VEGETABLE CROPS HOTLINE

A newsletter for commercial vegetable growers prepared by the Purdue University Cooperative Extension Service

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In This Issue

A Brief Primer on Disease Management of Pumpkin

(Dan Egel, egel@purdue.edu, (812) 886-0198)

In the next month, many growers will start to plant pumpkins. This article will introduce aspects of disease management of pumpkins prior to the growing season.

The information below is discussed under several of the most common diseases of pumpkins in Indiana. The objective of this article is to discuss what diseases are more likely to be important in Indiana and when to manage these diseases. A fungicide schedule is available here. General fungicide recommendations for all vegetables can be found at mwveguide.org. Contact Dan Egel for a hard copy of these or other extension bulletins.

Black rot-this fungal disease can cause dark watery lesions on pumpkin fruit and, upon occasion, brown lesions on leaves. When this disease occurs on fruit it is known as black rot; when the disease occurs on foliage, it is known as gummy stem blight although it is caused by the same organism. Black rot is more common on squash and pumpkin; gummy stem blight is more common on cantaloupe and watermelon.

The fungal organism that causes black rot can survive in crop residue, so crop rotation and fall tillage are critical for the control of black rot. Fungicides should start when pumpkin plants have become well established and begun to grow into a small upright 'bush'.

Plectosporium blight-pumpkin fruit or foliage affected with Plectosporium blight appear speckled with a small, light-colored scars (Figure 1). Lesions may appear spindle shaped. Lesions are more common on the handle of the pumpkin where they may make the fruit unmarketable.

Figure 1. Plectosporium blight has caused lesions on the handles and fruit of these pumpkins.

The fungal organism that causes Plectosporium blight may survive in crop residue. Therefore, crop rotation and fall tillage is important. The occurrence of Plectosporium blight is sporadic; however, when it does occur, it can be a serious and difficult to control disease. If the disease threatens, regular fungicide applications such as described under black rot may be appropriate.

Phytophthora blight is consistently one of the most important diseases of pumpkin in Indiana. Phytophthora blight causes soft, rotten areas on fruit that may be covered in a white mold in moist weather (Figure 2). Vines and leaves may also be affected. The fungus like organism that causes Phytophthora blight survives well in soils and has a large host range. Therefore, crop rotation may not be effective in control of this disease. Phytophthora blight is an important disease of all cucurbits and is described in more detail here.

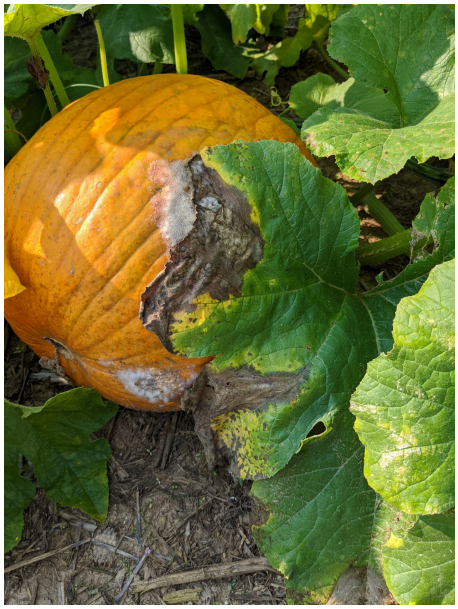


Figure 2. Phytophthora blight has caused mold covered lesion on the surface of this pumpkin as well as necrotic lesions on the leaves.

The fungus like organism that causes Phytophthora blight is favored by wet soils and heavy rains. Water that stands in pools, whether in fields are on plastic, favor the survival and spread of Phytophthora blight. Select fields, if possible, that are well drained and do not have a history Phytophthora blight.

The fungicides that are effective against Phytophthora blight are often not effective against other fungal diseases. Fungicides should start at or close to bush stage if not before.

Powdery mildew is perhaps the most easily recognized pumpkin disease that occurs in Indiana. A white, talc-like growth may be detected on leaves and stems. Although fruit are usually not directly affected, severe powdery mildew may cause the stems (handles) to become prematurely, brown and whither.

Several excellent pumpkin varieties have partial resistance to powdery mildew. Most growers find it necessary to use fungicides to manage powdery mildew. Systemic fungicides are recommended since powdery mildew colonies can be on either side of the leaf. Start fungicides at the bush stage-when the plant has grown upright and right before it starts to vine. At this stage, the canopy inside the 'bush' maintains the high humidity which is perfect for powdery mildew.

Bacterial spot of pumpkin-this is an important and difficult to control disease of pumpkin in Indiana. (Officially, the disease name is Xanthomonas leaf spot.) Lesions of bacterial spot of pumpkin leaves can be recognized by the light brown, almost angular nature of the lesions. These lesions do not cause economic damage. However, leaf lesions may harbor bacteria that may splash onto fruit where they may cause scab-like lesions which lower the marketability of the fruit (Figure 3). Occasionally, lesions may become secondarily infected by fungi, causing a large whole well into the flesh of the pumpkin.

Figure 3. Several necrotic lesions caused by bacterial spot of pumpkin can be observed here. One lesion is much larger and has probably been infected by a secondary fungus.

The bacteria that cause bacterial spot of pumpkin may survive on crop residue. Therefore, crop rotation and fall tillage are important in the management of this disease. The bulletin described above discusses the use of copper products when the fruit are softball sized or earlier if lesions are observed on leaves.

Pumpkin production in Indiana can be affected by several viral diseases. These diseases are vectored or spread by aphids. Insecticides are often not effective in stopping the spread of viruses because aphids can transmit the diseases in seconds. The most effective management for virus diseases of pumpkin in Indiana is to avoid late planted pumpkins. In southern Indiana, planting pumpkins by about mid-June or sooner will lessen the severity of virus symptoms. This is because earlier planted pumpkins will set fruit before viruses because a problem.

Season Extension Strategies—What I learned in a CA trip

(Wenjing Guan, guan40@purdue.edu, (812) 886-0198)

Thanks to my University of California Cooperative Extension colleagues, I visited central valley vegetable production last week. Undoubtedly, I learned a lot on this trip. I want to share what I learned with Indiana growers in a few newsletter articles. This short article highlights two things I saw farmers use to extend early-season crop production. In a large watermelon field, I found watermelons are grown on clear plastic (Figure 1). Dr. Zheng Wang, the vegetable crop advisor at the University of California Cooperative Extension, told me that the large-scale watermelon growers use clear plastic for the early crops. The purpose is to warm the soil

and get a fast-growing crop. He said the nighttime temperature was in the 50s°F after the crop was planted about a month ago. The watermelons were fast-growing under clear plastic mulch. Occasionally, I saw weeds under the clear plastic. But in general, the crop looks excellent. On a diversified Asian vegetable farm, we saw every pepper plant surrounded by a styrofoam cup (Figure 2). This approach also protected the plants from cool temperatures at the beginning of the season.

Figure 1. Watermelons are on clear plastic mulch.

Figure 2. Pepper plants grow in a foam cup

Weed Spotlight

(Emmanuel Cooper, coope392@purdue.edu) & *(Stephen Meyers, slmeyers@purdue.edu, (765) 496-6540)*

Velvetleaf (*Abutilon theophrasti*) – Mallow Family

Synonyms: pie marker, buttonweed, Indian mallow, butter print, velvet weed, butter-weed, Indian hemp, cotton-weed, and wild cotton.

Identification and General Description

- Summer annual that grows 3 to 8 feet tall.
- Heart-shaped leaves and stems are covered with short, soft hairs giving it a velvety feel.
- Young leaves and stems emit an unpleasant odor when crushed.
- When mature, leaves are alternate.
- Fibrous root system with a shallow taproot.
- Yellow to yellow-orange flowers with five petals form on the upper branches.
- Plants flower from July through September.
- Each flower includes many stamens which fuse to form a tube.
- Spreads by seed and is self-fertile.
- Seed capsules are circular cluster of 12 to 15 seedpods, ½ to 1 inch long.
- One plant can produce up to 17,000 heart-shaped seeds.
- Seeds can remain viable in the soil for up to 50 years.

Figure 1. Velvetleaf seedling with heart-shaped and hairy seed leaves. (Photo by University of Missouri)

Figure 2. Velvetleaf flowers showing 5 fused sepals. (Photo by AgPest New Zealand)

Figure 3. Velvetleaf seeds, 3mm long. (Photo by University of Missouri)

Impacts/ Why is it important to know?

- Common in horticulture and agronomic crops.
- Contains chemicals that inhibit germination of some crop seeds.
- Competes well for water, light and soil nutrients.
- Can host insects and disease organisms harmful to crops.

Figure 4. Velvetleaf can grow up to 1.5 meters tall and completely covered in soft hairs. (Photo by King county, WA)

Control Methods/ What can you do?

- Preventing seed introduction by using tested seed and removing visible soil from tractors and implements prior to entering velvetleaf-free fields.
- If small infestations occur or escape treatment, rogue plants before they set seed.
- Mowing can be effective only when plants are still small.
- Plowing or tilling aids in velvetleaf seed germination. This can be exploited to promote germination in fields that are left fallow. Once seedlings emerge and are small, implement a post-emergence control (herbicide, tillage, flaming). Repeat to encourage successive flushes.
- Rotate to crops that have more effective, registered herbicides.
- Non-selective herbicides, such as glyphosate, can be effective. Use shielded or directed applications to keep non-selective herbicides from contacting the crop.
- Herbicides containing 2,4-D can be effective, but have limited uses in vegetables.
- Herbicide applications to emerged weeds should be applied before weeds are 4 inches for optimum results.

See the *Midwest Vegetable Production Guide* for more information about how to control major weeds including velvetleaf, in most vegetable crops.

Order the printed *Midwest Vegetable Production Guide* here:

https://app.thebookpatch.com/BookStore/midwest-vegetable-production-guide-for-commercial-growers-2022/5a453903-1f7f-4108-b17b-fe3ef6791ebe

Use the searchable online Midwest Vegetable Production Guide here: https://mwveguide.org/

References

Spencer, N., 1984. Velvet leaf, abutilon theophrasti (Malvaceae), history and economic impact in the United States. Economic Botany 387 (4), 407 – 416.

Uva, R.; Neal, J.; and DiTomaso, J., 1997. Weeds of the Northeast. Cornell University Press, Ithaca, (NY) – 14850. p 256. ISBN 0801433916

Scouting Report

(Dan Egel, egel@purdue.edu, (812) 886-0198)

The following is a brief report of the pest and non-infectious problems found on vegetable in Indiana over the past 10 days.

Tomato-In high tunnels and greenhouses, scattered growers have observed leaf mold, gray mold and white mold. Tomato spotted wilt has also been observed on tomatoes in high tunnels. Unfortunately, herbicide drift has also been reported on tomatoes in high tunnels.

Cucurbits-Most diseases reported on cantaloupe and watermelon have been those observed in transplant trays. These diseases include gummy stem blight and angular leaf spot. In the field, Fusarium wilt has been observed on watermelon. Hail damage has been observed on cantaloupe and watermelon in the field. Cucumber beetles have been observed on cucurbits. Drift damage has also been observed

on cucurbit crops. Figure 1 shows an example of a contact herbicide on a watermelon leaf in contrast with gummy stem blight.

Figure 1. Contact herbicide damage on a watermelon leaf, on the left, causes a round, light colored lesion with little internal structure. The leaf with gummy stem blight, on the right, has expanded, dark lesions with clear ring-like structure.

Cabbage-Black rot has been observed on cabbage.

Meteorological Summer Begins

(Beth Hall, hall556@purdue.edu)

June 1st marked the beginning of meteorological summer (i.e., June, July, and August). Time between sunrise and sunset is still increasing, temperatures are increasing, and vegetation is growing. How did this past spring compare to climatology and what is expected over the next several months?

Let us start with May's climatology. May's average temperature across Indiana was 2-4 degrees warmer than normal. These warmer temperatures were reflected in both the average maximum and minimum temperature, as well. Last month's precipitation total was above normal throughout most of Indiana except for the counties along the Ohio River and the northwestern part of the state. This has led to the US Drought Monitor designating the first introduction of "Abnormally Dry" conditions in Indiana since last October (Figure 1)!

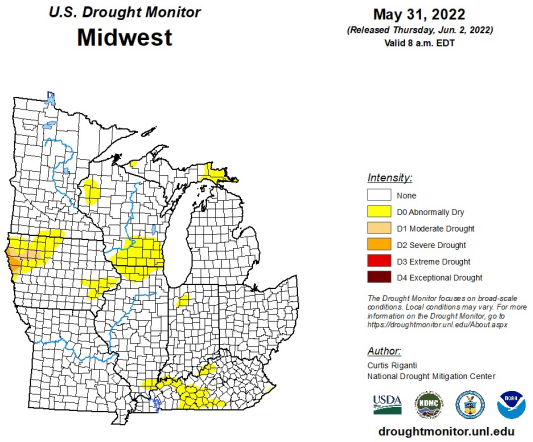


Figure 1. US Drought Monitor showing the introduction of Abnormally Dry (D0) conditions for a few counties in northwestern Indiana and a slight spillover of Abnormally Dry conditions in far southwestern Indiana as of May 31, 2022.

For this past spring (March-April-May), the similar pattern for precipitation occurred as for May where central and northeastern Indiana were near normal to slightly above normal, yet the southern and northwestern counties were drier than normal. What is interesting, however, is while total amounts were near normal, the number of wet days seemed to be greater than normal, meaning fewer field days and chances for the soils to dry up. This was a great example of how the timing and intensity of precipitation may be more important than total amounts, depending upon the application of interest. The average spring temperature was slightly below normal for northwestern Indiana and within 2 degrees above normal across the rest of the state.

Climate outlooks for June are indicating too much uncertainty regarding temperature and precipitation. However, above-normal temperatures are favored for the June-July-August period with equal chances of having above-, below-, or near-normal precipitation amounts. This propensity of uncertainty is likely due to the current La Niña event weakening without fully transitioning to another phase (i.e., Neutral or El Niño). These phases already have weak correlation to weather in the Midwest region, but with the current phase already weak, there are challenges to predicting with high confidence how the climate is likely to be over the next several months.

Modified growing degree-day accumulations are progressing faster in southern Indiana than in northern Indiana when considering a start date of April 15th. Central and southern Indiana has areas where the GDD accumulations are 40-60 units above the 1991-2020 climatological average for this time of year, whereas northern Indiana is only 10-30 units below average (Figures 2 and 3).

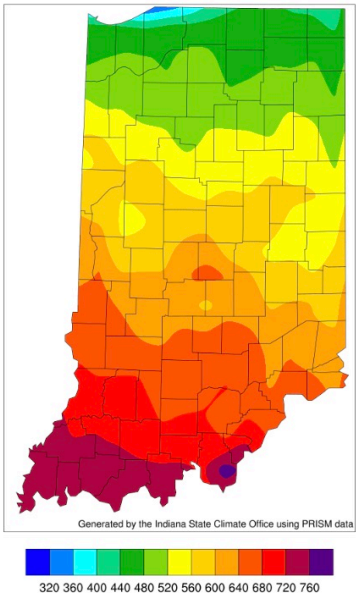


Figure 2. Modified growing degree day (50°F / 86°F) accumulation from April 15-June 1, 2022.

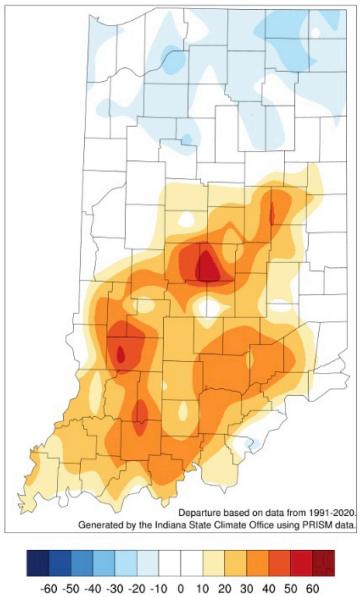
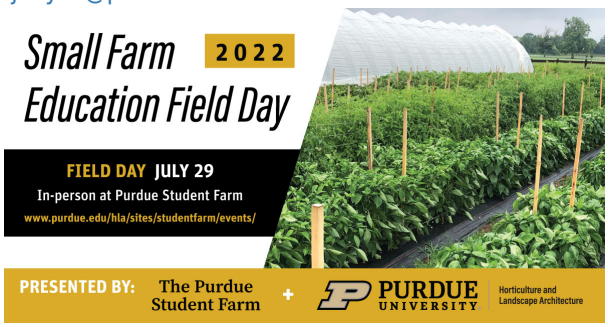


Figure 3. Modified growing degree day (50°F / 86°F) accumulation from April 15-June 1, 2022, represented as the departure from the 1991-2020 climatological average.

Purdue Small Farm Education Field Day – Save the Date!

The annual Purdue Small Farm Education Field Day will be presented on July 29th from 9 am – 12 pm at the Purdue Student Farm, West Lafayette. Watch this newsletter and Purdue Extension social media for more information, or contact Petrus Langenhoven at (765) 496-7955, plangenh@purdue.edu or Lori Jolly-Brown (765) 494-1296, ljollybr@purdue.edu.



Pinney Purdue Vegetable Field Day August 9, 2022 – Save the Date!

The Pinney Purdue Vegetable Field Day/Twilight Meeting will be held August 9, 2022 at 11402 S. County Line Road, Wanatah, IN. The evening program will feature plot tours for farmers and for homeowners featuring topics of irrigation, sweet corn, pumpkins, soil health and cover crops. An afternoon session for farm advisors and educators will include demonstration and discussion of drip irrigation, cover crops, high tunnels, and equipment for vegetable farms, with an emphasis on small-scale farms.

Watch this newsletter and Purdue Extension social media for more information, or contact Liz Maynard at (219) 548-3674, emaynard@purdue.edu.

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Editor: Wenjing Guan | Department of Horticulture and Landscape Architecture, 625 Agriculture Mall Dr., West Lafayette, IN 47907 | (812) 886-0198