got two consecutive weeks of FRAC 3 sprays, so need to rotate to another mode of action. If SLB pressure continues to be low, instead of skipping or stretching fungicide program, Bravo could be used alone (multi-site mode of action, FRAC M5). Gavel (FRAC 22) may be added to Bravo or use Zing! (FRAC 22 + Bravo) for an extra kick against SLB. If insecticide needs to be applied during an SLB stretch week, perhaps Lifegard or other FRAC P06 could be used here.
- In week #7, when SLB pressure is expected to be building, rotate to our only FRAC 7(1) "big gun", Luna Tranquility 16 fl oz.
- In week #8, rotate back to FRAC 3 "big gun" Quadris Top 14 fl oz + Tilt 8 fl oz (FRAC 3b + 3a), and protect that last double FRAC 3 app with another FRAC group such as Gavel (FRAC 22).

- I have only figured out three ways to extend this program without exceeding 3 apps per FRAC:
  - Delay start of SLB fungicides by using mancozeb 1 lb with Movento. This would only work if BLB pressure was below 1.0 per leaf at time Movento needed to be applied, as mancozeb 1 lb only works against BLB when spray is initiated when BLB pressure is very low. Theoretically, Lifegard could be used in this timeslot as well.
  - Use Miravis Prime. It could go in with the first Movento spray and be co-applied with Gavel since the FRAC 12 in Miravis Prime has no activity on SLB. For second Movento spray, Inspire Super, then after the SLB stretch with Bravo, Omega + Tilt, Luna Tranquility and QT + Tilt + Gavel. This program uses 2 apps of FRAC 7 (1 & 4) and 3 apps of FRAC 3 (2 x 3a, 2 x 3b).
  - In Elba only, Scala 9 fl oz + Rovral 1 pt (FRAC 9a + 2) can be added somewhere, probably with first Movento.

Week No.	Insecticide	BLB	SLB	DM	FRAC Group
1-2	none	Brav	Bravo 3 pt		<b>M5</b> <sup>1</sup>
3	Movento	Inspire Su	per 20 fl oz	No	3b/9b <sup>2</sup>
4	Mayanta	Tilt 8	ß fl oz	Ne	3a
4	wovento	Omega 16 fl oz		INO	29
5		Brav	o 3 pt	No	M5
•		Brav	o 3 pt		M5
6			Gave	2 lb	<b>22</b> /(M3)
7	Yes	Luna Tranq	uility 16 fl	No	7(1) <sup>3</sup> /9a
			Quadris To	p 14 fl oz	<b>3b</b> /(11)
8	Yes	Tilt 8	3 fl oz		3a
			Gave	2 lb	22/(M3)

# EXAMPLE FUNGICIDE PROGRAM: NO SCALA, ROVRAL, MIRAVIS PRIME OR MERIVON.

<sup>1</sup> Bold indicates activity on SLB.

<sup>2</sup> a, b, c: indicates different active ingredient within same FRAC group.

<sup>3</sup> 1, 2, 3: indicates different sub-class of FRAC group. Cross-resistance among FRAC sub-classes can differ. For example, resistance to Endura may not confer resistance to Luna products or Merivon.

<sup>4</sup> If treatment does not provide activity against downy mildew (DM) and risk warrants DM protection, then mancozeb or other protectant should be added to tank mix.

7(1)	1	3a	2	9a	1
7(4)	0	3b	2	9b	1
Total 7 apps:	2	3c	0	Total 9:	2
Total 22:	2	Total 3 apps:	3		
Total 29:	1	Total M5:	4		

# Management of Cercospora Leaf Spot in Table Beet in 2020

Julie Kikkert, CCE Cornell Vegetable Program, and Sarah Pethybridge and Daniel Heck, Cornell University

### PRESENCE AND RISK

Cercospora leaf spot (CLS) caused by the fungus Cercospora beticola was confirmed on leaves collected from a table beet field in Genesee County, NY on June 24, 2020. The detection corresponds to periods of moderate to high risk calculated in some beet growing areas using the CLS decision support system (Table 1). The effect of temperature and relative humidity on the growth of C. beticola and spread of CLS have been well-studied in sugar beet, and these were used to develop a CLS decision support system. This system has been operating for many years in North Dakota for CLS management in sugar beet. In our table beet studies in New York, using this decision support system reduced the number of sprays applied throughout the season for CLS management without significantly reducing root yield or increasing disease severity. Please contact one of us if you need a copy of the CLS decision support system manual.

Table 1. Risk of Cercospora leaf spot on table beet from June 27 to July 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. Low risk: <= 3; Moderate: 4 to 6; and High Risk: >6

	June 27	June 28	June 29	June 30	July 1	July 2	July 3	July 4
Location	Achieved			Forecast				
Albion	7	4	2	1	2	2	2	1
Appleton North	5	5	3	4	4	2	1	1
Ashwood	4	5	4	4	4	2	2	2
Bergen	5	5	4	5	5	3	3	3
Corwin	5	5	4	4	4	2	1	2
Dansville	4	5	4	4	4	3	3	2
Elba	6	7	6	5	4	3	3	3
Fairville	5	5	5	6	5	4	4	3
Gainesville	1	2	4	5	5	4	4	4
Geneva (Cornell)	5	5	5	5	4	3	3	2
Geneva (Bejo)	6	6	5	5	4	2	2	2
Knowlesville	4	6	5	4	3	1	1	2
Lyndonville	4	6	6	3	2	4	4	4
Medina	5	5	4	4	3	1	1	1
Point Breeze	6	6	6	7	4	1	2	3
Waterport	4	5	5	6	4	1	2	3
Williamson (Demarree)	4	6	6	6	5	2	1	1

Accessed date: June 29, 2020

#### DISEASE SYMPTOMS

CLS symptoms first appear as small, individual gray to black-colored lesions on the leaves, which rapidly grow together resulting in defoliation. In a red table beet cultivar (e.g. Ruby Queen and Merlin), a reddish-purple color surrounds the lesions. In yellow or white table beet cultivars, the lesions may by surrounded by a tan-brown ring. First symptoms are typically observed in older leaves, while younger leaves become infected as the disease progresses. The color and presence of structures produced by *C. beticola* called pseudos-tromata in the lesion distinguishes CLS from other leaf diseases. Pseudostromata are small (pin-head size), black, and numerous across the lesions (not in a circular pattern). On the pseudostromata, the spores of the fungus may be visible. These may be observed with a hand lens in the field, but sometimes require incubation in a humid chamber and/or observation with a microscope.

#### **IN-SEASON MANAGEMENT OF CLS WITH FUNGICIDES**

First, <u>not</u> all fields will need treatment with a fungicide. Make a decision whether or not to spray based on how close the field is to harvest, the incidence of the disease in the field, and the risk for infection based on weather data and forecasts. The CLS decision support manual provides detailed instructions, but we briefly summarize the important points:

#### **Fungicide Product:**

*C. beticola* is at high risk of developing resistance to single-site mode of action fungicides. Resistance to FRAC group 11 fungicides (e.g. **Quadris**) is prevalent within the *C. beticola* population and use is hence discouraged for CLS control in table beet in New York.

Propiconazole (e.g. **Tilt**) is a FRAC group 3 fungicide that has been the workhorse over the past several years. However, our research has shown that approximately 30% of isolates show moderate resistance to Tilt and three isolates are highly resistant. Tilt will likely continue to be a first-line product used in table beets this year.

Newly registered on table beets for 2020 is **Miravis Prime** which consists of pydiflumetofen + fludioxonil (FRAC group 7 + 12). Miravis Prime was the most efficacious product in our research trials and should be considered for the most high-risk situations. For resistance management, the second line products that are considered best for rotational purposes after a first spray of Tilt or Miravis Prime, include Merivon (FRAC group 7 + 11), Luna Tranquility (FRAC group 7 + 9) or Double Nickel (FRAC group 44).

#### Fungicide Timing and Frequency:

- Once the in-row canopy has closed and there is contact between plants, begin scouting for CLS lesions.
- The first fungicide application (irrespective of product choice) should be considered when the disease reaches an average action threshold of 1 CLS lesion per leaf or 15-20% of incidence. Use the following sampling strategy in the field to evaluate the action threshold:
  - Select an area within the field which may be of highest risk (e.g. adjacent to another beet field or field with a history of beets; low-lying area, etc);
  - 2. Evaluate 6 randomly selected leaves along a row at 1 ft intervals;
  - 3. Continue until you have evaluated at least 15 sampling locations;
  - If at least 18 leaves have at least 1 CLS lesion per leaf, the average action threshold to consider the first fungicide application has been reached. Application should coincide with a time of either high or moderate risk depending upon product choice.
- The optimal time for the first application and threshold for scheduling subsequent applications varies according to product choice (see CLS decision support system manual).
- Consult the Re-Application Interval specified on the fungicide label as to when to start evaluating risk periods for the subsequent applications.
- The optimal time for subsequent fungicide applications varies according to product choice (see CLS Decision Support System Manual).
- Observe the Pre-Harvest Interval for each fungicide during the latter part of the season.

# Weather Charts

John Gibbons, CCE Cornell Vegetable Program WEEKLY WEATHER SUMMARY: 6/23/20 - 6/29/2020

#### Rainfall (inch) Temperature (°F) Location\*\* Week Month June Max Min 0 14 Albion 1.31 88 57 1.21 2.33 83 51 Arkport Bergen 1.99 2 83 84 59 Brocton 1.42 2.35 81 60 Buffalo\* 0.98 3.49 88 56 0.71 1.21 Burt 85 58 1.53 3.78 82 47 Ceres Elba 1.22 2.13 84 56 Fairville 0.73 1.38 86 55 0.74 57 Farmington 1.47 85 Fulton\* 0.79 1.52 88 56 Geneva 0.83 1.44 86 59 Hammondsport 0.64 1.31 84 53 1.92 2.52 Hanover 83 59 0.53 1.54 83 60 Lodi Niagara Falls\* 0.85 2.26 85 56 Penn Yan' 0.82 1.18 87 57 0.68 1.48 84 54 Rochester\* Sodus NA NA 88 54 0.47 South Bristol 1.18 83 58 Varick NA NA 85 56 Versailles 1 57 2 59 84 59 Williamson 0.60 1.13 87 57

#### ACCUMULATED GROWING DEGREE DAYS (AGDD) BASE 50°F: APRIL 1 - JUNE 29, 2020

Location**	2020	2019	2018
Albion	790	685	910
Arkport	677	643	987
Bergen	755	687	846
Brocton	794	698	NA
Buffalo*	777	672	969
Burt	725	590	786
Ceres	657	707	823
Elba	752	636	874
Fairville	757	626	813
Farmington	785	652	851
Fulton*	782	615	827
Geneva	806	696	883
Hammondsport	765	662	845
Hanover	792	696	913
Lodi	822	732	921
Niagara Falls*	772	628	1033
Penn Yan*	831	740	937
Rochester*	802	761	983
Sodus	745	613	802
South Bristol	774	662	865
Varick	858	755	933
Versailles	777	699	904
Williamson	737	589	782

\*Airport stations

\*\* For other locations: <u>http://newa.cornell.edu</u>

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### **VEGETABLE SPECIALISTS**

**Elizabeth Buck** | 585-406-3419 cell | emb273@cornell.edu fresh market vegetables, weed management, soil health

**Robert Hadad** | 585-739-4065 cell | rgh26@cornell.edu farm food safety, organic, business & marketing, fresh market vegetables

**Christy Hoepting** | 585-721-6953 cell | cah59@cornell.edu onions, cabbage, broccoli, garlic, pesticide management

Julie Kikkert, Team Leader | 585-313-8160 cell | jrk2@cornell.edu processing crops (table beets, carrots, peas, snap beans, sweet corn)

**Margie Lund** | 607-377-9109 cell | mel296@cornell.edu potatoes, dry beans, and post-harvest handling and storage

Judson Reid | 585-313-8912 cell | jer11@cornell.edu greenhouses/high tunnels, small farming operations, fresh market vegs

### PRECISION AG SPECIALIST

Ali Nafchi | 585-313-6197 cell | anafchi@cornell.edu

### PROGRAM ASSISTANTS

John Gibbons | jpg10@cornell.edu Angela Ochterski | aep63@cornell.edu Caitlin Tucker | cv275@cornell.edu Sarah Vande Brake | sv483@cornell.edu Emma van der Heide | ev247@cornell.edu

### ADMINISTRATION

Peter Landre | ptl2@cornell.edu Steve Reiners | sr43@cornell.edu

### **Cornell Cooperative Extension** Cornell Vegetable Program

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

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