



# PENNSYLVANIA VEGETABLE MARKETING & RESEARCH PROGRAM

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## Pennsylvania Vegetable IPM Weekly Update

June 7, 2023

**This is the first IPM Weekly Update for the 2023 season – however the next issue will not be until June 21.**

*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 as of June 6, 2023

*Beth Gugino and Kathy Demchak*

#### GENERAL CONDITIONS

The month of May will be on record as one of the driest across much of the mid-Atlantic region with precipitation ranging from 50 to 75% of normal. Growers with access to and knowledge about irrigation practices have fared well although reduced yields and poor growth have been reported for some crops like strawberry. Scattered storms over the weekend provided a bit of relief for some but for others resulted in crops damaged by localized hail. The weather is forecasted to be cooler than average before turning more seasonable and will likely continue on the drier side with some spotty thundershowers according to Penn State Meteorologists at Weather World (<http://weatherworld.psu.edu/>).

#### HIGH TUNNEL PRODUCTION

The drier weather has led to increased insect pest pressure rather than disease pressure in high tunnel production. There have been numerous reports of outbreaks of **aphids** and **thrips** in high tunnel crops. In some cases, natural predators including lacewings, parasitoid wasps, and lady beetles have been observed feeding on aphid infestations. Both lacewings and lady beetles have larvae that resemble small alligator-like bodies and are voracious feeders of aphids.

**Crop nutritional issues** have been observed in several high tunnels and greenhouses. It is important to know what nutrients are being applied at what rates. Water quality in terms of pH and soluble salts is also important for optimizing nutrient availability and minimizing nutritional stress. Plant tissue testing can be an important source of information during the season to help adjust in-season fertility. For a tutorial on plant nutrition in hydroponic systems check out [Hydroponic Systems and Principles of Plant Nutrition: Essential Nutrients, Function, Deficiency, and Excess](#). For those growing in native soils check out a series of articles that was recently written by Elsa Sánchez and Tom Ford based on soil samples from the high tunnels of 27 growers. These articles will help growers navigate the topics of soil chemical properties and crop health and include High Tunnel Soil Health Test Report: [Soil pH](#), [Soluble Salt Levels](#), [Soil Nutrient Levels](#), and [Organic Matter and Cation Exchange Capacity](#).



*Aphid mummies resulting from predation by parasitoid wasps. Photo: T. Butzler, Penn State Extension.*



*Lady beetle larvae. Photo: W. Beck, ISU, Bugwood.org.*

## FIELD PRODUCTION

**Cucumber beetles** have been observed in various cucurbit crops this week. Adults are attracted to volatiles from cucurbit cotyledons, an aggregation pheromone emitted by males, and the combination of this pheromone and volatiles coming from frass and plant-feeding. Females lay eggs at the base of plants, and larvae feed on roots. Minimizing the immigration of these overwintered adults will go a long way towards minimizing populations later in the season. Neonicotinoids are effective but are systemic and are highly toxic to bees. Limiting neonics to treated seed such as FarMore FI400, which includes the neonic thiamethoxam, keeps the residues that show up in nectar and pollen at very low or non-detectable levels. Very low rates applied to transplants may also reduce residues to which bees are exposed. In addition to feeding on crops, these beetles can be particularly problematic through their ability to spread the bacteria that cause cucurbit bacterial wilt, particularly in cucumbers and melons. Plant death is most likely on younger plants. Make sure to scout for these pests and be prepared to manage them if necessary. Once bacterial wilt has affected the crop, there is no rescue treatment to manage it so transmission must be prevented by managing beetle activity. UMASS Extension recommends treating when beetle numbers reach one beetle per two plants out of at least 25 plants scouted. This is especially important in plantings of non-insecticide treated seed.



*Striped Cucumber Beetle. Photo: N. Sloff, Penn State.*

Sweet corn insect trapping via pheromone traps began in several areas of Pennsylvania this week, with a few sites having started last week. Centre, Juniata, and Lancaster counties report an average of two **corn earworm** catch over a 7-day period. At this level, spray frequency is recommended at 7+ day intervals. Corn that is tasseling or silking is very attractive to corn earworm, so risk of damage will increase as corn reaches these growth stages. So far, no **fall armyworm** has been caught for this season in Pennsylvania.

If you have planted Bt sweet corn with the VIP traits for corn earworm, you will likely see minimal damage from caterpillar feeding but may still need to scout and treat for other pests, such as sap beetles or flea beetles. If you have not planted VIP corn, keep an eye out for our reports as your corn approaches tasseling as this is when management should begin.

**Tomato physiological leaf curl** has been observed in some fields as a result of the high temperatures. Symptom severity varies by cultivar with some showing minimal curling while others will develop curling into the mid and upper canopy. Yield loss has not been documented as a result of leaf curl.



*Curling of lower tomato leaf in response to heat stress. Photo: B.K. Gugino.*

**Cucurbit downy mildew** is currently reported as far north as coastal South Carolina on butternut squash (*Cucumis sativus*) and on acorn/yellow/summer squash, watermelon, and cucumber in southern Georgia.

**Basil downy mildew** was confirmed in a greenhouse planting in southeastern PA this past week. 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 released several resistant sweet basil varieties for consideration. Current management recommendations for in the field as well as greenhouse production in the mid-Atlantic region can be found [here](#).



*Purple-gray sporulation of downy mildew on the underside of basil leaves. Photo: B.K. Gugino.*



## BERRY CROPS

Dry conditions combined with hot temperatures on June 1<sup>st</sup> and 2<sup>nd</sup> made a rough strawberry season even rougher. In most of the state, temperatures have cooled and are slowing down ripening, which should help with reducing plant stress, but that doesn't help with having too few berries for customers.

**Poor growth and collapsing strawberry plants** have been reported statewide. Numerous samples checked for pathogens at the Plant Disease Clinic only occasionally turned up *Pythium*, a part of the **black root rot complex** that includes winter injury as a factor in disease development. Similar problems have occurred on numerous varieties from different plant sources and in different production systems, leaving environmental conditions as the one common denominator. Winter injury can affect translocation, and on top of that, plants were likely using much more water than normal given the low humidity the past few weeks with essentially no rainfall. At this point, the best thing you can do for any remaining strawberry crop and plants are to give them plenty of water.

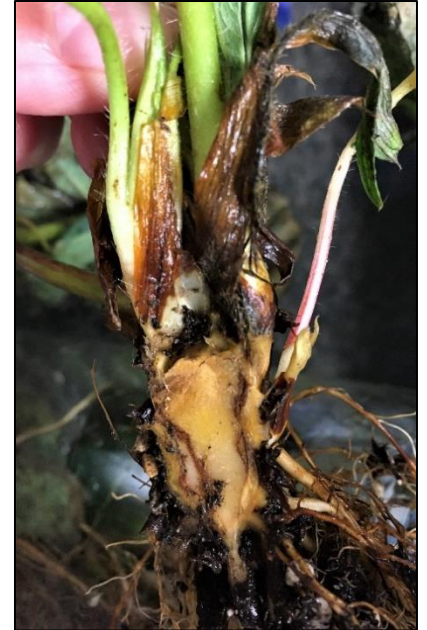
**Thrips** are typically the worst in years when conditions are dry, and this year they are causing fruit bronzing and raised seeds on strawberries on a number of farms. Raised seeds are caused by anything that damages the fruit surface resulting in it failing to expand and envelop the seeds as it normally would. Thrips are difficult to control and require good spray coverage; Assail and Radiant may be applied if plants are no longer in bloom to protect pollinators.



*Bronzing and raised seeds on unripe strawberry caused by thrips damage. Thrips can be seen just below the strawberry seed in the center of the photo. Photo: K. Demchak.*

### **Strawberry plants collapsing during harvest**

is common once the stress of fruiting is added. While it may be too late to do anything for this year's crop, it is important to sort out whether the main problem was environmental or not. Winter-injured plants, if not damaged too badly, should be able to recover, and healthy daughter plants can fill in matted-row plantings. A general rule of thumb is that crown tissue is relatively uniform in color with winter injury and is usually some shade of tan or light brown in a certain area of the crown unless severely injured. Pathogenic diseases often exhibit sharp delineations in light and very dark colored tissue where it is still healthy vs. diseased.



*This strawberry plant tested positive for phytophthora crown rot. Note the dark color of the diseased portions and marked differences in color. Photo: K. Demchak.*

With hot temperatures, bright sunshine, and dry conditions, **sunscald** on strawberries is common and may continue to occur. At first, the upper surface of the strawberries may look bleached, but eventually become tan, soft, and sunken. Keep plantings well-watered to keep plants from wilting and fruit from becoming even more exposed.



*At first, sunscald on strawberries will show up as bleached areas on the upper fruit surface, but these areas will later soften, turn tan in color, and collapse. Photo credit: K. Demchak.*

**Orange rust** on black raspberries and blackberries is quite common this year. Infected plants should have been removed by now, but if they were not, cover and bag the canes and try to clip them carefully to avoid spreading spores. Remove them from the field, and then dig the remaining parts of the plant out. Apply a fungicide in category 3 or 11 to help protect remaining plants. See this article for more information:

<https://extension.psu.edu/bramble-disease-managing-orange-rust>.