WEEKLY CROP UPDATE
UNIVERSITY OF DELAWARE COOPERATIVE EXTENSION

**Volume 27, Issue 17** **July 19, 2019**

# Vegetable Crops

**Vegetable Crop Insect Scouting** – *David Owens, Extension Entomologist;* owensd@udel.edu

**Sweet Corn**

*Moth Vial Testing*

We have resumed corn earworm vial testing for pyrethroid resistance. Moth survivorship currently runs at 34% (44 moths treated). This means that additional modes of action should be featured in a spray program. Incorporation of a diamide (Coragen or Harvanta) or a pre-mix product (Besiege) will be necessary. Other products that can be included in a spray rotation include Radiant or Blackhawk and Lannate. If you are experiencing heavy moth pressure and are relying on pyrethroids alone, spray schedules should be tightened. If other modes of action are in your spray rotation, your spray schedule should be fine. If you are fortunate to receive a heavy rain event, consider re-treatment a little sooner, especially if the previous application did not have a diamide.

*Trap Counts:*

Sweet corn pheromone and blacklight traps are checked twice weekly on Mondays and Thursdays. By Tuesday and Friday morning, data is uploaded to our website https://agdev.anr.udel.edu/trap/trap.php. Moth counts from Monday are as follows:

| Trap Location | BLT – CEW | Pheromone CEW |
|---|---|---|
| | 4 nights total catch | |
| Dover | 3 | 75 |
| Harrington | 1 | 41 |
| Milford | 0 | 55 |
| Rising Sun | 0 | 43 |
| Wyoming | 4 | 147 |
| Bridgeville | 1 | 51 |
| Concord | 1 | 35 |
| Georgetown | 1 | 14 |
| Greenwood | 0 | |
| Laurel | 2 | 63 |
| Seaford | 1 | 36 |
| Trap Pond | 5 | 9 |
| Lewes | 0 | 33 |
| Dover | 3 | 75 |
| Harrington | 1 | 41 |

**Cucurbits**

Continue scouting for spider mites. Mite populations in weather like we are having can increase 10x in a week. The first watermelons are being harvested now. This is a good time to assess fruit for rind feeding injury caused by worms and cucumber beetles. Your insights on who causes what type of scar and how much is acceptable and how much is unacceptable is greatly appreciated.

## Plugged Emitters in Drip Irrigation – *Gordon Johnson, Extension Vegetable & Fruit Specialist;* gcjohn@udel.edu

Drip emitters can become plugged with fine particles, mineral deposits, or biofilms. When emitters become clogged, the plants nearest the clogs will receive less water and have more water stress and grow less or be stunted. This is seen most commonly in higher density planted crops such as peppers.

A common cause of plugged emitters is water containing high levels of dissolved iron. This can cause a proliferation of iron utilizing bacteria. These bacteria form heavy biofilms on the inside of the drip tube. They also oxidize the iron in the water (as part of their metabolism) and leave behind iron precipitates that can plug emitters. Chlorination of drip lines is needed to control iron bacteria.

**From the Mid-Atlantic Commercial Vegetable Recommendations:**

"Periodic treatment before clogging develops can keep the system functioning efficiently. The frequency of treatment depends on the quality of the water source. Generally, two or three treatments per season is adequate. Irrigation water containing high concentrations of iron (greater than 1 ppm) can also result in clogging problems due to types of bacteria that "feed" on dissolved (ferrous) iron. The bacteria secrete a slime called ochre that may combine with other solid particles in the trickle tubing and plug emitters. The precipitated (ferric) form of iron, known commonly as rust, can also physically clog emitters."

"Treating water containing iron with chlorine will oxidize the dissolved iron, causing the element to precipitate so that it can be filtered and removed from the system. Chlorine treatment should take place upstream of filters in order to remove the precipitated iron and microorganisms from the system. Take care when adding chlorine to trickle irrigation systems, however, since concentration at or above 30 ppm can be toxic to growing plants."

"For managing dissolved iron and microbes in the water source, one of the following basic strategies is suggested as a starting point:

For iron treatment:

- Inject liquid sodium hypochlorite continuously at a rate of 1 ppm for each 1 ppm of iron in irrigation water. In most cases, 3 to 5 ppm is sufficient.

For bacteria treatment:

- Inject liquid sodium hypochlorite continuously at a rate of 5 to 10 ppm where the biological load is high or

- Inject 10 to 20 ppm during the last 30 minutes of each irrigation cycle or

- Inject 50 ppm during the last 30 minutes of irrigation cycles one to two times each month or

- Super chlorinate (inject at a rate of 200 to 500 ppm) once per month for the length of time required to fill the entire system with this solution and shut down the system. After 24 hours, open the laterals and flush the lines."

Another common problem in some aquifers, is well water with high levels of calcium and magnesium ("hard water"). In high water pH conditions, these can precipitate out as calcium or magnesium carbonates that will clog emitters. If you look inside the drip tubing you will see a white or chalky film. In addition, if soluble phosphorus fertilizers are put into water with high levels of dissolved calcium or magnesium salts, they can precipitate out as calcium or magnesium phosphates, also plugging emitters. Acidification of water can reduce or eliminate this problem. Also, avoid running phosphorus through the drip if you have hard water.

Inadequate filtering is another possible cause of plugged emitters. While this is most common when using surface water from ponds, ditches or streams it can also occur in wells that have fine particles in the water.

## Heat Damage in Vegetables – *Gordon Johnson, Extension Vegetable & Fruit Specialist;* gcjohn@udel.edu

The current heat wave is causing losses in vegetables and fruits. The following are some effects of high temperatures on vegetable and fruit crops.

The plant temperature at which tissue dies is around 115°F. Normally, plant temperature is just above air temperature. However, plant temperature can rise to a critical level under certain conditions. Plants have 3 major ways in which they dissipate excess heat: 1) long-wave radiation, 2) heat convection into the air and 3) transpiration.

A critical factor is transpiration. If transpiration is interrupted by stomatal closure due to water stress, inadequate water uptake, injury, vascular system plugging or other factors, a major cooling mechanism is lost. Without transpiration, the only way that plants can lose heat is by heat radiation back into the air or wind cooling. Under high temperatures, radiated heat builds up in the atmosphere around leaves, limiting further heat dissipation.

Dry soil conditions start a process that can also lead to excess heating in plants. In dry soils, roots produce Abscisic Acid (ABA). This is transported to leaves and signals to stomate guard cells to close. As stomates close, transpiration is reduced. Without water available for transpiration, plants cannot dissipate much of the heat in their tissues. This will cause internal leaf temperatures to rise.

Vegetables can dissipate a large amount of heat if they are functioning normally. However, in extreme temperatures (high 90s or 100s) there is a large increase the water vapor pressure deficient (dryness of the air). Rapid water loss from the plant in these conditions causes leaf stomates to close, again limiting cooling, and spiking leaf temperatures, potentially to critical levels causing damage or tissue death.

Very hot, dry winds are a major factor in heat buildup in plants. Such conditions cause rapid water loss because leaves will be losing water more quickly than roots can take up water, leading to heat injury. Therefore, heat damage is most prevalent in hot, sunny, windy days from 11 a.m. to 4 p.m. when transpiration has been reduced. As the plants close stomates to reduce water loss, leaf temperatures will rise even more. In addition, wind can decrease leaf boundary layer resistance to water movement and cause quick dehydration. Wind can also carry large amounts of advected heat.

Photosynthesis rapidly decreases above 94°F, so high temperatures will limit yields in many vegetables and fruits. While daytime temperatures can cause major heat related problems in plants, high night temperatures can have great effects on vegetables, especially fruiting vegetables. Hot night temperatures (nights above 75) will lead to greater cell respiration. This limits the amount of sugars and other storage products that can go into fruits and developing seeds.

High temperatures also can cause increased developmental disorders in fruiting vegetables. A good example is with pollen production in beans. As night temperatures increase, pollen production decreases leading to reduced fruit set, reduced seed set, smaller pods, and split sets. Most fruiting vegetables will abort flowers and fruits under high temperatures.

Heat injury in plants includes scalding and scorching of leaves and stems, sunburn on fruits and stems, leaf drop, rapid leaf death, reduction in growth, and lower yields. Wilting is the major sign of water loss which can lead to heat damage. Plants often will drop leaves or, in severe cases, will “dry in place” where death is so rapid, abscission layers have not had time to form.

On black plastic mulch, surface temperatures can exceed 150°F. This heat can be radiated and reflected onto vegetables causing tremendous heat loading. This is particularly a problem in young plants that have limited shading of the plastic. This can cause heat lesions just above the plastic. Heat lesions are usually first seen on the south or south-west side of stems. High bed temperatures under plastic mulch can also lead to reduced root function limiting nutrient uptake. This can lead to increased fruit disorders such as white tissue, yellow shoulders, and blotchy ripening in tomato fruits.

High heat and associated water uptake issues will cause heat stress problems. As heat stress becomes more severe a series of event occurs in plants starting with a decrease in photosynthesis and increase in respiration. As stress increases, photosynthesis shuts down due to the closure of stomates which slows or stops $CO_2$ capture and increases photo-respiration. This will cause

growth inhibition. There will be a major slow-down in transpiration leading to reduced plant cooling and internal temperature increase. At the cellular level, as stress becomes more severe there will be membrane integrity loss, cell membrane leakage and protein breakdown. Toxins generated through cell membrane releases will cause damage to cellular processes. Finally, if stress is severe enough there can be plant starvation through rapid use of food reserves, inefficient food use, and inability to call on reserves when and where needed.

Another negative side effect of reduced plant photosynthate production and lower plant food reserves during heat stress is a reduction in the production of defensive chemicals in the plant leading to increased disease and insect vulnerability.

The major method to reduce heat stress is by meeting evapotranspiration demand with irrigation. Use of overhead watering, sprinkling, and misting can reduce of tissue temperature and lessen water vapor pressure deficit. Certain mulches can also help greatly. You can increase reflection and dissipation of radiative heat using reflective mulches or use low density, organic mulches such as straw to reduce surface radiation and conserve moisture. In very hot areas of the world, shade cloth is used for partial shading to total incoming radiation and heat.

## Sulfur Deficiency in Sweet Corn and Watermelons

– *Jerry Brust, IPM Vegetable Specialist, University of Maryland*; jbrust@umd.edu

In the last few weeks several sweet corn fields as well as some watermelon and even a few tomato fields have been found with sulfur deficiencies (Figs. 1 and 2). In sweet corn, symptoms often appear as green leaves with light yellow or green striping on the newer leaves (Fig. 1). In watermelon symptoms appear as a light green or light yellowing of the leaves of newer growth (Fig. 2). In tomato, unless severe, you usually do not see any visible sulfur deficiency symptoms in the field, but fruit set and quality could be worse. Sulfur is vital to plant growth as it helps develop enzymes in plants. A deficiency in sulfur affects a plant's protein synthesis, structure, and chlorophyll production (hence why plants turn a pale green or light yellow). Overall plant development and growth are stunted without enough sulfur. Newly transplanted vegetables often have a higher mortality rate than is typical.



Figure 1. Sulfur deficiency symptoms in older (top) and younger (bottom) sweet corn

This is the fourth year that we have seen sulfur deficiencies in at least two of these three crops (it is a bit unusual to see sulfur deficiency in tomato). I have not seen consistent sulfur deficiencies in other vegetable crops over this same time period. Sulfate is relatively mobile in most soils and sulfur deficiencies can occur with heavy rainfalls. Organic matter supplies most of the sulfur to the crop, but sulfur must be mineralized to sulfate-S to be taken up by crop plants. Because mineralization is carried out by soil microorganisms, soil temperature and moisture primarily determine when and how much sulfur is made available to the crop. Excessively wet or dry conditions reduce microbial activity and reduce S availability from soil organic matter. For all the above reasons under field conditions sulfur deficiency and its symptoms can be highly variable. Although sandier soils are much more likely to be deficient in sulfur, I have seen sulfur deficient watermelon and sweet corn in soils with higher levels of clay or organic matter (2-4% OM).

There are other deficiencies that can cause striping or the general yellowing in sweet corn or watermelon respectively and only by conducting a tissue test can you be sure. Sulfur can be added to the crop in combination with several other nutrients such as ammonium or potassium and spray-grade ammonium sulfate is a good choice for foliar applications.

Figure 2. Sulfur deficiency in watermelon - foreground melons worse

# Agronomic Crops

**Agronomic Crop Insect Scouting** – *David Owens, Extension Entomologist;* owensd@udel.edu

**Soybean**
Continue scouting for spider mites and defoliators. Hot dry weather has slowed soybean growth, making plans much more susceptible to both types of pests. Further, our full season beans are in their reproductive stages when thresholds decrease. We need a canopy leaf area index value of 3.5 to 4 for full yield potential. This would mean that there are 3.5 to 4 acres of leaves for every acre of ground below. An excellent publication with photographs of what these LAI values look like can be found: https://www.pubs.ext.vt.edu/content/dam/pubs_ext_vt_edu/444/444-203/SPES-74.pdf.

**Sorghum**
Sorghum is beginning to head. There are three pests that need to be scouted for: sorghum midge, corn earworm, and white sugarcane aphid. Sorghum midge is a tiny orange-ish fly that infests flowering sorghum, and only flowering sorghum. Once pollen anthers turn orange, it is no longer susceptible to midge. Some folks use a clear Ziploc to cover the head and tap midges out. Thresholds are one midge per head with 25-30% heads blooming. Pyrethroids will do a good job on midges.

Corn earworm moths are highly attracted to flowering sorghum and will lay eggs in the head. Thresholds are 1-2 per head. One caterpillar/head can consume 5% of the yield potential. Sample 5 heads in 10 locations in the field by banging the head into a 5 gallon bucket and count any earworms, fall armyworm, or sorghum webworm. Thresholds for webworms are 5 larvae per head.

The third pest to be on the lookout for is sugarcane aphid. Last year we detected enough aphids to say that they do get up this far north. They form dense colonies on the underside of leaves, they are smooth, light yellow with black cornicles, antennae, and feet, and are small. The yellow sugarcane aphid is a seedling pest and is a larger, darker yellow aphid with long

hairs. White sugarcane aphid reproduces quickly and is resilient to pyrethroids. I do not think that it will be abundant this year in our area, but parts of Virginia's Eastern Shore have had yield limiting populations in recent years. Sugarcane aphid thresholds depend on plant growth stage; at boot to milk, thresholds are 50 aphids per leaf on 20 - 30% of plants. Look under upper and lower canopy leaves.

## Corn and Soybean Disease Update – *Alyssa Koehler, Extension Field Crops Pathologist*; akoehler@udel.edu

**Corn**

Corn in the area is at VT to R3 with some scattered reports of Grey Leaf Spot. I have found a few cases of Diplodia Leaf Streak that can look similar to other corn lesions, like those from Northern Corn Leaf Blight. Diplodia leaf streak has oval to elongated, brown lesions with yellow margins. Inside of the lesions, you will see black fungal fruiting structures called pycnidia; these are not present in lesions from Northern Corn Leaf Blight.


Figure 1. Diplodia Leaf Streak, note black dots (pycnidia) at the center of the lesion

**Soybean**

Overall disease pressure has been low in soybeans. There have been a few fields of double-crop beans with emergence issues. *Pythium* in the roots, as well as lesions from *Fusarium* on the cotyledons have been present on diseased seedlings. Downy Mildew has been observed, but it is not typically a disease that impacts yield. We have also seen a few cases of stem rot caused by the fungal Diaporthe/Phomopsis complex. *Diaporthe* spp. can cause stem canker, pod and stem blight, and late season Phomopsis seed decay. In the case of stem canker, a red-brown canker begins at a node and can extend to several nodes on the stem, sometimes girdling the stem resulting in plant death. Leaves may have interveinal necrosis and remain attached to the petioles even once they are dead and dried. Pod and Stem blight is usually most visible from R6 to R8 where black specks form in straight lines on mature stems. These raised, black dots are fungal structures, called pycnidia that house the spores of the pathogen. Warm, humid weather can favor the development of pod and stem blight. The Crop Protection Network publication *Scouting for Soybean Stem Diseases* provides some nice images and a helpful diagram for sorting through symptoms of soybean disease https://crop-protection-network.s3.amazonaws.com/publications/cpn-1002-scouting-for-soybean-stem-diseases.pdf

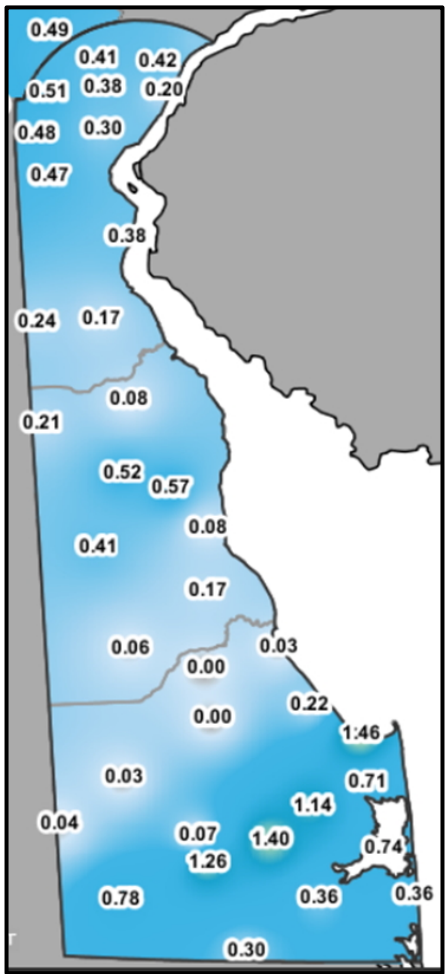
# General

## Irrigation Management: A Nice Rain for Some – Continued Drought for Others- *James Adkins, Agricultural Engineer;* adkins@udel.edu

Wednesday evening brought thunderstorms and significant rain to parts of Delaware while other areas only received wind and lightening. The storms followed a track roughly parallel to Rt 9 with farms from Laurel to Lewes receiving from ¾" – 2". Zero to a mere trace of rain fell in a band from Seaford to Primehook to the south and Harrington to Bowers to the north. Another band of rain averaging ½" passed through Woodside and Dover with folks to the north

receiving shattered showers with significant rains north of the C & D canal.

Both corn and full season soybeans are predicted to use over 0.26" per day next week. With sporadic and limited thunderstorms in the forecast, farmers are continuing to face the challenge of when to start back after a rain event. For the sandy loam soils present at UD's Warrington farm and the high predicted ET rates, corn will need irrigation on day 4 after a profile filling rain and soybeans will need irrigating 3 days after a big rain. The shallower root zone of soybean versus corn is the cause of the reduced irrigation break. Coarser soils like loamy sands should initiate irrigation 2-3 days after rain while heavier loams, silt loams and clay can take a 5 to 6-day irrigation lapse.



24 hour rainfall from DEOS for rainfall on July 17. (http://www.deos.udel.edu/)

Keep in mind that just because a farm received an 1" of rain there is no guarantee that all of it infiltrated and was stored in the soil. Thunderstorms tend to dump water faster than the soil can absorb and thus runoff from the high parts of the field to the low creates soil moisture variability and will require irrigation sooner to prevent yield loss in the high areas.

The information presented below is an example of the soil moisture status at University of Delaware's Warrington Irrigation Research Farm. Actual field values will vary greatly depending on crop stage, soil type and local rainfall. There are many tools available that provide field by field values to assist farmers in making irrigation scheduling decisions including paid services through local crop consultants, irrigation equipment manufacturer's, Climate Corp, etc and free tools like KanSched and the Delaware Irrigation Management System (DIMS) http://dims.deos.udel.edu/

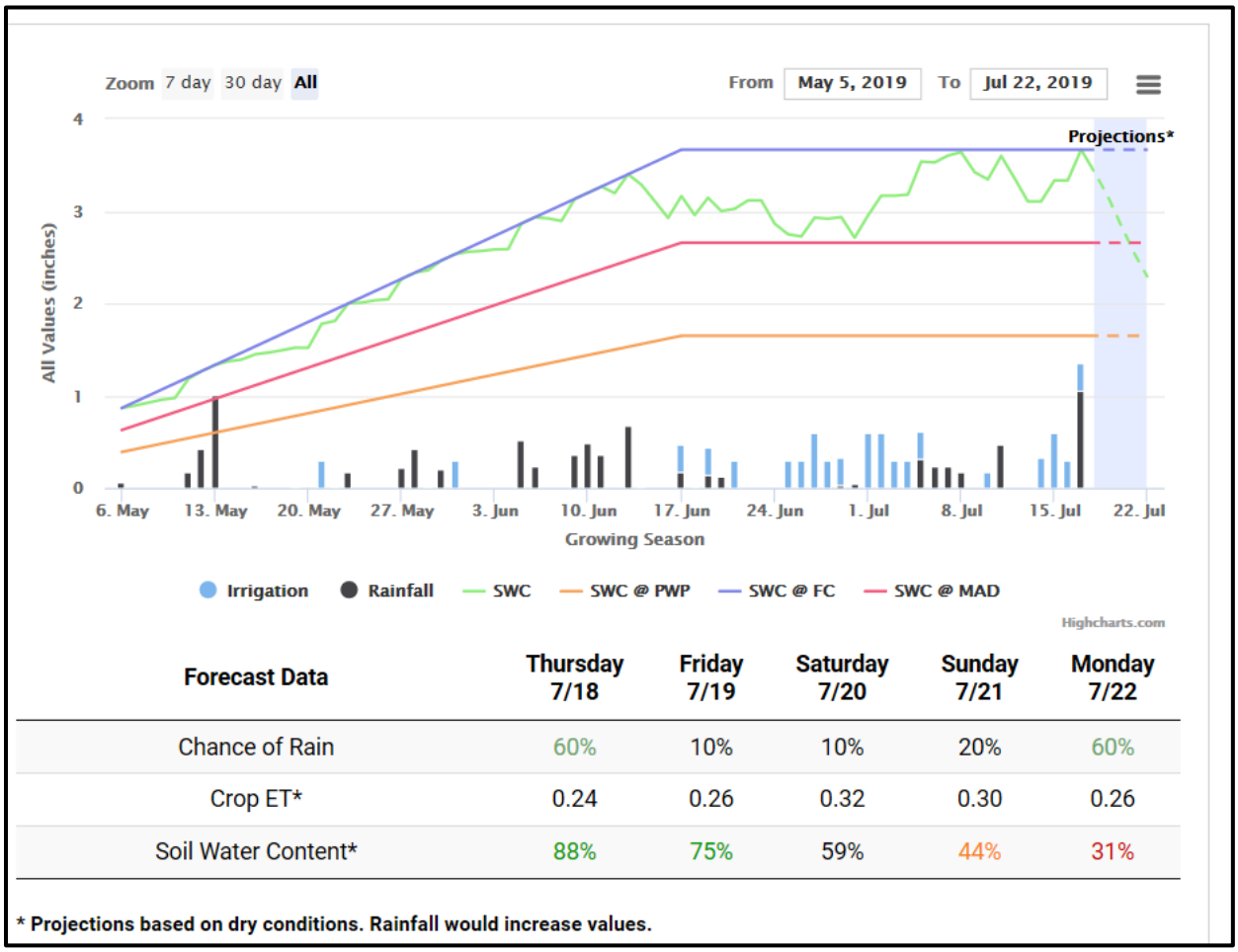
**Field Corn**

Daily corn evapotranspiration (ET) rates for April 25th planted 114 day corn at R1 averaged 0.25"/day for the past week. While the temperature has been very high with plenty of sunlight, the high humidity has kept crop ET rates under the 0.3"/day we typically see at this stage. Soil moisture sensors in the field are in line with the model predictions and have been a good confirmation that our estimated soil moisture values are correct. This field received 0.47" of rain on July 11 and 1.05" last night (July 17) in addition to 1.5" of irrigation in 5 events since last Thursday. This same field is predicted to use 0.24", 0.26", 0.32", 0.30", 0.26" for Thursday 7-18 – Monday 7/22 for an estimated daily usage of 0.27" per day for the upcoming week. These are estimated values and are no substitute for daily ET use models and field level soil moisture data.

**NOTE: Despite a profile filling rain on Wednesday night, this field will require irrigation on or before Sunday.**

At this point in the growing season most corn fields are at least into the VT – R2 stage; Crop water usage will be nearly the same from V14 until R2/blister stage. Farmers should continue to intensively irrigate through the R2 stage and gradually taper off through R3 until black layer.

**Irrigated Corn Soil Moisture Report for the UD Warrington Farm Stage R1 – DIMS Report**




| Forecast Data | Thursday 7/18 | Friday 7/19 | Saturday 7/20 | Sunday 7/21 | Monday 7/22 |
|---|---|---|---|---|---|
| Chance of Rain | 60% | 10% | 10% | 20% | 60% |
| Crop ET* | 0.24 | 0.26 | 0.32 | 0.30 | 0.26 |
| Soil Water Content* | 88% | 75% | 59% | 44% | 31% |

*** Projections based on dry conditions. Rainfall would increase values.**

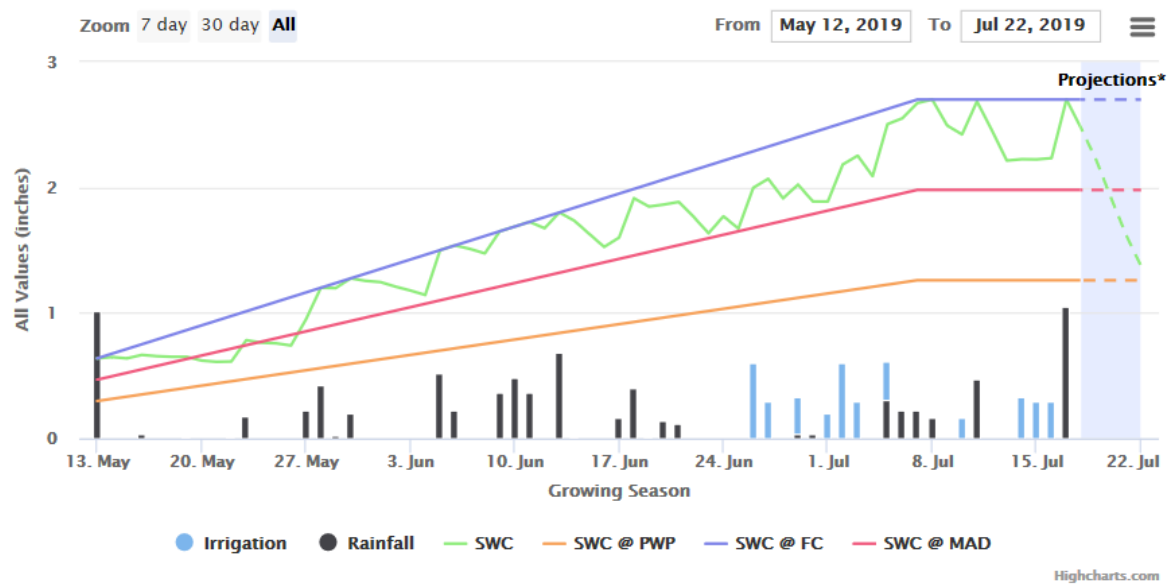
**Full Season Soybeans**

May 2nd planted soybeans at the UD Warrington Irrigation Research Farm are into the R3 stage as of July 11th. We received 1.52" of rain in 2 events and applied a total of 0.9" in 3 irrigation events over the past week. The average daily crop water use was 0.24" per day and the predicted daily ET for next week is 0.26" per day (the same amount as corn). Remember to irrigate in small but frequent doses to avoid pushing water beyond the root zone. Multiple years of soil moisture sensor data show soybeans to use water primarily from the shallow (0-8") soil profile.

**Double Crop/Late Season Soybeans**

Continue to irrigate in small amounts of around 0.2-0.3 inches to maximize canopy development. Keep in mind that irrigation that infiltrates beyond 6" will be of little benefit to the crop. Barley and early wheat beans should be using an estimated 0.18" per day.

**Irrigated Soybean Soil Moisture Report for the UD Warrington Farm Stage R3 – DIMS Report**




| Forecast Data | Thursday 7/18 | Friday 7/19 | Saturday 7/20 | Sunday 7/21 | Monday 7/22 |
|---|---|---|---|---|---|
| Chance of Rain | 60% | 10% | 10% | 20% | 60% |
| Crop ET* | 0.23 | 0.25 | 0.30 | 0.29 | 0.25 |
| Soil Water Content* | 84% | 66% | 45% | 25% | 8% |

*** Projections based on dry conditions. Rainfall would increase values.**

## Guess the Pest! Week 14 & 15 Answer: Spider Mites, Powdery Mildew and Downy Mildew

– *David Owens, Extension Entomologist,* owensd@udel.edu

Congratulation to Kathleen Heldreth, Keith McGowan, and Chris Burkhart for correctly guessing the three problems on cucurbits. The first two images were spider mites. Early spider mite infestations on watermelon do not always reveal themselves on the upper side of the leaf because of the thickness of the leaf. On the underside of the leaf, you will see a grayish stipling. By the time advanced stipling and leaf yellowing is present, extremely large populations are present. The third image had both powdery mildew and downy mildew. Both diseases are active and require specific fungicides. Kate Everts with the University of Maryland wrote some excellent posts on both diseases. Last year's can be found here: https://sites.udel.edu/weeklycropupdate/?p=12182, and this year's here: https://sites.udel.edu/weeklycropupdate/?p=13650.

Early signs of spider mites on watermelon


Advanced stipling and leaf yellowing indicate that extremely large populations of spider mites are present.


Both powdery mildew and downy mildew infecting a cucurbit leaf.

**Guess the Pest! Week 16** – *David Owens, Extension Entomologist,* owensd@udel.edu

Test your pest management knowledge by clicking on the GUESS THE PEST logo and submitting your best guess. For the 2019 season, we will have an "end of season" raffle for a $100.00 gift card. Each week, one lucky winner will also be selected for a prize and have their name entered not once but five times into the end of season raffle. A lucky winner will also receive a heavy duty sweep net.

We are starting to see leaf discoloration like the below image on vegetables, and you may see it more in the field with recent conditions. What is causing it?


To submit your answer, please go to: https://docs.google.com/forms/d/e/1FAIpQLSfU

PYLZnTRsoI46hXmgqj8fvt5f8-JI0eEUHb3QJaNDLG_4kg/viewform


# Announcements

### Field Tour of Carvel Crops Research

Wednesday, August 14, 2019 3:30-5:30 p.m.
University of Delaware
Carvel Research & Education Center
16483 County Seat Hwy
Georgetown, DE 19947

Please mark your calendars and save the date to join us for the 2019 Crops Research Tour at the University of Delaware Carvel Research and Education Center. This event will include wagon tours of agronomic and vegetable research plots. Dinner will be provided.

### Ag Horizons Conference

Thursday, August 15, 2019
University of Delaware
Carvel Research & Education Center
16483 County Seat Hwy
Georgetown, DE 19947

A lot can happen on a farm and in the farm community over the course of a year. When a new farm bill is introduced, it can be doubly eventful. In order to take stock of the past crop year and to plan for future ones, the Ag Horizons Conference aims to serve as a State of Agriculture meeting for Delmarva producers and ag influencers.

Organized by University of Delaware Cooperative Extension and the USDA Risk Management Agency, the Ag Horizons Conference will feature sessions appealing to producers of a variety of commodities, including poultry, grain, and specialty crops, and will focus on changes brought about by new farm policy. Participants include:

- Delaware Department of Agriculture
- USDA Risk Management Agency
- Farm Service Agency
- Natural Resource Conservation Service (NCRS)
- Conservation Districts
- Delaware Poultry Industry

Program includes lunch.

*Register for the Ag Horizons Conference by emailing lgw@udel.edu or decrophelp@gmail.com or by calling 302-831-2538. Registration is encouraged to ensure proper resources are available to each attendee.*

USDA
U.S. Department of Agriculture
Risk Management Agency

UNIVERSITY OF DELAWARE
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### Cut Flowers 1: Succession Planting, Harvesting Tips, & Pest Control

Sunday, July 21, 2019 1:00 – 4:00 p.m.
Hattie's Garden
31341 Kendale Rd, Lewes, DE 19958

Local, sustainable flowers are increasingly popular with farmers, at markets, and with florists! Join us at Hattie's Garden to learn the following important cut flower production skills: succession planting, harvesting techniques, and organic pest control. All experience levels are welcome! (Rain Date: July 22nd, same time, same place.)

This workshop will be led by farmer/owner Hattie Allen, who is deeply committed to growing flowers sustainably and organically. Thanks to Hattie and to the organizers of Future Harvest CASA and the University of Delaware.

https://www.eventbrite.com/e/cut-flowers-1-succession-planting-harvesting-tips-pest-control-tickets-63985426132

### Cut Flowers 2: Advanced Annuals, Post-Harvest Handling & Season Extension

Saturday, September 28, 2019 1:00–4:00 p.m.
Masterpiece Flower Farm
7945 Old Ocean City Road, Whaleyville, MD 21872

Join us at Masterpiece Flower Farm and learn how to grow advanced annuals such as Dahlias, Ranunculus, and Lisianthus. Special focus will be given to post-harvest handling practices. We will also discuss tips for season extension. All experience levels are welcome. (Rain Date: September 29th, same time, same place.)

This workshop will be led by farmer/owner Crystal Giesey, who is deeply committed to growing flowers sustainably and organically. Thanks to Crystal and to the organizers Future Harvest CASA and the University of Delaware.

https://www.eventbrite.com/e/cut-flowers-2-advanced-annuals-post-harvest-handling-season-extension-tickets-64194508503

# Weather Summary

**Carvel Research and Education Center Georgetown, DE**

**Week of July 11 to July 17, 2019**

**Readings Taken from Midnight to Midnight**

**Rainfall:**

0.46 inch: July 11
0.07 inch: July 17

**Air Temperature:**

Highs ranged from 95°F on July 17 to 88°F on July 13.

Lows ranged from 74°F on July 17 to 65°F on July 11.

**Soil Temperature:**

82.0°F average

**Additional Delaware weather data is available at http://www.deos.udel.edu/**

***Weekly Crop Update is compiled and edited by Emmalea Ernest, Associate Scientist – Vegetable Crops***