

WEEKLY CROP UPDATE



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Vegetable Crops

No Till and Strip Till Fresh Market

Vegetables-Gordon Johnson, Extension
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Most fresh market vegetable crops are either grown under conventional tillage or plasticulture systems requiring significant tillage. From a soil health perspective organic matter is the driver for healthy soils and the more the soil is worked, the faster that organic matter is decomposed and lost from soils.

One solution for this dilemma is using no-till, where organic matter can be conserved or increased. The best success story with no-till vegetables has been with pumpkins, which are commonly direct seeded through a killed cover crop mulch (often hairy vetch or rye) or through crop residue (most commonly barley or wheat small grain stubble). The mulch provided keeps pumpkins off the ground and has greatly reduced fruit diseases and improved quality. Other seeded crops such as sweet corn and snap beans have been successfully no tilled in the region.

No-till also has been shown to work with transplanted crops. Systems were developed and tested for tomatoes on hairy vetch and for numerous crops transplanted through small grain cover, from peppers to cantaloupes. There were several no-till transplanters developed and we tested one at UD back in the 1990s.

Incorporating leguminous cover crops into these systems can reduce nitrogen needs for the vegetable crop being grown. In the pumpkin no-till into hairy vetch system, typically no additional N will be needed.

There are several reasons why no-till has not been more widely adopted for vegetable crops. No-till vegetables cannot be grown for early crops which are often the most profitable, due to soil temperatures remaining cooler, longer. Establishment can be an issue, especially through thick cover crop mulches. Weeds are controlled partially by the mulches and herbicides can be used for residual control; however, weed escapes can be problematic because cultivation is not available as a tool. Certain pests such as slugs, mites, and several insects can be an issue in no-till. Drip irrigation is also more difficult to use in no-till.

An alternative that combines some of the benefits of no-till with conventional tillage is strip-till, where cover is maintained between rows and a 6-12-inch tilled strip is where vegetables are seeded or transplanted. Strips can be formed with narrow rotary cultivators or with strip till coulters. This allows for earlier crops and for better establishment. A subsoiler can be run in the strips to improve root development. Management of the strip area needs to be planned ahead of time so that cover crops do not get too large, strips are formed when cover crops are small. There is also potential to install drip irrigation in the strips. In

a strip-till system weed management is critical and residual herbicides will be critical.

Research has shown that for many vegetables, yields in strip till and no-till are comparable or higher than similar season conventional or plasticulture production.

The following are some of the keys to success with no-till fresh market vegetables:

1. Well drained soils are best for no-till and strip-till.
2. Fields to be no-tilled or strip-tilled should have minimal weed seed banks and little or no perennial weed problems.
3. An effective cover crop is required for no-till and strip-till systems to work. The cover crop should produce enough biomass to cover the soil and provide mulch that limits light and weed germination. Winter cover crops that have worked well for vegetable no-till in our area are hairy vetch, crimson clover, rye, vetch-rye combination, ryegrass, and subterranean clover. For late summer, no-till vegetable crops, several of the millets have provided good cover.
4. The cover crop should be easy to kill by chemical or mechanical means and have little or no-regrowth potential. Proper timing of cover crop kill is necessary to avoid reseeding in no-till systems. For strip-till systems, strips need to be formed early in the growth stage of the cover.
5. Attention needs to be paid at planting in no-till systems to provide good soil-seed contact for direct seeding or root placement and firming for transplants.
6. Provision should be made for moving residual herbicides into the soil through the mulch cover. This may require overhead irrigation.

7. Provision should be made to manage weed escapes. This may require spot spraying or hand weeding.

Causes for Vegetable Transplant Stunting- *Gordon Johnson, Extension Vegetable & Fruit Specialist; gcjohn@udel.edu*

Each year we see problems with stunted transplants. In some cases, plants appear to have abnormal growth with compressed internodes, “twisted” stems, or abnormally shaped leaves. In other cases, plants are not putting on any new growth. In May 2023 night temperatures have been cool, and warm season vegetable transplants have been slow growing.



Figure 1. Stunted tomato plant in 2023, 14 days after transplanting with no new growth.

Transplant stunting can be caused by several factors during greenhouse production, during shipping and handling, during planting, and post planting.

Problems with Greenhouse Media

Each year there are some problems that arise with vegetable transplants related to issues with the growing medium. This is often seen as poor growth, yellow plants, or stunted plants. Greenhouse media manufacturers have good quality control measures in place, but things can go wrong on occasion; inadequate mixing, critical components missing or in the wrong proportions (i.e. wetting agents, fertilizers, lime), or defective, poor quality components. Media can also be affected by poor storage and handling. Most commonly this occurs when it is stored outside, and bales or bags get wet. In addition, media has a certain shelf life; old media often dries out and is hard to get rewetted.

When growers start filling trays, any media that does not handle well should be viewed as suspect and should not be used. Contact your supplier and have them inspect and run tests on the suspect media. Avoid using overly dry or caked media, media that is hard to loosen, media with a bad smell, water-soaked media or media that is hard to wet.

Most media (but not all) will come with a starter lime and fertilizer charge. The fertilizer is designed to give about 2-3 week of nutrients. If the fertilizer is missing or improperly mixed or in the wrong proportion, seeds will germinate but seedlings will not grow much and will remain stunted. In this case, liquid fertilizer applications will need to be started soon after plant emergence.

Peat based media are acidic in nature and we generally can grow at lower pH's than soil. Plants will perform well from 5.4 to 6.4. Lime is added to peat-based media and reacts over time after first wetting so pH will begin its process. Above 6.4 we often see iron deficiencies in transplants. This also occurs if irrigation water is

alkaline (has high carbonates) causing pH to rise too high over time.

In high pH situations, to get transplant growth back to normal, use an acidifying fertilizer (high ammonium content) for liquid feeds. Use of iron products, such as chelated iron, as a foliar application on transplants can help them to green up prior to the pH drop with the acid fertilizer. In severe cases with very high media pH, use of iron sulfate solutions may be needed to drop the pH more rapidly. Acid additions to greenhouse irrigation water may also be considered for where water is alkaline.

If lime is missing or inadequate, and pH is below 5.2, plants may have calcium and magnesium deficiencies or may have iron or manganese toxicities. This also occurs in media that has been saturated for long periods of time. To correct this situation, apply a liquid lime solution to the media and water it in well. Calcium deficiencies will lead to damage to growing points and stunted and distorted plants.

Media that does not wet properly may not have enough wetting agent or the wetting agent may have deteriorated. They will be difficult to water and will not hold water well thus stressing plants. Application of additional greenhouse grade wetting agent may be needed.

If the initial media fertilizer charge is too high, or if too high of a concentration of liquid fertilizer feed is used, or if incorporated slow-release fertilizer "dumps" nutrients, high salt concentrations can build up and stunt or damage plants. Leaf edge burn, "plant burn", or plant desiccation will be the symptoms. Test the media for electrical conductivity (EC) to see if salt levels are high. The acceptable EC will depend on the type of test used (saturated paste, pour through, 1:1, 1:2) so the interpretation from the lab will be important. If salts are high, then leaching the media with water will be required.

Problems with Transplants in Small Cell Sizes
More and more transplants are being grown in small tray cell sizes. These small size transplant

plugs can become extremely root bound and may not put on new roots after transplanting. Another issue is when small cell transplants become waterlogged by overwatering. There will be limited oxygen to roots in this situation and plants may turn yellow and remain stunted. This is very common in peppers.

Problems Related to Transplant Height Control and Greenhouse Conditions

Growers use a range of techniques to manage transplant height in the greenhouse. This includes limiting phosphorus (P) fertilization, minimizing day-night temperature differentials, brushing plants, limiting water, and using plant growth regulators (limited for vegetable transplants). Each of these if not properly managed can cause long term stunting. Most growth regulators labelled for floral crops are not labelled for vegetables. Plants exposed to limited P may have a severe deficiency that will take several weeks to grow out of. Warm season transplants exposed to cold air can become yellow and be stunted because roots stop growing. This is particularly a problem near vent inlets and in hardening off areas. Plants that are overly water stressed drop leaves and take a long time to recover. Plants exposed to damage from heaters that are improperly venting exhausts into the greenhouse may suffer severe damage and show yellowing, distorted growth, and leaf drop. Diseases of roots, Pythium in particular, can be an issue, particularly when plants are placed directly on the ground (even if landscape fabric is in place). This can be a major source of plant stunting and transplant losses.

Herbicide Use in and Around Greenhouses

Transplant deformities and stunting can also occur when herbicides have been used to kill weeds in and around greenhouses. In the enclosed environment of a greenhouse, volatilization is enhanced, and severe damage can occur from many common herbicides. Greenhouse vents and fans can draw in herbicides applied nearby also causing severe damage.

Problems During Shipping and Handling

Growers often receive boxed transplants from southern sources but cannot plant immediately. Plants that are shipped without trays (already pulled) or that are bare rooted that are packed tightly in boxes must be planted quickly. Delays will lead to plant deterioration, leaf loss, and potential disease buildup. Once transplanted, some of these plants may now grow out.

Planting and Plant Stunting

Transplants that are planted in extended cloudy periods may not grow well in the field, especially if plants have come out of the greenhouse after an overcast period. In years with cold, cloudy, windy weather after transplanting, we have had large losses of transplants in the field. It is critical to have warm soil conditions after transplanting to allow roots to grow out into the bed quickly. In cold, cloudy conditions, plants shut down physiologically, little root growth occurs, and the existing roots on the transplant do not function well. If there is any wind, plants lose more water than they can take up and they die due to desiccation. This is accelerated when the sun does come out - the first sunny day after an extended cold, cloudy period will often result in extensive losses of weakened transplants. Extra caution should be taken to minimize root injury during transplanting, particularly with vine crops. When transplanting, make sure that there is good root to soil contact and there are few air pockets around roots. Plant stunting can also occur with improper application of chemicals or fertilizers in the transplant water (phytotoxicity, salt damage)

Post Planting

We have already seen severe damage to transplants this year with seed corn maggots and root maggots post planting. Currently cucumber beetle feeding is a major problem that can lead to poor plant performance.

Beet and Spinach Leafminers- Jerry Brust, *IPM Vegetable Specialist, University of Maryland*; jbrust@umd.edu

In high tunnels and in the field, I have seen spinach and beet leaf miners (*Pegomya hyoscyami*) and (*P. betae*) respectively in swiss chard and spinach. These leafminers are a type of blotch leafminer, creating irregularly shaped mines. These flies attack crops and weeds in the plant family Chenopodiaceae, which includes chard, beets, and spinach and the weed lamb's quarters. These fly species are very similar, but the spinach leafminer may also feed on Solanaceous crops such as peppers.

Adults are small flies about 1/3 inch in length and gray to brown. Larvae are whitish and cone shaped. Flies of both species overwinter as pupae in the soil. In April and May, flies emerge and lay white eggs in groups of 4-8 on the underside of leaves (Fig 1). Eggs hatch and larvae begin feeding between leaf tissues creating mines (Fig. 2). As the larvae feed and develop, they create areas of dead tissue where they have fed. These areas are opaque at first and then later turn brown (Fig. 3). Once inside the leaf tissue larvae are difficult to control. The larvae are active for about two to three weeks, before dropping to the ground and pupating in the soil. The entire life cycle is 30-40 days. There are three to four generations per season. Once the summer is over, leafminers will overwinter as a puparium in the soil emerging in early spring the next year to start the cycle again.

Leafminer feeding has little impact on overall plant growth but can be quite damaging to vegetables grown for edible greens. So, a crop such as Swiss chard or spinach that you are trying to sell the leaves of are greatly impacted while something such as turnips or beets that you are selling the bulbs of are less impacted (unless you are selling the tops too).

The damage to the Swiss chard and spinach I saw probably could have been far less if the first infested leaves with leafminers or fly eggs had been removed or destroyed. Any additional plantings of spinach or chard this season (or next

year) on this farm should be planted in a different area of the field because of pupae still in the soil. Once the spinach or chard is planted in a new area a row cover or chemicals can be used to protect the plants and keep the leafminer flies that emerged from previously infested sites from laying eggs.

Because these leafminers feed almost exclusively on one crop group, and some weeds that include chickweed, pigweed and lamb's quarters, weed control and crop rotation are important management tools. Chemical controls such as dinotefuran, thiamethoxam and spinetoram (spinetoram also has translaminar activity and if combined with an adjuvant is more effective against larvae) are foliar and soil controls for use in spinach. Chemical controls for leaf miners in other crops are more limited, so check the 2022/2023 Mid-Atlantic Commercial Vegetable Production Recommendation guide and always follow label instructions. For organic production spinosad can provide good control if used at or before egg laying and has only minor impacts on natural enemies. Neem oil can be used to prevent egg laying but is not as effective as spinosad. As always thorough coverage is necessary for good control which includes getting the material to the underside of the leaf.



Figure 1. Leafminer eggs are white and laid on underside of leaf.



Figure 2. Leafminer eggs have hatched and larvae are mining between leaf layers.



Figure 3. As larvae grow their damage becomes more pronounced

Bacterial Canker of Tomato- Jerry Brust, IPM Vegetable Specialist, University of Maryland; jbrust@umd.edu

A disease of tomato that we usually only see occasionally has been observed more frequently this year in several high tunnels in Maryland. The disease is bacterial canker, caused by the bacteria (*Clavibacter michiganensis*). A common symptom of the disease is leaf tips and margins that are yellow surrounded by dark brown tissue (fig. 1), although at times there can no yellow border, which is typically due to the cultivar or the environmental conditions. Veins on the leaves can become dark and sunken. Leaves can wilt starting at their tips to their branches, after which they die and fall from the plant.

Systemic infections of bacterial canker usually occur on more mature plants that are growing poorly with the oldest leaves curling, turning yellow and wilting. Fruit symptoms usually manifest themselves as small, round, raised white lesions with yellow margins especially near the calyx.

Bacterial canker of tomatoes is often introduced into a field via infected seed or transplants and can be spread by splashing water or plant contact (pruning and trellising). The disease can survive in soil debris for up to three years and can also survive on stakes (especially if wooden) or tools. Several nightshade species act as hosts for the disease. There are no spray treatments that are effective for its control.



Figure 1. Bacterial canker typical secondary symptoms on leaves.

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

Sweet Corn

The earliest sweet corn will soon be silking. As a general reminder, thresholds for silking sweet corn can be found on the Insect Trapping webpage:

<https://www.udel.edu/academics/colleges/canr/cooperative-extension/sustainable-production/pest-management/insect-trapping/>.

The last time I looked, the links for action thresholds for snap beans and sweet corn had

been inadvertently switched. It is important to look at both black light and pheromone trap counts. There are occasions when the black light traps will indicate a more conservative spray schedule than pheromone traps.

Typically, this early flush of moths is fairly susceptible to pyrethroid insecticides. In UD spray trials following recommended spray intervals, pyrethroids have given very good control early, with very little difference among pyrethroids or spray regime. Spray trial results can be found here:

<https://www.udel.edu/academics/colleges/canr/cooperative-extension/sustainable-production/pest-management/insect-management-reports/>. We will begin pyrethroid resistance monitoring at the beginning of June.

Please note that we have adjusted some of our trapping locations to be closer to sweet corn.

Thursday trap counts are as follows:

Trap Location	BLT - CEW	Pheromone CEW
3 nights total catch		
Dover	3	7
Harrington	0	3
Milford/Canterbury	3	3
Rising Sun	3	0
Wyoming	1	2
Bridgeville/Redden	1	3
Concord	4	46
Georgetown	2	4
Woodenhawk	2	2
Laurel	3	63

Potatoes

A question came into the office this week of when to expect European corn borer activity in the area for scouting and treating. We have had pheromone traps deployed across the state for several years in a row for ECB but have only caught an occasional moth. This does not necessarily mean that ECB is not a potential threat. However, with the prevalence of Bt field corn in our area, populations are nowhere near where they once were. Southern New Jersey is reporting European corn borer activity, albeit at very low levels. If you are in an area where there is relatively little Bt field corn and you have experienced ECB injury in the recent past, be sure to scout for egg masses under leaves in the lower portion of the canopy or signs of larval infestation. Excellent materials for controlling ECB include Vantacor, Exirel, Besiege, Elevest, and Minecto Pro; Radiant and Blackhawk; and Avaunt. All of these materials will also control Colorado potato beetle. Leafhoppers are active in low numbers across the area and should be scouted for. Leafhoppers are most susceptible to pyrethroids and neonicotinoids and may still be suppressed by in-furrow neonics. The pyrethroid component of Besiege and Elevest will control leafhopper.

Eggplant

Scout for flea beetles, especially with the cooler weather we have experienced. Colorado potato beetle have been reported from eggplant, and as we move into June, we will need to start paying attention to spider mites, which love eggplant.

Tomato

Be aware that stink bugs are typically our most important pest of early tomatoes. Once green fruit are present, stink bugs can be scouted for by shaking plants or monitoring fruit damage, but the number of samples required may be prohibitively great. So far, stink bug activity in our black light traps has been light. Of the neonicotinoids, only dinotefuran has good to excellent activity on stink bugs. Of the pyrethroids, only bifenthrin has fair to good activity on brown stink bugs.

Cucurbits

Continue scouting for striped cucumber beetles. We conducted another round of bioassays using beetles collected by Nichole Krambeck from the Salisbury region this week, which was fairly similar to the previous week's in that bifenthrin resulted in about 40-60% mortality, Hero at its high rate resulted in higher mortality, and Mustang resulted in fairly low levels of mortality. At this time, I am hesitant to recommend using any pyrethroids for cucumber beetle management on Delmarva.

Begin scouting for two spotted spider mites. We typically begin finding them moving into fields from weedy edges around the first week of June. We are starting to see low levels of mites moving onto pokeweed. By the end of June, mites often defoliate pokeweed, and it turns a bright yellow and pink color which stands out.

Snap Bean

Bean leaf beetle are active in snap bean. Thresholds are 1 beetle per plant and 20% defoliation. Bean leaf beetle come in many different color and spot patterns but always have a black triangle mark on their wings where they come together. Feeding injury will appear as round to blocky holes in the leaves. They are quite susceptible to pyrethroids.

Snap beans planted at the research station during the previous week experienced significant seedcorn maggot damage. When doing stand counts, pay attention to plants with dead apical meristems where the unifoliates should be growing. Other signs of seedcorn maggot include small plants, plants that are 'hooked', and, upon digging, seedlings with swollen stems below ground with a grayish or reddish discoloration.

Fruit Crops

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

San Jose Scale Alert

Between May 27 and May 30, we will reach 400-450-degree days for San Jose scale crawler emergence to begin. University of California IPM program recommends waiting until 600 degree days (base 51) after male capture (April 13-20) before making an application.

(<https://ipm.ucanr.edu/agriculture/prune/san-jose-scale/>). Recommended insecticides include Esteem and Senstar (scale specific), neonicotinoids (may be effective on plum curculio), organophosphates, and spirotetramat.

Plum Curculio continue to be active, and this is generally the time a second cover spray for codling moth is recommended. Neonicotinoids and organophosphates can provide curative control, killing small larvae in fruit.

Reduced Fruit Size in Strawberries-*Gordon Johnson, Extension Vegetable & Fruit Specialist; gcjohn@udel.edu*

Often, strawberry growers will have some plantings with reduced fruit size. The following are some possible causes:

In plasticulture strawberries, one critical factor with varieties such as Chandler is the number of branch crowns that develop in the fall. Early planting or extended warm weather in the fall may cause plants to produce excess crowns leading to too many buds, flowers, and fruits per plant in the spring and, consequently, small berries. This is also a common problem with carry-over plasticulture strawberries where crown thinning was not done or was inadequate.



Figure 1. Carry over ‘Camarosa’ strawberries with too many branch crowns producing many small fruit.

Another cause of smaller sized strawberries is related to pollination. Strawberries are aggregate fruits. That is, they have multiple ovules per receptacle where the fruit is formed. The strawberry receptacle may have up to 500 ovules per berry. You will see these as “seeds” on the outside of the strawberry fruit which are called achenes. To have the largest berry possible, you need as many of these ovules to be successfully pollinated as possible. With pollination the receptacle tissue around the achenes will develop to form the strawberry fruit.

Strawberries have both male and female flower parts on the same flower and can self-pollinate. Wind and rain can move pollen within the flower. However, this usually does not allow for full pollination of all the ovules. Bees such as honeybees or bumblebees are usually necessary to allow for complete pollination. Some flowers actually produce bigger berries with cross pollination with pollen from other flowers. Incomplete pollination will often result in smaller or misshapen berries.

Strawberry flowers are not heavy nectar producers. However, bees do visit the flowers and studies have shown that where native bees

are limited, adding hives of honeybees or bumble bees increased productivity. It is recommended that each flower receive 16-25 bee visits. This is particularly true of the king berries, which form from the first flower to open on a fruiting truss.

This additional pollination by insects is limited when row covers are placed over fields for extended periods during flowering, by poor weather for honeybee flights (rainy, windy, cold), or by other actions affecting pollinator performance.

Fire Blight in Pome Fruits *Gordon Johnson, Extension Vegetable & Fruit Specialist; gcjohn@udel.edu*

May is when fire blight peaks in apples, pears, Asian pears, and ornamentals such as crabapples and flowering pears from earlier flower infections. After bloom, shoot blights are common in new growth. We are seeing both currently.

The fire blight pathogen, (*Erwinia amylovora*), overwinters on branch cankers from the previous year’s infections. In spring, as temperatures warm, bacteria multiply at the edge of these cankers and create a yellow exudate that oozes on the bark surface several weeks ahead of bloom. Prior to bloom, insects that are attracted to the ooze, such as flies, spread the bacteria throughout the orchard. During bloom, pollinating insects (bees) spread the bacteria to the blooms. Blooms are susceptible to infection up to petal fall. Infections occur when temperature and moisture conditions are favorable, that is, greater than 60°F with free water (rain or dew). Infection symptoms will appear 1-4 weeks after bloom. In addition, shoot blights can occur when the inoculum is high in the orchard. Shoot tip infections occur most commonly on water sprouts and young shoots with about 10 leaves.



G Johnson, University of Delaware

Figure 1. Fire blight shoot strike.

Symptoms of the blossom blight phase of fire blight will be the wilting and death of flower clusters which then can spread to the branch and kill portions of the branch. Areas turn dark in color (brown or black). Shoot infections appear as a wilt with a characteristic “shepherd’s crook” symptom. Shoot infections can also spread to nearby branches and even the main trunk. Fire blight infected areas are often called “strikes”. There are apple rootstocks that are highly susceptible to fire blight (M.26, M.9, Mark). If they become infected, the canker will infect the trunk of the rootstock below the graft union and the tree will decline over 1-2 year period. What makes this disease particularly devastating is that one flower or shoot infection has the potential to kill the whole tree (particularly in young orchards).

In fire blight susceptible orchards, prebloom sprays of copper fungicides can help reduce the bacteria on plant surfaces. Use bloom sprays of the antibiotic Streptomycin on a 3-7 day

schedule when conditions are favorable (above 60° F, and >60% humidity). Post bloom Streptomycin sprays may also be needed with susceptible trees to control shoot blights.

According to Penn State, post-bloom, to prevent shoot blight, include a plant defense elicitor (example: Actigard 1-2 oz/A) or Apogee/Kudos (2-6 oz/A) in your streptomycin application to help limit potential shoot blight post petal fall. Spraying Cueva at 2 qt/A starting at petal fall has shown to limit shoot blight. This needs to be done on a weekly basis through approximately mid-June.

There are fire blight resistant apple and pear varieties and rootstocks. In our Delmarva production area, growers should consider using resistant varieties if they meet market and quality standards rather than trying to control the disease with sprays. Fire blight resistant apple rootstocks are also advised for our area.

Once fire blight “strikes” occur on branches, there is no curative action that can be taken. These strikes must be pruned out below the strike (8 inches below the visible discolored branch area) and destroyed. Do not leave the blighted pruning’s in the orchard. Also disinfest pruning shears and loppers between cuts using alcohol or bleach solutions to avoid inadvertent spread. If main trunks are infected, they should be cut 8 inches below the visible infection.

Agronomic Crops

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

Corn

Continue scouting for stink bug and cutworm activity, particularly in late planted, late burn-down fields. Cutworm are large enough to cut plants, and we experienced a significant cutworm flight earlier this year in our Smyrna and Middletown traps. This does not necessarily mean that a given field in those areas will have

cutworm or that a given field outside of those areas will not. Cutworm are attracted to weedy fields to oviposit.

Soybean

Reports continue to come in of slug damage, particularly in norther Delaware and adjacent areas in Maryland where ground is heavier. It is extremely important to make sure seed slots are closed. With the relatively dry weather recently, turbo tillage, vertical tillage, or strip tillage should all provide sufficient reduction in slug activity around the furrow. Slug bait is an option, and should be considered if, after planting a field with a high number of slugs in it the seed slots did not close well. Open seed slots are going to concentrate slugs around the seed as they seek moisture and shelter, making a delayed rescue treatment problematic. If applying bait, you will want to achieve 5-6 bait pellets per square foot. Remember, provided that a field is irrigated, even stand counts as low as 70,000 can provide a good yield.

Grasshopper nymphs are hatching out of the soil. Grasshoppers are frustrating pests to make recommendations on. Nymphs tend not to feed much on plants, but their defoliation level gradually increases until reaching potentially concerning levels in mid-late July, at which time they are larger and a bit more difficult to control. Remember, defoliation thresholds are fairly high, at 30% during vegetative stages and 20% during reproductive stages. Other thresholds used

(<https://soybeanresearchinfo.com/soybean-pest/grasshoppers/>) are 30-45 nymphs per square yard. We conducted a spray trial in 2020 with various products. Elevest at a mid-rate provided greater knockdown than pyrethroids alone, followed by dimethoate and a low rate of Prevathon. Please note that Prevathon has been replaced by Vantacor recently. If using a pyrethroid, use the high label rate.

Other defoliators active now include bean leaf beetle and various members of the defoliating worm complex.

Wheat

Low numbers of true armyworm have been reported this week feeding in wheat. Thresholds are 1-2 larvae per linear foot or 3-5 per square foot. It is important to examine ground residue as well because they generally like to hide during the day. At this point, our only pyrethroid control option is Mustang due to its relatively short pre-harvest interval of 14 days.

Early Season Moth Trapping

This is the last week of trapping for true armyworm and black cutworm. Many thanks to Joanne Whalen and Haley Sater (UMD extension) for assistance with traps and to the 5 farmers who hosted our traps near their telephone poles.

Location	# of Nights	Total Catch	
		TAW	BCW
Willards, MD	5	0	0
Salisbury, MD	7	0	4
Seaford, DE	7	0	0
Sudlersville , MD	7	0	8
Harrington, DE	7	15	7
Smyrna, DE	6		
Middletown, DE	6		

Alfalfa

Scout for potato leafhopper. Thresholds per 100 sweeps can be found here:

https://www.udel.edu/content/dam/udelImage/s/canr/pdfs/extension/sustainable-agriculture/pest-management/Insect_Control_in_Alfalfa_-_2023.pdf.

Monthly Grain Market Outlook- *Nate Bruce, Farm Business Management Specialist,* nsbruce@udel.edu

It was not long ago; corn prices were in the (\$6.00/bushel) range. Bearish news such as China cancelling imports, and the Black Sea Grain Corridor continued to negatively impact corn prices over the course of the month, driving them into retreat. National corn planting progress has been well ahead of schedule, adding to declining prices. Soybean prices have also been in retreat over the course of the month. Sales for 2022/23 remained well below the USDA projected pace, and the 2023/24 season is off to a slow start. Soybean exports have been crippled due to increased competition from South America. As harvest season approaches, wheat prices have been highly volatile over the course of the past month. Crop conditions in major wheat growing areas have been extremely poor, from excessive drought, to heat issues. Coupled with the Black Sea Grain Corridor, wheat prices have been a mixed bag this past month.

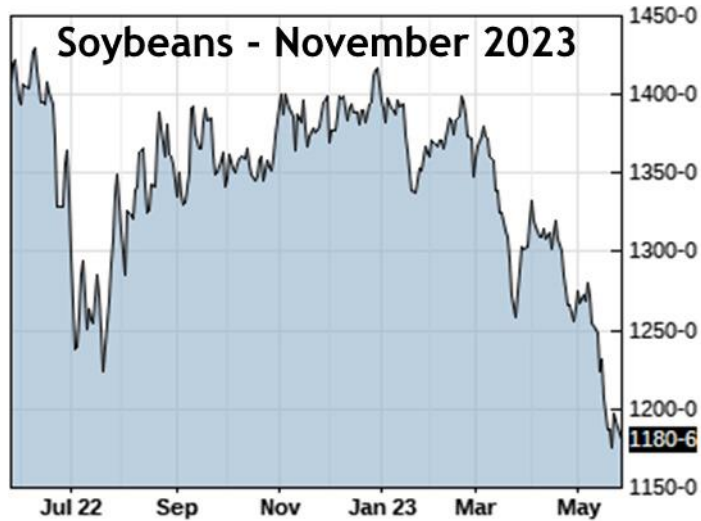
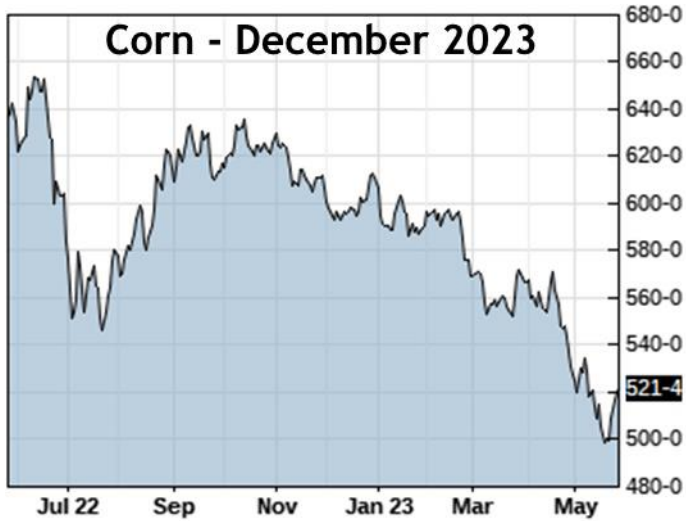
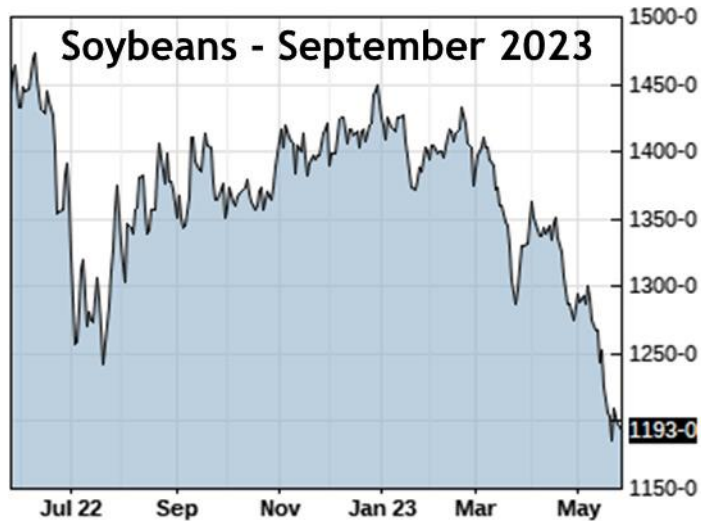
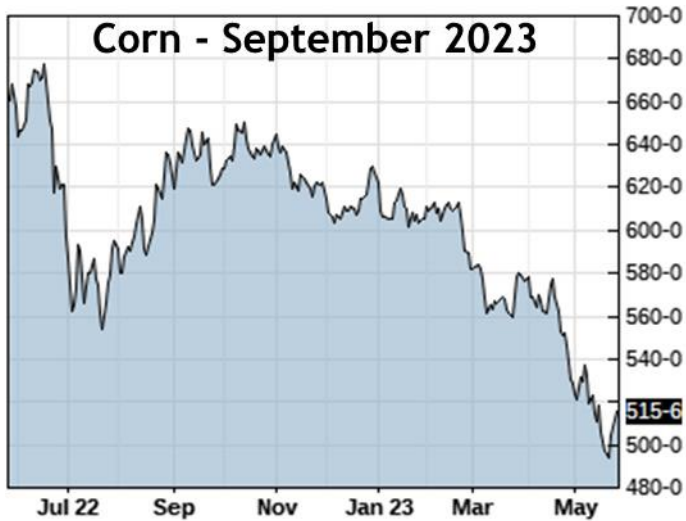
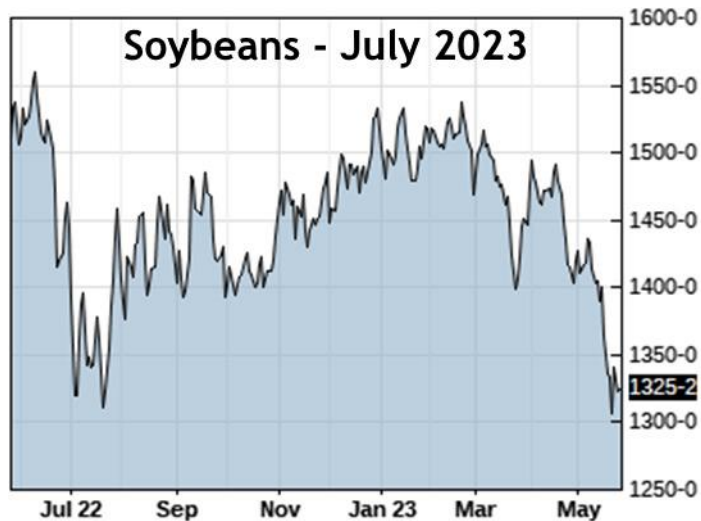
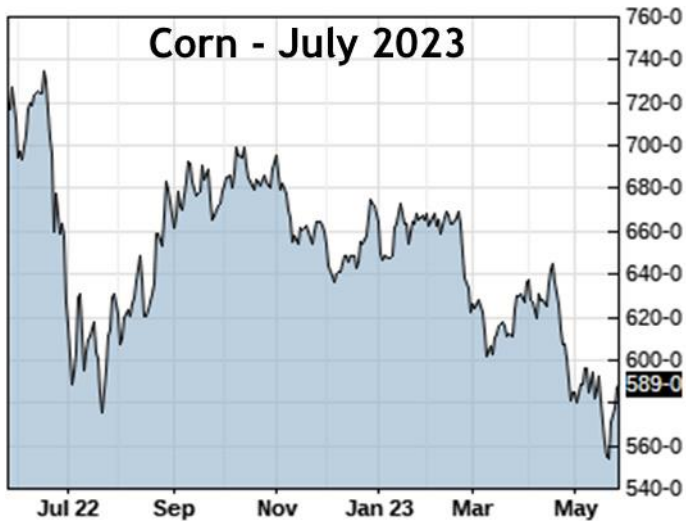
The May USDA World Agriculture Supply and Demand Estimates Report (WASDE) 2023/24 outlook for corn is greater exports, and domestic use, larger production, and higher ending stocks. 2023/24 US corn ending stocks are estimated at 2,222 million bushels. This is 805 million bushels higher than last year's estimate. If this estimate comes to fruition, this will be the highest ending stocks since "2016/17". The corn season-average farm price per bushel is estimated to be \$4.80, down \$1.80 from 2022/23. The 2023/24 soybean outlook is for lower exports compared to 2022/23 due to South American competition, higher supplies, crush, and ending stocks. The USDA WASDE report estimated US soybean ending stocks at 335 million bushels. This is 120 million bushels higher than last year's estimate. The soybean average farm price per bushel is estimated to be \$12.10, down \$2.10 from last year's estimate. The 2023/24 outlook for wheat is increased domestic use, smaller stocks, and reduced supplies and exports. The USDA WASDE report estimated wheat ending stocks at 556 million bushels, down from last year's estimate

of 598 million bushels. The projected wheat season average farm price is estimated to be \$8.00 per bushel, down \$0.85 from last year.

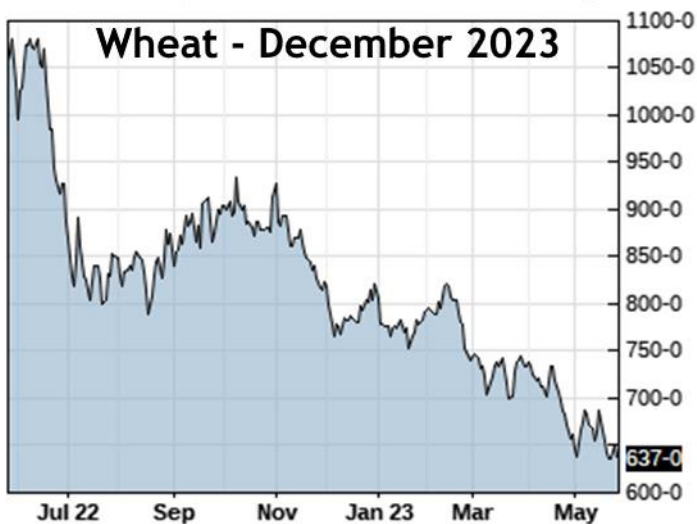
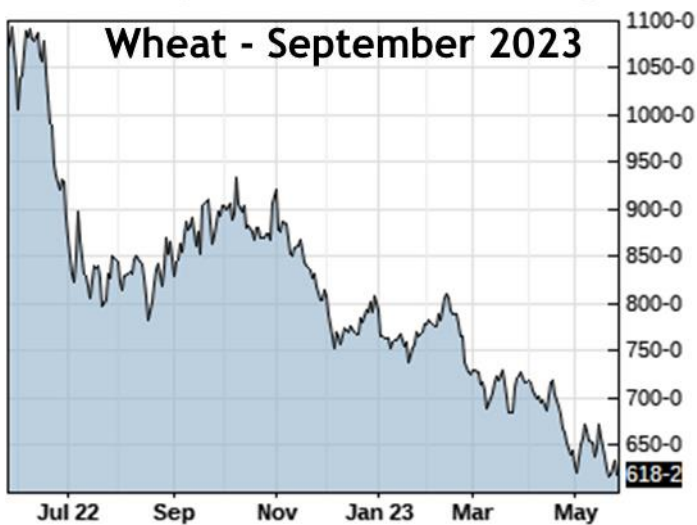
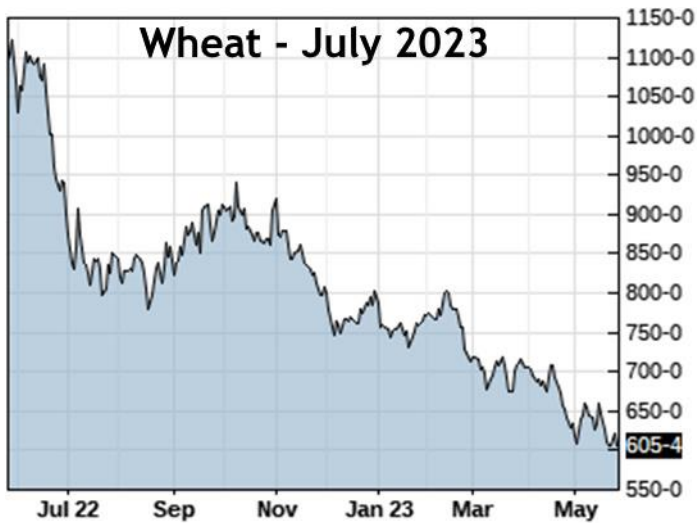
In international grain market news, the United Nations brokered Black Sea grain deal was extended for two months to ease food supplies worldwide. The deal allows for wartime exports of food and fertilizers from the Ukrainian ports of Odessa, Chornomorsk, and Pivdennyi. The Ukrainian government has accused Russia in recent weeks of blocking exports out of the port of Pivdennyi. This has added tension to an already difficult agreement. During the month of May, Chinese buyers cancelled large imports of United States corn imports due to weak demand and cheaper supplies from Brazil. Brazil is expected to become the world's top corn exporter this year. United States corn is less competitive in the export market with supplies from Brazil being \$30/ton cheaper. Conab, "Brazil's" food supply and statistics agency, raised its forecast for Brazilian soybean and corn production. Conab predicted Brazilian farmers will harvest a record 154.8 million tons of soybeans, which is an increase of 23.3% above the last year, and a record 125.5 million tons of corn, 11% above last year.

Corn Market Futures

Soybean Market Futures



Wheat Market Futures



General

New Castle County Ag Agent Introduction-Nick Adams, New Castle County Ag Agent;
naadams@udel.edu

My name is Nick Adams, and I am the New Castle County Agriculture Agent for the University of Delaware Cooperative Extension. I graduated from University of Delaware with a B.S. in Plant Science and a minor in Environmental Soil Science. I also worked on the Newark Campus farm while obtaining my degree, with a focus on vegetable production. After graduation I spent 3 years as a Precision Agriculture Technician where I worked with variable rate technology and crop scouting. I spent the last year as a Soil Conservationist with USDA-NRCS in New Castle & Kent Counties, working with producers to create Conservation Plans and utilizing Farm Bill programs to address resource concerns. I am looking forward to being active in the field and helping everyone in any way possible!

I can be reached at (302) 476-1136 and my email is naadams@udel.edu. My office address is 461 Wyoming Rd, Newark, DE 19716.

Guess The Pest! May 19 Answer: Loose Smut- David Owens, Extension Entomologist, owensd@udel.edu

Congratulations to Madeline Henrickson and several others for correctly identifying last week's challenge as loose smut. I borrowed the photo from an excellent University of Maine fact sheet on smut: <https://extension.umaine.edu/publications/1016e/>. Essentially, the infection for smut occurred the previous year when seed were being pollinated.



Guess The Pest! May 26- David Owens, Extension Entomologist, owensd@udel.edu

This week, we have a cosmetic pest of landscaping, commonly used around poultry houses that I get phone calls regarding in August. What is this? Click on the link <http://www.udel.edu/008255> or the Guess The Pest Logo to log your answer!



Announcements

Pest & Beneficial Insect & Plant Disease Walks

Sussex Pest Walk: June 6, 4:00-6:00 pm

Kent Pest Walk: June 13, 4:00-6:00 pm

NCC Pest Walk: June 22, 4:00-6:00 pm

Diagnostics hands-on workshop: July 11

Save the Dates! Featuring Experts Jill Pollok, Brian Kunkel & John Emerson.

More information to follow.

A Day in the Garden Open House

Saturday, June 24, 2023 10:00 a.m.-2:00 p.m.
Carvel Research & Education Center
16483 County Seat Hwy, Georgetown, DE

Join Sussex County Master Gardeners for a tour of their demonstration garden! Attend workshops and tours, enjoy the Peter Rabbit puppet show, go on a scavenger hunt, and shop the Plant and Book Sale!

[Register online](#) or call 302-856-7303

Mini Workshops

10:30 a.m. - New to Delaware with MG Susan Trone and MG Maggie McLaughlin

11:00 a.m. - Propagating Hydrangeas with MG Michele Walfred

11:30 a.m. - Making Salsa with MG Ana Dittel

12:00 p.m. - Growing Groundcovers with MG Gainor Urian

12:30 p.m. - Log and Succulent Centerpiece with MG Mary Noel - space limited to 20

1:00 p.m. - Small Fruits Tour with Emmalea Ernest, UD Fruit & Vegetable Scientist

Displays

Plant Sale - lots of natives!

Beekeepers - MG Chris Dominic, Jim Hopkins

Ask an Expert with Brian Kunkel, Megan Pleasanton, and Tracy Wootten - Bring your sick plants and gardening questions!

Invasives - Crape Myrtle Bark Scale, Invasive Plant Law, Ban Information

Bugs - Dennis Barto

And more!

Children's Activities

CD Painting

Butterfly Scavenger Hunt

Peter Rabbit Puppet Show

Grower Survey to Understand Implementation of Produce Safety Practices, Costs, and Barriers

The Produce Safety Alliance (PSA) Team and personnel from the Northeast Center to Advance Food Safety (NECAFS) at the University of Vermont would like to understand the costs and the barriers of beginning or expanding food safety practices on farms and in packinghouses to make educational materials more relevant to fruit and vegetable growers and packers. To do so, we are asking personnel from fruit and vegetable operations to share their experiences of produce safety practice implementation and the costs they have incurred meeting produce safety standards and market expectations.

Use the link below to learn more and participate in the survey:

https://qualtrics.uvm.edu/jfe/form/SV_agW9o6VWOUCivCC

The survey is also available in Spanish:

https://qualtrics.uvm.edu/jfe/form/SV_agW9o6VWOUCivCC?Q_Language=ES

Seeking Soils with Acidic pH (<5.8) for soil pH and Lime Requirement Research-

The University of Delaware Soil Testing Program and the Penn State Agricultural Analytical Services Laboratory are seeking soil samples for a research project related to improving soil pH measurements and lime recommendations. Specifically, we need approximately 30 low pH soils collected from across Pennsylvania and the Delmarva to represent a variety of soil types and cropping systems.

What do we need?

A 5-gallon bucket of topsoil collected from the top 6-inches of the soil from agricultural fields, with documented soil pH of 6.0. or lower that has not received lime in at least two years (>3 years preferred).

The sample can be collected from a single location in the field (no need to take a random sample).

Please remove plant residues from the sample.

Please collect the soil when it is relatively dry.

Please provide the latitude and longitude from the sample location (or a precise address) so that we can obtain soil series information. Exact locations of the samples collected will not be shared beyond the project team.

When do we need it?

Preferably by late July 2023.

We need to receive soils early enough that we can dry and homogenize them prior to starting the research in Fall 2023.

Where do we bring the soil samples?

You can drop off the samples at any UD Extension office or the UD Soil Testing Lab. When dropping off a sample, please label the bucket with the following: "UD Soil pH Study c/o Amy Shober", your name, where the sample was collected, and a contact number (or email).

For individuals located farther from a UD Extension Office or Newark main campus, we

will arrange a sample pick up or have the samples shipped to Newark at no cost to you.

Who do I contact to arrange sample pick up or if I have additional questions?

Delmarva - Amy Shober (ashober@udel.edu)

Pennsylvania - John Spargo (jts29@psu.edu)

Invitation for UD Cooperative Stakeholders to Provide Input on CANR Dean Search

Wednesday, May 31, 2023 7:30 p.m.

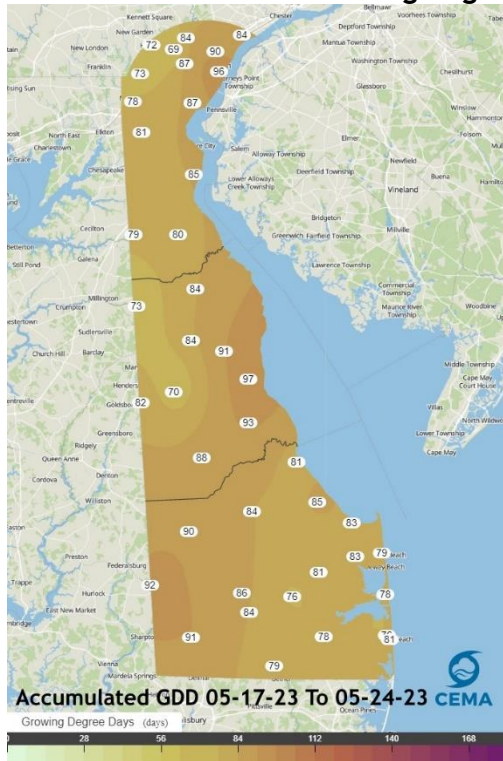
The Advisory Search Committee for the University of Delaware College of Agriculture and Natural Resources Dean position invites you to participate in an [open Zoom session on May 31, 2023 at 7:30 p.m.](#) to seek input on the following questions:

1. What attributes are most important to you in our next Dean?
2. What would you like to see the next Dean accomplish?
3. What opportunities and challenges exist for our next Dean?
4. What do you feel are the existing strengths of the College of Agriculture and Natural Resources?

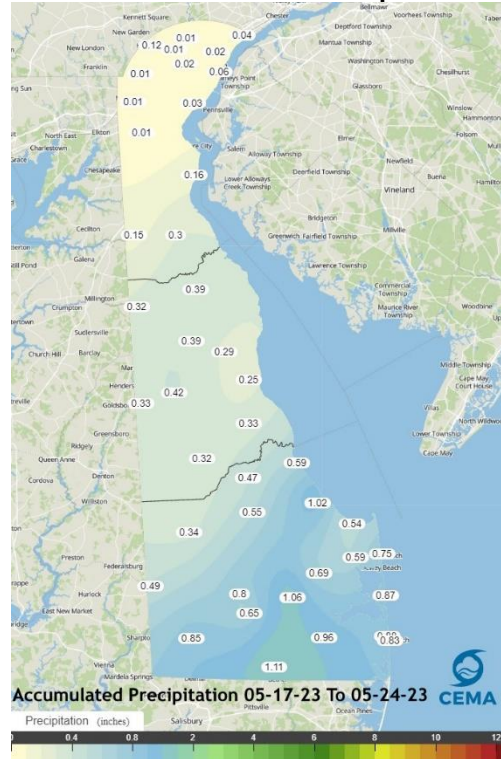
We welcome you to participate and provide your input.

Weather Summary

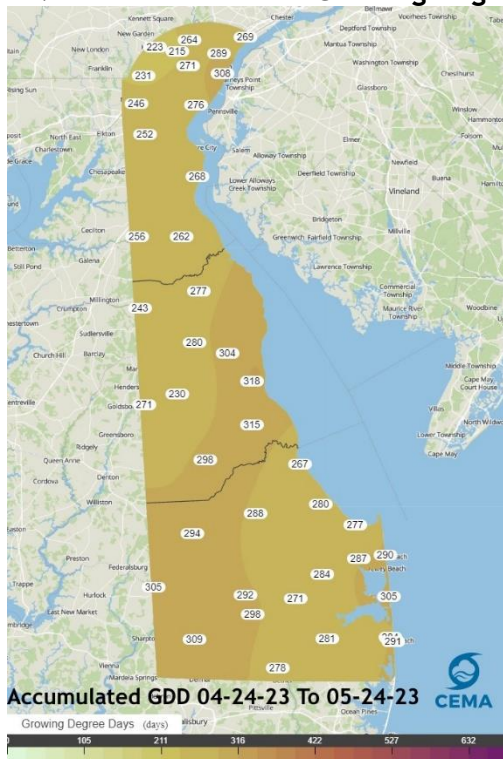
1 Week Accumulated Growing Degree Days



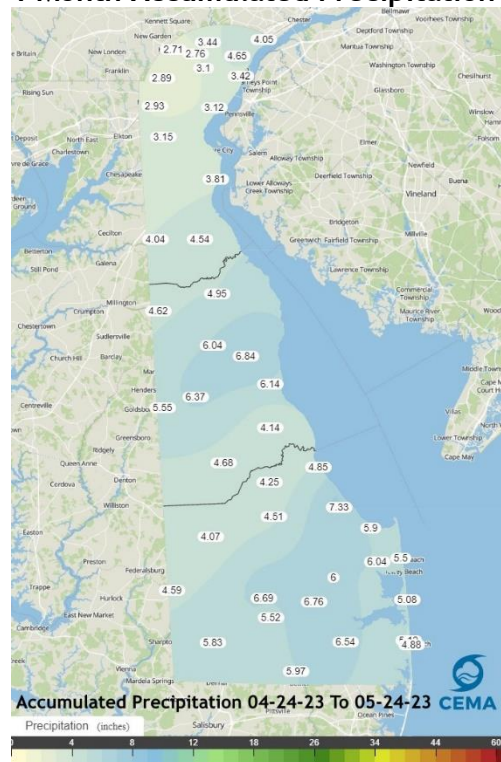
1 Week Accumulated Precipitation



1 Month Accumulated Growing Degree Days



1 Month Accumulated Precipitation



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!

***Weekly Crop Update is compiled and edited
by Emmalea Ernest, Scientist - Vegetable
Crops and Drew Harris - Kent Co. Ag Agent***

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