WEEKLY CROP UPDATE

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Vegetable Crops

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

Cucurbits
Begin scouting for first generation striped cucumber beetles. It takes nearly 30 days for larvae to complete development, adults starting flying around the third-fourth week of May. Adults in this generation can feed on rinds. In recent trials and bioassays conducted on Delmarva, pyrethroids have been somewhat inconsistent in controlling them. Acetamiprid, cyclaniliprole and cyantraniliprole, and carbaryl demonstrated good efficacy. Carbaryl can flare mites. The diamides cyclaniliprole (Harvanta) and cyantraniliprole (Exirel, Minecto Pro) are excellent worm products.

Scout fruit for evidence of Lepidopteran rind feeding. Worm scars tend to be larger and smooth, whereas beetle scarring tends to be more uneven, resulting in a 'dirty' look.

Spider mite counts in melon fields we have been scouting are lower this week than last.

Sweet Corn
Scout for whorl stage fall armyworm infestations. Last week we captured a couple of fall armyworm in pheromone traps. This week, scattered whorl infestations were reported in southern New Jersey.

Corn earworm captures in pheromone traps continue to be fairly low. We captured on of our first European corn borer this week in Seaford. Trap captures are as follows:

Trap Location	BLT - CEW	Pheromone CEW
	3 nights total catch	
Dover	0	15
Harrington	0	20
Milford	1	9
Rising Sun	1	28
Wyoming	0	4
Bridgeville	0	4
Concord	0	12
Georgetown	0	11
Greenwood	1	21
Laurel	0	17
Seaford	0	---
Lewes	---	19 (1 night)

Managing Phytophthora in Watermelons – *Gordon Johnson, Extension Vegetable & Fruit Specialist;* gcjohn@udel.edu

As watermelon season progresses and we see wetter weather patterns, Phytophthora blight caused by *Phytophthora capsici* (P. cap) can become a major limiting disease in watermelons. P. cap is not a fungus – it belongs to a group of organisms called Oomycetes which are more closely related to algae than fungi. Oomycete specific fungicides help control this disease in other crops such as pickling cucumbers and lima beans. However, due to the nature of the plasticulture growing systems used in watermelons, with much of a field in impervious

plastic, water collecting between the rows allows for the disease to proliferate and spread rapidly when multiple inch rainfalls occur.

Watermelon fruit can become infected at any stage of maturity, either from direct contact with the soil or from splashing rain. Initially, symptoms will appear as small water-soaked areas that quickly enlarge and can become covered in sporangia in high humidity. Sporangia-covered lesions will have a gray to white appearance. The rot will develop rapidly until the fruit is completely collapsed.

P. capsici has two mating types (called A1 and A2) that are genetically distinct. When both mating types are present in one field, they mate to produce survival structures called oospores. Oospores can survive in the soil for many years and provide the initial inoculum for disease initiation when conditions become favorable. The asexual stage of *P. capsici*, which is responsible for initiating infection, depends on water for infecting and moving between plants. Disease will almost always begin in low spots of fields or in areas that do not drain readily, such as row middles. When contaminated soils are saturated for several hours and temperatures are relatively warm, *P. capsici* will form structures called sporangia. Sporangia can directly germinate to cause disease; however, they also contain asexual, swimming zoospores that are released into the saturated soil in wet conditions. Zoospores are attracted to living plant parts in the soil and on the soil surface and swim toward them. Once they find a host plant, zoospores can germinate and infect any plant part, but in the case of watermelons, fruits readily become infected.

Oospores are spread from field to field in infested soil adhering to machinery or humans. Zoospores are spread primarily splashing water from rain, or water running through fields during rain events. If contaminated field runoff drains into an irrigation pond, that irrigation pond may become a source of inoculum and spread the pathogen throughout the crop or onto other fields.

As stated before, Oomycete specific chemicals will not fully control P. cap in watermelons. This is because once the fruit sets on the ground, the chemicals cannot reach that part of the fruit. Research has also shown that applications through the drip system are not effective at controlling the fruit rot phase of the disease. Continue foliar applications and start at first fruit set.

On a positive note, resistance to P. cap has been found in watermelon germplasm and breeding lines have been released from the USDA research program in Charleston S.C. (see https://cuccap.org/breeding/watermelon/#phytophthora) However, it will take several years to get this resistance into commercial varieties.

Current chemical control recommendations are shown below:

Code	Product Name (*=Restricted Use)	Product Rate	Active Ingredient(s)	PHI (d)	REI (h)	Bee TR
Apply one of the following fungicides and tank mix with fixed copper at labeled rates when conditions favor disease development (for suppression only). Materials with different modes of action (FRAC codes) should always be alternated to reduce the chances for fungicide resistance development:						
49 + 40	Orondis Ultra 2.33SC	5.5 to 8.0 fl oz/A	oxathiapiprolin + mandipropamid	0	4	--
49+M05	Orondis Opti[1]	1.75 to 2.5 pt/A	oxathiapiprolin + chlorothalonil	0	12	--
40	Revus 2.08F	8.0 fl oz/A	mandipropamid	0	4	--
40 + 45	Zampro 525SC	14.0 fl oz/A	dimethomorph + ametoctradin	0	12	--
43	Presidio 4SC[2]	4.0 fl oz/A	fluopicolide	2	12	L
M03+22	Gavel 75DF	1.5 to 2.0 lb/A	mancozeb + zoxamide (**note**: some cultivars are sensitive to mancozeb)	5	48	--
21	Ranman 400SC	2.75 fl oz/A (**Do not apply with copper**, see label for details)[2]	cyazofamid	0	12	L
40	Forum 4.17SC	6.0 fl oz/A	dimethomorph	0	12	N
22	Elumin 4SC	8 fl oz/A	ethaboxam	2	12	--
M05+22	Zing! 4.9SC[1]	36.0 fl oz/A	chlorothalonil + zoxamide	0	12	N

[1]Tank mixes of additives, adjuvants, and/or other products may result in crop injury.
[2]Presidio may also be applied through the drip irrigation (see supplemental label).
[3]Ranman should be tank mixed with an organosilicone surfactant when disease is severe, or a non-ionic surfactant or blend of organosilicone and non-ionic surfactant disease is moderate or light.

Growers must also use cultural controls to manage this disease. The following are guidelines for cultural control of Phytophthora blight in watermelons:

1) Practice long rotations in fields with a history of P. cap infections. Plant non-host crops such as corn, small grains, soybeans, or brassicas in these fields for at least 3 years (4-5 years would be ideal). Remember that P. cap also infects tomato, pepper, eggplant, cucumbers, squash, pumpkins, melons, lima beans, snap beans and a number of weeds such as purslane, black nightshade, and Carolina geranium.

2) Avoid introducing Phytophthora into uninfected fields. After working in Phytophthora-infested soil, wash soil from equipment. Always work in clean fields before working in infested fields.

3) Water management: Phytophthora requires saturated soils for infection. Use the following methods to encourage drainage and avoid prolonged soil saturation.

- Be careful to not overwater and check irrigation system regularly for leaks and fix them.
- Break up hardpan and encourage drainage by using a V-ripper or other sub-soiling tool in row middles. Do this pre-planting and as needed during the season.
- Avoid soil compaction. Use farm machinery as little as possible throughout the season and never work in fields when the soil is wet.
- Make sure water can flow out of the field. Create breaks in raised beds and clear away soil at the ends of rows to prevent damming.
- Leave windbreak stubble between each row to reduce splash dispersal of inoculum. Inoculum can move rapidly across plastic mulch and bare soil.
- Shape row middles in a V pattern so that water drains to the middle.

4) Limit impervious surfaces (plastic mulch covered area)

- Use narrow width plastic mulch in high, dome-shaped raised beds of at least 9 inches.
- Increase row width. Avoid 6-7’ rows and switch to 8-10’ row widths

5) Consider systems that leave plant residue or cover in the row middles

- Consider mulch based no-till systems for later plantings that do not use plastic mulch
- Use every row rye windbreaks that are planted early to give the most mulch after rolling in the growing season.
- Consider living mulch row middles. We are experimenting with ladino clover row middles that stay throughout the season.

P. cap infected watermelon. Note large lesions covered with white sporangia.

Part of this article was adapted from https://ag.umass.edu/vegetable/fact-sheets/phytophthora-blight

Pollination-Related Problems in Vegetables

– *Gordon Johnson, Extension Vegetable & Fruit Specialist;* gcjohn@udel.edu and *Emmalea Ernest, Scientist - Vegetable & Fruit Crops*; emmalea@udel.edu

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We are seeing quality problems in many fruiting vegetables. Often this is due to poor pollination.

Cucurbits

Misshapen fruit is a sign of incomplete pollination in cucurbits. This includes bottlenecked fruit; fruit with a pinched end; crooked or lopsided fruit; fruit small in size or nub-like; and fruits with prominent lobes or that are triangular in shape. Causes of incomplete pollination may be inadequate pollen transfer by pollinating insects; inadequate pollen sources (pollenizers); or hot, dry weather that reduces pollen viability or that desiccates flower parts during pollination. Research has shown that a minimum of 1,000 grains of pollen are required to be distributed over the three lobes of the stigma of the female flower of a watermelon to produce a uniformly shaped fruit.

Hollow cavities in fruit and vacant seed cavities are related to lack of seed formation, again traced back to poor pollination. Fruit tissue separation, such as hollow heart in watermelon, has also been linked to inadequate pollination and may be worsened by rapid fluctuation in environmental conditions affecting fruit development.

Each year we see pumpkin fields with poor fruit set or fruit carry. Remember that in larger pumpkin sizes, each plant will only carry 1-2 fruits. The large vining plants also need considerable space – 25 to 50 square feet per plant. While planting Jack-o-lantern types at higher densities might at first seem to be a way to achieve higher yields, interplant competition will increase, and you can decrease fruit carry because of this competition.

A major reason for poor fruit set in some years is high temperatures during flowering in July. Day temperatures in the 90s or night temperatures in the high 70s will cause flower and small fruit abortion. For pumpkin growers that do wholesale and start shipping right after Labor Day, this will limit early pumpkin availability. Varieties vary considerably in their ability to tolerate heat and to set under hot conditions. Inadequate irrigation and excessive water stress can also reduce fruit set, increase abortions, and reduce fruit carry. High temperatures and water stress reduce photosynthesis and the ability of the plant to carry fruits. Drought can also cause a higher-than-normal male/female flower ratio, thus affecting the number of fruits per plant.

Sweet Corn

Sweet corn growers often see quality problems related to poor pollination as a result of high temperatures. This problem is more severe in less stress tolerant varieties and where irrigation is inadequate.

In corn, silk elongation begins 7 to 10 days prior to silk emergence from the husk. Every potential kernel (ovule) on an ear develops its own silk that must be pollinated for the ovary to be fertilized and develop into a kernel. The silks from near the base of the ear emerge first and those from the tip appear last. Under good conditions, all silks for an ear will emerge and be ready for pollination within a span of 3 to 5 days and this usually provides adequate time for all silks to be pollinated before pollen shed ceases.

Pollen grains are borne in anthers, each of which contains a large number of pollen grains. The anthers open and the pollen grains pour out after dew has dried off the tassels. Pollen is light and can be carried considerable distances (up to 600 feet) by the wind. However, most of it settles within 20 to 50 feet. Pollen shed is not a continuous process. It stops when the tassel is too wet or too dry and begins again when temperature conditions are favorable.

Under favorable conditions, a pollen grain upon landing on a receptive silk will develop a pollen tube containing the male genetic material, develop and grow inside the silk, and fertilize the female ovary within 24 hours. The amount of pollen is rarely a cause of poor kernel set. Each tassel contains from 2 to 5 million pollen grains, which translates to 2,000 to 5,000 pollen grains produced for each silk of the ear shoot.

Poor seed set is often associated with poor timing of pollen shed with silk emergence (silks emerging after pollen shed). Shortages of pollen are usually only a problem under conditions of extreme heat and drought. Extreme heat and desiccating winds can affect pollen germination on silks or pollen tube development leading to poor seed set. Insects that clip silks during pollination can cause similar problems.

Tomatoes
In tomatoes, day temperatures over 95°F and/or night temperatures in excess of 80°F can cause pollination problems due to reduced pollen production, reduced pollen viability, or reduced pollen germination or pollen tube production. This can lead to flower drop, smaller fruit, misshapen fruit, or reduced gel formation inside the fruit producing hollow areas. To manage these pollination related problems in tomatoes, use "hot-set" type tomatoes bred for better production under heat conditions. Use hot-set varieties for plantings where high temperatures are expected during pollination.

Beans
In snap beans and lima beans, plantings that flower and set pods during summer conditions when night temperatures are high (> 68°F) will be susceptible to reduced sets and yields, split sets, small pods, and misshapen pods. Most of our currently grown lima bean varieties and many commercial snap bean varieties are susceptible to heat stress related yield losses due to reduced pollen production when nighttime temperatures are high before and during flowering. This is why bean crops are planted in certain periods to avoid pollination related losses (snap beans planted for spring and fall crops but avoiding summer crops, lima beans planted in June and early July for fall harvest). Some heat tolerant snap bean varieties are available, including PV 857, Bridger and Usambara. Small seeded lima beans are more heat tolerant than the large seeded Fordhook and pole types (i.e. Dr. Martin).

Potential Vegetable Problems from Heavy Rains

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

This past week we had thunderstorms come rolling through parts of the mid-Atlantic region. These storms often had damaging winds associated with them, but what might be worse is they dropped tremendous amounts of rain in a very short period of time. Some fields received 3-5 inches of rain. This level of rain can lead to several problems in the coming weeks in vegetables.

One problem is flooded fields and standing water, possibly for days. This is occurring and is predicted to occur more frequently not only in our area but throughout the Midwest. There are physiological effects on plants that occur in a field when there is standing water for any length of time, but there are other problems that could occur when growers use grafted plants to protect their crop from soil diseases.

Grafting vegetable crops has increased dramatically in the last 10 years to the point where most growers are producing at least one grafted vegetable crop. Most grafting is done to manage a soil disease problem such as Fusarium wilt, Fusarium crown and root rot, southern wilt, corky root rot or root knot nematodes. In the past when growers were faced with a soil disease problem they would fumigate with methyl bromide (MBr). When MBr was removed growers turned to grafting preferred scions such as an heirloom tomato variety that has no Fusarium wilt resistance onto root stocks with resistance to that disease. The problem is, and it has become yearly that I see it, when we have one of these heavy down pours and the field floods and the flood waters become high enough (or plants are too low in the plant hole) to over-ride the graft on the plants and the scion becomes infected with the disease the root stock is resistant to (Fig. 1).

Another potential problem is when flood waters sit in the field for 48-72+ hrs. and various root rots caused by *Rhizoctonia* or *Pythium* species infect the grafted root system which is not resistant to these pathogens. At other times when a tomato plant sits in water-logged soil for

days it starts to put out adventitious roots and these roots can develop from the base of the scion when grafted to some rootstocks. These adventitious roots can then come into contact with the soil and introduce soil-borne pathogens into the scion.

The frustrating part for growers in all of this is that this little 2-3-hour event in the 5-month or more production cycle of this crop could disrupt much of the work the grower has put into managing the crop. Bottom line is that grafting is a great way of managing some soil-borne diseases for our vegetable crops and has become very common place as a tool growers can utilize. However, even if growers use grafted tomato or cucurbit plants, they need to understand that they may not be "home-free" from these soil diseases and need to include some practices that help alleviate the possibility of flooded fields. One thing that can be done now is to be sure you have the best drainage for a field so that water from downpours can be moved off of saturated ground more quickly. And it may be practical in the future to increase the size of beds from 1-3 inches to 6+ inches to prevent flood waters from over-topping them.

Figure 1. Row of grafted heirloom tomatoes wilting due to a soil disease in a briefly flooded field.

Fruit Crops

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

Grapes
Continue scouting for potato leafhopper and Japanese beetle. Leafhoppers are susceptible to pyrethroids, while Japanese beetles are best controlled by Carbaryl (watch out for flaring mites, do not apply in very hot sunny conditions) followed by Imidan, Avaunt, Assail and Neem.

We captured our first grape berry moths of the season last week. Scouting recommendations from Cornell are to visually inspect 50 clusters in 4 locations in the vineyard and treat when injury approaches 6% of the clusters. Avaunt will also control grape berry moth caterpillars, along with pyrethroids which curiously are not labeled for Japanese beetles in grapes but are for other crops.

Small Fruit
Spotted wing drosophila catches continue to increase where we have traps. Expect numbers to continue rising as more and more wild hosts begin to produce (primary hosts right now are blackberries). Treatment options, depending on crop and preharvest interval, include Cormoran, Lannate, pyrethroids, Imidan, Verdepryn, Exirel, Malathion, Delegate and Entrust. Clean pick fruit often. Frequent fruit picking can help reduce the amount of time females have access to fruit. Remove and destroy fallen fruit or unmarketable fruit by placing in a clear plastic bag in the sun. Harvested fruit should be refrigerated promptly to stop larval development.

Blackberry Damage and Disorders – *Gordon Johnson, Extension Vegetable & Fruit Specialist;* gcjohn@udel.edu

Blackberries are being harvested throughout the region currently. The blackberry is a composite fruit with many tiny berries (druplets) attached to a receptacle. These druplets are subject to damage during the ripening period.

The following are some common problems with blackberries during fruiting:

Stink Bug Damage
Stinkbugs feed on the fruit receptacle (the white part at the center of the fruit) and in doing so damage druplets as they insert their mouthparts. Stinkbugs may feed on green, red or black fruit.

Feeding results in only localized damage to one or two druplets most commonly. A secondary type of damage can occur if the stink bug injects its "stink" into the fruit while it is feeding. This may result in a blackberry fruit that can “taste like a stink bug smells”.

Stinkbug damage in blackberry.

Sunscald
Sunburn of fruit is commonly seen when daytime temperatures exceed 90 ˚F. At these temperatures fruit in direct sunlight may reach temperatures that exceed the air temperature by several degrees. When this occurs the fruit is essentially boiled by the sun. Symptoms include druplets that look “blanched” or “cooked”.

Most commonly, symptoms are present on only the side of the fruit exposed to the sun and the shaded side of the fruit will not have any damage.

Prevention methods include closely picking berries every few days, encouraging good plant health so that there is sufficient leaf cover to protect berries from the sun and orienting the trellis to shade the fruit for most of the day.

Sunscald in blackberries

White Druplet
White druplet is associated with a drop in humidity and an increase in temperature. As this happens there is less moisture in the air to deflect solar radiation from directly contacting the berries. This increased solar radiation is blamed on individual or groups of druplets turning first white and then later brown in color.

This disorder is often a problem early on in the season and may lessen as the season progresses. Orienting the trellis to shade the fruit for most of the day is a method to prevent this disorder on susceptible varieties.

White druplet disorder.

Information in this article is from What Is Going On With My Blackberry Fruit? by Amanda McWhirt - June 22, 2017, University of Arkansas
https://www.uaex.edu/farm-ranch/crops-commercial-horticulture/horticulture/ar-fruit-veg-nut-update-blog/posts/fruitdisorders.aspx

Agronomic Crops

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

Alfalfa
Continue scouting for blister beetles in flowering alfalfa and as well as potato leafhopper. In the alfalfa recommendations page, there is an economic threshold table developed by Penn State for potato leafhopper. Remember that with potato leafhopper, early harvest is also an option. Harvest will destroy most of the nymphs and the adults will leave the field. If there are multiple 'cuttings' in a local farmscape or if there are snap beans nearby, scout those crops after an infested field is cut.

Pasture Grass
Begin monitoring for true armyworm. The threshold used in other states for armyworm is around 2-3 per square foot, depending on crop growth and value. During the day, it will be low in the canopy or hiding under debris but will come up in the evening and overnight hours. They are rather sporadic, but can quickly defoliate a field when present in large numbers. They are susceptible to pyrethroids.

Soybean
Full season soybean fields are at R2. At this point, our defoliation thresholds begin to decrease. The primary defoliators present are leaf feeding worms and grasshoppers. We have had variable efficacy with pyrethroids in 2019 and 2020 trials. The biggest curiosity active in some fields right now is green stink bug. We have had a large green stink bug flight this year, and near-threshold (5 per 15 sweeps) populations have been reported from R2 soybean. At this stage they are not an immediate threat to the crop, but may need to be controlled between R3 and R4. I suspect that lower thresholds may be justified in Plenish soybean, but do not have hard research to back that up. Remember that stink bugs tend to aggregate in fields, especially close to woods (where green stink bugs develop their first generations). Pay attention to wooded edges, especially small fields with a large wooded perimeter, and woods that have a lot of wild cherry, maple, and tree of heaven. Green stink bugs are susceptible to pyrethroids, brown stink bugs are more difficult to kill with pyrethroids, and the best pyrethroid for brown marmorated stink bugs is bifenthrin.

Together with UMD extension ag agent Alan Leslie and extension entomology specialist Kelly Hamby, we have updated a Dectes Stem Borer fact sheet. For right now, it can be found here: https://extension.umd.edu/resource/dectes-stem-borer-management-soybeans-fs-1196.

Field Corn
Many corn fields are at VT or R1. Scout these fields for brown stink bugs. You do not have to look at the entire plant, brown stink bugs are going to concentrate around the ear zone. Fields at V14 to VT with 10 or more stink bugs present on 100 plants are above threshold, once silking begins to about R2, the threshold rises to 28 bugs per 100 plants. More information and management considerations can be found here: https://corn.ces.ncsu.edu/stink-bug-management-in-corn/.

If you do not observe threshold level stink bugs, scout for grasshopper defoliation and silk feeding. If neither pest is present in concerning numbers, an insecticide is very unlikely to benefit the crop even if tank mixed with a fungicide.

Western corn rootworms are now active. Fields that were in corn in 2021, are in corn in 2022, and will be in corn in 2023 should be scouted between now and late July to assess for potential concern in 2023. Western corn rootworm lay overwintering eggs in corn and larvae feed on corn roots in the spring. Crop rotation breaks this lifecycle. Insecticide application to an infested field is unlikely to be of benefit for next year. Thresholds used out West are 1 beetle per plant.

Soil Moisture Through July 4th - *Jarrod O. Miller, Extension Agronomist*, jarrod@udel.edu

It should have been obvious from observing rainfed fields or dry corners, but our soil moisture has steadily fallen across the region since May (Figure 1). Updated information on soil moisture only went through July 4th as of writing this article, so I can't be sure what statewide rainfall may have done to bring soils back to balance. According to Figure 1, most of Sussex County has a volumetric water content of 0.15 or less.

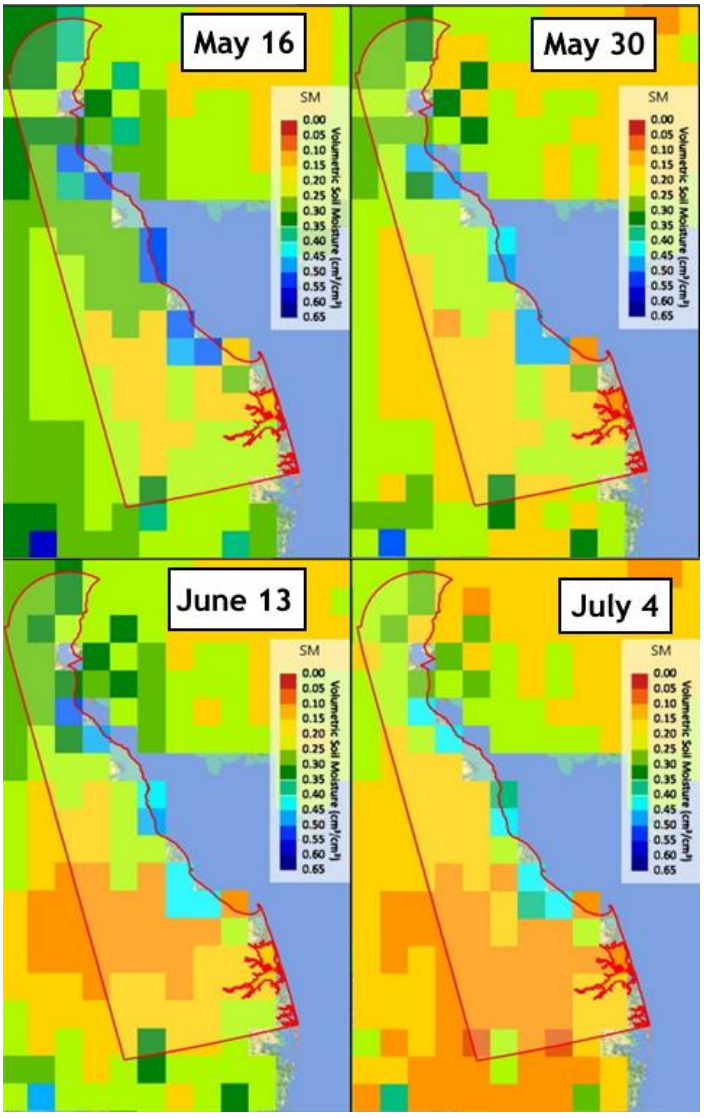


Figure 1. Soil moisture continued to dry from May through July 4th (prior to this week's rainfall).

Over the past three years in Georgetown, the pattern of soil moisture has been the same (Figure 2). A steady drop occurs from April until the beginning of July, when corn begins to pollinate and soybeans begin to flower. However there are differences in how we get to this point. 2021 was very dry in late May, but saw significant moisture in June, while 2020 and 2022 maintained moisture contents above 0.1 for most of May. It is not unusual to have drier soils in early July, but since both corn and beans are entering reproductive stages, any field that can be irrigated will help reduce stress and maintain yields.

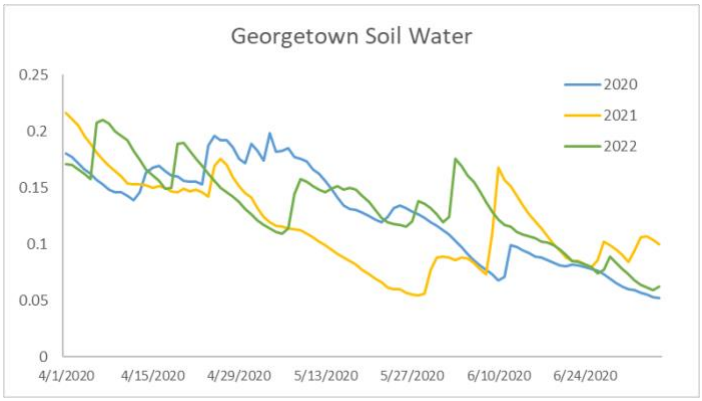


Figure 2. Soil moisture in Georgetown April 1st through July 6th (ignore the 2020 year on the x-axis).

Corn Disease Identification – *Alyssa Koehler, Extension Field Crops Pathologist*; akoehler@udel.edu

As corn is beginning to tassel, it is a good time to scout fields to decide if a fungicide will be applied. While you are out scouting, here are some tips for sorting out pathogens.

Grey Leaf Spot

Grey leaf spot (GLS) is our most common foliar disease of corn. Symptoms usually begin on lower leaves as small, tan, rectangular lesions with a yellow halo. When lesions are young, they can be difficult to distinguish from other common corn foliar diseases. As lesions mature, they become more diagnostic. At maturity, lesions are grey to tan in color, with a long rectangular shape (Figure 1); partially resistant hybrids can have more jagged margins than lesions on susceptible cultivars. Lesions often join to form large necrotic areas under favorable

environmental conditions. Yield reductions are typically observed when lesions are present on the two leaves below the ear leaf or higher, so these are the leaves to pay close attention to when scouting. If over 50% of plants have lesions on 5% or more of this leaf surface (flag leaf or 2 below), you may want to consider a fungicide application. If applying a fungicide, VT/R1 timing has shown the greatest chance of economic return for GLS. The 2022 Fungicide Efficacy for Control of Corn Diseases, provides ratings of product performance across multiple diseases based on trials conducted by Extension specialists across the country.

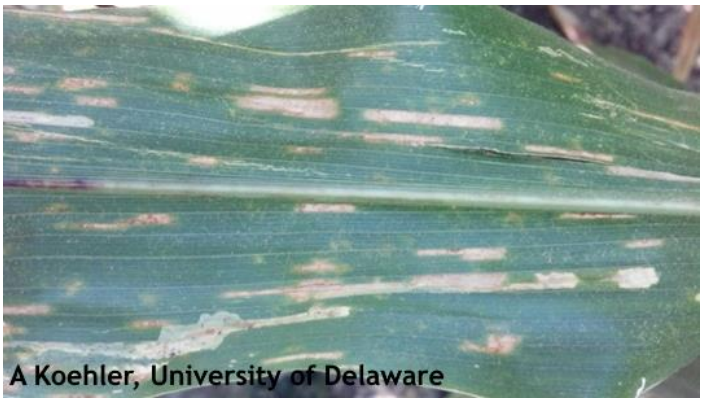


Figure 1. Rectangular lesions of Grey Leaf Spot on Corn

Curvularia Leaf Spot

Curvularia leaf spot is a new disease that was first observed in the region at the end of 2020. Lesions will have a brown border with a yellow halo that can look very similar to the start of a GLS lesion. However, these lesions will usually stay small and round, while GLS lesions will continue to expand to a rectangular shape (Figure 2). Lesions can be scattered or in dense groups. At present, this disease is not associated with notable yield loss and foliar fungicides are not labeled for management of Curvularia leaf spot.

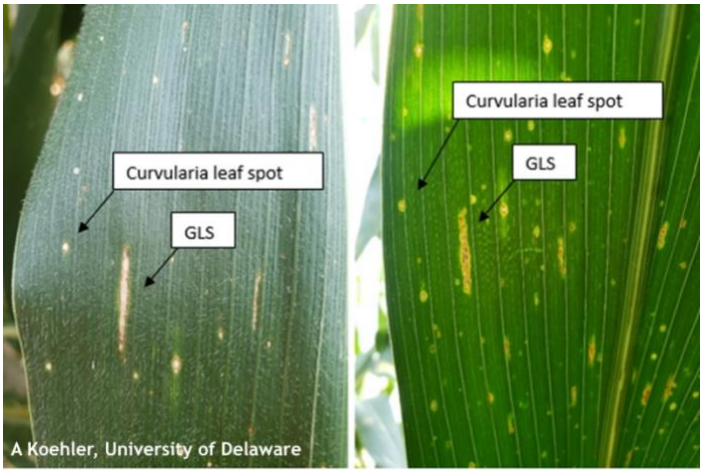


Figure 2. Curvularia leaf spot v. GLS on the upper (left) and lower (right) corn leaf

Northern Corn Leaf Blight

Northern Corn Leaf Blight (NCLB) is present in the regions at low levels, often showing up later in the season. Like many of the foliar pathogens, it is favored by prolonged wet weather and canopy moisture. These lesions will be oblong to cigar shape (Figure 3).

Figure 3. Northern Corn Leaf Blight lesions

Diplodia Leaf Streak

Diplodia leaf streak can be observed occasionally in the region, most often in fields with corn on corn rotation. These lesions can look similar to NCLB, but inside of the lesions you will see black dots called pycnidia that contain spores of this fungus (Figure 4).

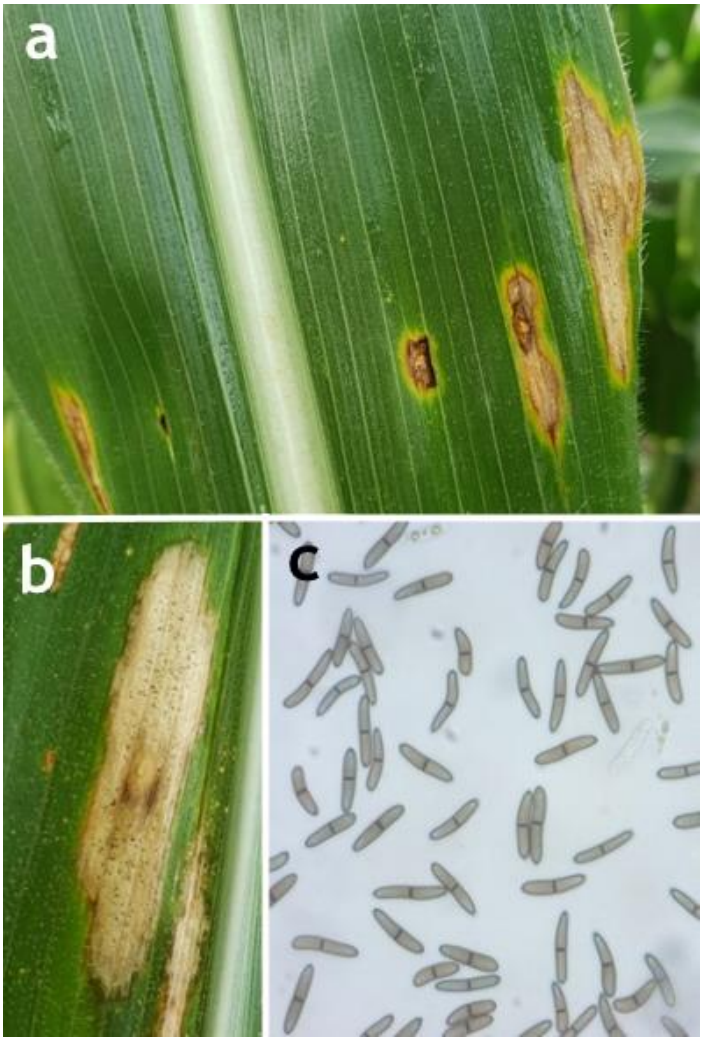


Figure 4. Symptoms of Diplodia leaf streak (a), close up of a lesion with black pycnidia (b), pill-shaped spores of *Stenocarpella maydis* (c)

Tar Spot

As you are out scouting this year, you will also want to keep an eye out for **Tar Spot**, a foliar disease caused by the fungus *Phyllachora maydis*. It first showed up in northern Illinois and Indiana in 2015 and was found in Lancaster County at the end of the 2020 season and continued to spread to surrounding PA counties in 2021. To date, this disease has not been reported in DE or MD. The fungus produces small, raised, black bumpy lesions that look like specks of tar, giving it the common name of tar spot (Figure 5). These structures known as stroma can be on the upper or lower leaf surface and do not wipe off the corn leaf. In severe cases, lesions may also be observed on the leaf sheaths, husks, and tassels. Tar spot is most often observed after silking, but can appear earlier, particularly in areas where it is established. If you suspect you have Tar Spot, please contact your county Extension agent or submit a sample to the UD plant diagnostic lab for confirmation.

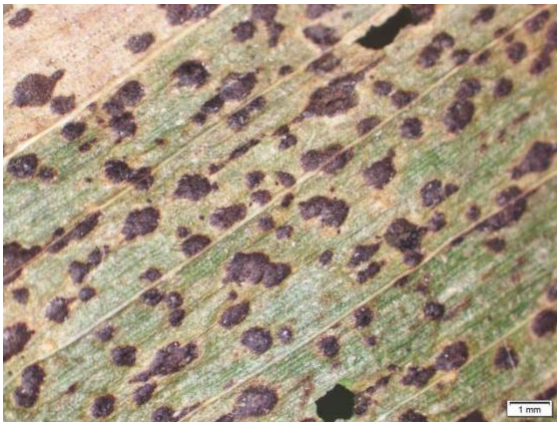


Figure 5. Slightly raised, black stroma of *Phyllachora maydis* (https://cropprotectionnetwork.org/publications/an-overview-of-tar-spot)

Summer Annual Forage Establishment Budgets

– *Nate Bruce, Farm Business Management Specialist*, nsbruce@udel.edu

Livestock grazing in the Mid-Atlantic region presents unique challenges for producers because of the geographic location (humidity, forage varietal selection, etc.). Regional producers have started to incorporate warm season summer annual grazing forages in grazing systems for annual production because cold season grasses' growth falters in the summer months. University of Delaware has created establishment budgets for several summer annual grazing forage options commonly found in the Mid-Atlantic region (sorghum, sudan, sorghum-sudan, and pearl millet). The budgets do not contain machinery expenses for haying and creating silage because these machinery expenses can vary considerably from operation to operation. Also, many producers may graze summer annuals and not hay their fields or cut for silage. All forage options have a no-till budget and a conventional tillage budget. The associated PDF has all the budget options. An

excel sheet that can be downloaded on the University of Delaware website is forthcoming.

General

Root Knot Nematode in Field Crops and Vegetables – *Alyssa Koehler, Extension Field Crops Pathologist*; akoehler@udel.edu

Root knot nematodes (RKN) are plant pathogenic roundworms that live in the soil and feed on plant roots. They are favored by sandy soils found across much of DE and eastern shore MD. There are multiple species of RKN, the southern root-knot nematode (*Meloidogyne incognita*) is the most common across Delaware and can be yield limiting to soybeans, lima beans, snap beans, watermelons, cantaloupes, cucumbers, and a wide range of others hosts. With such a big host range, RKN populations can become very high and turn into chronic pests within fields. As the name implies, root knot nematodes cause large, irregular growths called galls on roots (Figure 1). Root knot nematodes overwinter in the soil as eggs. When susceptible plants are planted, root exudates will trigger hatching and juvenile nematodes will move towards the root tip to establish a feeding site (gall). The nematode remains attached to the root and will lay eggs that hatch and infect more roots as long as soil temperatures are favorable. The lifecycle from egg to reproduction can be as short as 21-28 days allowing multiple generations to occur within a single growing season. Symptoms from RKN include stunting, reduced vigor, and wilting that can go overlooked or be attributed to other issues. To determine if plants are infected with RKN, roots must be inspected for galls, knots, or swellings. In soybeans (Figure 1), galls can distinguished from beneficial nitrogen fixing bacterial nodules by splitting open a structure. When split, galls are colorless to milky white inside, while nodules are pink. Nematode damage often appears patchy within the field and plants are typically most susceptible to damage at the seedling stage. Soil samples for nematode analysis can be collected from areas where damage has been observed in the past or areas where nematodes are suspected. The Koehler lab is conducting nematode surveys across the state, if you would like to be added to the survey, please contact akoehler@udel.edu.

Figure 1. Severe root galling on soybean caused by root knot nematode

Management of RKN is best achieved prior to planting. Preventative strategies can include rotation with small grains, variety selection when available, select cover crops, using transplants free of nematodes, nematicides, and soil fumigants. Research has shown some reduction in nematode populations following soil incorporation of large amounts of organic

matter, such as sorghum-sudangrass green manure in combination with poultry compost. Some rapeseed cultivars, such as 'Dwarf Essex' and 'Humus' also are suppressive to nematode populations. In vegetable production, pre-plant fumigants can include Telone or Vapam. Once a crop has been established, management options are less effective. Vydate L can be applied to cucurbits at 0.5 to 1.0 gal/A and incorporated into top 2-4 inches of soil, or at 2.0 to 4.0 pt/A applied 2 weeks after planting and repeated 2-3 weeks later. Velum Prime, which is in a different chemical class, can be applied to cucurbits at 6.5 to 6.84 fl oz/A through drip irrigation at 5-day intervals (see label for details). Symptoms become most apparent when plants are under stress, providing adequate nutrition and moisture to reduce plant stress can somewhat mitigate the damage observed.

NRCS Offers Conservation Options to Help Farmers Navigate Changes

Recent global events have caused shifts in the agricultural industry. If you are a producer that is considering changes to your crop management and rotations this fall or next year, the USDA Natural Resources Conservation Service (NRCS) is here to help you navigate conservation options. Here are some beneficial ways that conservation can improve your operation's productivity, the environment, and your bottom line.

Soil Health
Soil health conservation practices, such as reduced till, no-till, cover crops, and residue management, can improve soil organic matter which makes your soil and the plants you grow healthier. Healthier soil can absorb and retain more water for longer periods of time, making your farm more efficient with water usage and nutrient use efficiency. Conservation tillage systems, such as reduced till and no-till, can also reduce fuel use. By using proven soil health practices and systems, producers can increase the health of their soils and reduce the need for expensive inputs like nutrients and pesticides.

Irrigation Efficiency
NRCS can help you improve your irrigation efficiency to ensure each drop of water is used wisely. Efficient water usage on your farm can reduce expenditures for energy, chemicals, and labor; and enhance revenues through higher crop yields and improved crop quality. Funded conservation practices include conversion to more efficient irrigation systems, such as micro-irrigation or subsurface drip irrigation, installation of irrigation pipeline, irrigation water management, structures for water control, and flow meters. Tools like drip irrigation, which provides water precisely to where and when it's needed, can achieve greater precision with flow meters and soil moisture sensors.

Precision Ag/Nutrient Management
NRCS technical and financial assistance for precision agriculture allows producers to use less fertilizer without reducing yields, saving farmers money over time and extending critical products in short supply worldwide.

Change is the only constant and NRCS is ready to help you further promote land and water stewardship should changes arise. We have a team of professional conservation planners who can work with you to apply the most effective practices in the best places to achieve optimal results. NRCS offers both technical and financial assistance to support your unique conservation and business goals.

Contact your local USDA Service to learn how NRCS can help you improve the health and productivity of your agricultural land. To find the USDA Service Center closest to you, visit www.nrcs.usda.gov and click on the Contact Us tab.

USDA is an equal opportunity provider, employer and lender.

Announcements

2022 Beginning Farmer Training Program

The Delaware Beginning Farmer Program is for new and beginning farmers working in small-scale vegetable and/or fruit production. Through hands-on training, demonstrations, workshops, field trips and farm tours, as well as self–study, growers will learn and grow with Delaware Cooperative Extension, and other invited agriculture industry professionals.

Although not limited to the following topics, this training will explore the fundamentals of soil fertility and health, basic crop production, integrated pest management, and business planning and development. This training will also provide an excellent networking opportunity.

Sessions are covered by one affordable registration fee of $75. Sessions are held at Fischer Greenhouse on the College of Agriculture and Natural Resources' campus in Newark, unless otherwise noted.

Wednesday, September 14, 6-8 pm, Course Orientation, Soil Health

Wednesday, September 28, 6-8 pm, Variety Selection

Saturday, October 1, 9-11 am, Hands- On Planting, Setting up an Indoor Seed Starter Unit

Wednesday, October 12, 6-8 pm, Small Farm Business Planning

Saturday, October 15, 9-11 am, Field Trip to Against the Grain Farm at William Penn Farm

Wednesday, October 26, 6-8 pm, Weed Identification and Management, Small Scale Irrigation

Wednesday, November 2, 6-8 pm, Integrated Pest Management: Insect and Disease Pests

Saturday, November 12, 9-11 am, Field Trip to Worrilow Hall Labs, UD Fresh to You

Wednesday, November 16, 6-8 pm, Delaware Beginning Farmer Resource Panel with DDA, NRCS, Farm Bureau and others

Register online at: https://www.pcsreg.com/2022-beginning-farmer-training-program

National AgrAbility Training Webinars

Each webinar begins at 2:00 p.m. EDT on the given Thursday. For session descriptions and more information, visit ***http://www.agrability.org/ntw-encore/***.

July 21: "Becoming an Informed Champion and Collaborator with Behavioral Health"

August 4: "Farm Rescue - Helping Farm Families in Crisis"

August 18: "Vision Solutions for Farmers"

September 1: "Working with Capstone Students to Augment AgrAbility Services"

September 15: "Managing Stress on the Farm"

September 29: "Making Lemonade When Outreach Events Hand You LEMONS!"

October 13: "Build Resilience into Your Farm: Let Nature do the Heavy Lifting"

October 27: "Low Stress Marketing for Farmers"

A question & answer period is scheduled for each presentation.

To participate in any of these free webinars, ***click here to access the online registration form***. Please pass on this invitation to others you believe may be interested. Contact AgrAbility at 800-825-4264, visit ***www.agrability.org/ntw-encore***, or email ***agrability@agrability.org*** if you have questions.

Nematode Field Day

Thursday, August 18, 2022 3:00-6:00 p.m.
University of Delaware
Carvel Research & Education Center
16483 County Seat Hwy, Georgetown, DE

Interested in learning more about nematodes? This field day will cover nematodes of concern in agronomic and vegetable crops, highlight ongoing research, and end with a boxed dinner. Details on registration coming soon! Please contact Alyssa Koehler akoehler@udel.edu with any questions.

Free Film Screening: Delmarva and the Ground for Change

Monday, July 11, 2022 3:30 p.m.
Clayton Theater, Dagsboro, DE

The Delaware Soil Health Partnership is inviting those interested in learning more about conservation efforts

on Delmarva to a free film screening of "Delmarva and the Ground for Change."

Farmers across Delmarva are leaders in practices that promote healthy soils. These practices also safeguard working lands from climate change extremes. This film follows three family-owned farming operations who all care about and depend on soil.

A discussion over ice cream, provided by Vanderwende's, will follow the event. One Delaware Nutrient management credit is available for attendees. Seating is limited, preregistration is highly encouraged.

Featured Sussex County farmers Roland and Laura Hill, of Deerfield Farm in Lewes, will be in attendance.

For more information or to register, visit www.sussexconservation.org/events or call Siobhan Kelley, communications and outreach specialist at SCD, 302-856-2105, ext. 122.

Soil Health Field Day

Tuesday, August 16, 2022 9:00 a.m.-1:00 p.m.
Baxter Farms, 23073 Zoar Rd, Georgetown, DE

The Delaware Soil Health Partnership will hold an in-person soil health field day on Tuesday, Aug. 16, at 9 a.m.

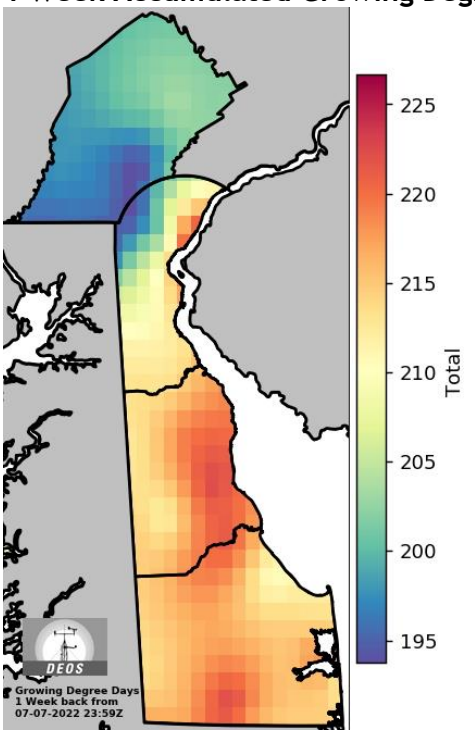
Rick Clark, a fifth-generation farmer from Williamsport, Ind., will discuss farming green and his experience with organic no-till on nearly 7,000 acres. University of Delaware Extension agents will provide the latest research updates while Jay Baxter, owner of Baxter Farms, will discuss experiences in the field.

The field day will be held at Baxter Farms, 23073 Zoar Rd, Georgetown, DE 19947 in Georgetown, Del. Lunch will be provided. Nutrient management credits are pending, and preregistration is required.

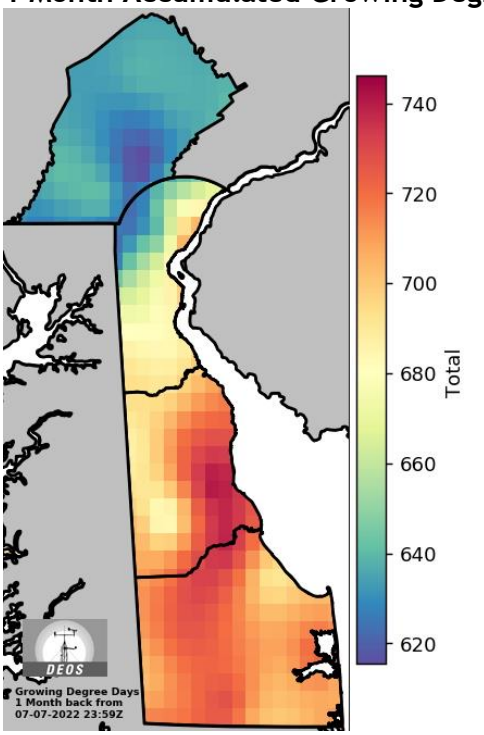
For more information or to register go to https://www.sussexconservation.org/events/field-day.html.

Weather Summary

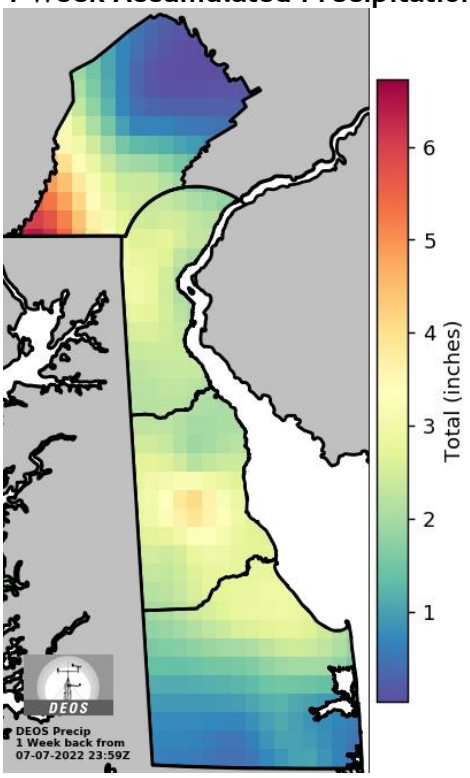
1 Week Accumulated Growing Degree Days



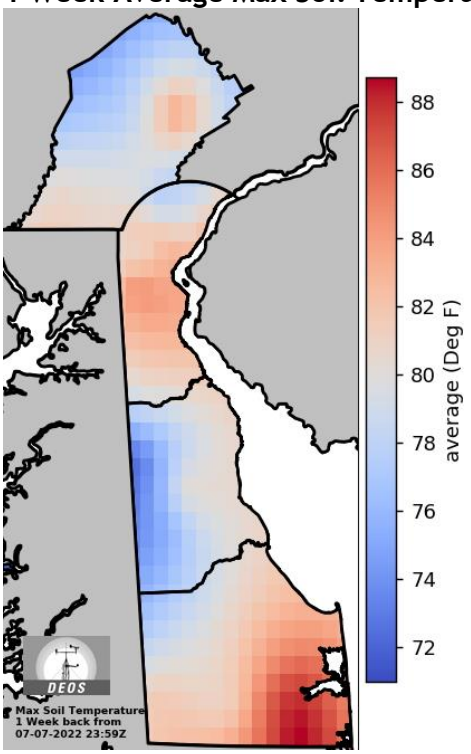
1 Month Accumulated Growing Degree Days



1 Week Accumulated Precipitation



1 Week Average Max Soil Temperature



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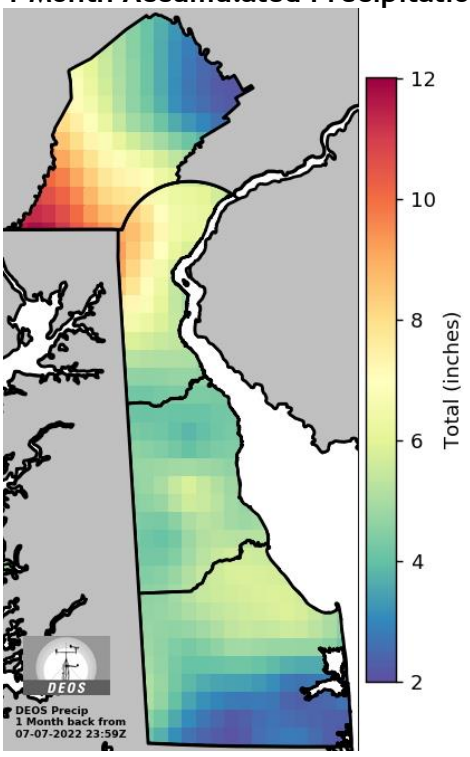

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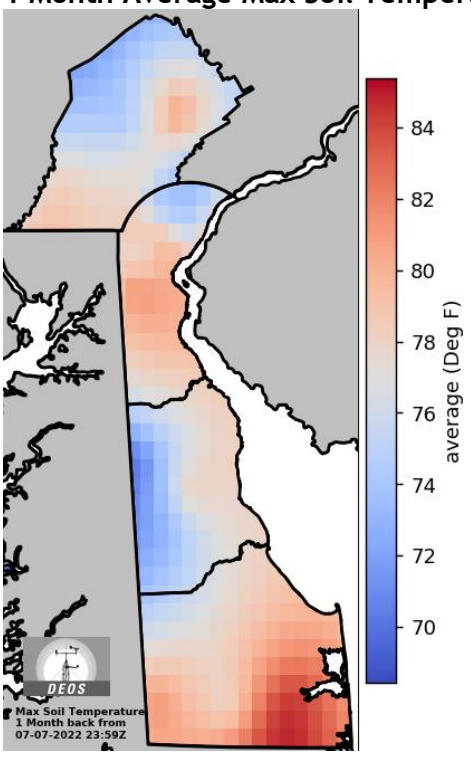

These weather maps are generated from DEOS weather station data and are part of a new Ag Weather website that is under development. Your feedback is welcome!
Thanks!! Emmalea (emmalea@udel.edu)

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