

VEGETABLE CROPS HOTLINE

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



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Results of Wet Condition on Watermelon and Cantaloupe

(Wenjing Guan, guan40@purdue.edu, (812) 886-0198) & (Dan Egel, egel@purdue.edu, (812) 886-0198)

The 2019 production season started with above-normal rains. The wet conditions affected agriculture production, including watermelon and cantaloupe. In this article, we will review some of the watermelon and cantaloupe problems that are often associated with wet conditions.

Manganese toxicity- This nutrient disorder occurs more often on cantaloupe that is grown in soils with pH lower than 5.5. Although liming before planting is a common practice, it is not unusual that we see soil pH that has dropped below 5.5 in sandy soil, especially during wet years. Manganese exists in soil solution as either reduced (Mn^{2+}) or oxidized (Mn^{3+}) form. Plants take up manganese in the reduced form (Mn^{2+}). The proportion of exchangeable Mn^{2+} increases dramatically as soil pH decreases, and this reaction is promoted in waterlogged soils with low oxygen condition. As raindrops fall through the air, they dissolve CO_2 and form enough carbonic acid to lower the pH of the water from 7 to about 5.6. The acid in precipitation contributes to soil acidification, another reason manganese toxicity occurs in wet years.

If manganese toxicity is detected during the season, there is not much we can do to alleviate the problem, especially when fertigation is not applicable. If the system is set up to apply fertigation through drip tapes, using fertilizers with a nitrogen source from nitrate-nitrogen (calcium nitrate and potassium nitrate) instead of ammonium-nitrogen may help

by increasing soil pH. Potassium carbonate can also raise soil pH. It is water soluble and can be applied through drip systems. However, as correcting soil pH can be a prolonged process, it may be too late to see a yield response in the current season if the symptom has already been noticed.

Manganese toxicity can mimic a disease. It may seem to spread, but actually the plants in the lowest pH soil show the symptoms first. Then the symptom 'spreads' to other areas with soil pH a bit higher. Alternaria leaf blight is the disease most commonly mixed up with Manganese toxicity. It is important for growers to learn the symptom and address the problem in right direction. Please refer to this article [Manganese Toxicity on Cantaloupes](#) for detailed symptom description and additional information about this problem.

Watermelon hollow heart- is mainly caused by poor pollination. When the pollinizer plants (diploid watermelons) are located further away from the seedless plants, they are more likely to develop hollow heart. In addition, cold weather and the lack of bee movement during fruit set also causes poor pollination and increases the chance of hollow heart.

The critical time for fruit set is typically happened around 5-6 weeks after transplanting. Continuous cloudy and rainy days during fruit set period will affect bee movement, and is likely to increase the chance of hollow heart. With the harvest still a few weeks ahead, hollow heart has not been reported yet this year. However, early planted fields may have experienced more than usual rainy and cloudy days in the early half of June this year.

It is important to note that there is a significant varietal difference for hollow heart. A list of hollow heart ratings among 38 seedless watermelon varieties can be found in [2018 Watermelon Variety Evaluation in Indiana](#) on page 14. More information about watermelon hollow heart can be found in the article [Hollowheart of Watermelons](#).

Mature watermelon vine decline- commonly known as watermelon sudden wilt. It happens late in the season, a few days before first harvest or right after. The resulting vine wilt and collapse may cause poor-quality fruit. Although the definite cause of mature watermelon vine decline has not

been determined, it is generally agreed that the symptom is associated with the plant and with poor root system that cannot adequately supply the plant with water and nutrient late in the season. Watermelon develops a much more robust root system under drier conditions when the roots are forced to explore water deep in the soil. With constantly wet soil, roots lose the capability to grow deep. In addition, it places oxygen stress that results in additional physiological stress and perhaps necrosis of fine roots. As a result, mature watermelon vine decline often appear after heavy rains, and appear first in low, poorly drained areas. More information about mature watermelon vine decline can be found in this article [Late-season Vine Declines of Melons: Pathological, Cultural and Both?](#)

Phytophthora blight– This disease is more likely to develop during periods of heavy rains in relatively poorly drained soils. Recently, we observed this disease on both watermelon and cantaloupe. Large, soft lesions develop on fruit, typically close to where it comes into contact with the soil, and make fruit ripen prematurely. Yield loss caused by Phytophthora blight can be dramatic. Considering the excessive rains this season, Dr. Dan Egel is recommending growers apply specialized fungicides for Phytophthora blight. More information about this disease can be found in this article [Phytophthora Fruit Rot of Watermelon](#). Recommended fungicides and spray schedule can be found in [Midwest Vegetable Production Guide](#) and purdue.ag/melonfs.

Considerations with Delayed Pumpkin Planting

(Liz Maynard, emaynard@purdue.edu, (219) 548-3674)

The wet spring has likely delayed some planting of pumpkins. What does delayed planting mean for yield? Data and observations from Purdue Ag Centers offer some perspective to supplement other experience.

Figure 1 shows how pumpkin yield was affected by planting date for 6 trials. Each line represents a different trial. The Y-axis shows relative yield within in each trial. Yield of the first planting date for each trial is set to 100. For the two trials at Pinney Purdue (orange lines, PP2002 and PP2003), pumpkins seeded June 20-25 yielded 70%-85% of pumpkins seeded by early June. In the 1995-1996 trials at Southwest Purdue Ag Center (light green lines, SW1995 and SW1996), pumpkins transplanted June 25-30 produced about 50% of those transplanted two weeks earlier (June 10-15). Transplanting two weeks later (July 10-15) produced only 30% of the yield compared to the June 10-15 plantings. In the 1997-1998 trials at Southwest Purdue Ag Center (darker green lines, SW1997 and 1998) transplanting July 5 produced 45%-55%

of the yield compared to transplanting June 20-25.

Delayed planting can alter the relative timing of the pumpkin crop and specific insect, disease, or weed issues, causing them to be either more or less of a problem. Regular and methodical scouting will make it easier to spot trouble before it gets out of hand.

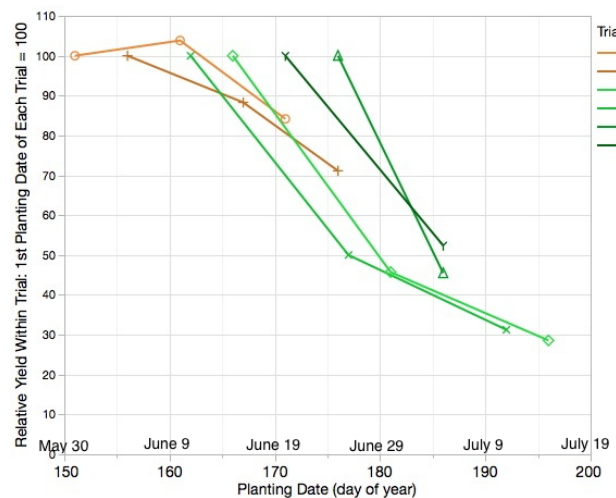


Figure 1. Relative yield of pumpkins planted on different dates in 6 trials. PP=Pinney Purdue Ag Center, Wanatah, IN. SW=Southwest Purdue Ag Center, Vincennes, IN. Data for SW from Brust, G.E. 2000. Reflective and black mulch increase yield in pumpkins under virus disease pressure. Horticultural Entomology 93:828-833.

Corn Earworm Trapping is Underway

(Laura Ingwell, lingwell@purdue.edu, (765) 494-6167)

We have begun our state-wide trapping and monitoring program for corn earworm (Figure 1). The latest trap catch information can be found [here](#). Traps have been placed at each of the eight Purdue Agricultural Centers throughout the state. Trap catches at the reporting farms are already in the double digits. Please refer to [E-31](#) to learn more about corn earworm identification and management.

Management and insecticide sprays target the eggs that are laid, preferably on fresh corn silk. If no field corn in the area is silking, which is true for most this year, use a threshold of 1-3 moths per night per pheromone trap. You only need to spray your sweet corn if it has silk present. When field corn begins to silk and green silk is present the threshold increases to 10 moths per night. Eggs are laid individually on developing silk. They hatch within 2-5 days and the larvae follow the silk channel down into the developing ear to feed. Once inside the ear, there is no effective control. Therefore, monitoring and spray coverage are key. You want the hatching larvae to experience a lethal dose. See [ID-56](#) for a complete list of spray recommendations, but briefly for organic production Entrust® is the only product available that provides good control. For conventional commercial growers we recommend Coragen® and Radiant®.



Figure 1. Corn earworm adult on silk. Photo by John Obermeyer.

Indiana Climate and Weather Report

(Beth Hall, hall556@purdue.edu)

When I was very young, I remember my father talking about “knee high by the Fourth of July”. As I got older I thought that expression was so strange for it seemed the corn was usually “man high” by the Fourth of July. Obviously, the excessive rains and cooler temperatures have had an impact this year! While the above-normal precipitation from April and May may have tempered in June, Indiana is still getting “normal” amounts of rain on relatively saturated soils (Figure 1). In fact, preliminary data from June suggests that most of Indiana was near normal for precipitation with the southern third well above normal. Average temperatures in June were also near normal to a few degrees below normal.

How will July end up? If it matches the climatological “normal” July, then average daily temperatures would be 70°F-75°F across the northern part of the state and above 75°F in the southern part. The national Climate Prediction Center’s July outlook is showing confidence that temperatures will overall be below normal across northern Indiana with no confidence in either above- or below-normal temperatures for the southern counties. Precipitation amounts are expected to be above normal.

The 2-week outlook is showing confidence of above normal precipitation from July 8-14 and the 7-day precipitation forecast is predicting 0.75”-1.25” through July 8th. In a nutshell, expect more rain and fewer oppressively hot days over the next few weeks.

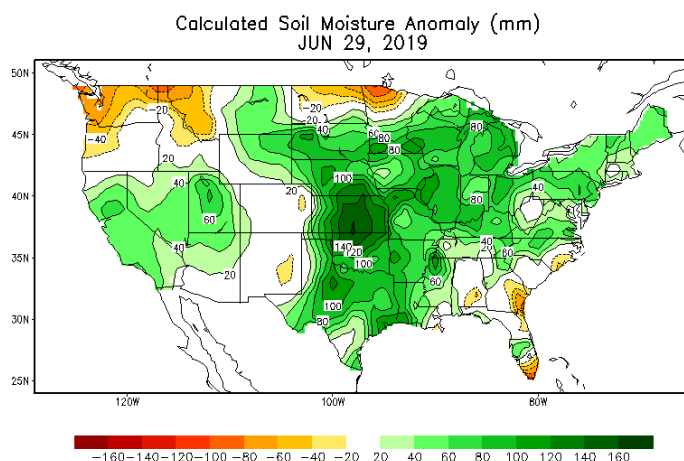


Figure 1.

Upcoming Events

Meigs High Tunnel Field Day

Date: July 18, 2019

Location: Purdue Meigs Farm, 9101 S 100E, Lafayette, IN 47909

Topics of the field day include Production of specialty melons in high tunnels; Early detection of bacterial wilt; Impact of crop rotation and rootstock on the resilience of high tunnel tomatoes. Lunch and refreshments are provided. Registration is free, but required.

Register here

https://purdue.ca1.qualtrics.com/jfe/form/SV_0HXQwDluRiOnwAB For questions please contact Lori Jolly-Brown at ljollybr@purdue.edu or (765) 494-1296




Meigs High Tunnel Field Day
 Thursday July 18, 2019 from 10:00 am to 1:00 pm
 Meigs Horticulture Research Farm
 9101 S. 100 E., Lafayette IN, 47909



The field day at Meigs Horticulture Farm, presented by the Horticulture and Landscape Architecture Department and the Department of Entomology, will focus on aspects of high tunnel cantaloupe, cucumber, and tomato crop production. It will feature tours of conventional and hydroponic high tunnel production research. Eighteen high quality specialty melon varieties will be on display grown vertically or the conventional way. Research have shown that the yield of personal sized melons grown in high tunnels are about three times higher than conventionally grown melons. Past research with insect exclusion netting have shown to exclude cucumber beetles effectively from the high tunnel environment. This year, we are working on implementing new technology to detect bacterial infection in the plants, prior to visual wilting symptoms, in order to improve management. The sensors we are using for early detection will be available and on display. New research are looking at the known risks involved when growing tomatoes without crop rotation in high tunnels. We are comparing the impact of mono cropped tomato vs. a more diverse rotation on soil microbial communities, crop resistance to insect pests and pathogens and yield. In addition, we are grafting heirloom tomato scions onto wild tomato rootstock to determine whether grafting provides greater resiliency in buffering high tunnel tomatoes against yield decline in monoculture over time. Attendees will also have an opportunity to discuss current challenges and future directions of research areas for high tunnel production systems.

Presentations and Tours

1. Production of Specialty melons in High Tunnels
2. Early Detection of Bacterial Wilt
3. Impact of Crop Rotation and Rootstock on the Resilience of High Tunnel Tomatoes

Lunch and Refreshments are provided.
 Registration is free, but required.
 Register here https://purdue.ca1.qualtrics.com/jfe/form/SV_0HXQwDluRiOnwAB
 For questions please contact Lori Jolly-Brown at ljollybr@purdue.edu or 765-494-1296




Small Farm Education Field Day at Purdue Student Farm

Date: August 1, 2019

Location: Purdue Student Farm, West Lafayette, IN 47907

The Purdue Student Farm is proud to announce its second annual Small Farm Education Field Day. The event is packed with educational sessions during the morning, followed by a tour and hands-on experiences on the farm. Topics of discussion throughout the day include basic planning tools for a sustainable small farm operation, testing and restoring soils in urban and peri-urban systems, scheduling crops in high tunnels, using different cover crops to build your soil, calculating profits and return on investment using enterprise budgets and food safety plans for small growers and gardeners. During the afternoon there will be a rototiller versus power harrow, high tunnel tomato and sweet pepper production, leaf mold composting, vegetable wash station design, and solar dryer demonstrations.

Registration fee is \$20.

Register here

https://purdue.ca1.qualtrics.com/jfe/form/SV_3qQf05iryF3COp

Registration closes July 29, 2019.



Join us for

Purdue Small Farm Education Field Day

August 1, 2019

EDUCATIONAL SESSIONS

- Basic planning tools for increasing the sustainability of your farm
- Testing and restoring soils in urban and peri-urban systems
- Scheduling crops in high tunnels
- Dynamic tools to calculate your profits and return on investment
- Food safety plans and certification process for gardeners
- Rototiller versus power harrow and seeder demonstration
- High tunnel tomato and bell pepper production
- Practical applications of leaf mold composting
- Vegetable wash station design
- Solar dryers for postharvest processing of fruits and vegetables

Lunch catered by Juniper Spoon

More information:
Lori Jolly-Brown
ljollybr@purdue.edu
https://purdue.ca1.qualtrics.com/jfe/form/SV_3qQf05iryF3COp
Registration fee: \$20
Additional attendees: \$10
Purdue Daniel Turf Center
1340 Cherry Lane
West Lafayette, IN 47907



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