



PENNSYLVANIA VEGETABLE MARKETING & RESEARCH PROGRAM

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Pennsylvania Vegetable IPM Weekly Update

August 14, 2019

The information supplied in these Updates is from Penn State Extension Specialists and Educators.

These Updates are a service of the Pennsylvania Vegetable Marketing and Research Program which, in cooperation with the Pennsylvania Vegetable Growers Association, supports vegetable research at Penn State University and other institutions.

CURRENT VEGETABLE AND BERRY ISSUES

General conditions: Weather conditions have been variable across the state leading to issues with rain checking and radial cracking in tomatoes as well as blossom end rot in pepper.

INSECT PEST UPDATE

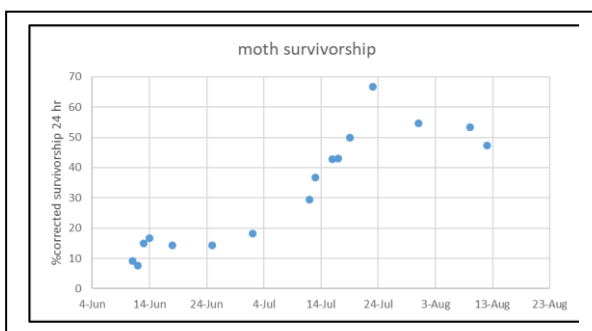
Flea beetle pressure is high in several crops such as eggplant. The next generation of **Colorado potato beetle** has hatched. **Continued broad mite damage** is being observed in peppers in parts of the state despite the application of miticides. **Cucumber beetles** continue to remain active in cucurbit fields as are **squash bugs**. Second generation feeding by cucumber beetles and transmission of the bacterial wilt pathogen later in the season can result in water soaking and V-shaped lesions that become tan in color as the bacteria moves in the leaf tissue (pictured right); adult feeding also cause scarring of the fruit. Squash bugs can transmit a different bacterial pathogen, causing yellow vine



Symptoms of bacterial wilt later in the season resulting from 2nd generation cucumber beetle transmission of the pathogen.
Photo credits: Beth Gugino.



Carrot seed moth (far left, photo D. Biddinger) compared to European corn borer (center, photo M. Rice).



Adult corn earworm survivorship in adult vials treated with a pyrethroid (cypermethrin) in Delaware. Historical baselines of susceptible populations are ~ 5 or 10% survival. Data from David Owens, University of Delaware

decline. **Sweet corn trap counts** continue to be variable across the state, with populations in some locations remaining low while in others the counts are rather high. Moving traps close to silking corn tends to increase trap capture. Some locations are getting the non-target carrot seed moth in European corn borer traps. This will occur in traps baited with the New York strain pheromone, but not the Iowa strain pheromone. In the fall armyworm traps, the non-target species called Intermediate Cucullia, or Intermediate Hooded Owlet, is showing up. Some growers are continuing to experience worm issues in ears despite low trap counts and a regular spray program. Populations of corn earworm carrying resistance to pyrethroid insecticides tends to increase in August. Historically, this problem has been greater in areas to the east of the Appalachians and is well documented this year from Delaware (see graph above).

GENERAL VEGETABLE DISEASE UPDATE

Late blight originating from natural inoculum was confirmed on both tomato and potato at the Penn State research farm in Centre Co. The source inoculum was likely either seed potato or a cull pile residing on the farm. Samples were sent for genotyping. Based on images provided, it is also suspected on tomato in a home garden in Mercer Co. The plant has been disposed of to prevent further spread. **Late season diseases** like anthracnose on tomato and pepper are becoming more common. **Bacterial canker** has been more common in tomato fields than bacterial spot and speck this season. **Powdery mildew on all cucurbit crops** is widespread. To help with resistance management, severely affected fields showing powdery mildew over 75% of the leaf surface should only be sprayed with protectant fungicides. This reduces exposure of the pathogen population to single-site mode of action active ingredient and thus selection of resistance within the population. **Cucurbit downy mildew** is now confirmed on winter squash (*Cucurbita moschata*), jack-o-lantern pumpkin and cucumber in Lancaster and/or Chester Co., PA. Despite the drier conditions, **Phytophthora blight** is causing fruit rots in some cucurbit fields. Be on the lookout for **northern corn leaf blight** it is characterized by elongated tan lesions unusually on the lower leaves and then spreading up the plant. Under humid conditions, the lesions will produce dark gray spores on the lower leaf surface giving them a dusty appearance. The greatest losses occur when symptoms are observed in the upper 2/3 of the crop canopy by silking.

BERRY UPDATE

For this time of year, the usual suspects are being observed in berry plantings. **Spotted wing drosophila** is present in moderate numbers, and populations are likely to increase given the relatively cool temperatures and high humidity we are currently experiencing. SWD is mainly a problem for primocane-fruiting raspberries and blackberries, and later-season blackberries and blueberries, though day-neutral strawberries may also be affected. Chemical sprays are still the mainstay of control methods, but cultural techniques can assist in management. In primocane-fruiting raspberries and later-season blackberries, minimize weeds and the amount of crop foliage present in the lower canopy. For raspberries and blackberries, this includes using techniques such as keeping rows narrow, thinning primocanes of primocane-bearers, removing leaves from the lower foot of the primocanes, and prompt removal of floricanes from plantings managed for both a summer and fall crop. This allows better penetration of sprays into the lower canopy where SWD prefers to hide. Be sure to get good spray coverage, and make sure the entire canopy is treated including lower portions. With raspberries and blackberries, frequent harvest can assist in control. **Powdery mildew, common leaf spot** and **leaf scorch** are a common sight on strawberry plants across central PA. Common leaf spot causes “birds-eye” spots and the center of the spot frequently falls out, whereas leaf scorch spots develop a tan center which remains. Several fungicides are effective; see the Mid-Atlantic Commercial Vegetable Production Recommendations for labeled products. **Fruit anthracnose** is being reported on day-neutral strawberries. Manage resistance development by using captan alone or including captan in tank mixes.



(Top) Common leaf spot: Note the whitish center to the spots and missing tissue.
(Bottom) Leaf scorch: Note the centers of the spots remain intact, even when the spots have advanced to the point where they coalesce. Photo credit: Kathy Demchak.

VEGETABLE DISEASE UPDATES

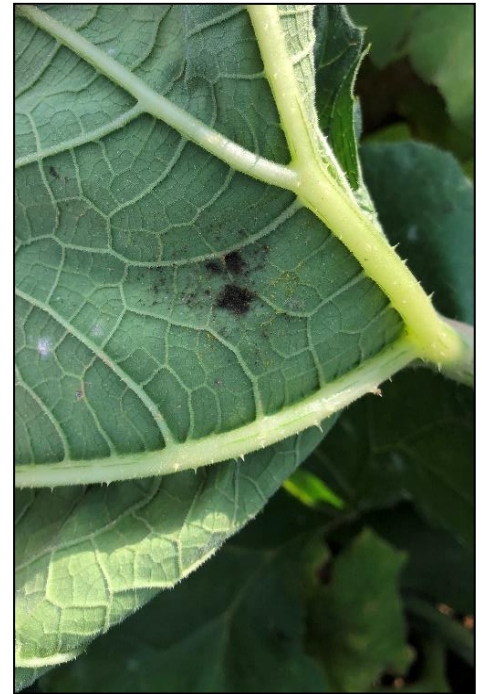
Dr. Beth Gugino, Extension Vegetable Pathologist, Penn State University

GENERAL UPDATES:

- Within the past couple of days, **late blight** resulting from natural inoculum was confirmed **on both tomato and potatoes** being grown at the Penn State research farm commonly referred to as Rock Springs in Centre Co., PA. Samples were submitted for genotyping. The inoculum source is likely either potato seed or a cull pile located on the periphery of the research farm. Based on images provided, it is also suspected on tomato in a home garden in Mercer Co. The plant has been disposed of to prevent further spread thus preventing any further confirmation. It was previously confirmed on potato in Erie Co., PA earlier this season and determined to be US-23. Check the USAblight.org website for the latest reports.
- Continue to be on the lookout for **cucurbit downy mildew**. The unsettled weather across parts of the state this week put the eastern half of PA again at high risk for downy mildew infection across all different types of cucurbit crops. Another downy mildew look-alike was spotted in my pumpkin trial this past week. Dark fuzzy growth was observed on the underside of several pumpkin leaves. Upon closer inspection, it turned pumpkin pollen that had adhered to the underside of the pumpkin leaf was colonized by secondary fungi giving it a fuzzy appearance. In this case, the corresponding location on the upper leaf surface was not yellow and angular in shape.

We are actively monitoring for this disease so please either contact me via email at bkgugino@psu.edu, by phone at 814-865-7328 or contact your local Extension office for confirmation. All reports aid in our ability to successfully forecast disease risk. Check the [CDM ipmPIPE website](http://CDM.ipmPIPE.website) for the latest reports and forecasts that are updated three times per week.

- **Northern corn leaf blight** has been observed in several sweet corn fields across the state. Northern corn leaf blight symptoms are usually first observed on the lower leaves and the spread up the plant. The lesions are initially small, elliptical and gray-green in color. As the disease progresses the lesions will expand to 1 to 6 inches long, become tan in color and are not restricted by the leaf veins. Eventually, the lesions will coalesce and cover the entire leaf. Under humid conditions, the lesions will produce dark gray spores on the lower leaf surface giving them a dusty appearance. A new lesion can produce spores in as little as one week under favorable conditions. The spores are then disseminated by rain splash to the leaves of nearby plants or they can be carried in the wind longer distances during storms. The greatest losses from NCLB occur when severe necrosis develops on the upper 2/3 of crop canopy by silking. The reduction in photosynthesis due to the necrosis results in reduced ear fill and when symptoms develop on the husks they appear older and are less marketable. NCLB specific fungicides include those in FRAC group 11 (strobilurins; e.g. Quadris and Headline) and FRAC group 3 (triazoles; e.g. Tilt). There are also a number of products that contain both FRAC groups (11 + 3; e.g. Quilt and Stratego). Rotate between these FRAC codes and tank mix with a broad-spectrum protectant for resistance management when symptoms are first observed in the field will help manage NCLB. PHIs vary between the products so read the labels carefully when the crop is near harvest.



Downy mildew look-alike: Pumpkin pollen colonized with saprophytic fungi giving it a dark fuzzy appearance. Photo: Beth K. Gugino.



Northern corn leaf blight on sweet corn. Photo: Margaret T. McGrath, Cornell University.

SWEET CORN INSECT PET MONITORING

Dr. Shelby Fleischer, Extension Vegetable Entomologist, Penn State University

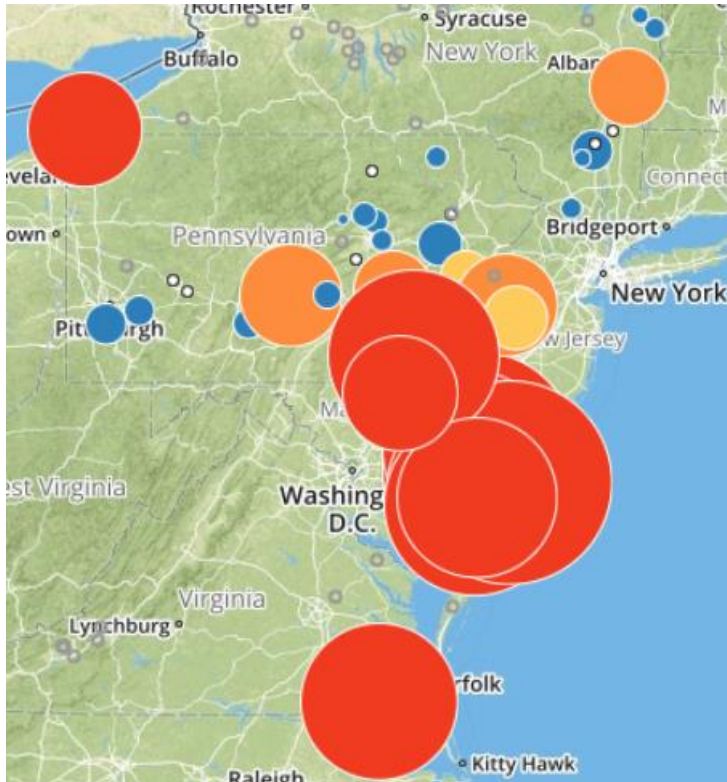
Corn earworm (CEW) captures stayed high in the southeast and increased in Erie, but stayed low to moderate elsewhere. Within the last 2 weeks, 16 of 32 reporting sites exceeded spray thresholds, and sites in Erie and Lancaster showed patterns of spiking. Data coming from sites where sprays are applied may reduce counts, and moving traps close to actively silking corn will tend to increase catch. Within the last 2 weeks, counts suggesting a tight (3-4) day spray interval occurred in Bucks, Erie, Lancaster, and Mifflin counties. Sites in Bucks, Erie, Schuylkill and York counties suggested a 4-5 day interval, and in Centre, Lancaster, and Lehigh a 5-6 day interval. Populations of CEW carrying resistance to pyrethroids tends to increase in August. Historically, this problem has been greater in areas to the east of the Appalachians and is well documented this year from Delaware (see graph on page 1). Non-pyrethroid options include Coragen, Blackhawk, and Radiant, however these will not control sap beetles, BMSB, or insects feeding on silk (Japanese beetles, adult corn rootworms). Adding a pyrethroid, or the premix Besiege, should help with pests that are not “worm” species.

European corn borer (ECB) counts exceeded spray thresholds in northern counties (Bradford and Susquehanna). Sprays targeting CEW will control ECB. Some locations are getting the non-target carrot seed moth in ECB traps. This will occur in traps baited with the New York strain pheromone, but not the Iowa strain pheromone.

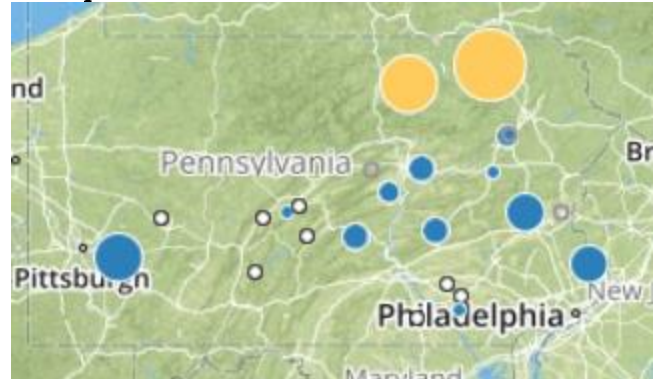
Fall armyworm (FAW) captures are low but are now showing up at multiple sites. Positive counts were recorded in 12 of 20 sites. A non-target called Intermediate Cucullia, or Intermediate Hooded Owllet, is also showing up in the FAW traps.

Current Trap Counts

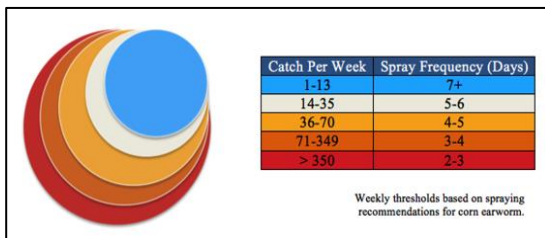
Corn Earworm



European Corn Borer



Fall Armyworm



Average Weekly Catch – a moving average for the last 7 days. The average catch per night (catch, divided by the number of nights trapping), divided by the number of nights where data exist, multiplied by 7. Weeks where all the average-catch-per-night values are nulls are treated as if no data exist for that week.

County	Town/Farm	CEW			ECB			FAW		
		31-Jul	7-Aug	14-Aug	31-Jul	7-Aug	14-Aug	31-Jul	7-Aug	14-Aug
Blair	Curryville	null	1	6	null	0	0	null	0	0
Blair	Tyrone	null	15	3	null	0	0	null	0	0
Bradford	Sechrist Farm	8	1	0	16	13	14	1	2	0
Bucks	Bedminster	10	null	65.1						
Bucks	Buckingham	14	70	27	11	8	6			
Butler	Cabot	5	null	null				0	null	null
Centre	State College	5	4	19	0	0	0	4	5	4
Centre	Rock Springs	6.3	4.6	3.6	1	1.5	1	0	1	0
Clinton	Loganton	0.9	0	null	8.8	2	null			
Erie	Fairview	12	21	41				1	0	2
Erie	Lake City	81	2	87				13	10	3
Indiana	Brush Valley	1	1	0				0	0	0
Indiana	Creekside	16.8	8	0	0.5	0	0	2.8	2	1
Juniata	Port Royal	4.2	14	5	null	5.8	3	0	0	0
Lancaster	Landisville	1	null	19.3	1	3	0	0	0	0
Lancaster	Neffsville	19	11	21	0	1	0	0	0	0
Lancaster	New Danville	42	106	196	2	0	1	0	6	7
Lehigh	Germansville	1.8	3	17.1	0	0	6.2	0	0	0
Luzerne	Drums	4	null	13	6	null	1	null	null	null
Luzerne	Plains	0	null	0	0	null	2			
Lycoming	Linden	0	null	.9				0	null	1.8
Lycoming	Montoursville	4.7	17	4				0	5	0
Lycoming	Muncy	3.9	6	4				0	0	1
Mifflin	Belleville	115	22	70	null	5	0	0	0	4
Montour	Washingtonville	0	7	3	1	3	3			
Northampton	Nazareth	0	null	null	1	null	null	0	null	null
Schuylkill	Tower City	null	0	41	null	.5	3	null	0	0
Susquehanna	Montrose	4	6	3	8	0	22	.5	null	null
Union	New Berlin	1	3	0	1.5	6	2	0	0	0
Washington	Venetia	33	17	11						
Westmoreland	Jeannette	null	6	6	null	3	10			
York	York	9	24	55	0	0	0	1	1	1

THRESHOLDS

CEW Threshold			ECB Thresholds		
	Catch Per Week	Spray Frequency		Catch Per Week	Spray Frequency
Almost absent	1-13	7+			
Very low	14-35	5-6	Almost absent	< 14	7+
Low	36-70	4-5	Very low	15-35	6
Moderate	71-349	3-4	Low	36-70	5
High	> 350	2-3	Moderate	> 70	4

Reproductive (tassel/silk) and late vegetative corn attracts moths. Shorten spray schedules when populations increase. If CEW is not a problem, then consider ECB.