



PENNSYLVANIA VEGETABLE MARKETING & RESEARCH PROGRAM

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Pennsylvania Vegetable IPM Weekly Update

July 1, 2020

These are cooperative projects involving Penn State University researchers, Penn State Cooperative Extension educators, growers, the Pennsylvania Department of Agriculture, the Pennsylvania Vegetable Marketing and Research Program and the Pennsylvania Vegetable Growers Association.

Vegetable Disease Updates

Beth Gugino, Extension Vegetable Pathologist, Penn State University

GENERAL UPDATES:

- In general, disease pressure across vegetable crops has been relatively low in part due to the drier conditions. Nevertheless, it is important to be scouting for summertime diseases like powdery mildew on cucurbits, Septoria leaf spot on tomatoes as well as early blight on tomatoes and potatoes. Plant stress can render plants more susceptible to diseases and plants suffering from root rots and vascular diseases such as Verticillium wilt, Fusarium wilt and bacterial wilt can collapse more quickly under drought conditions.
- There continue to be **no reports of late blight** on tomato or potato in the region. If you suspect late blight on your farm please let me know either by email at bkgugino@psu.edu or by phone at 814-865-7328 or contact your local Extension Office.
- This past week there have been a couple reports of **downy mildew on cucumber** in North Carolina and Georgia and just today another report in southern Michigan. The prevailing weather pattern and dry conditions across the mid-Atlantic region over the past week have been less favorable for the spread. Keep in mind that downy mildew can also develop in high tunnel cucumbers under conditions of high relative humidity. If you want to receive automatic alerts via text or email from the CDM ipmPIPE monitoring website you will need to [sign-up or re sign-up](#) if you were signed up before due to a change in the IT platform hosting the website. For emails, EDDMapS Alert will now be the subject line from alerts@cdm.ipmpipe.org.



Despite being protected, high tunnel cucumbers are still susceptible to downy mildew. Photo credit: Tom Ford.

- Be on the lookout for **high tunnel tomatoes with green and yellow shoulders!** These symptoms are not caused by a disease but rather a combination of nutritional issues (too much nitrogen and too little potash), high temperatures and tomato cultivar. Similar to blossom end rot, once the symptoms develop it is too late. Adjusting soil pH prior to planting and tissue testing to maintain optimum potassium levels during fruiting are critical. Some growers are also considering the use of shade cloth to reduce light intensity and there are now alternative plastics on the market that aim to reduce light intensity as well as temperature in high tunnels.

PA Vegetable and Berry Current Issues

Beth Gugino, Shelby Fleischer and Kathy Demchak, Penn State Extension Specialists in consultation with Penn State Extension Educators

General conditions and observations: Aside from some localized heavy thunderstorms, conditions across the state have been dry throughout much of June to the point where non-irrigated sweet corn and pumpkin crops are starting to suffer. After a cooler than average May the temperatures in June have been running close to normal. As a result, fewer disease issues are being reported in field-grown vegetable and small fruit crops due to the drier conditions. However, the warm and dry conditions are much more favorable for insect development. There have been reports of nutrient imbalances in high tunnel and greenhouse tomatoes (high nitrogen and low potash) that have caused green and yellow shoulders and pollination issues in squash have led to some misshapen fruit.

FIELD PRODUCTION UPDATE

There have been several reports so far this season of **residual herbicide damage** resulting from applying manure or compost that was tainted with the herbicide active ingredient aminopyralid. When buying hay for animal feed, it is important to know what herbicides may have been applied to that field. Aminopyralid breaks down very slowly and in some cases, a concentration as little as 1 part per billion of residual active ingredient can damage sensitive vegetable crops like tomato and pepper. Since aminopyralid is an auxin growth regulator it will cause cupping and twisting of the leaves and stems as well as distortion of the apical growing points (pictured right). If you are concerned about contamination, you can conduct your own bioassay by mixing some of the manure or compost with a potting mix and seeding a sensitive crop like peas or beans and observing them for symptoms. If it is contaminated, do not apply onto field where vegetables or other broad-leaf crops will be grown to avoid crop injury.



Severe aminopyralid injury on pepper because of a contaminated manure application. Photo credit: Tom Butzler.

Cucurbit downy mildew has continued to move slowly over the past two weeks with the majority of outbreaks being reported on cucumber and reaching up the east coast as far north as North Carolina along with a single report in the most southwest county in Michigan. The current weather conditions have not placed Pennsylvania at risk of downy mildew from these known sources.

Basil downy mildew was just confirmed in field grown basil as well as sweet basil grown in “box stores” for retail in southern New Jersey today. Although also called downy mildew, the pathogen that causes this disease on basil is different than the one affecting cucurbit crops such as cucumber and pumpkin. Management primarily relies on the use of fungicides and environmental modification however, Rutgers has recently released a number of resistant sweet basil varieties. Basil downy mildew is being monitored similarly to cucurbit downy mildew. More information can be found at <http://basil.agpestmonitor.org> as well as current management recommendations for in the [field](#) as well as [greenhouse](#) production in the mid-Atlantic region.

Cucumber Beetles continue to be active. We are still seeing the overwintered adults in central PA, but eggs laid from those overwintered adults develop as larvae on roots, resulting in new generation of adults that can boost populations. Scout fields that had significant adult immigration earlier this year for a rise in adult beetle populations. **Squash Bugs** are also now readily seen as egg clusters, adults, and hatching nymphs. Sprays to control squash bugs are most effective prior to canopy closure. Joining this group of cucurbit pests – all of which are

specialists on cucurbits - soon will be adults of the **Squash Vine Borer**. Squash vine borer is a charismatic, day-flying moth, one of the clear-wing moths, that has one generation a year in PA. It is often mistaken for a wasp, flying near the base of squash or pumpkin. It lays its eggs near the base of plants, and larvae bore directly into the vines. Scout for entry wounds with lots of frass. Control requires sprays directed at the base of plants during the adult flight period, about weekly intervals for 3-4 weeks. Damage has been concentrated in smaller fields or gardens, because the eggs are distributed among fewer plants. However, there has also been appreciable damage in commercial butternut or winter squash fields.



Squash vine borer adults will be active soon. This clear-wing day-flying moth is often mistaken for a wasp. It lays eggs at the base of plants, and larvae bore into the stem. Photo credit: N. Sloff.



Hopperburn on potatoes, from potato leafhopper feeding. Photo credit: S. Fleischer.

In areas where fields are drying down, or hay is being harvested, scout for **potato leafhopper** (PLH) or **mites** moving out of those fields into vegetable fields. PLH feeding results in a sheath that is left in the plant which disrupts the flow of

water and nutrients, causing highly variable symptoms in different plants. In potatoes, it causes a marginal leaf necrosis. Mites can develop quickly. Early infestations are often localized and targeted spot-sprays can help slow their spread while conserving many beneficials that feed on mite eggs and larvae. Effective spray options are miticides, and are listed in the Veg Guide for the different crops. Pyrethroids can flare mite populations when the mites are resistant, and the pyrethroid kills off the natural enemies. **Japanese beetles** are also emerging as adults now. **Corn earworm** populations have been low to moderate but increasing.

BERRY CROPS

Spotted wing drosophila is widespread though numbers are still low. This pest can multiply very rapidly, so monitoring with traps or close examination of fruit should be undertaken to ensure that fruit is kept clean. Cultural controls consist of harvesting frequently, harvesting thoroughly, removing and bagging unmarketable fruit rather than letting it lay in the row middles, and keeping rows narrow and weeded. Growers should ensure that coverage is thorough and that lower parts of the plant canopy are covered. Insecticide rankings can be found here, but keep in mind that not all of these products are labeled for berry crops crops. <https://cpb-us-w2.wpmucdn.com/u.osu.edu/dist/1/8311/files/2014/12/SWD-efficacy-synthesis-2013-2m3vn6k.pdf> Insecticides in the pyrethroid class work well but they can result in flare-ups of two-spotted spider mites.

Cyclamen mites continue to cause symptoms of damage in strawberries in some fields. The period after renovation before foliage has grown back is an opportune time for treatment with a miticide for June-bearers in matted-row production. Predatory mites have also provided good control if damage is limited in scope.

Fruit anthracnose was less problematic than in years past on June-bearing strawberry cultivars; however, most day-neutral cultivars are very susceptible and are showing symptoms. As noted in an earlier article, resistance of the fungus causing fruit anthracnose to category 11 fungicides has been widely noted on susceptible cultivars. Captan should be the backbone of a spray program to minimize resistance development. Fungicides in classes other than group 11 that are quite effective on fruit anthracnose include Switch (category 9 + 12), Miravis Prime (category 7 + 12), and PhD or Oso (category 19). Any fungicides in chemical classes other than category M (indicating multi-site activity) are at risk for resistance development. See more info regarding fungicides and resistance management in the second half of this article: <https://extension.psu.edu/strawberry-anthracnose-better-understanding-and-management>.



Two-spotted spider mite on strawberry leaf underside. Photo credit: Kathy Demchak.

Now is the time of year when **two-spotted spider mites** can multiply really rapidly, especially in high tunnels. Predators should be released when populations are still low. It may be difficult or impossible for predators to catch up if two-spotted mite populations are already out of hand.

Sweet Corn Insect Pest Monitoring

Shelby Fleischer, Extension Vegetable Entomologist, Penn State University

Interactive Maps with Google style view at <http://www.pestwatch.psu.edu/sweetcorn/tool/index.html>

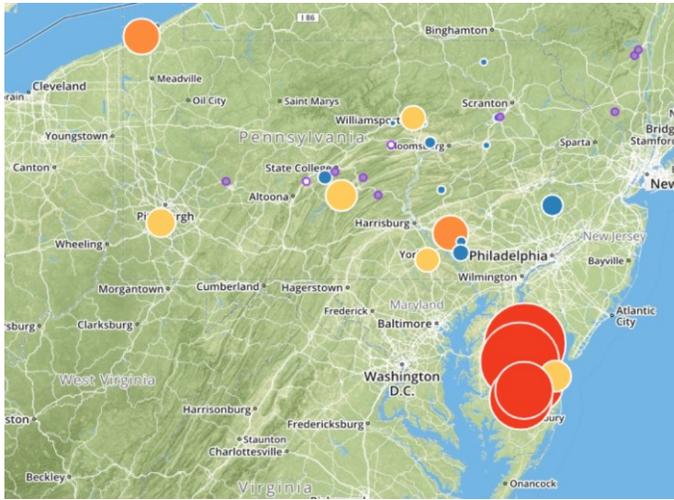


Corn Earworm

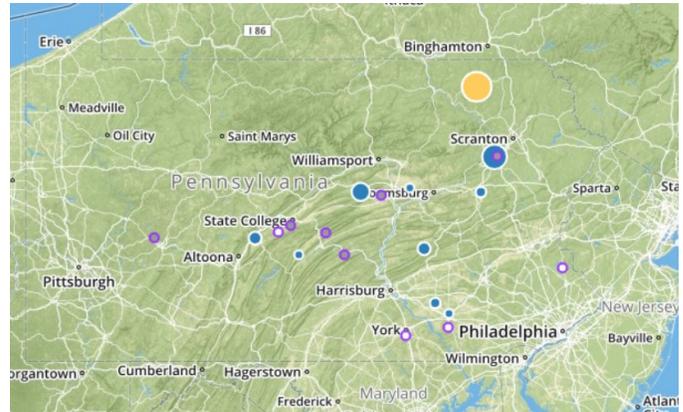
Corn earworm (CEW) catch reached or approximated spray thresholds in Bucks, Erie, Lancaster, Lycoming, Mifflin, Washington, and York counties. Sites in Erie and Lancaster, as well as Mifflin last week, suggest tightening spray frequencies to 4-5-day intervals. Multiple sites are showing an increase from last week. Tasseling and silking corn will be very attractive. Moths will also lay eggs on many host when corn is not available. Tomatoes and hemp make good hosts (CEW is also known as tomato fruitworm).



ECB feeding

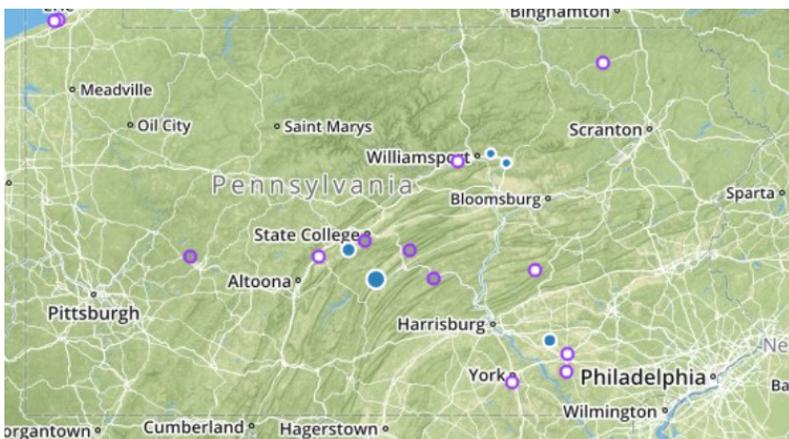


CEW counts continue to be high in DE reached spray thresholds in 7 counties.



ECB first generation flight is starting to decline, except in the cooler northeast corner of the state.

European corn borer (ECB) adults remain active, but counts are starting to decrease, suggesting that the first generation flight has already peaked. Counts are low except for a few hotspots, notably in Luzern and Susquehanna counties. Scout for feeding damage and shothole patterns.



FAW are being detected at low levels in PA. Open circles are zero counts.

Fall armyworm (FAW) counts are low.



ECB shot hole pattern from tunneling through leaf prior to leaf unrolling.

TRAP COUNTS: Moving average for the last 7 days. The catch/number of nights trapping, divided by the number of nights with data, times 7. Weeks where all the average-catch-per-night values are nulls are treated as if no data exist for that week. Shaded cells indicate no trap for that site.

County	Trap Name	CEW			ECB			FAW		
		17-Jun	24-Jun	1-Jul	17-Jun	24-Jun	1-Jul	17-Jun	24-Jun	1-Jul
Blair	Tyrone	1	3	0	0	0	3	0	0	0
Bucks	Bedminster	2	3	13	0	0	0			
Centre	Harner	---	4	---	---	0	---	---	0	---
Centre	Rock Springs	3	5.5	5.8	0	0	0	0	0	2.3
Clinton	Loganton	0	2.9	0	1.3	14	6			
Erie	Dudas Farm	3.5	4.7	7				0	0	0
Erie	Mason	16.3	22.8	37.3				0	0	0
Indiana	Creekside	11.7	6	---	0	0	---	0	0	---
Juniata	Happy Breeze	1.3	3	---	8.9	6	---	0	0	---
Lackawanna	Ransom	0	0	---	0	2	---			
Lancaster	Landisville	1	8	36	0	2	2	3	2	2
Lancaster	Neffsville	4	4	3	0	1	1	1	0	0
Lancaster	New Danville	7	18	8	0	1	0	0	0	0
Luzerne	Drums	0.8	1	1	6.9	1	2			
Luzerne	Plains	---	1	2	---	17	11			
Lycoming	Linden	---	1.2	---				---	0	---
Lycoming	Montoursville	---	19.8	---				---	1.2	---
Lycoming	Muncy	---	0.6	---				---	4.1	---
Mifflin	Streamside	---	35	28	---	0	1	---	11	4
Montour	Washingtonville	1.2	3	4	6.3	2	1			
schuylkill	Tower City	3	3	2	1	3	3	0	0	0
Susquehanna	LaRue Farm	8	---	1	38	---	16	0	---	0
Union	Lewisburg				18.7	6	---			
Washington	Venetia	35	20	24						
York	York	0	0	17	0	0	0	0	4	0

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

	CEW			ECB	
	Catch/Week	Spray Frequency		Catch/Week	Spray Frequency
Very very low	1-13	7 – or no spray		<15	7 – or no spray
Very low	14-35	5-6		15-35	6
Low	36-70	4-5		36-70	5
Moderate	71-349	3-4		>70	4
High	>350	2-3			

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Where trade names appear, no discrimination is intended, and no endorsement by Penn State Extension is implied.