

# WEEKLY CROP UPDATE



UNIVERSITY OF DELAWARE  
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EXTENSION

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## Vegetable Crops

**Vegetable Crop Insect Scouting** - David Owens, Extension Entomologist, [owensd@udel.edu](mailto:owensd@udel.edu)

### Asparagus

Scout for asparagus beetle adults and eggs on emerging spears. Eggs are small, cylindrical and dark colored. They stick into the spear at a 90-degree angle. Asparagus beetles have large white square shaped spots bordered by dark metallic blue bands. It can take a week for eggs to hatch. Feeding on spears results in scarring, browning, and hooked tips. Examine 10 plants in 5-10 different spots in a field, best on a warm, sunny afternoon when beetles are going to be most active. A treatment may be justified if 10% of spears are infested with beetles or 1-2% have eggs. Labeled products for spears include malathion, permethrin, and carbaryl.

### Potatoes

With this week's extremely warm weather, Colorado potato beetle should have been able to fly from volunteer emerging potato to new locations. If you have potato up and out of the ground, begin checking for CPB. Generally, seed piece treatment with a neonic or a diamide should provide an extended period of control, although data from VT's Tom Kuhar suggests that we have lost quite a bit of residual control time compared to when the neonics were first developed, meaning the products will not be effective for quite as long as they once were.

### Snap Beans

Seedcorn maggot adult activity will begin

increasing again this week. With warm temperatures and relatively dry soil, the risk for heavy damage should be a bit lower, but this is a pest that is hard to predict. If planting into a tilled field (tilled within the last week or so), an insecticidal seed treatment is recommended.

**Minimum Soil pH for Vegetables** - Gordon Johnson, Extension Vegetable & Fruit Specialist; [gcjohn@udel.edu](mailto:gcjohn@udel.edu)

The following are minimum pHs for various vegetable crops.

Crop	Min. pH
Cucumbers, cantaloupes, squash, pumpkins	5.8
Watermelons	5.5
Tomatoes, peppers, and eggplant	5.8
Cole crops (broccoli, cabbage, cauliflower, Brussels sprouts, kale, collards)	6.0
Spinach, beets, chard	6.0
Snap beans and lima beans	5.8
Sweet corn	5.8
Peas	6.0
Potatoes (scab resistant)	5.5
Carrots	5.5
Sweet potatoes	5.5
Onions	5.8

Below these pH levels, crop performance will be affected, and yields will be reduced. Lime should be applied immediately if soil pH has dropped to these values. Target pHs for

vegetable crops can be found in Table B1 in the [Mid-Atlantic Commercial Vegetable Production Recommendations](#).

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### **Before Laying Plastic, Check the Soil pH -**

*Gordon Johnson, Extension Vegetable & Fruit Specialist; [gcjohn@udel.edu](mailto:gcjohn@udel.edu)*

Mid-April is when plastic mulch laying starts for many of our summer crops. Each year we see problems with low bed pH under plastic mulch. This can result in a range of problems including poor growth, manganese toxicities, calcium and magnesium deficiencies, poor fruit quality, increased water stress, and increased blossom end rot.

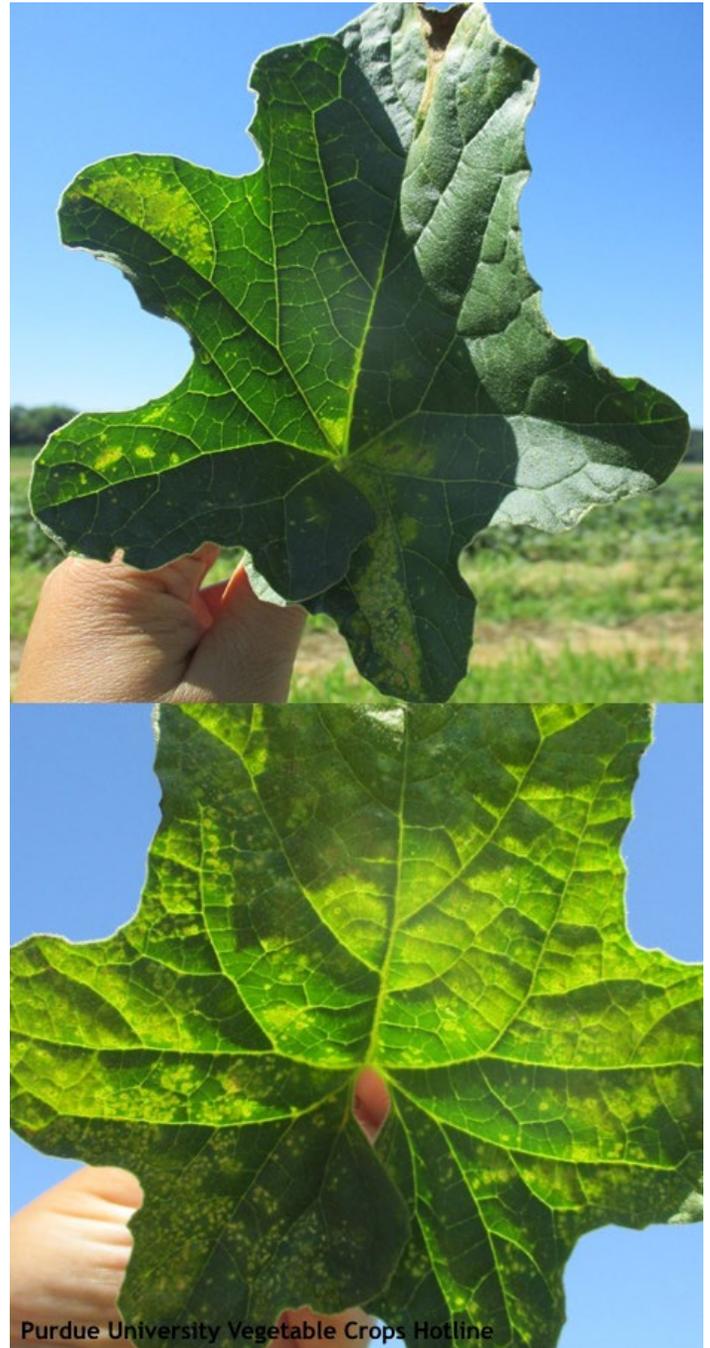
If whole field pHs are below 5.8 there is a high likelihood that areas in the field have a pH of 5.2 or below. If fields are in the third year from a lime application, the risk of low pH areas in the field also increases.

At pHs below 5.2, there is an increase in exchangeable aluminum ( $Al^{3+}$ ) which is toxic to plant roots. This free aluminum will cause roots to stop growing. Roots will be short, thickened, and stubby and will be brown in color and there will be few fine roots. Poor root growth will lead to increased plant stress, reduced nutrient uptake, reduced water uptake, and poor aboveground growth. In addition, exchangeable aluminum competes with cation nutrients such as calcium ( $Ca^{2+}$ ) and magnesium ( $Mg^{2+}$ ) on soil exchange sites. Excess aluminum reduces phosphorus and sulfur availability by complexing with those nutrients, rendering them unavailable for plants.

Another issue at low pH is that certain minerals become more available and may increase to toxic levels. This is what happens with manganese in some low pH soils. Sensitive crops such as muskmelons can be injured when available manganese increases to toxic levels.

Another issue is with the use of nitrogen fertilizers with ammonium or urea which are acid forming. Ammonium is found in ammonium sulfate, ammonium nitrate, mono and di-ammonium phosphate, and urea ammonium nitrate solutions. Urea is found in UAN and as

straight urea. Urea has the short-term effect of increasing pH, but once ammonium is released in the soil from the reaction of the urea, the long-term effect will be to reduce pH.



Manganese toxicity in cantaloupes due to low soil pH. Cantaloupes are particularly sensitive to manganese when bed pH drops below 5.8.

All manures and organic nitrogen sources release ammonium upon mineralization. Depending on the organic source, the pH may decrease. Poultry manures tend to maintain pH as do many

composts, but other organic nitrogen sources will often lower the pH.

In plasticulture beds, the use of these acid forming fertilizers or soil amendments during bed formation or with fertigation through the drip tape will lower soil pH: if the bed pH is marginal to begin with (5.3-5.6) it can be lowered over the season to below the critical pH of 5.2 and cause problems with the growing crop.

Once plastic is laid, there are few solutions to correct the pH of the soil. The key is to apply needed lime before the mulch is applied.

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**Sulfur and Vegetable Crops** -Gordon Johnson, *Extension Vegetable & Fruit Specialist*; [gcjohn@udel.edu](mailto:gcjohn@udel.edu)

Sulfur is considered one of the secondary macronutrients that vegetable crops require for growth. Sulfur is a component of four amino acids and is therefore critical for protein formation. It is also a component of certain glycosides that give pungency to mustard family crops (greens, cole crops) and allium crops (onions, garlic).

In the last 30 years, as industrial air pollution has been reduced (especially pollution from coal fired power plants) we have had less sulfur deposition from rainfall. Sulfur deficiencies are more common and sulfur additions in fertilizers or manures is being required for many crops to produce high yields.

Most of the sulfur in the upper part of the soil is held in organic matter. Upon mineralization, sulfur is found in the soil as the sulfate ion ( $\text{SO}_4^{2-}$ ) which has two negative charges. The sulfate ion is subject to leaching, especially in sandy textured soils (loamy sands, sandy loams). It does accumulate in the subsoil but may not be available for shallow rooted vegetables.

Sulfur can be added by using sulfate containing fertilizers such as ammonium sulfate, potassium sulfate, and K-mag (sulfate of potassium and magnesium). It is also a component of gypsum (calcium sulfate). In liquid solutions, ammonium thiosulfate is often used as the sulfur source. Sulfur is also found in manures and composts.

For example, broiler litter has about 12-15 lbs of sulfur per ton.

In vegetable crops, sulfur removal is generally in the 10-25 lb/A range. Mustard family crops (cole crops such as cabbage and broccoli, mustard and turnip greens, radishes) remove between 30 and 45 lbs/A of sulfur. Research in our region has shown response to added sulfur for sweet corn and for watermelons. In Florida research it was shown that adding 25 pounds of sulfur per acre boosted yields by 1.7 tons per acre in tomatoes. Similar results were found with strawberries.

Our general recommendations are to apply 20-40 lbs of sulfur per acre on sandy soils for most vegetable crops. Remember to take credit for any sulfur being added with fertilizer sources such as ammonium sulfate (24% sulfur).

One vegetable where we want to limit sulfur is with sweet onions. Because sulfur increases onion pungency, and sweet onions are sold based on their low pungency, we limit sulfur applications to this crop.

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**Seed Maggots Very Active in Early Planted Vegetables** - Jerry Brust, *IPM Vegetable Specialist, University of Maryland*; [jbrust@umd.edu](mailto:jbrust@umd.edu)

The warmer than usual February and the cooler weather we have been having the last 3-4 weeks has created ideal conditions for one of our more problematic early season pests, namely seed maggots. These maggots include seedcorn maggot *Delia platura* (SCM), onion maggot *Delia antiqua* (OM) and cabbage maggot *Delia radicum* (CM). All three species overwinter in the soil as a maggot inside a brown pupal case (Fig. 1). In March and April small, grayish-brown flies (Fig. 2) emerge, which are usually SCM or possibly CM, OM flies usually peak 3-4 weeks later. Adult flies are most active from 10 a.m. - 2 p.m. and are inactive at night, in strong winds or when temperatures are below 50° F or above 80° F. Adults live 2-4 weeks and females lay hundreds of eggs.



Figure 1. Seed maggot larvae and pupae



Figure 2. SCM adult

Seedcorn maggot eggs are oviposited in soils with decaying plant material or manure. Onion maggot females lay eggs in soil near onion plants. Female cabbage maggot flies seek out and lay eggs on the lower portions of stems of young host seedlings or in nearby cracks in the soil. Some wild crucifers, such as yellow rocket, are important hosts for cabbage maggot and are especially important for their overwintering success; when these weeds are abundant they can lead to heavy infestations of spring crucifers.

Seedcorn maggot adults also are attracted to the organic media around the roots of transplants where they lay their eggs. Within a few days the eggs hatch and the tiny maggots burrow into roots or stems and damage is usually restricted to the early seedling stage of vegetables. SCM larvae will move into small stems and move up the plant causing a swelling of the stem just above ground level, while also causing root collapse and decay. If these stems are split you usually can find the white cylindrical larvae (Fig. 3). Onion or cabbage maggots inflict similar damage but usually continue to feed on the expanding bulb during later stages of growth (Fig. 4). A single maggot can destroy up to 20 small seedlings. Both SCM and OM can attack onion bulbs, but SCM also can attack vegetable seeds and transplants.

Complete larval development requires 2-4 weeks. Maggots then enter a pupal stage that lasts another 2-4 weeks. There are 3-4 generations per season in our area, with the most destructive being the early spring and later fall generations. When wilted transplants or newly emerging seedlings are inspected in the field, maggots are sometimes not found (they have already pupated), but their tell-tale damage appears as hollowed out seeds or stems and roots held together by a few strands of plant material.



**Figure 4.** Seed maggot damage to turnip bulb



**Figure 3.** Seed maggots in the stems of different seedlings

### Cultural Controls

Avoid planting in soils that have a great deal of non-decomposed organic matter, such as fields with manure or compost applications or a heavy cover crop or are very weedy. Rotate early season crops away from any areas that had onions or crucifers last fall. Early spring-planted crops are more likely to be damaged when the soil is too cold for rapid germination and emergence. If serious infestations are expected, wait until the soil warms up in the spring. Recently seeded or transplanted crops can be covered with floating row covers, which act as barriers against any of the root maggot flies. Do not use row covers where onions or brassicas were grown the previous year. When soil temperatures increase and maggot first-flights end, the row covers can be removed.

### Chemical Management

Treatments should be applied pre-plant or at-planting to be effective. The use of treated seed (Commercially treated seed only: for onion-Trigard ST or Cruiser 5FS for peas and beans) or soil application of an insecticide give good to moderate control of SCM, CM and OM. There are several ways to apply an insecticide to the soil at or right after planting: 1. Through low pressure drip or trickle irrigation, 2. An in furrow spray directed on or below the seed, 3. A narrow

(< 2 inches) surface band spray over the seed line during planting that is incorporated to a depth of 1 - 1½ inches with sufficient irrigation within 24 hours of application, 4. A post seeding drench, transplant water drench, or hill drench. Unfortunately, there are not many chemicals that can be used for control, however some of the chemicals that can be used include: 1. Diazinon AG500 (onions-moderate control; for Cole crops not labeled for cabbage maggot on collards, kale and kohlrabi) 2. Cyantraniliprole (Verimark, Cole crops) 3. Tolfenpyrad- soil applied (Torac, Cole crops) 4. Imidacloprid has been found by growers to reduce maggot damage when it is soil applied and is registered for use for other pests on the crop. 5. The post-planting sprays of malathion or pyrethroids are meant to control or reduce the adult fly populations but are not that effective and will do little to control maggots already present in the soil. The use of these products can vary depending on the particular crop so be sure to check the label before using.

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**Delaware 24c Labels for Herbicides in Vegetables** - Mark VanGessel, *Extension Weed Specialist*; [mjv@udel.edu](mailto:mjv@udel.edu)

### **Rotation Interval for Halex GT to Lima Beans is Reduced for Delaware**

A Special Local Needs label (24c) to allow lima beans to be planted 10 months after a Halex GT application. The full label has an 18-month restriction, which prevented Halex GT application in one year and rotation to lima beans the next season. This label specifies that soil pH needs to be at least 6.0 and at least 18 inches of rain or irrigation occurred between application and planting lima beans. This means fields with corn treated with Halex GT last summer can be rotated to lima beans this summer. This label has only been approved for Delaware at this time and the label is valid for five years.

### **Command in Peas Can Now Rotate to Lima Bean**

FMC Corporation collaborated with Departments of Agriculture in Delaware, Maryland, and New

Jersey labeling Command 3ME for use on lima beans through the release of a 24(c) Special Local Need Label. This change occurred last spring. Along with the label for use in lima beans, this label also allows for planting lima beans 60 days after application in a preceding crop. This allows use for Command use in peas and planting lima beans at least 60 days later.

### **GoalTender Label for Cole Crops**

The GoalTender label for cole crops has been renewed by NuFarm, and the label has been extended until 2027. This allows postemergence use in broccoli, cabbage, and cauliflower.

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**Direct-to-Consumer Market Analysis Excel Spreadsheet**- Nate Bruce, *Farm Business Management Specialist*, [nsbruce@udel.edu](mailto:nsbruce@udel.edu)

Whether it be produce, meat, or value-added products, marketing costs are incurred when selling direct-to-consumer. Marketing expenses can vary significantly between market channels, with some being more profitable options than others. It is important to analyze each market and determine which ones are more profitable and which ones are not.

University of Delaware Cooperative Extension has developed a direct-to-consumer market analysis Excel spreadsheet that can help producers determine which direct-to-consumer market avenues are most profitable, relative to marketing expense. This workbook is designed to be updated very easily. Enter the name of the market channel you are selling into (roadside stand, farmers market, corner store, etc.) next to the market 1, 2, 3, etc. You can also update the Excel sheet name in addition to reflect this market. Type in your sales and marketing expenses into the associated marketing channel sheet and the workbook will automatically update. Be sure to update this workbook periodically and mark the date of the revision when saving the file. When you download the Excel file, there is a sample market given in the first sheet (Market 1).

Net returns, or profit is determined after subtracting marketing expenses from sales in each given market sheet. In addition, the

number of net returns (whether it be negative or positive) per marketing expense dollar is also given. Lastly, the percent return over marketing costs is also determined. Sometimes there are reasons to stay in markets that are not always profitable such as if it is a new market or if it is hyperlocal with low transportation expenses.

You can download the direct-to-consumer market analysis spreadsheet here:

<https://sites.udel.edu/weeklycropupdate/files/2023/04/Direct-to-Consumer-Market-Analysis.xlsx>

Additionally, the spreadsheet will be added to the University of Delaware Cooperative Extension website on a new farm business management webpage section.

If you have any questions on the spreadsheet and using it as a template for analyzing your own direct to consumer sales, please contact me at by email at [nsbruce@udel.edu](mailto:nsbruce@udel.edu) or by phone 302-363-7619.

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**Experienced Pole Lima Growers Needed to Test New Variety** - *Emmalea Ernest, Scientist - Vegetable Crops and Co-Ag Program Leader;* [emmalea@udel.edu](mailto:emmalea@udel.edu)

A new pole lima bean variety (DP1600203) developed at the University of Delaware is available for testing in 2023. Growers who would like to assist with testing are asked to report yield data for the trial variety and for an adjacent identical row-length of their standard variety.

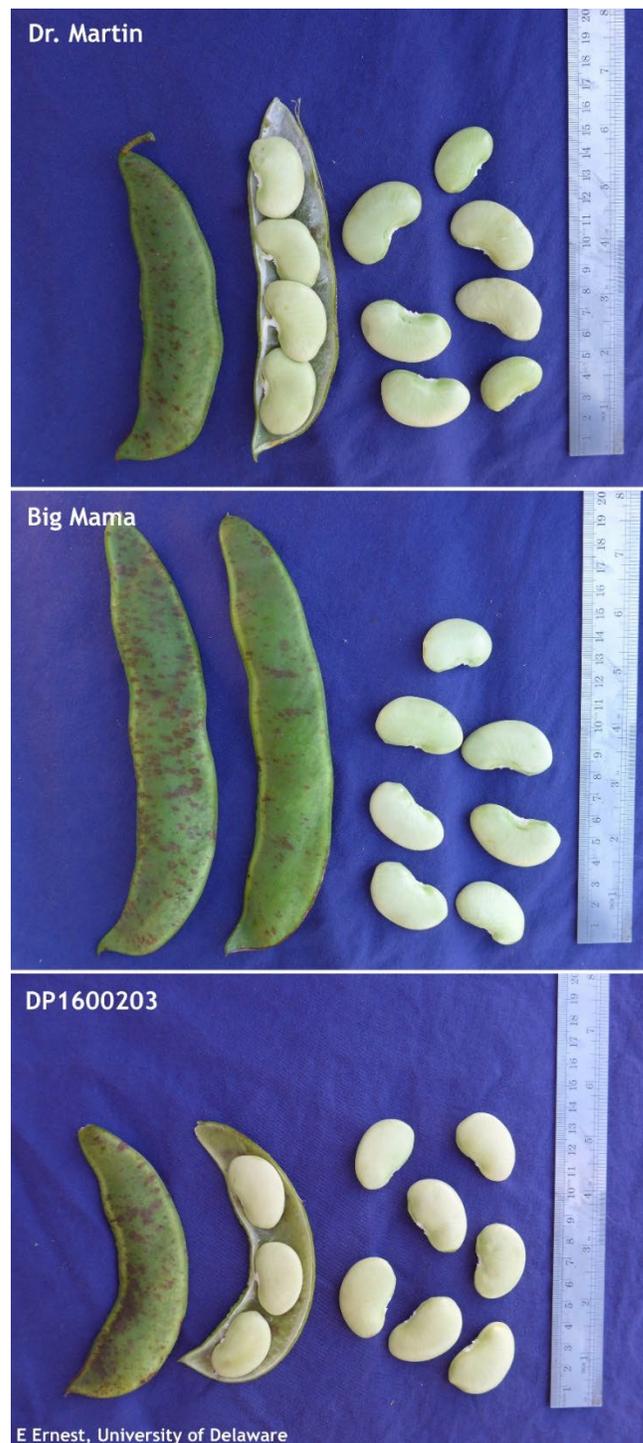
If you save your own pole lima bean seed, the trial variety should be grown in a different area from your seed production plants. Otherwise outcrossing can occur and your own pole lima strain will not grow true from seed.

A limited amount of seed is available. Each trial participant will receive 10 seeds. If you would like to be considered for the trial, please fill out this online form:

<https://forms.gle/4dphkHys9mzTUUMg8>

### **Trial Variety DP1600203**

The trial variety DP1600203 (it will get a better name if it is officially released) produces large green seed. Succulent seeds are slightly smaller than those of Dr. Martin and slightly larger than those of Big Mama. DP1600203 produced higher yields than Dr. Martin and Big Mama in trials conducted in 2021 and 2022.



E Ernest, University of Delaware

# Fruit Crops

**Strawberry Insect Scouting** - David Owens, Extension Entomologist, [owensd@udel.edu](mailto:owensd@udel.edu)

Continue scouting strawberries for tarnished plant bug. Adults and nymphs feed on flowers and developing fruit. They feed on seeds causing the portion of the strawberry around those seeds to stop growing, resulting in misshapen fruit and 'button' berries. Adults are a little bit smaller than your small finger nail with dark brown and yellow stripes. Nymphs are quite small and green. Shake or flick flower clusters onto plastic and count adults and nymphs. There is a dynamic sampling plan here:

<https://ag.umass.edu/fruit/fact-sheets/strawberry-ipm-tarnished-plant-bug>.

Check a minimum of 15 flower clusters and consider a treatment if 3 or more bugs are found. Less than that, continue sampling. Pay attention to weedy field edges where they overwinter.

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**Misshapen Strawberry Fruits, Cold Damage and Frost Injury** - Gordon Johnson, Extension Vegetable & Fruit Specialist; [gjohn@udel.edu](mailto:gjohn@udel.edu)

Strawberries with row covers removed were exposed to freezing temperatures on April 10 in some areas of the state.

Frost and freezes will commonly kill the whole strawberry flower. Cold damage that does not kill the whole flower will also cause berry deformities because some achenes have been damaged. Cold injury can also cause fruit with multiple tips.

Misshapen strawberries during spring often result from poor pollination. Strawberries are aggregate fruits. 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. To avoid misshapen fruits the achenes need to be pollinated evenly and

fully. With pollination, the receptacle tissue around the achenes will develop to form the strawberry fruit.



G Johnson, University of Delaware

Frost injury. Pistils in the center of blossoms turn black or brown.

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 produce bigger berries when cross pollinated 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.

You can distinguish poor pollination from other types of damage because fruit will have variable achene (seed) size. Large seeds received pollination, while small seeds did not. Poor pollination is common when plants have been under row covers during bloom and when the bloom period has been rainy, stormy, or cold. Tarnished plant bugs can also cause deformities. When adults and nymphs feed on the flowers and

developing fruit, they kill a portion of the tissue while the rest of the berry continues to develop around the dead spot. The insect does not feed on the seeds, thus, they will all be of the same size unlike distorted berries due to poor pollination.



G Johnson, University of Delaware

Strawberry deformities caused by poor pollination, cold injury and tarnished plant bug damage. If berries have seeds of different sizes, it is due to poor pollination.

## Agronomic Crops

**Agronomic Crop Insect Scouting** - David Owens, Extension Entomologist, [owensd@udel.edu](mailto:owensd@udel.edu)

### Early Season Moth Activity

Many thanks to Haley Sater with UMD Cooperative Extension and Joanne Whalen, Extension entomologist emeritus extraordinaire for assistance with checking traps.

Location	# of Nights	Total Catch	
		TAW	BCW
Willards, MD	7	16	12
Salisbury, MD	4 (Apr 10)	6	5
Seaford, DE	7	33	15
Sudlersville, MD	7	28	10
Harrington, DE	7	183	43
Smyrna, DE	7	693	71
Middletown, DE	8	12	52

Moth counts fluctuated a bit with some sites showing a small increase and others a decrease.

The northern half of Kent County and New Castle County continue to indicate a cutworm flight is ongoing, and a true armyworm flight along the east side of Rt 1. We will be tracking degree days to forecast when black cutworm larvae will be large enough to cut plants, but keep in mind that there are other cutworm species in the area with differing timings. Scout emerging corn for signs of cutworm activity - holes in leaves, large gouges, and partially cut/withering plants. Withering plants can also be a sign of wireworm or white grub damage.

**Small Grain Disease Updates** - Alyssa Koehler, Extension Field Crops Pathologist; [akoehler@udel.edu](mailto:akoehler@udel.edu)

Across much of the region, barley is approaching or at heading and wheat is ranging from Feekes 7-9. I have heard very few reports of powdery mildew this season and with more warm weather on the way, it is unlikely to develop. We did receive quite a few calls this spring about yellow patches, particularly in malting barley (Figure 1). These patches tested positive for Barley Yellow Dwarf Virus (BYDV) and often had *Pythium* species recovered from the root system. We do not usually see such early symptoms of BYDV and we will be keeping a close eye on the amount of symptoms in barley and wheat flag leaves as we continue to understand what factors were contributing to these patches. Leaf discoloration from BYDV in flag leaves can be yellow, orange, red, or purple and plants may have shortened internodes resulting in shorter plants (Figure 2).

We are currently at low risk on The Fusarium Risk Tool <http://www.wheatcab.psu.edu/>, with the eastern part of Sussex County moving to medium/high risk only for very susceptible hybrids in the six day outlook (Figure 3). In barley, flowering begins just before the spike emerges from the boot. While florets are not as susceptible, *Fusarium* can infect the glumes and produce deoxynivalenol (DON). DON accumulation is the primary concern, especially for malting barley acreage. If making a fungicide application to manage FHB in barley, the optimum stage to protect barley glumes is when

the spike is fully emerged from the boot and florets are exposed (Figure 4). Work in North Carolina has shown that application up to 6 days after 100% emergence can reduce infected kernels and DON. In our 2022 malting barley fungicide trials we had moderate FHB pressure and saw DON reduction with anthesis application of Caramba, Miravis Ace, Prosaro Pro or Sphaerex. We also had some two pass treatments, which had the lowest DON and Fusarium damaged kernels (Table 1).



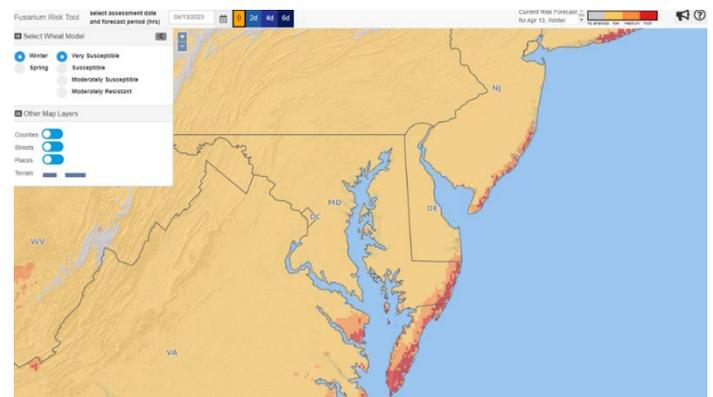
A Koehler, University of Delaware

**Figure 1.** Yellow patches present in multiple malting barley fields this spring that were positive for barley yellow dwarf virus and Pythium species in the root system



A Koehler, University of Delaware

**Figure 2.** Discoloration of flag leaves due to barley yellow dwarf virus



**Figure 3.** Fusarium Risk Tool Prediction for April 13, 2023



A Koehler, University of Delaware

**Figure 4.** Stages of barley at or near spike emergence, with the two right spikes (100% emergence and 6 days after) at optimum stage for fungicide application.

Table 1: Carvel Research and Education Center Georgetown, DE  
2022 Barley Fungicide Timing Trial

Treatment <sup>z</sup>	% Frost Incidence <sup>y</sup>	% Frost Severity	FHB % Incidence <sup>x</sup>	FHB % Severity <sup>w</sup>	DON (PPM)	FDK (%)	Yield (Bu/A) <sup>v</sup>
Control	52.0	8.50	26.0	2.24	2.32 a	2.08 a	67.5 c
Prosaro anthesis 6.5 oz/a	66.0	13.46	27.0	2.43	1.72 ab	1.44 ab	69.1 bc
Caramba anthesis <sup>t</sup> 13.5 oz/a	56.0	9.11	31.0	2.29	1.51 b	1.52 ab	70.7 abc
Miravis Ace anthesis 13.7 oz/a	44.0	8.50	23.0	2.10	0.71 cde	1.00 bc	80.2 ab
Prosaro Pro anthesis 10.3 oz/a	54.0	11.12	29.0	2.94	0.85 cd	1.16 bc	75.8 abc
Sphaerex anthesis 7.3 oz/a	66.0	14.39	27.0	1.96	1.28 bc	0.92 bc	65.7 c
Miravis Ace anthesis fb Prosaro Pro 5 daa 13.7 oz/a fb 10.3 oz/a	70.0	12.99	22.0	1.68	0.30 e	0.52 c	77.6 abc
Miravis Ace anthesis fb Sphaerex 5 daa 13.7 oz/a fb 7.3 oz/a	52.0	10.28	26.0	2.80	0.40 de	1.08 bc	74.8 abc
Miravis Ace anthesis fb Tebuconazole 5 daa 13.7 oz/a fb 4 oz/a	46.0	6.92	16.0	1.54	0.79 cd	1.08 bc	81.7 a
<i>p</i> -value LSD ( $\alpha=0.05$ )	0.58 <i>ns</i>	0.31 <i>ns</i>	0.85 <i>ns</i>	0.90 <i>ns</i>	0.0001 0.6	0.0002 0.5	0.002 8.15

<sup>z</sup> Applications were made at anthesis 4/25/22 and 5 days after anthesis (daa) 4/29/22 using a CO<sub>2</sub> pressurized backpack sprayer equipped with Turbo TwinJet 1102 nozzles calibrated to deliver 20 GPA at 40 psi. All treatments included 0.125% non-ionic surfactant, Induce 90SL, fb= followed by.

<sup>y</sup> Percent of 10 heads showing frost damage. Means followed by the same letter are not significantly different based on Fisher's Least Significant Difference (LSD;  $\alpha=0.05$ ), *ns*= not significant.

<sup>x</sup> Fusarium Head Blight Incidence was visually assessed as the % of 20 barley heads per plot displaying symptoms.

<sup>w</sup> Fusarium Head Blight Severity was visually assessed as the average amount of symptoms present on 20 barley heads per plot.

<sup>v</sup>Plots were harvested 6/21/22 and yield was adjusted to 13.5% Moisture.

Variety: Violetta

Planting Date: 10/20/21

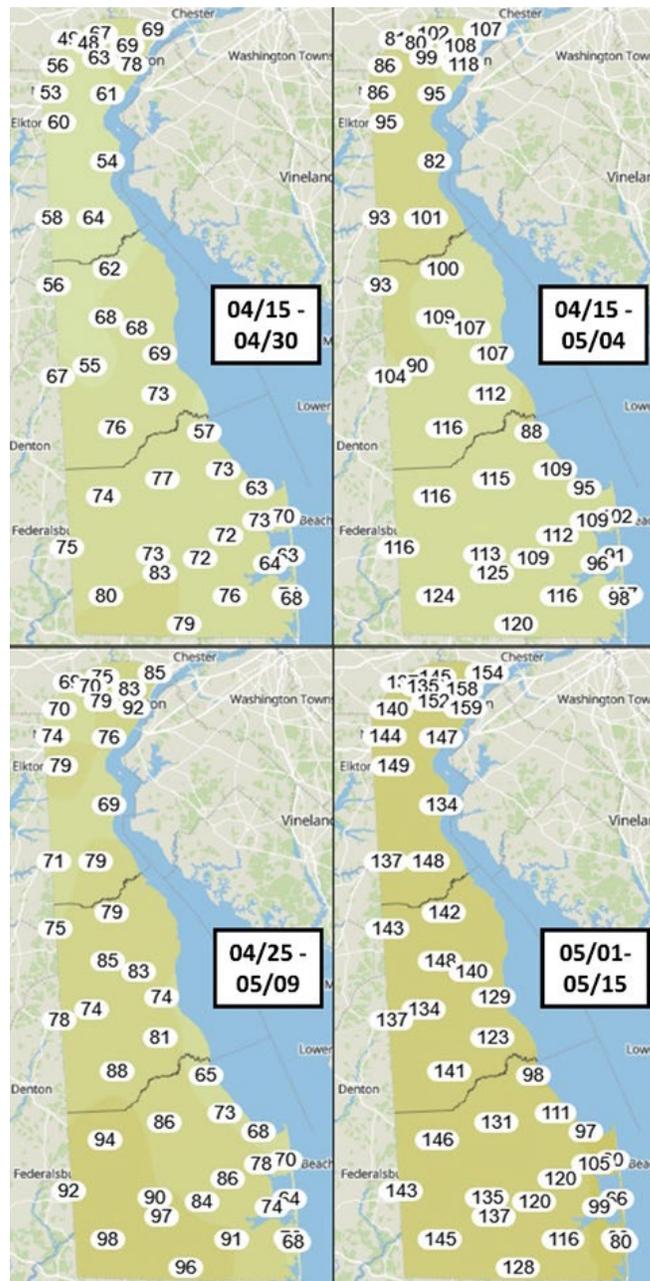
Planting Population: 1.5 mil sd/A

## Growing Degree Days and Planting Decisions for Corn - Jarrod O. Miller, Extension Agronomist, [jarrod@udel.edu](mailto:jarrod@udel.edu)

Based on past growing degree information for Delaware (<https://sites.udel.edu/agronomy/2022/06/22/a-verage-delaware-growing-degree-days-2019-2021/>), corn emergence may occur anywhere from 84-150 GDD, with an average of 109 GDD. A more nationally recognized value for corn emergence is about 120 GDD for 50% of your stand.

With warmer temperatures over the next few weeks, some planting has already started, and may see reduced stands if cooler temperatures and wet soils prevail. In 2022 (Figure 1a), planting April 15<sup>th</sup> did not obtain enough growing degree days over a two-week period to reach emergence, particularly in the northern end of the state. Sussex county didn't reach 109-120 days until around May 4<sup>th</sup>. Even planting on April 25<sup>th</sup> did not result in 109-120 GDD within two weeks (Figure 1c), which is when we typically start at our Georgetown research farm.

Statewide in 2022, a May 1<sup>st</sup> planting was when we accumulated enough growing degrees statewide (Figure 1d), although the coastline during that time remained cooler. Remember that these are air temperatures, and soil temperatures rise and fall slower. For 2023, the slightly warmer weather looks conducive to earlier planting if you are willing to risk some stand loss and later emergence. However, this can rapidly change, so choose fields with *good drainage and limited residue/cover* to enhance soil temperatures and emergence.



**Figure 1.** Accumulated growing degree days in 2022 based on a) April 15<sup>th</sup>-30<sup>th</sup>, b) April 15<sup>th</sup>-May 4<sup>th</sup>, c) April 25<sup>th</sup>- May 9<sup>th</sup>, and d) May 1<sup>st</sup> to May 15<sup>th</sup>.

**Soybean Planting Research Updates - Jarrod O. Miller, Extension Agronomist, jarrod@udel.edu**

**Planting Date Decisions**

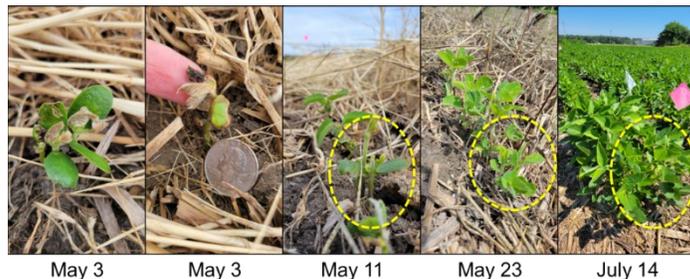
Over three seasons (2020-2022) the Delaware Soybean Board supported research observing different planting dates for soybeans, which ranged from April 12<sup>th</sup> to June 4<sup>th</sup>, depending on the year. All three studies were done at our research farm in Georgetown, DE where we observed no differences in yield for a maturity group 4.5 soybean.

Seeds were left untreated so that any early season diseases could cause losses, but none were observed during the study, besides some diaporthe. In 2021, stands were reduced on the earliest planting due to an issue with a row unit planting too deeply, yet yields remained similar at the end of the season. We also observed some freeze damage in 2022 on the earliest planted beans, but no yield differences by the end of the season. One interesting note was that soybeans typically had less aluminum in their tissue with later plantings, and this could be related to yield losses, and could be diluted with higher soil pH. More work needs to be done to understand the mechanism of aluminum availability in the soil.

We did not observe a yield boost with earlier planting, as some states have reported. But, we also did not observe yield losses, despite a lack of seed treatment, planting depth mistakes, and freeze damage. Results will certainly vary across the state, based on local weather conditions and pathogen vectors, but mid-April planting of soybeans may be a safe bet for southern Delaware.

**Table 1.** Soybean yields based on planting dates from 2020-2022.

2020		2021		2022	
Date	Yield	Date	Yield	Date	Yield
05/08	74.0	04/12	50.1	04/13	67.0
05/21	75.9	04/28	52.7	04/26	68.0
06/04	72.1	05/10	53.1	05/11	67.9



**Figure 1.** Freeze damage to soybeans planted on April 13, 2022, did not result in any yield differences by the end of the season.

**Row Spacing and Population Decisions**

As noted in an earlier Delaware Agronomy Blog post (<https://sites.udel.edu/agronomy/2023/01/27/2022-soybean-yield-response-to-planting-populations-row-spacing-and-irrigation-in-delaware/>), we have not observed yield differences in full season beans planted between 60-180,000 seeds per acre. We did observe a yield boost of 10.6 bushels when planted in 15” rows over 30”, as well as 25.9 bushels in irrigated plots.

Populations can certainly be lowered to what you are comfortable with, as long as considerations for reduced stands due to disease, pests, and soil conditions are also considered. Lower populations will also take longer to canopy, particularly in 30 inch rows, which may allow for greater weed pressure.



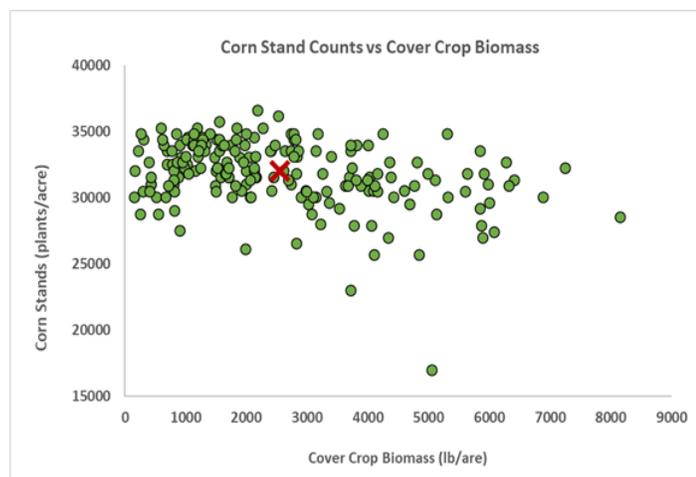
Rainfed plots senescing earlier under our variable rate linear irrigation field.

## Cover Crop Burndown and Corn Stands -

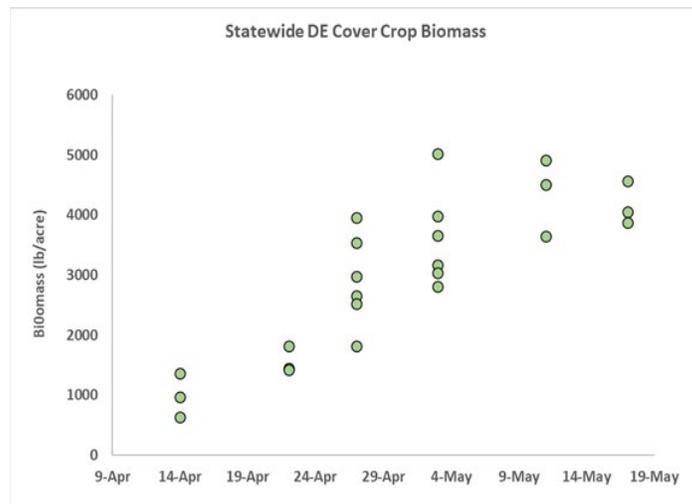
Jarrold O. Miller, Extension Agronomist, [jarrod@udel.edu](mailto:jarrod@udel.edu) and Amy Shober, Extension Nutrient Management and Environmental Quality Specialist; [ashober@udel.edu](mailto:ashober@udel.edu).

Cover crop residues may be beneficial for retaining soil moisture and suppressing weeds, but these residues can also cause impact planting and germination of the subsequent cash crop. We have occasionally observed issues with reduced cash crop stands in our research studies, particularly when planting green into high biomass cover crops.

For example, we noted a reduction in corn stand counts with increasing cover crop biomass (lb/acre; Figure 1). While there was high variability in stand counts across all plots, we saw a trend for a reduction in corn stand counts when cover crop biomass exceeded 2,500 lb/acre, which was the average cover crop biomass measured in our study (Figure 1, Red X). Based on data collected across DE in 2021 (Figure 2), we noted that cover crop biomass reached 2,500 lb/acre when cover crops were terminated at or after April 29. Based on our past results, we suggest growers consider termination of actively growing cover crops before the end of April to prevent issues with corn germination and stand establishment. As always, we recommend growers use their best judgement based on past results.



**Figure 1.** Cover crop biomass impacted corn stand establishment in 2021 UD Field trials, especially when cover crop biomass exceeded 2,500 lb/ac (Denoted by the red X).



**Figure 2.** Cover crop biomass increased with later termination timing in 2021 UD field trials. By 29 Apr 2021, cover crop biomass in most plots was >2,500 lb/ac, which may negatively affect corn germination and establishment.

## General

**Guess the Pest! April 7 Answer: Spotted Lanternfly** - David Owens, Extension Entomologist, [owensd@udel.edu](mailto:owensd@udel.edu)

Congratulations to Buzz Lowe and many others for correctly identifying the walking domino as Spotted Lanternfly. As a reminder, participants who enter correct pest i.d's will be entered for a sweep net among other items as well as a potential shout-out in next week's column.



Photo by Lawrence Barringer

This week SLF eggs began hatching in Georgetown. It is time to resume checking vehicles, equipment, and especially plants to make sure no unwanted insects are hitching a ride. As a reminder, all of Delaware is under Spotted lanternfly quarantine. More information can be found at DDA's website: <https://agriculture.delaware.gov/plant-industries/spotted-lanternfly/>.

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**Guess the Pest! April 14** - David Owens, Extension Entomologist, [owensd@udel.edu](mailto:owensd@udel.edu)

This problem has been fairly quiet in small grains the last several years in Delaware but reared its ugly head in the late winter/early spring in many fields. What is going on with the plants of unusual color?



This year, Guess the Pest participants will be entered into an end of season sweep net drawing

(as well as other potential items). To enter a guess, click on the Guess The Pest Logo or visit: <http://www.udel.edu/008255>

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**Reminder for Required Trainings for Herbicide Use** - Mark VanGessel, Extension Weed Specialist; [mjv@udel.edu](mailto:mjv@udel.edu)

Xtendimax, Tavium, and Engenia labels require that applicators complete training every year. Each applicator needs to have their own certification; working under the supervision of someone who has completed the training is not allowed. Training is available online through Bayer, BASF, or Syngenta.

Paraquat also requires training for applicators, mixers, and handlers. Training certificates need to be updated every three years. This training is available on-line at <https://npsec.us/paraquat>.

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**Scout Your No-Till Fields for Burndown Effectiveness** - Mark VanGessel, Extension Weed Specialist; [mjv@udel.edu](mailto:mjv@udel.edu)

A lot of no-till fields have been treated already. Until this past week our weather has been up and down, so do not assume all the treatments were effective. One of the best ways to ensure effective burndown is to wait for the weather to improve, but that is "easier said than done". So if you treated fields already scout them to be sure the herbicides worked as you expected and it will allow you to plan before the surviving weeds (or cover crop) get too large. It is often easier to treat these fields before the crop has been planted.

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# Announcements

## Free Safety Training for Farmworkers

Telamon is offering safety training programs for farmworkers. All the trainings are offered in English and Spanish, and by request can be provided in Haitian Creole and French. The trainings are provided at no cost to the employer.

If you are interested in any of the free trainings listed below for workers on your farm, please contact:

Cheryl Redd

[credd@telamon.org](mailto:credd@telamon.org)

Cell (304) 960-6691

## Worker Protection Standard

This satisfies the yearly training requirement of the worker protection standard – a pesticide safety training required by the EPA at agricultural establishments for workers that work in the field where pesticides have been used or will be used during their employment. All instructors have at least a Train the Trainer Certificate from PERC, approval number: EPA WPS TTT W/H 00030.

## Heat Stress Prevention

This is an OSHA approved training that teaches workers how to recognize the symptoms of heat-related illness, including heat exhaustion and heat stroke. It teaches what to do to prevent injury, and how to treat someone suffering from heat stroke while waiting for emergency medical help.

## Limiting Exposures Around Families

This training is intended for families, or spouses of farmworkers and explains how to protect yourself or family from pesticides in the environment including clothing of a farmworker, or residues that reach the home from spraying by a nearby farm.

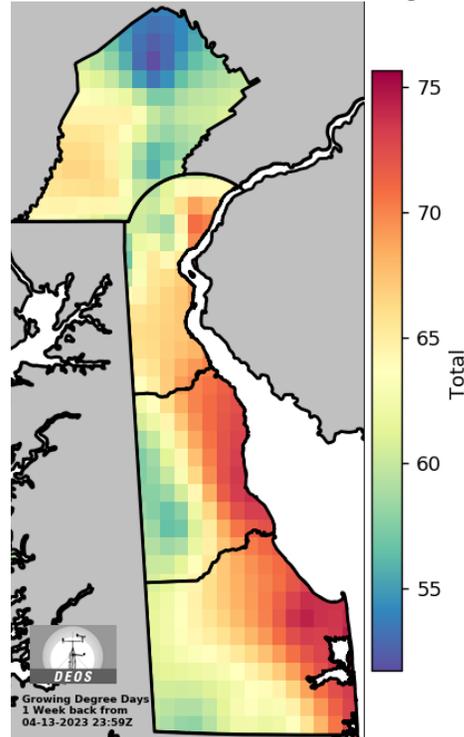
## José Learns About Pesticides

This presentation is for children and teaches them how to protect themselves from pesticides that may be near the home or on the clothing of their parents who work on a farm. It teaches them to not touch clothing that may be contaminated, not to play with pesticide containers, and to not enter a field when pesticides are being applied or have a “No Entry” sign displayed.

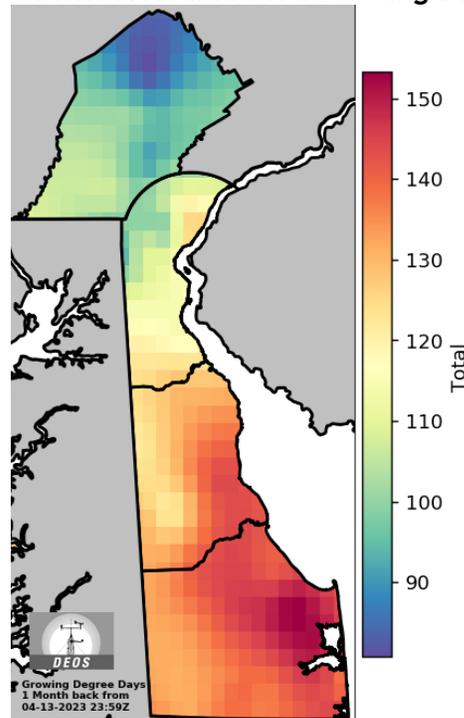
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# Weather Summary

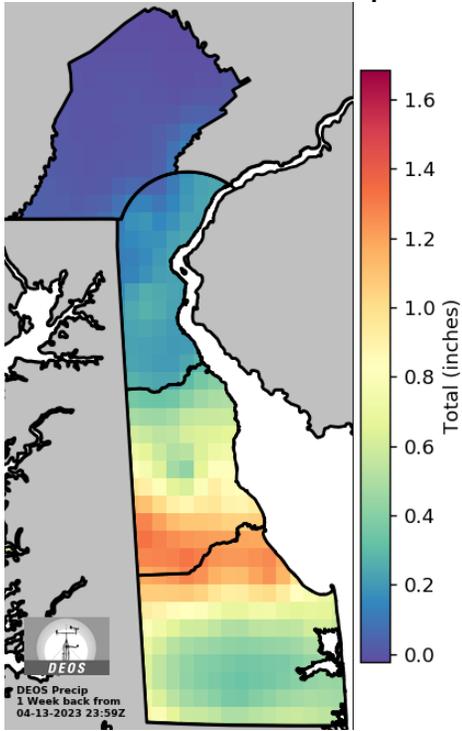
## 1 Week Accumulated Growing Degree Days



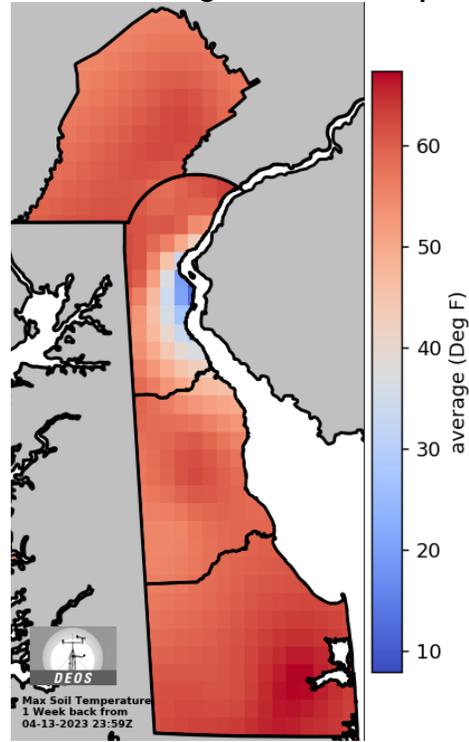
## 1 Month Accumulated Growing Degree Days



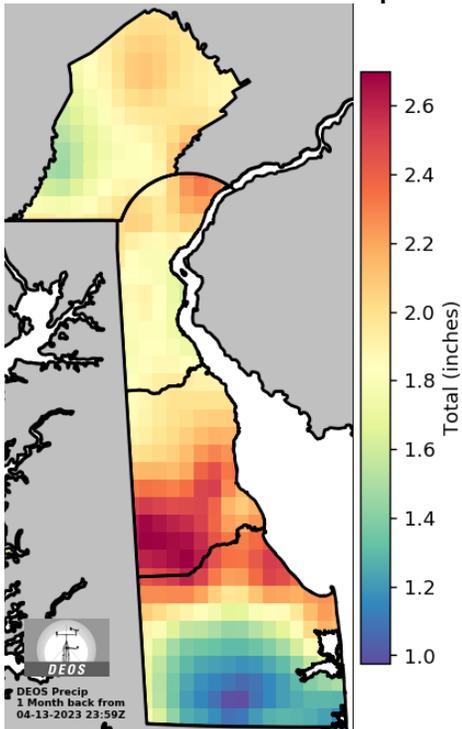
1 Week Accumulated Precipitation



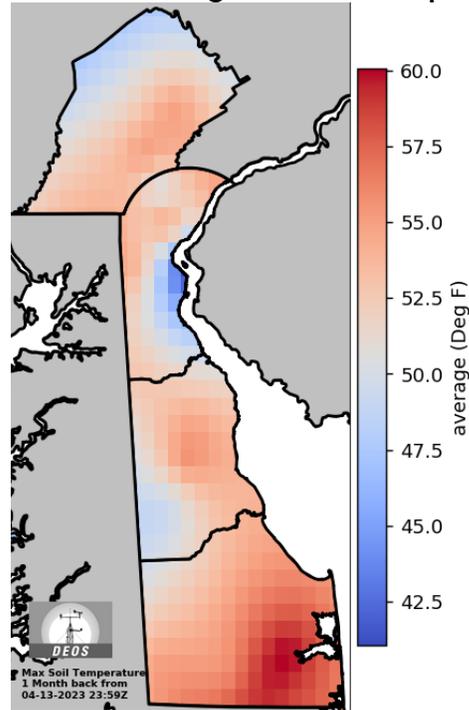
1 Week Average Max Soil Temperature



1 Month Accumulated Precipitation



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!

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

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