



PENNSYLVANIA VEGETABLE MARKETING & RESEARCH PROGRAM

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Pennsylvania Vegetable IPM Weekly Update

August 30, 2023

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.

PA Vegetable and Berry Current Issues for August 29, 2023

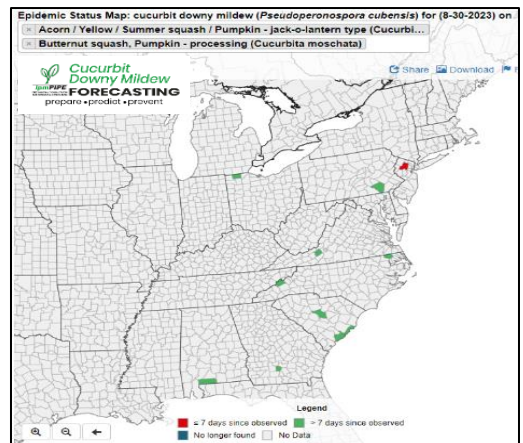
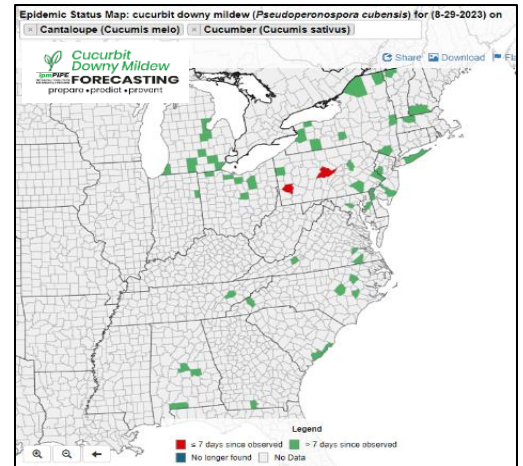
Beth Gugino and Kathy Demchak

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FIELD/HIGH TUNNEL PRODUCTION

Downy mildew on butternut squash and jack-o-lantern pumpkin was reported this past week in eastern PA and in northern NJ. These are the first reports on hosts other than cucumber/cantaloupe in the region, so all cucurbit crops are not considered at risk. Inclusion of downy mildew specific fungicides are recommended especially for crops with a later harvest date.

In drier parts of the state, **powdery mildew** disease pressure is high in cucurbit crops. If disease pressure is high and the crop is close to harvest, consider simplifying your fungicide program to primarily include protectant products like chlorothalonil or softer reduced risk products to reduce the risk of fungicide resistance. Continue to target applications towards the handles of pumpkins being marketed for the fall foliage/festival season.



Water-soaked and crusty lesions on Delicata squash fruit caused by Xanthomonas leaf blight. (Photo: L. Fronk, Penn State Extension)

Symptoms of **Xanthomonas leaf blight**, formerly known as bacterial leaf blight, are being reported on the fruit of several cucurbit crops including pumpkin and Delicata squash. It causes small water-soaked spots on the fruit that are often crusty and leave entry points for other pathogens especially soft rotting bacteria. Rain splash spreads the bacteria from the leaves to the fruit surface. Management should focus on reducing bacterial disease on the leaves using copper-based products along with mancozeb. In some trials in the Midwest, inclusion of Actigard or Regalia also helped when

applied preventatively. A 3-year crop rotation is recommended to reduce future disease pressure in the field.



White speckling on zucchini fruit and diamond-shaped lesions on the stem caused by Plectosporium blight. (Photo: L. Fronk, Penn State Extension)

Plectosporium blight has also been observed on cucurbit crops such as zucchini. This fungal disease causes very distinct small diamond- or spindle-shaped lesions on the plant stems, petioles, and leaf veins as well as small white lesions on the fruit. It can also cause less distinctive yellow-tan lesions on the leaves. Under moist conditions and moderate temperatures, the lesions can coalesce together reducing overall marketability of the fruit. The lesions on the fruit can also be an entry way for opportunistic soft-rotting bacteria that can lead to complete fruit collapse as was the case in one field. Some other reports were coming from fields that were being actively managed with fungicides for powdery and downy mildews. The fungicides applied for managing powdery mildew will help manage Plectosporium blight; however, they need to be applied weekly and with a high volume of water to get good coverage under the plant canopy. Over the past several years, this disease has become increasingly more common and should become a regular part of a scouting program. Chlorothalonil alternated with a strobilurin-type fungicides such as Quadris Top (FRAC 3+11), Cabrio (11), Flint (11) or Pristine (7+11). Consecutive applications of FRAC 11 containing fungicides should not be applied.

Phytophthora blight continues to be reported in fields experiencing lots of rain. Infected fruit will develop a “powdered sugar” coating of spores on the surface. These spores are easily dispersed during rain events and are spread through a field along with the movement of water. Make maps of where you saw disease this year so you can plan for next year. Phytophthora can survive in the soil for multiple years, so rotating to non-host crops and managing water drainage are critical. Targeted fungicides can help reduce disease when used preventatively; however, management can be challenging when excessive rains are in the forecast.



Powder sugar-like sporulation caused by Phytophthora blight on bell pepper fruit. (Photo: Beth K. Gugino)

Fusarium crown and root rot is also being reported on cucurbits as well as other crops. The pathogen is favored by heavy rain and warm temperatures and can survive in the soil for several years so crop rotation is important. There are a few fungicides that could be applied through the drip, but they would need to be applied preventatively.

Late blight was confirmed on tomato in Onondaga County, NY this past week. This makes three counties in NY with reports of late blight on tomato and one of those also on potato. So far there have been no reports on tomato or potato in PA. Be scouting regularly for late blight especially as the night temperatures decrease and longer dew periods persist.

BERRY CROPS

The main problem reported in small fruit crops right now continues to be **spotted wing drosophila** on fall berries, mainly day-neutral strawberries. The first symptom noticed is berries that turn soft soon after harvest. This can be from two things: One is that eggs may be inserted under the fruit surface, and the hole made can serve as an entry point for fungi. The second is that feeding by the larvae destroys fruit



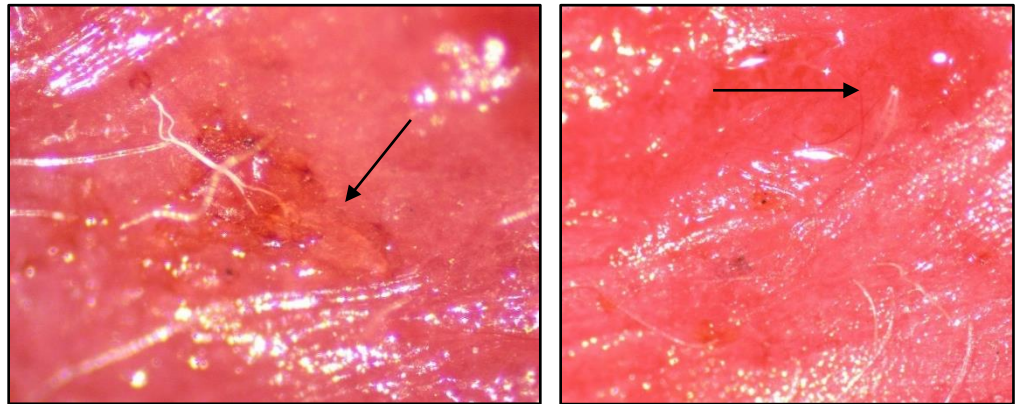
Rotted crown and pinkish discolored roots (left) caused by Fusarium crown and root rot on cucumber that results in whole plant death (right). (Photo: Beth K. Gugino)

integrity under the surface, leading to soft spots that often appear light in color with no noticeable fungal growth. This could lead a grower to believe mistakenly that the problem might be sunscald. Insecticides to control spotted wing drosophila and their efficacy ratings can be found here: <https://extension.psu.edu/spotted-wing-drosophila-insecticide-efficacy>.

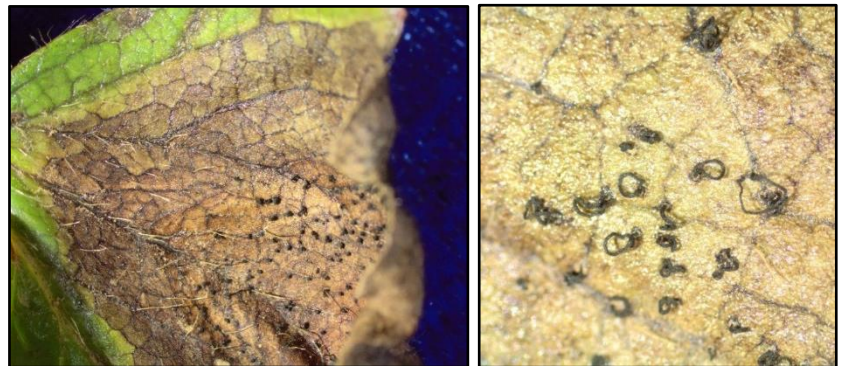
Growers establishing new strawberry plasticulture plantings are justifiably concerned about the health of their strawberry plugs. So far, samples of strawberry plug plants have primarily had **Botrytis**, though some **Phomopsis leaf blight** and **anthracnose** have also been detected. In one case, **Neopestalotiopsis** had been found. Some southern growers are continuing to struggle with this disease. So, what can growers do to minimize their risks? First, before planting, check

your plants carefully for any symptoms indicating disease presence. Dead or dying plants, or a decline in leaf health with lesions becoming more numerous or appearing to spread rapidly are the symptoms of greatest concern. Remove any dead leaves before planting and remove them completely from the vicinity, preferably discarding them in the trash. If you see plants that look especially suspicious, avoid planting those to the extent possible. Take care to get the plants in the ground at the correct depth, and re-check their depth after planting. Plants that are planted too deeply can develop a crown rot if soil washes into the crown, and plants that are planted too shallowly can dry out. And last, stay on top of a fungicide program. See this article for additional details on managing new plantings: <https://extension.psu.edu/strawberry-plasticulture-plug-planting-ways-to-increase-chances-for-success>.

If you wish to check samples for **Neopestalotiopsis**, it is possible to incubate samples yourself. This involves putting some of the leaves that are showing symptoms in a zipped plastic bag with a damp paper towel and placing the bag in a warm spot (room temperature is fine) out of direct sunlight - too much heat or water, or water plus heat can give the impression that your plants have a horrible disease when it was just that the leaves got cooked. The leaves should remain green or mostly green for at least a few days. If you see lesions growing extremely rapidly – meaning that much of the leaf is consumed within a few days, then you will want to watch closely (using a hand lens or strong magnifying lens) for black tendrils of spores emerging from black pustules on the leaf surface over the following day or two. You can also use your phone to take a photo as long as it is in focus and of high resolution, and then zoom in. Be aware that you may see a lot of other fungi growing, including *Botrytis* or fuzzy-looking fungi that are saprophytes (i.e., both live on dead tissue), so do not be alarmed by this. The main goal is to look for the tendrils of black spores. If you see those, then it is time to contact your local extension office, your supplier, and/or an extension specialist.



In the photos of a strawberry fruit above, an egg can be seen under inserted under the fruit surface (left), and the “tail end” of a spotted wing drosophila larva can be seen protruding from the fruit (right). (Photos: K. Demchak)



Neopestalotiopsis on ‘Chandler’ strawberry leaves. Lesions grow to consume most of the leaf on susceptible varieties like ‘Chandler’ within a few days (left), and then tendrils of spores emerge within another day or two (right). (Photos: K. Demchak)

PestWatch Report – August 29

Glen Bupp and Leah Fronk

MOTH CATCH VARIABLE ACROSS THE STATE THIS WEEK

Corn earworm numbers caught in traps reporting data this week were variable across the state, increasing at some sites and decreasing at others. Sites in Bedford, Bucks, Erie, Franklin, Juniata, Lancaster, Mifflin, and York are experiencing moderate moth pressure indicating a 3-4 day spray schedule. Butler, Clinton, Indiana, and Washington mostly saw a decrease in numbers and could back down to a 5 day spray schedule. Other counties are experiencing numbers low enough to suggest a 6-7+ day spray schedule.

As a reminder, 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.

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, Verimark, Blackhawk, and Radiant, as pyrethroid resistance has increased in migrating corn earworm populations. Particularly, we tend to see more resistance later in the season, 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, stink bugs, 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.

Only 2 fall armyworm were caught in Pennsylvania this week, both in Centre County. By managing for corn earworm, fall armyworm should be adequately controlled, as well. Fall armyworm damage can occur on the ear, as well as on the foliage. Foliage feeding will leave ragged edges and waste that resembles sawdust.

Average weekly catch for corn earworm.

Location	20-Aug	27-Aug	Location	20-Aug	27-Aug
Bedford, Pennsylvania			Indiana, Pennsylvania		
Peach Hill Orchard	117	137	Brush Valley	42	37
Blair, Pennsylvania			Indiana		
Hillview Farms	70	34	Juniata, Pennsylvania		
Bucks, Pennsylvania			Port Royal		
Doylestown,	185	186	Lancaster, Pennsylvania		
Butler, Pennsylvania			Landisville		
Renfrew	139	68	Neffsville		
Centre, Pennsylvania			New Danville		
PSU Research Farm	17	50	Drums		
State College	7	20	Mifflin, Pennsylvania		
Clinton, Pennsylvania			Belleville		
Loganton	40	70	Susquehanna, Pennsylvania		
Erie, Pennsylvania			LaRue's Montrose		
Lake City Nursery Rd	3	17	Washington, Pennsylvania		
Lake City Rt 5	19	106	Peters Township		
Franklin, Pennsylvania			York, Pennsylvania		
Waynesboro		85	York		
			73	80	

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



Fig 1. An adult male corn earworm moth caught in a monitoring trap



Fig. 2. Fall armyworm feeding damage on corn