



PENNSYLVANIA VEGETABLE MARKETING & RESEARCH PROGRAM

2301 N. Cameron St., Harrisburg, PA 17110 | 717-694-3596 | pvmp@embarqmail.com | PAVeggies.org

Pennsylvania Vegetable IPM Weekly Update

June 22, 2022

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.

Pest Watch Report

Karly Regan, Penn State Extension Educator

MOTH CATCH INCREASING THROUGH PENNSYLVANIA

As more sites have begun reporting throughout Pennsylvania, corn earworm numbers have been detected above threshold for more of the state. Sites in Blair, Franklin, Lehigh, Mifflin, and Washington counties are experiencing catches per night of 6-9 moths per night which means a spray interval of 4-5 days would be suggested for corn that's tasseling or silking in those areas. Corn that is tasseling or silking is very attractive to corn earworm, as eggs are laid on silks, and control must be achieved while larvae are recently hatched before they've entered the ear.



Fig 1. Corn earworm begin feeding at the ear tip and leave moist frass behind. Photo credit: Karly Regan

Once the spray threshold is reached, you can consider products from the pyrethroid class, diamide class, or spinosyn class for effective control. We tend to see the best efficacy from non-pyrethroid products such as Coragen, Blackhawk, and Radiant, as pyrethroid resistance has increased in migrating corn earworm populations. However, we tend to see more resistance later in the season than now, as moths migrate from further south in the United States up to our region. Diamides and spinosyns do not provide effective control of other pests such as sap beetles, brown marmorated stink bug, Japanese beetles, or adult corn rootworms. If you're seeing these pests as you scout your corn, consider adding a pyrethroid, or the premix Besiege to control those.

So far, very few fall armyworm have been caught for this season in Pennsylvania, though some feeding damage has been observed. While corn earworm will

typically target the reproductive parts of the corn plant, fall armyworm may cause damage to leaves, as well leaving behind shredded leaves and waste that resembles sawdust.



Our program is not monitoring for European corn borer this season, as area-wide numbers have been low for many seasons. Insecticides targeting corn earworm will provide control of any European corn borer that may be feeding on sweet corn, as well.

Fig 2. Fall armyworm feeding damage, including shredded leaves and sawdust-like frass. Photo credit: Karly Regan

Average weekly catch – 7-day moving average. The average catch per night (total catch, divided by the number of nights trapping), divided by the number of nights where data exist, multiplied by 7. If no data exist for that week, null is reported.

County	Site	CEW		FAW	
		June 13	June 21	June 13	June 21
Blair	Curryville	1.7	7	0	0
Blair	Sinking Valley	0.9	2.1	0	0
Bucks	Doylestown	0	0.6	0	0
Centre	State College	0.3	2	0	0
Centre	Rock Springs	0.7	2.8	0	0
Clinton	Loganton	Null	0.3	Null	0
Franklin	Shippensburg	0.3	9.1	Null	0.1
Franklin	Waynesboro	8	8.7	0	0
Indiana	Indiana	Null	2.7	Null	0
Lancaster	Landisville	0.1	Null	0	Null
Lancaster	New Danville	0	Null	0	Null
Lehigh	Germansville	Null	5.8	Null	0
Mifflin	Belleville	Null	7.1	Null	0
Washington	Venetia	Null	5.4	Null	Null
York	York	0.3	0	0	0

THRESHOLDS Reproductive (tassel/silk) and late vegetative corn attract moths. Shorten spray schedules when populations increase.

Threshold based on CEW	Catch per week	Spray Frequency
Almost Absent	1-13	7+
Very low	14-35	5-6
Low	36-70	4-5
Moderate	71-349	3-4
High	>350	2-3

Vegetable and Berry Current Issues as of June 21, 2022

Beth Gugino, Shelby Fleischer, Kathy Demchak, and Karly Regan, Penn State and Penn State Extension

GENERAL CONDITIONS

Deformed crops such as tomato, cucumber, and zucchini have been reported in several parts of the state. On tomato, this is often called zippering or catfacing on the fruit while on cucurbits, the blossom end may not fill completely to form a uniform fruit. This is often the result of a weather-related pollination issue that occurred earlier in the season. As spring comes to a close and we officially enter the summer season, spring temperatures across much of Pennsylvania averaged normal while precipitation varied from slightly above normal in the far western and eastern regions of the state to slightly below in the most northern and southern tiers (Northeast Regional Climate Center; <https://www.nrcc.cornell.edu/regional/narrative/narrative.html>).

Do you have Aggressive Honey Bees?

In much of the northern US, beekeepers are not prepared to manage and work with highly defensive honey bees, which can pose a threat to beekeepers and the public. Without proper management plans or testing availability, beekeepers and the public may be injured or killed when working with or near these aggressive colonies. With support from the Pennsylvania Department of Agriculture (PDA), members of Penn State's Lopez-Urbe Lab and their collaborators are working to develop a reliable genetic protocol that would be available to beekeepers and apiary inspectors who may need to reliably test for the presence of defensive behavior in PA. With this information, we will develop a management plan to monitor and control these defensive bees.

We are looking to test and sample defensive colonies throughout Pennsylvania and need YOUR help. We are interested in visiting colonies that chase you out of the beeyard, chase and sting people when the hive is not open or disturbed, and/or fly in your face and stick to the front of your veil, even when you use smoke. If you believe you have a honey bee colony that fits this description, please see our website at <https://lopezuribelab.com/blog/defensive-honey-bees-in-pennsylvania/> or contact us at lopezuribelab@gmail.com.

FIELD PRODUCTION

Last week **cucurbit downy mildew** was confirmed in at least one commercial cucumber field in southern New Jersey. This is the time of year to be regularly scouting cucumber and cantaloupe fields. Please report if you suspect downy mildew. This disease is best managed on an areawide scale to reduce overall inoculum. Fungicides are currently the best management tool, and their timely application can effectively manage this disease.

Bacterial diseases of onion are becoming a common sight in fields as the temperatures increase and the onions start sizing up. These diseases are most likely to spread when the bacteria are splash dispersed between plants during strong thunderstorms and high winds that can damage the plants. Copper-based fungicides tank mixed with an EBDC fungicide such as mancozeb will help protect the uninfected plants but not stop the disease once it starts in the symptomatic plants. **Onion thrips are being reported in onions** as well and should be managed once populations exceed one thrips per leaf. In addition to reducing photosynthesis, they can also increase the risk of bacterial bulb rot as their feeding creates easy entry points into plant tissue. Thrips can also feed on grasses, so movement into vulnerable vegetables often increases as small grains approach harvest time and hay crops are cut. Be sure to scout for them as hay is cut in your area.



Onion thrips appear yellow to beige targeting the neck of onions. Feeding damage appears as whitening of the leaf as the thrips remove chlorophyll. Photo: Karly Regan.

Corn earworm trap counts have been increasing throughout the state and reached spray thresholds of 4- to 5-day intervals at sites in Blair, Franklin, Lehigh, Mifflin, and Washington counties. Corn that is tasseling or silking will be highly attractive to these moths, so be prepared to spray corn that has reached these growth stages. Since eggs are laid on silk, control via insecticides is best done through contact to the very young larvae before they move into the ear.

Many commonly occurring insects of vegetable crops are appearing, often in low numbers or a few locations. **Flea beetles** are causing shothole damage to potato and eggplant. **Spider mites** are showing up in vine crops and strawberries. Spider mites often initiate populations in localized aggregations and thrive in hot, dry conditions. **Sap beetles** have been reported in strawberries and could move into sweet corn as ears begin to develop. Initiate sanitation (clean harvest, clean up fields after harvest) now to avoid sap beetle problems in corn later in the season.



Corn earworm begins feeding at the tip of ears and often leaves moist frass behind. Photo: Karly Regan.



Pale striped flea beetle adult (left), and characteristic shot hole damage (center)
Photos: W. Cranshaw, Bugwood.org.



Early spider mite feeding damage on vine crops will appear as yellow spots on leaves. Photo: Karly Regan.

BERRY CROPS

Now that strawberry harvest is winding down in much of the state, it is time to decide whether to carry over plantings or not. If you are growing 'Chandler', 'Flavorfest' or any other variety with any symptoms of **Neopestalotiopsis**, it is strongly recommended that the planting not be carried over. It is important to avoid having this disease become established in your fields or surrounding vegetation.

If you have carried over plasticulture plantings successfully in the past, and the plants look healthy this year, it is fine to keep them, but in general we have seen increased winter injury, disease, insect pressure and plant death in carryover fields. In matted-row plantings, the renovation process causes older plants to be replaced with new ones, so a quick decline in plant health is less likely than in plasticulture. The plant sources and varieties grown in matted-row fields in PA are different from those which have had **Neopestalotiopsis** issues; we have not been able to find this disease in matted-row fields in PA so far. Otherwise, it seems that strawberries have had every disease and insect issue possible this year, along with a compressed harvest season.



Symptoms of Neopestalotiopsis on leaves consist of large areas of the leaf being invaded and black pycnidia within the lesions. Photo: K. Demchak.

Injury from **herbicide drift to each of our major berry crops has been reported**. Hopefully, if a neighbor's farm is involved, a reasonable conversation concluding in reaching an understanding will occur. However, if that is not the case, this article includes some steps to take (<https://extension.psu.edu/herbicide-drift-and-sensitive-plants-what-to-do-if-drift-is-suspected>). Several growers have reported **blueberry canes stems being loaded with fruit and having few leaves**. In these cases, each bud on the cane was only floral, with few or no leaf buds present. This is occurring mainly in 'Bluecrop' which tends to overfruit if not pruned hard. It is likely that some combination of environmental conditions, plant stress, cane age, and variety have combined to cause this issue. Canes overloaded with fruit should be removed to encourage more new canes to grow to bring the plant back into balance, as younger canes are more vegetative. If there is an underlying source of plant stress (high pH, lack of mulch, lack of water, poor nutrition), this should be corrected. Heavier pruning of old canes may be needed in the planting in the future.



*Fruit load imbalance on canes of 'Bluecrop'.
Photo: K. Demchak.*

Scale insects have also been noted on some of these older canes, sometimes with crawlers present. Esteem (with a 7-day PHI) is an effective option to treat the crawler stage. Many of the broad-spectrum insecticides used for spotted wing drosophila are effective on crawlers, too, but also kill beneficials that may have been keeping the scale insects at bay.

Orange rust is being seen on black raspberries and blackberries.

There is no cure for this disease, as it is systemic in the plant, so plants should be dug out after the tops are carefully removed to avoid dispersing spores. Category 3 and category 11 fungicides can help to protect other plants in the planting but will not cure the disease.



*Orange rust pustules on blackberry leaf underside.
Photo: K. Demchak.*

There are other rust diseases that are not systemic that could be present, but orange rust causes much more extensive leaf symptoms than other rusts at this time of the year.



Scale insects, unidentified as of this writing, in a split in blueberry cane bark. A tiny yellow crawler (in box) can be seen on the blueberry bark. Photo: K. Demchak.

As you are harvesting raspberry or blackberry plants that would have been tipped last summer, you may notice a hole in the cane pith at the tip of the cane. If this hole only extends a few inches downward, it is not caused by a borer pest, but instead is a hole made by an emerging solitary bee pollinator. Some solitary bee larvae may still be developing in additional chambers in the stem, and could be mistaken for borer larvae.

Spotted wing drosophila season is just around the corner. See this article for more information <https://extension.psu.edu/spotted-wing-drosophila-a-2021-update-for-berry-growers> and this accompanying table for efficacy ratings of insecticides and berry crops on which they may be used: https://extension.psu.edu/downloadable/download/sample/sample_id/4466/

Plans are being made for releases of small numbers of a **beneficial parasitoid (*Ganaspis brasiliensis*)** that attacks **Spotted Winged Drosophila** in central and southeastern PA (as well as surrounding states), and for monitoring to determine its establishment this summer, fall, and next spring

Vegetable Disease Updates

Beth Gugino, Penn State Extension Vegetable Pathologist

GENERAL UPDATES:

- There are currently **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.
- Heavy rains and saturated soils create ideal conditions for **Phytophthora blight** on primarily affecting peppers, eggplant, and cucurbit crops. Saturated and flooded soils allow the pathogen to quickly spread across and between fields in the water. Although fungicides applied through the drip irrigation or directed towards the base of the plants can help suppress the disease, under ideal conditions for disease development, they often fail. An accurate diagnosis is important to inform future management strategies that can rely on host resistance for peppers and long-term strategies to improve soil health and drainage on the farm. Remember that the pathogen can also be easily moved between farms in infested soil on shared equipment.
- **Tomato spotted wilt virus (TSWV)** was confirmed in a couple high tunnels on one farm and is likely present in others. This virus is vectored by thrips which are common in greenhouse ornamentals. This is one of the reasons it is recommended that vegetable transplants are not grown in the same greenhouse as ornamentals. Once confirmed, removing symptomatic plants is recommended to reduce potential spread. Also scout and manage thrips populations as well as weeds that can harbor the virus.
- Although there have been no additional reports in the last week, **scouting for cucurbit downy mildew** on cucumber and cantaloupe this time of year is critical. This disease is best managed as an areawide effort so monitoring and knowing potential sources of the pathogen helps both commercial growers and home gardeners alike. If you suspect cucurbit downy mildew 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. For the latest reports and forecasts check out <https://cdm.ipmpipe.org/>.
- **Bacterial disease of onion** was confirmed in all five fields being scouted in Mifflin, Clinton, and Lancaster Counties as part of a "Stop the Rot" project funded by USDA NIFA SCRI 2019-51181-30013. Bacterial disease is



Hole in tipped black raspberry cane from a solitary bee, not a borer pest. Photo: K. Demchak.



Stunted and chlorotic plants with bronzing on the leaves characteristic of TSWV infection. (Photo credit: Beth Gugino).

characterized by a small white lesion that expand and progress down the leaf causing a wilted bleached interior leaf. Eventually the bacteria can move down the neck and into the bulb scales. One field had onions planted side-by-side on both standard black plastic as well as silver plastic. Taking advantage of the comparison, the number of symptomatic plants (disease incidence) planted into silver averaged 8.6 across three rows while it averaged 42 plants across four rows of black plastic. Previous research has demonstrated that higher soil temperatures are more favorable to disease development and this observation continues to support those results.



Clinic Corner:

Findings from the Penn State Plant Disease Clinic

Jennie Mazzone Penn State Research Technologist and Assistant Diagnostician

Black Rot on Broccoli (and other Cole Crops)

A broccoli sample from Allegheny County, PA was submitted to the [Penn State Plant Disease Clinic](#) in June with V-shaped leaf lesions. These lesions were yellow and brown in color. Microscopic examination of the lesions revealed bacterial streaming. This indicates black rot disease, caused by the bacterium *Xanthomonas*, which we were able to confirm with an Agdia Immunostrip *Xanthomonas* test.

Characteristic symptom of onion bacterial disease (Photo credit: Beth Gugino).

Black rot is caused by the bacterium *Xanthomonas campestris* pv. *campestris*. This is a common disease of crucifer crops worldwide. The bacterium can infect the plant at any age. When the bacteria enter the plant through the hydathodes (natural openings in leaf margins), they create a V-shaped lesion that is initially pale green and later yellow/brown, as we saw on the sample submitted. These areas enlarge as disease progresses until entire leaves may drop off. Bacteria may also enter through wounds caused by heavy rain, hail, insect feeding, or mechanical injury. If seedlings are infected, the entire plant may become yellow and die. Black veins on leaves, stems and roots may also occur.



Black rot V-shaped leaf lesions showing yellowing and browning on broccoli (Photo credit: Jennie Mazzone).

The black rot pathogen is seed-borne, so purchasing certified seed or transplants or [hot water treating seed](#) is important. If hot-water treating, it is important that cole crop seed be seeded directly after treatment due to potential seed coat splitting during treatment. Extended warm, wet weather favors pathogen spread. Avoid planting any crucifers in the same field for at least two years since the bacterium can survive on debris in the soil. Refer to the [Mid-Atlantic Commercial Vegetable Production Recommendations](#).

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