WEEKLY CROP UPDATE

UNIVERSITY OF DELAWARE COOPERATIVE EXTENSION

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Vegetable Crops

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

Cucurbits
Continue monitoring for spider mites, especially on field edges. With current weather conditions, spider mite populations can increase nearly 10x per week. Spider mite populations are especially likely to explode when plants are carrying a large fruit load. It might be useful to treat with a miticide if a moderate population is present right before harvest activity begins (but within label PHIs). Harvest stresses plants and can result in mites increasing rapidly.

Sweet Corn
Begin monitoring for fall armyworm in whorl stage sweet corn! We have a couple of pheromone traps in Sussex County that have captured a couple of moths. While this may not seem like much, our pheromone traps didn't capture many last year either despite the severe damage to turf grasses observed.

Corn earworm pheromone trap captures have decreased again. Delaware trap thresholds tend to be on the conservative side, and it may be possible for many areas to be on a 4 to even 5 day spray schedule, depending on the stage of the crop (early silking corn is most attractive to females), previous application (I expect Besiege and Elevest to have greater residual efficacy, based on a 2018 trial), and of course, local trap capture (traps adjacent to silking corn will provide the best read on moth pressure).

Thursday trap captures are as follows:

Trap Location	BLT - CEW	Pheromone CEW
	3 nights total catch	
Dover	1	7
Harrington	1	4
Milford	0	7
Rising Sun	1	20
Wyoming	0	1
Bridgeville	0	55
Concord	1	17
Georgetown	0	5
Greenwood	1	8
Laurel	1	17
Seaford	0	---
Lewes	---	12

Tomatoes
Continue scouting for spider mites. Mite thresholds are 2-4 mites per upper canopy leaflet. It is possible however that intense localized hotspots exist in a planting. Heavy mite populations can also cause a fruit injury that looks very similar to 'gold fleck'. Use high pressure, high water volume to get as much product to where the mites are located (under leaves). Agri-mek has translaminar activity. Also note the adjuvant requirement on Agri-mek's label. Other labeled materials include Onager, Nealta, Oberon, Portal, Magister, Oberon, and Acramite. Do not apply Acramite and Kanemite back to back, and do not apply Magister and Portal back to back, they are in the same mode of action.

Eggplant
Scout for mites and for Colorado potato beetles. Eggplant is especially susceptible to mite

infestation. Fortunately, there are a plethora of options for mite management. Colorado potato beetles are also highly attracted to eggplant. Destroying nearby non-crop hosts such as horse nettle may help reduce potato beetle infestation in the general landscape. Be on the lookout for orange egg clusters on leaves. There are 8 modes of action available. Rimon, group 15, is a growth regulator and most likely effective on small larvae as opposed to large larvae.

Snap Beans
Corn earworm flight right now is low. Turn scouting attention to potato leafhopper and to spider mites. Spider mites love snap beans, and any snap beans previously treated with a pyrethroid may be at a greater risk of spider mite. Minecto Pro is labled for snap beans and would pick up worms, but the risk of a worm issue is low right now. Dimethoate has efficacy on both leafhopper and mites. If mites are not a significant threat, potato leafhopper is susceptible to pyrethroids. Thresholds are 5 leafhoppers (adults plus nymphs) per sweep. We have had a large stink bug flight in several locations, thresholds are 7 stink bugs per 50 sweeps.

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

We have recently seen late planted watermelon transplants die due to excess heat on black plastic mulch. Heat necrosis is a common problem on black plastic mulch in summer plantings in clear weather and at high temperatures. This is a common problem in later plantings of peppers and tomatoes grown in smaller cell sizes; however, all transplants can be affected. Black plastic can heat up to well over 120°F on hot days in the late spring and summer. Vegetable transplants are exposed to these high soil temperatures at the soil line around the transplant hole. The stem tissue just at or above the level of the plastic may be killed at these high temperatures and the transplants will then collapse and die. Similarly. vine crop transplants laying on the hot plastic may be damaged. Small transplants do not have the ability to dissipate heat around the stem as roots are not yet grown out into the soil and water uptake is limited. Another factor in heat necrosis is that there is little or no shading of the mulch with the leaves of small transplants.

Heat necrosis on pepper stem next from excessive temperatures from black plastic mulch.

There are a number of practices that can reduce heat necrosis in later planted vegetable transplants:

- Avoid using tender transplants that have not been hardened off.
- Use larger transplants with greater stem diameters and more leaves to shade.
- Make a larger planting hole, cutting or burning out the plastic.
- When transplanting into the plastic, make sure the stems of transplants do not touch the plastic once set.
- Water sufficiently in the hole to reduce heat load.
- Plant in the evening once the plastic has cooled down or in the very early morning. Avoid transplanting on very hot days or when extended hot, sunny weather is forecast.
- Switch to white or aluminized plastic mulch for later plantings. This will reduce the heat loading significantly.

● In smaller plantings you may paint the planting zone on the black plastic mulch white with latex paint and then plant through this white strip once dry. Another option is to spray on white particle film at the plant base. You can also mulch around the planting holes with wet straw to reduce heat loading or cover around the transplant stem with sand or clean soil.

● Use overhead irrigation after planting to keep the plastic cooler.

Growth Regulator Herbicide Damage to Vegetables

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

Growth regulator herbicides are often of most concern for drift damage to vegetable crops. This group includes dicamba, 2,4-D, MCPA, MCPP, triclopyr, picloram, clopyralid, and aminopyralid. Some of these herbicides can drift over one mile from where they were applied when volatilized.

Symptoms include leaves becoming cupped, crinkled, puckered, strap-shaped, stunted, and malformed. Leaf veins can appear parallel rather than netted, and stems become bent, twisted, and brittle.

Growth regulator herbicide injury symptoms will be concentrated on the upper part of the plant (growing points).

Growth regulator herbicide damage on tomato. Note leaf cupping, strapping, twisting, and unusual vein pattern.

Blossom End Rot Common So Far This Season

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

This summer has been unusual as it has been about normal for temperatures if not a little cooler, but we have had greatly varying amounts of rainfall over the last month. Some areas have remained dry with storms just missing farms while others have been hit with some heavy rains. This can make watering vegetables challenging to avoid problems such as blossom end rot, which is caused by a calcium deficit in the developing fruit.

Figure 1. Several different vegetables with blossom end rot

Calcium (Ca) moves to the plant via mass flow, i.e., where dissolved minerals like calcium move

to the root in soil water that is flowing towards the roots. As it passes through the plant Ca is deposited in tiny amounts into the fruit. If anything slows or interrupts this stream the tiny amount of Ca needed at that moment is not deposited and the area furthest from the top of the fruit suffers—resulting in blossom end rot (BER). I have seen more BER this year on a large number of different vegetables than I have in the past several years (Fig. 1).

Figure two shows how precise and constant the Ca flow in a plant has to be to supply just the right amount of Ca at the right time. The large fruit on this particular plant developed before there was a Ca interruption, but the fruit a little younger suffered a Ca interruption, with the smallest (youngest) fruit suffering the greatest Ca interruption. At the time it was taken tissue analysis from this same plant showed that calcium was in the moderate range when the blossom end rot took place, demonstrating the importance of irrigation and water supply to reduce blossom end rot. Not much you can do about no rains or heavy rains, except try to maintain as even a water supply to your vegetables as is possible and remove any fruit from the plant you find that has blossom end rot.

Figure 2. Older larger fruit received enough Ca, but younger (smaller) fruit did not

Prepare for Cucurbit Downy Mildew

– *Andy Wyenandt, Specialist in Vegetable Pathology, Rutgers University*; wyenandt@aesop.rutgers.edu

This article was originally published in the Rutgers Plant and Pest Advisory

Cucurbit downy mildew was reported on cucumber in southern New Jersey on 11 June and in Lancaster County, PA on 23 June. These are the first two reports of CDM in the region to date. All cucumber and cantaloupe growers should be scouting on a daily basis and initiating preventative fungicide programs. For a review of CDM and its control please see below.

In 2004, cucurbit downy mildew re-emerged in the US with a vengeance causing significant losses in cucurbit production. In most years prior to this, concern for CDM control was minimal, since the pathogen arrived late in the growing season (in more northern regions), or the pathogen caused little damage, or never appeared. After 2004, with significant losses at stake, and with very few fungicides labeled for its proper control, CDM became a serious threat to cucurbit production. Importantly, at the time, cucumber varieties with very good levels of CDM resistance were no longer resistant, suggesting a major shift in the pathogen population. Research done over the past 15 years has led to a better understanding of the pathogen. Recent research has determined that the CDM falls into two separate clades: Clade I and Clade II.

Some CDM (*Pseudoperonospora cubensis*) isolates fall into Clade I which predominately infect watermelon, pumpkin, and squash, where CDM isolates in Clade II predominately infect cucumber and cantaloupe. Research suggests that isolates in Clade II can quickly become resistant to specific fungicides (NCSU). Most cucumber varieties are resistant to Clade 1 isolates, but there is no resistance currently available for Clade 2 isolates. For pickling cucumber the varieties, Citadel and Peacemaker, are tolerant to clade 2 isolates. For slicing cucumbers, the varieties SV3462CS and SV4142CL are tolerant to Clade 2 isolates. All organic and greenhouse growers are encouraged

to use tolerant varieties since chemical control options are very limited (NCSU). An extended list of cucumber varieties with CDM resistance from the University of Florida can be found here. For the past decade, researchers from around the US have been closely monitoring and forecasting the progress of CDM through a website hosted by NCSU. The CDMpipe website is currently in the process of an upgrade and will now be hosted by Penn State University. All cucurbit growers are encouraged to sign up to the CDMpipe website to help them know what cucurbit crops are being infected (and where) and to follow the forecasting to know where the pathogen may move to next. As a note, in recent years, CDM control with certain fungicides has varied significantly depending on the cucurbit host and geographic region. This is extremely important since two clades of the pathogen are potentially present (affecting host range) as well as having a potential impact on control strategies. How do you know which clade may be present on your farm? Follow the reports. If CDM is mostly present in cucumber crops as it works its way up the east coast, then you are most likely to see it infect cucumber and cantaloupe on your farm first. Scout your fields regularly, especially if CDM is in the immediate region. Pay very close attention to symptom development and on what cucurbit crop(s) you see it on, this is especially important if you grow more than one cucurbit crop. Like cucurbit powdery mildew, once CDM arrives in the region preventative fungicide applications are necessary.

Fungicides for CDM Control
heir cucurbit fields on a weekly basis, note the efficacy, or lack thereof, they are seeing in the field, and incorporate the use of as many different FRAC groups as possible to help mitigate fungicide resistance development.

Fungicide Programs for CDM Control
An example of a fungicide program for CDM control in the mid-Atlantic region might look like this, where a CDM specific fungicide from a different FRAC group is used on weekly basis:

A – B – C – D – E

where A= Gavel (zoxamide, 22 + mancozeb, M03); B= Orondis Opti (oxathiapiprolin, 49 + chlorothalonil, M05); C= Ranman (cyazofamid, FRAC code 21); D= Orondis Ultra (oxathiapiprolin, 49 + mandipropamid, 40); E= Curzate (cymoxanil, 27)

Not all of the fungicides listed above are labeled for all cucurbit crops. Some fungicides, such as the Orondis products have limited number of applications. Growers will need to refer to local recommendations and the label for crop specifics. Remember, the label is the law.

A protectant fungicide such as chlorothalonil or mancozeb should be added (if not already included) to the tank mix with each high-risk fungicide to reduce selection pressure and to help control other important diseases such as anthracnose and plectosporium blight. All growers should follow use recommendations on labels and avoid overusing one mode of action, even if it works well. If loss of efficacy is present, the grower should avoid using that particular fungicide (FRAC group) for CDM control the rest of the growing season.

Growers should remember that fungicides specifically labeled for CDM control won't control CPM, and fungicides labeled for CPM control won't control CDM. Therefore, carefully following the disease monitoring and forecasting website, choosing varieties with CDM resistance, paying close attention to host crops, scouting fields on a regular basis, noting fungicide efficacy, and following proper fungicide resistant management guidelines remain critically important for successful CDM control.
For more information on the specific fungicides recommended for CDM control on cucurbit crops please see the 2022/2023 Mid-Atlantic Commercial Vegetable Production Recommendations.

Fruit Crops

Bird Control in Fruit Crops *–Gordon Johnson, Extension Vegetable & Fruit Specialist;* gcjohn@udel.edu

Cherries, blueberries and some grape varieties are susceptible to bird damage. Cherry season is over for this year; however, blueberry harvest is under way and grapes will be harvested later

this summer. Netting is effective, particularly in grapes where it can be mechanically applied. However it can be expensive in dwarf cherries and blueberries where structures will be needed to support the nets.

The following are some other methods to consider in managing birds in fruit crops:

Methyl Anthranilate
Methyl anthranilate is chemically similar to the major flavor component of Concord grapes and is manufactured in large quantities by food processors. Birds are repelled by its taste, and it is regarded as safe for human consumption. There are many bird repellent products available containing this chemical. It needs to be applied multiple times during the season.

Sugar
Applications of sucrose sugar syrup have been shown to repel birds from blueberry plantings. Many bird species cannot digest disaccharides. The sugar is applied when the fruits begin to turn blue, and reapplied after episodes of rain.

Audio Scare Devices
Devices such as "Bird-Gard" with digitized, species specific bird distress calls can be effective. There are several types available with different species recorded such as crows, robins and starlings that sound every minute during daylight hours. Other types use calls of birds of prey such as hawks or owls.

Visual Scare Devices
Reflective tapes, balloons, waving air man devices, predatory bird models, and other visual devices can help to scare birds but may not work as stand-alone methods for long periods.

Netting
Vineyard managers should take care to control birds in mid-late summer when sugar contents are peaking in grapes, making them a highly desirable food source. Netting is probably the most effective control method, followed by scaring devices.

It is possible to completely exclude birds from the grapes by netting the vines. The initial expense of the netting is quite high, but when amortized over the life of the netting (5-10 years) it becomes much more affordable. Applying and removing the netting are labor-intensive tasks. However, a number of bird netting implements have been designed that dramatically reduce the time and labor required to making bird netting more feasible. If the netting is just draped over the grapevines, birds have a knack for finding ways to get under the netting to feed. Therefore, it may be necessary to pin the ends of the netting together under the vines

Multiple layers of hay bale net wrap has been used as an alternative to the expensive bird netting. It is inexpensive and can be replaced each season.

Bird netting in grapes.

Applying multiple layers of hay bale wrap as bird netting in grapes.

Agronomic Crops

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

Stored Grains
Recently a question came in regarding what products are labeled for stored grains. Many easily found extension fact sheets are also nearly 7 years old or older. South Dakota State University's Dr. Adam Varenhorst wrote an excellent fact sheet recently that may be helpful, including a list of current products: https://extension.sdstate.edu/steps-prevent-stored-grain-infestations. Please also note that the use of chlorpyrifos is no longer an option where it might come into contact with agricultural produce including grain bins.

Alfalfa
Pay attention to flowering alfalfa for blister beetles. Recently we have seen large numbers of yellow striped blister beetles in non-crop areas. There are no thresholds for blister beetles. Insecticides can reduce live blister beetles, but if the dead insect does not fall completely out of the canopy, it could still cause problems in the cut forage. Nebraska's Gary Stone writes that "haying equipment without conditioners has shown to reduce the number of dead beetles. If the hay is harvested in this manner and the hay is allowed to dry in the windrows, the majority of Blister beetles can move out of the windrows before the hay is baled. The use of sicklebar mowers has shown an increase in Blister beetles in the harvested crop because the Blister beetles are crushed driving over the cut hay and then picked up when raked into windrows and baled.".

Scout for potato leafhoppers. By the time yellowing leaf margins are observed due to hopperburn, yield has already been impacted. Thus, routine scouting needs to be performed, especially in alfalfa that is not ready to harvest. Cutting alfalfa will kill nymphs and drive adults out of the field for a period of time. Leafhopper threhsolds per 100 sweeps increase as plant size increases, but can vary anywhere from the low teens to more than 100 per 100 sweeps. For more information, visit our insecticide recommendation guide (with information borrowed from Penn State https://www.udel.edu/content/dam/udelImages/canr/pdfs/extension/sustainable-agriculture/pest-management/Insect_Control_in_Alfalfa_-2020_-_David_Owens.pdf.

Soybean
Grasshoppers and worms are the most abundant defoliators present in soybean fields. Grasshoppers seem to be especially thick along grassy, sprayed ditchbanks and vetch cover crops. Be sure to scout areas with late terminated cover crops and double crop soybeans as they emerge. Defoliation thresholds for vegetative soybean are very high, around 40%, but once we progress into R2-R3, defoliation thresholds decrease substantially. If a treatment for grasshoppers is deemed to be necessary or desirable, high pyrethroid rates should be used, low to mid rates sometimes do not result in significant grasshopper reduction. Other products for which we have seen very good efficacy in limited trials include dimethoate at a 1 pint rate and Elevest tank mixed with MSO (per Elevest's label). Given Elevest's good efficacy in a 2020 trial, I expect Besiege would also have similar efficacy. Curiously, Vantacor (formerly Prevathon) and Elevest both advise to add MSO, but this stipulation is not present on the Besiege label.

Begin looking for and noting fields with Dectes stem borer.

Some of our earliest fields are starting to move into the R3 stage. Pay attention to stink bug numbers in these fields. R3-R5 are the most susceptible soybean stages to stink bug damage. Current thresholds are 5 per 15 sweeps.

Field Corn
Continue scouting tasseling field corn for stink bugs. They will most likely be present along field edges, especially edges that border grassy areas or previous small grains. If a significant number of stink bugs are found along edges, check field interiors. Check field interiors for late planted fields into late terminated small grain cover crop. If stink bugs are present only along edges, a simple border spray may provide good control.

A Few Weed Control Items – *Mark VanGessel, Extension Weed Specialist*; mjv@udel.edu

The June 30th cutoff for dicamba applications to Xtend soybeans has passed and the applications are no longer allowed. Anyone planning to spray with dicamba products they will need to switch a different herbicide. If the soybeans are Xtendflex, glufosinate is an option.

For Palmer amaranth control, a fomesafen product (Reflex, Flexstar GT etc.) is the other option. Fomesafen will also provide residual control for later emerging Palmer amaranth. If Palmer amaranth is getting taller, using a more aggressive (or "hotter") adjuvant mix should be considered to improve control, although there is a higher risk of leaf burn. For instance, crop oil rather than a nonionic surfactant; and using AMS with Flexstar GT can enhance control.

Double-cropped soybean fields may have some grassy patches where the wheat stand was poor. If the grasses are barnyardgrass, fall panicum or goosegrass, glyphosate may not have controlled them at burndown. These are two species that glyphosate is not as effective in controlling and if the plants were cut off during wheat harvest, there is less tissue to intercept the herbicide. Including a grass herbicide, such as clethodim, as a postemergence spray will control these escaped grasses.

General

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

Access to farmland can be challenging for established and new producers alike. Here in Delmarva, other external pressures such as development from coastal areas and conversion of farmland into solar fields are also factors. To better evaluate the top challenges that producers face in gaining access to new farmland, please complete the following survey:

https://delaware.ca1.qualtrics.com/jfe/form/SV_exQHd85LlYDoITQ

The survey should take no less than a minute to complete. Results will be discussed at a later date.

Announcements

Warm Season Annual Forage Pasture Walk

Thursday, July 7, 2022 6:00 - 8:15 p.m.
Mule Run Farms, Houston, DE 19954

Join University of Delaware Extension, University of Maryland Extension, and the Blessings of Houston, DE for an educational field day. The Blessings raise livestock and will discuss grazing management and how they incorporate annual forages into their grazing system to boost pasture production. Additional topics covered will include selection and use of annual forages in a pasture system, insect and weed management on pasture, and enterprise budgeting for forages.

Credits: Pesticide and Nutrient Management credits will be applied for.

Registration: Mark your calendar and register by Friday July 1st at : https://go.umd.edu/julypasturewalk The meeting is free and everyone interested in attending is welcome. If you have special needs in accessing this program, please call the office two weeks in advance. 302-831-2506.

Location Details: *The farm does not have a street number. The GPS coordinates are 38.916176, -75.482979. It is located between 1139 and 2122 Front Street and is approximately 0.5 miles west of the Holly Hill Road and Front Street intersection. Look for signs to help direct you to the correct location.*

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 7: "Taking Care of ALL Generations on the Farm"

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"

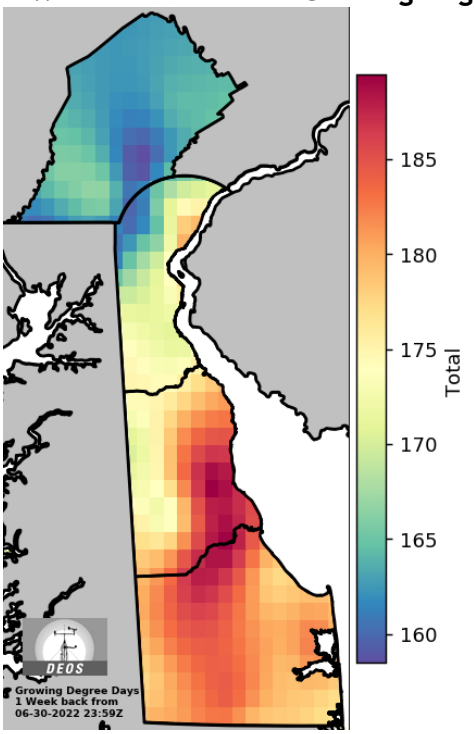
October 27: "Low Stress Marketing for Farmers"

A question & answer period is scheduled for each presentation.

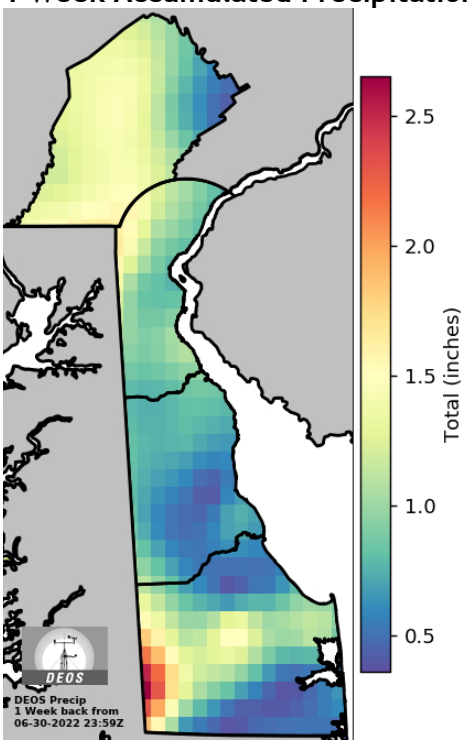
To participate in any of these free webinars, ***click here to access the online registration form***. Please pass on this invitation to others you believe may be interested. Contact AgrAbility at 800-825-4264, visit ***www.agrability.org/ntw-encore***, or email ***agrability@agrability.org*** if you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

Weather Summary

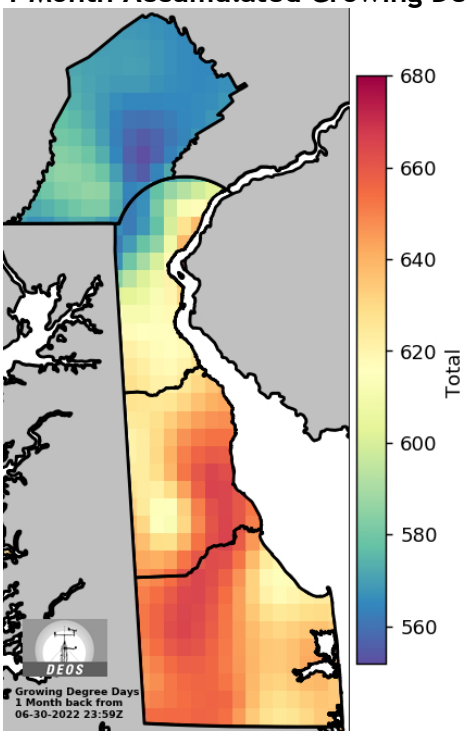
1 Week Accumulated Growing Degree Days



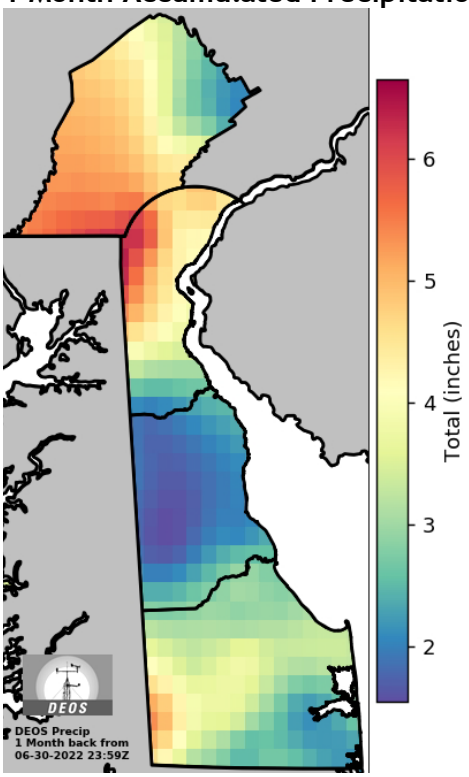
1 Week Accumulated Precipitation



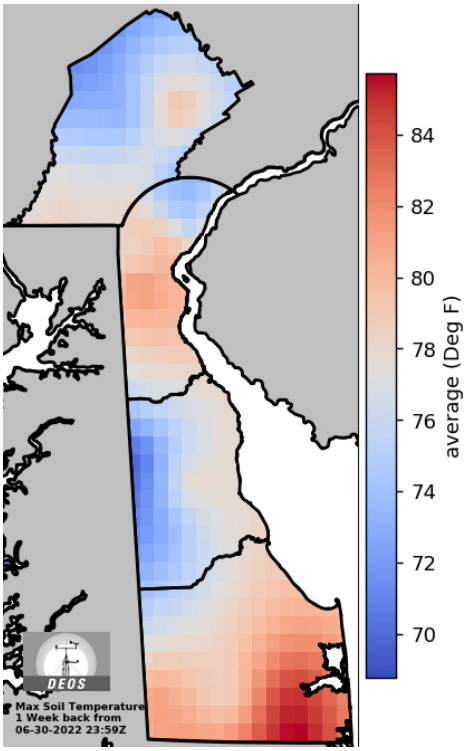
1 Month Accumulated Growing Degree Days

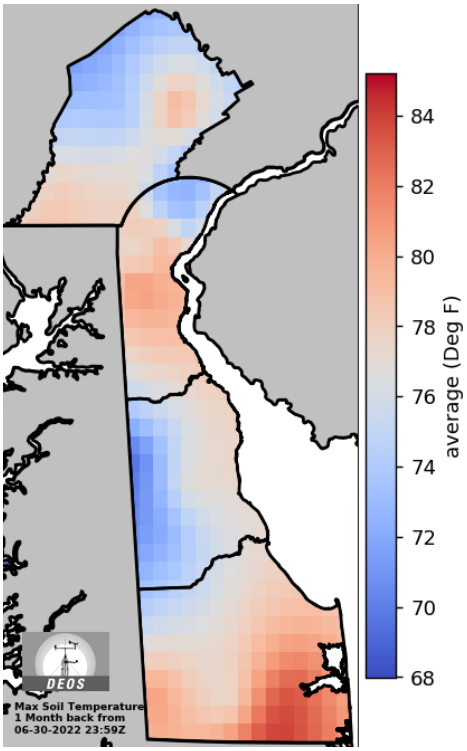


1 Month Accumulated Precipitation



1 Week Average Max Soil Temperature





1 Month Average Max Soil Temperature

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

Reference to commercial products or trade names does not imply endorsement by University of Delaware Cooperative Extension or bias against those not mentioned.