



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

As a reminder, sweet corn trapping information can be found here:

<https://agdev.anr.udel.edu/trap/trap.php>.

Threshold information can be found here:

<https://www.udel.edu/academics/colleges/canr/cooperative-extension/sustainable-production/pest-management/insect-trapping/silk-stage-sweet-corn/>. We are

currently catching low numbers in some of the blacklight traps.

Cucumber beetles seem to have not yet arrived on melons. Be scouting carefully and vigilantly. With the cool weather, melon plants are small and growing slowly. When the first cucumber beetles find a suitable host plant (and melons are the most abundant cucurbit), they begin producing an aggregation pheromone that draws in more male and female beetles. They will feed ravenously and mate. This activity can occur very quickly, and in a short period of time, beetles can do quite a bit of damage to small transplants. Any neonic in the drip will probably give about 2-3 weeks of residual control. Be sure to follow label guidance on amount of product per 100 ft of drip. If you go by the plastic footprint (so many beds x bed width = area x rate) you will significantly under treat.

Last year, beetles were first observed in Laurel May 14. At Carvel, large numbers were observed

on May 20 in melons on the south side of a woodline. On the north side of the woodline, melons of the same age were infested June 6. Bottom line, scout often, especially when the weather warms up, be prepared to treat, and call me before you kill all the beetles! I need a couple thousand for 2020 bioassays.

While checking fields for cucumber beetles, be on the lookout for aphids as well. Large numbers of aphids can result in leaf curling, and aphids can transmit viruses to melons. Another common sign of aphid presence is that of ants on the plants. Aphids excrete honeydew which the ants collect. In turn, ants will often protect aphids from parasitic wasps. Last year, large numbers of melon aphids colonized my transplants beginning in the greenhouse and then more severely once the plants were put out to harden off. Transplant treatment with a neonic will effectively eliminate the aphids. There are special instructions for treating transplants on the labels. Over application may result in phytotoxicity. Overhead watering may be necessary to wash material into the plug, but not so much that it leaches out. Residual efficacy of such a treatment is less than 14 days.

Beware of potential seedcorn maggot damage to direct seeded crops given the relatively cool soil, as well as cabbage maggot in Brassicas. Unfortunately, the best time to treat if adult activity is present is as a preventative treatment.

Poor Stands and Plant Vigor in Fresh Market Sweet Corn - Gordon Johnson, Extension Vegetable & Fruit Specialist; gjohn@udel.edu

Growers are reporting issues with stands and vigor in sweet corn fields in 2020, especially in early planted fields. There can be many causes for stand loss and weak seedlings: surface compaction and crusting, birds, soil insects, slugs, cold soils that delay emergence, soil diseases affecting seeds or seedlings, wet soils, fertilizer injury, deep planting, and herbicide injury are just a few examples. We also have had losses in 2020 due to sand blasting.

When checking sweet corn fields with vigor and stand problems, it is important to dig up seeds and affected plants and examine the seed remnants, roots, and mesocotyl (stem that pushes the seed leaf to emerge above the ground). Corn seedling survival and early vigor is directly tied to a healthy seed kernel and mesocotyl from planting through the six-leaf stage. Any damage to the seed or mesocotyl during this period can lead to stunted or weak seedlings, and in severe cases, seedling death. This is because the corn seedling depends on the seed for food to grow for several weeks after emergence until sufficient leaf area has been produced and nodal roots have become established. The seed kernel provides the means for early roots to grow and these food reserves are also mobilized and transported through the mesocotyl to grow the first stalk and leaf tissue. The mesocotyl also serves to transport water and mineral nutrients from the seedling roots.

Sweet corn is more susceptible to stand loss and poor vigor problems than field corn because the seed has less food reserves. Shrunken types (supersweet, sugary enhanced, augmented shrunken, synergistic varieties) have even less stored food than "normal" types and therefore are more susceptible to stand problems.

I have looked at sweet corn fields with stand loss and vigor problems (uneven growth) over the years. Often, when digging up the seedlings and examining the seed remnants and mesocotyls, the kernels will be disintegrated and there will be darkening at the mesocotyl attachment. This means that the seeds deteriorated prematurely

and the full content of the food reserves in the seed were not available for seedling development, leading to the stand and vigor issues. Premature seed deterioration and/or poor vigor seedlings can be due to diseases that cause seed rots, seedling blights and/or root rots. Soil insects can cause seed deterioration by feeding on seed contents or creating entrance wounds for disease organisms. In addition, certain soil insects and slugs can feed on the mesocotyl causing seedlings to collapse. Sweet corn that takes more than 10 days to emerge is at great risk of injury due to insects and diseases as seed treatments dissipate.

Cold stress and cold soils are common stress factors leading to poor stands. Often growers are pushing the limits and are planting sweet corn very early. In 2020 heat units have accumulated slowly and we are continuing to have cold weather into late May. While field corn will start to germinate at 50°F, many types of sweet corn need much warmer soils. This is especially true of supersweet varieties and other shrunken types, which perform best at higher soil temperatures (above 60°F). When soil temperatures are below 55°F, germination is greatly extended. Food nutrients are mobilized in the seed but are not being utilized rapidly by the plant. The seed then becomes a perfect food source for many soil microorganisms. On a positive note, many of the newer sweet corn varieties have much more cold tolerance and emerge more rapidly in cold soils.

Stand issues are often related to the inherent poor vigor of sweet corn. Work with seed suppliers to obtain their best lots with the largest seed sizes. Obtain varieties that perform better under cold stress. When possible, obtain reports from sweet corn trials to assess which varieties are the most cold tolerant. Request seed treatment information and select treatments with the best protection potential. There are in-furrow fungicide options; however, research is limited with sweet corn in our region.

Growers often face the decision on whether or not to keep plantings with poor stands. This is most often a marketing decision based on the need for and value of early sweet corn for that farm. An estimate of potential marketable ears will be based on stand counts of full vigor plants

from 20-40 sites throughout the field. This stand count information then can be used to estimate the value of the field as is versus the value of a later planted full stand crop.

Reduced Seed Set in Peas - *Gordon Johnson, Extension Vegetable & Fruit Specialist; gjohn@udel.edu*

Pea development has been slowed this year and a number of fields have had cold injury. One issue that could be a concern is early pea fields with reduced seed set. This is where pods develop but only one or two seeds are formed.

Reduced seed set occurs during flower development and pollination. Peas are self-pollinated. As the flower opens, the pollen from the anthers is released to the stigma of the pistil of the same flower. Once on the pollen is on the stigma, the pollen germinates and a pollen tube is formed and then grows down the style and when it reaches the ovule, the egg is fertilized by one of the two sperm cells, the other fuses with polar nuclei to become the seed endosperm. During the development of the pollen tube, plant hormones are released which are also essential for seed set.

Seed set problems therefore may be related to lack of pollen formation, pollen that does not release to the stigma, reduced pollen germination, abnormal pollen tube development, abnormalities in the stigma or stile, or abnormalities in the ovule. Lack of Gibberellin hormone release has also been shown to reduce seed set or lead to early seed abortion in peas.

What are the potential causes of reduced seed set in peas? Frost or freeze when flowers are opening has the potential to injure pollen or directly damage flower parts. Peas are very cold tolerant normally but are susceptible to injury at flowering. A number of pea field were flowering during a May 10 freeze event where temperatures dropped to below 30°F at some locations in 2020. Cold stress to peas at and after flowering has been shown to cause seed abortions in some varieties (several days below freezing in a row).

Other research has shown that peas under temperature and moisture stress produce fewer seeds. Experiments have shown that temperatures at 93°F or above can also reduce seed set in some varieties of peas. Dry soil conditions will magnify this effect.

Another factor to consider is timing of chemical applications to peas - applications near and at flowering may damage pea flowers under certain weather conditions and reduce seed set.



Pea pods with reduced seed set.

Swiss Chard with Leafminers and Seed Maggot Update - *Jerry Brust, IPM Vegetable Specialist, University of Maryland; jbrust@umd.edu*

Spinach and beet leafminers have been around in low numbers for the past few weeks, which is a couple of weeks ahead of schedule but have increased rapidly in the last 5-6 days. These leaf miners are found in beets, swiss chard and spinach but I usually find them more in swiss chard than spinach. Both of 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. Both 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 easily seen bright 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.

If you have seriously infested spinach or swiss chard now and you plan to make additional plantings of these crops this season it should be done 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 will emerge from the previous infested sites from laying eggs. Because these leafminers feed mostly 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 [2020-2021 Mid-Atlantic Commercial Vegetable Production](#)

[Recommendation](#) guide and always follow label instructions. For organic production spinosad (Entrust) with horticulture oil can provide good control especially 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.



G Brust, University of Maryland

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



G Brust, University of Maryland

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



G Brust, University of Maryland

Figure 3. As larvae grow their damage becomes more pronounced

Seed Corn and Other Maggots

Just a note to say I have gotten several calls, pictures and descriptions of seed maggots attacking the seeds of peas, lima, snap and kidney beans, cucumber and cantaloupe transplants and corn seed. Often no maggots are found in the hollowed out seeds or transplants because the fly larvae have already pupated and it is very difficult if not impossible to find the pupal case in soil. This has been a really good year for the flies to remain active in our vegetable fields far longer than they normally do. Flies do well in cooler wet weather, which we have had the past month and a half. I wrote an [article about these flies](#) back on the 10th of April as weather outlooks were predicting cool and wet conditions for the next few weeks—didn't realize it would be for the next month. Nothing can be done for the damaged seed or transplants now. Growers will have to replant or re-transplant the missing plants. If seed maggot adults (Fig. 4), which are thin brown/gray flies a little smaller than a house fly that tend to swarm around the soil are still active in your field you'll need to treat before replanting (see [2020-2021 Mid-Atlantic Commercial Vegetable Production Recs guide](#)).



Figure 4. Adult seed maggot

USDA Supports Specialty Crops Producers with Direct Payments for Losses Due to COVID-19

As part of the Coronavirus Farm Assistance Program, the U.S. Department of Agriculture (USDA) [announced](#) on May 19th that it will

provide up to \$2.1 billion in direct payments to specialty crops producers. The payments will be based on losses where prices and market supply chains have been impacted and will help producers facing additional adjustment and marketing costs resulting from lost demand and short-term oversupply for the 2020 marketing year as a result of COVID-19.

Producers that fall into one of the following categories may be eligible to receive a direct payment:

- Sales with a price loss of 5% or more between January 15 and April 15, 2020. Almonds, artichokes, beans, broccoli, cabbage, carrots, cauliflower, sweet corn, cucumbers, eggplant, lemons, iceberg and Romaine lettuce, dry onions, peaches, pears, pecans, bell and other types of peppers, rhubarb, spinach, squash, strawberries and tomatoes are eligible.
- Shipments that left the farm by April 15 and spoiled due to no market or for which no payment was received. All specialty crops are eligible.
- Shipments that have not left farm or mature crops that remained unharvested by April 15. All specialty crops are eligible.

Beginning on May 26, 2020, producers of all eligible commodities may apply for assistance through their local USDA Farm Service Agency Service Center. Specialty crops producers are encouraged to complete the application forms ahead of the application date. Producers can locate their service center and find application forms and additional information at [farmers.gov/cfap](#).

The payments are one of several measures USDA is taking to support America's specialty crops industry which has been greatly impacted by the COVID-19 national emergency. In addition to the direct payments, USDA has implemented the Farmers to Families Food Box Program, in which the USDA Agricultural Marketing Service is partnering with national, regional and local suppliers to purchase fresh produce, dairy and meat products and have suppliers package these products into family-sized boxes, then transport them to food banks, community and faith-based organizations, and other non-profits serving

Americans in need. More information about the food box program is available at <https://www.ams.usda.gov/selling-food-to-usda/farmers-to-families-food-box>.

USDA will also make an additional \$873.3 million in Section 32 purchases of specialty crops products for distribution to food banks. The use of these additional Section 32 funds will be determined by industry requests, USDA agricultural market analysis and food bank needs. The latest purchase solicitations are available at www.ams.usda.gov/selling-food-to-usda-terms/solicitations.

Fruit Crops

DDA Guidance for U-Pick Operations

The Delaware Department of Agriculture has issued [Guidance for Delaware U-Pick Farm Operations](#) during COVID-19. The guidance is available through [DDA's website](#). A link to the guidance document is at:
https://agriculture.delaware.gov/wp-content/uploads/sites/108/2020/05/APPROVED_Guidance-for-Delaware-U-Pick-Farm-Operations-During-COVID-19_5.19.pdf.

Reduced Fruit Size in Strawberries - Gordon Johnson, Extension Vegetable & Fruit Specialist; gjohn@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.

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.

Tarnished Plant Bug in Strawberries - David Owens, Extension Entomologist, owensd@udel.edu

This spring, cold weather has interfered with strawberry pollination resulting in misshapen berries. But there is another cause of deformed fruit: tarnished plant bug. Tarnished plant bugs are a brown to black, mottled, and small true bug with a creased back. Like all true bugs, they have piercing-sucking mouthparts. Nymphs are

green and can easily hide, but when disturbed move very quickly, unlike aphids, which they resemble. Adults feed, reproduce, and overwinter on an enormous variety of weedy and cultivated hosts, especially brassicas and legumes. Although the weather has since cooled, our warm winter and early spring allowed for earlier TPB activity; typically these are more problematic on late varieties and everbearing varieties. 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. They often feed and damage entire berry clusters.

There are a couple of ways to sample for TPB. The first method involves beating an entire plant over a sheet and repeating every 20 feet or so. The threshold used in the South is 1 adult or nymph per 20 plants. The other sampling method, more useful for nymphs than adults, involves beating 30 flower clusters throughout the field. UMass has a good table explaining sequential sampling where, depending on the number of insects and flower clusters examined, control is either not necessary - stop sampling, necessary - stop sampling, or if in between - keep sampling. This can result in a significant time savings. (<https://ag.umass.edu/fruit/fact-sheets/strawberry-ipm-tarnished-plant-bug>).

You can sample for the presence of tarnished plant bug by using a beat sheet or by beating plants on plastic. (White is often recommended and adults will be easy to spot, but small green nymphs tend to be easier to see on a black background). Sample one plant every 20 feet or so. If you find one adult or nymph per 20 plants, a treatment is advised. Keep in mind though that once a berry is deformed, the damage is done. Berries like the ones below were fed upon a couple of weeks prior.

There is a plethora of available synthetic insecticide treatments available. Several pyrethroids are labeled, with varying pre harvest intervals. Malathion is also labeled, as is Assail. Newer chemistries include Apta (also has some powdery mildew activity), Transform, and Beleaf. Among these, only Beleaf is rated as

having low bee toxicity. Be careful not to spray when bees are active; you do not want to risk having deformed fruit by poor pollination when trying to prevent deformed fruit by TPB. PyGanic and azadirachtin are organic options.



David Owens, University of Delaware

Berry deformed by TPB feeding



David Owens, University of Delaware

A damaged berry cluster due to TBP



David Owens, University of Delaware

A late instar TPB nymph

Agronomic Crops

Agronomic Crop Insect Scouting - David Owens, Extension Entomologist,
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This is the last week that we will be maintaining the true armyworm and black cutworm traps. Many thanks to the folks that let us put traps up in their fields and to Maegan Perdue, Emily Zobel, and Joanne Whalen for checking traps.

Counts are as follows:

Location	TAW/night	BCW/night
Willards, MD	1.7	4.6
Salisbury, MD	0.4	1.7
Laurel	0.2	2.8
Seaford	0.3	1.2
Harrington	2	7.4
Pearson's Corner	1.1	---
Sudlersville, MD	1	2.9

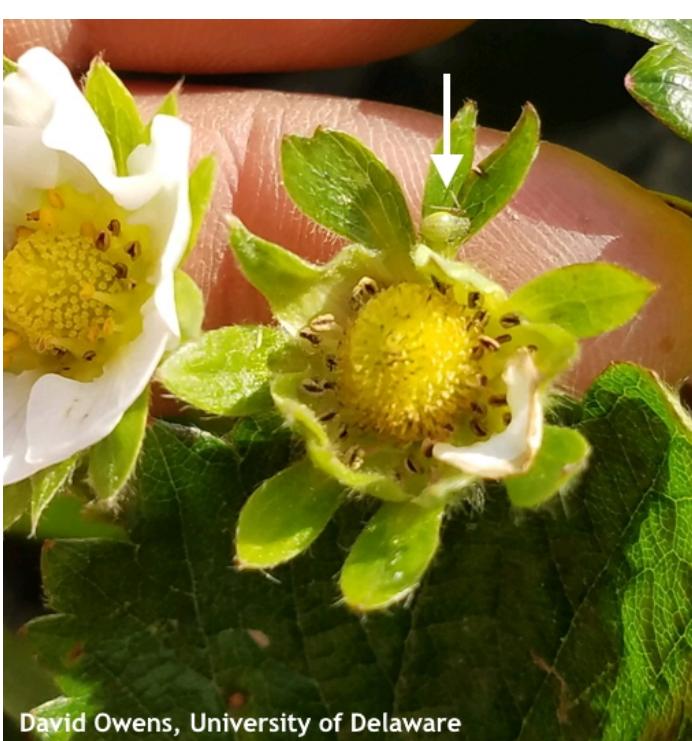
Slugs

There are reports of corn fields that have been treated for slugs or should be treated for slugs. Carefully watch the plants the next few days. If plants start going 'backwards,' a treatment may be necessary. While slugs generally do not like dry windy conditions, they retreat underground and in open seed slots and can cause unobserved damage. This also makes scouting for their presence a bit trickier. Any rain we might get will be favorable to both crop and slug, and if cool conditions persist, probably more favorable to the slug. There are two chemical options that have shown promise: UAN and Deadline.

Galen Dively (UMD) is putting together a slug control pamphlet and writes that Deadline "is effective both as a nerve poison if ingested at high concentrations and as a dermal irritant that causes slugs to secrete large amounts of mucus, resulting in desiccation. The efficacy of metaldehyde baits is highly dependent on temperature and humidity. Effective control is more likely if the bait is applied following a rain or irrigation that increases slug activity; however, heavy rains following application can lead to control failures because of reduced residual action and increased slug recovery from the water loss effects."



An adult tarnished plant bug



An early instar on the upper sepal demonstrating how well nymphs blend in.

Deadline M-Ps 'has longer residual action and contains a slug attractant which presumably increases control efficacy. This product is a pellet-type bait applied on corn as a broadcast or banded over-the-row application at 10 to 40 lbs/acre, respectively. Studies have shown that Deadline Bullet treatments can significantly reduce the number of slugs active at night and the amount of feeding injury. Both rates of 10 and 40 lbs/acre applied at planting provided greater than 90% control of slugs and reduced feeding intensity by 80%. The broadcast application at 40 lbs/acre gave slightly better control but not significantly different from the 10 lbs/acre banded treatment. Because of the high price, the application of 10 lbs. of bait banded over-the-row is the most cost-effective. An early treatment applied at planting or as plants emerge is necessary to prevent feeding injury to the most vulnerable plant stages. However, baits may be ineffective if slugs are feeding below the surface in the seed slot.

Regarding UAN, Joanne Whalen wrote in 2012 that "In years past, 30% UAN applied at night when the plants are dry and there is **no wind** has resulted in variable levels of success (the rate used in past years was 20 gallons per acre of 30% UAN on corn in the spike to one-leaf stage and the mix was cut 50/50 with water to reduce - **but not eliminate** – plant injury)."

Efficacy is heavily dependent on slug activity - this is contact only. In an experiment that Galen Dively performed where slug density ranged from 1 to 3 per plant, after 24 hours "spray volumes of 20 gallons/acre consisting of 5, 10, and 20 gallons of the nitrogen formulation reduced slug densities by 48%, 74%, and 81%, respectively. The 10 gallon rate mixed 1:1 with water may be the best choice because of the reduced cost and less risk from phytotoxicity to the corn foliage. Although the cost of a nitrogen spray could be partly offset by the added fertility, it is doubtful whether much of this nitrogen becomes available for plant growth."

Soybeans

Slugs are not the only potential stand reducer in soybean. The other potentially significant early season feeder is bean leaf beetle. I have not heard of any reports of BLB activity yet, but they

can be expected soon. Defoliation thresholds are 40% with 2 beetles per plant.

Following Current Corn Growth Stages -

Jarrod O. Miller, Extension Agronomist, jarrod@udel.edu; Cory Whaley, Sussex Co. Extension Ag Agent, whaley@udel.edu; James Adkins, Irrigation Engineer, adkins@udel.edu and Jake Jones, Extension Agriculture Agent, Kent County, ijjones@udel.edu

In 2019 we followed several corn planting dates to evaluate emergence and growth stages across Delaware. Fields planted in late April and early May took 7 to 10 days to emerge and 22 to 25 days to reach the V4 stage. This year, over the same time period, corn has taken 9-13 days to emerge, and the earliest planted field we found took 24 days just to reach V2. The weather has been cooler the last few days, and lowered heat accumulation again (Figure 1).

There is a good chance that many fields planted in mid-May will not be as far behind those planted the week before, as they accumulate growing degree days (GDD) at a more rapid pace. This can be seen in Table 1, where corn planted in New Castle County on May 6th or 13th would accumulate very similar GDD. Sussex County has been a little warmer but was still limited in heat units from May 2-13th (Figure 1). Keep track of your fields and scout for stages, as you may be sidedressing fields a little later than you expect.

Table 1. Accumulated Growing Degree Days Based on Planting Date

Planting Date	New Castle	Kent	Sussex
Apr 15	159.1	185.6	199.7
Apr 22	159.1	178.9	192.4
Apr 29	156.8	174.8	174.6
May 6	87.2	97.7	93.9
May 13	83.2	84.9	76.4

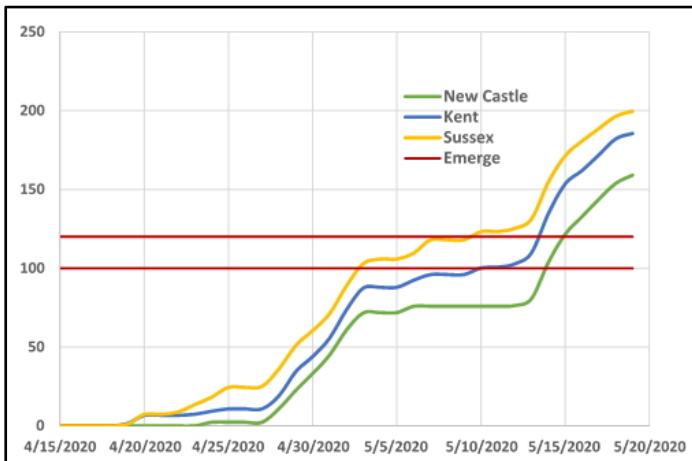


Figure 1. Accumulated Growing Degree Days in each County Since April 15th.

Agronomic Crops Disease Update - Alyssa Koehler, Extension Field Crops Pathologist; akoehler@udel.edu

Small Grains

The cool weather delayed flowering in wheat across much of the region. To date we have seen limited symptoms of Fusarium Head Blight (FHB). Bleached florets or bleached portions of the head are typically visible 18-24 days after flowering, but cool weather can delay symptom development. Foliar lesions along with floret discoloration from glume blotch have been observed in barley and wheat. Barley Yellow Dwarf Virus has been noted at low levels across multiple fields.

Corn

The cold weather and rain delayed corn planting across much of the region. As corn begins to emerge, environmental conditions may favor Pythium Root Rot, especially in low-lying areas of the field. Symptoms can include stunted, slower growing plants, to severely infected, dead plants (Figure 1). Infected plants typically have brown, rotted roots and mesocotyl (Figure 2). Once root systems have developed, seedlings can usually survive mild to moderate *Pythium* infections. Seed treatments with oomycete activity can provide some protection within 10-14 days after planting, and can be helpful for improving seedling emergence and reducing pre-emergent damping off. Multiple species of *Pythium* are able to infect corn, with each

species having a different optimal temperature. We have ongoing research projects to collect diseased samples and identify which species are most problematic in the Mid-Atlantic.



Figure 1. Corn seedlings with post-emergent damping-off caused by *Pythium* spp.



Figure 2. Corn seedling with necrotic, brown mesocotyl following infection by a *Pythium* spp.

General

EPA Extends Neonic Comment Period -

David Owens, Extension Entomologist,

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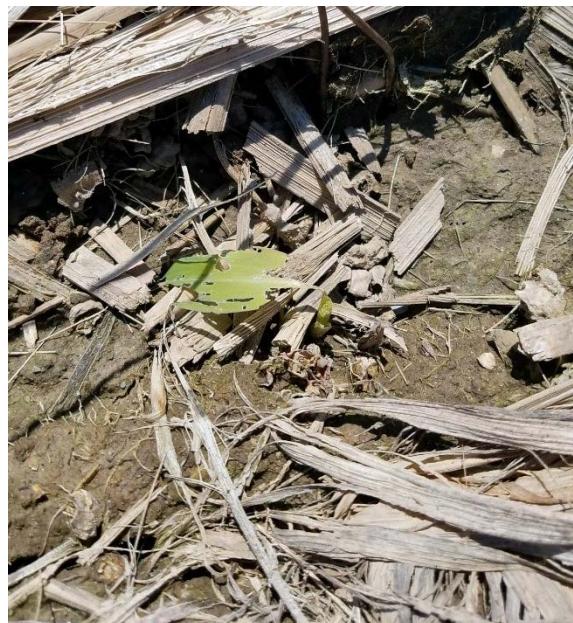
EPA is extending the comment period yet again for the proposed neonic risk mitigation interim decisions. You can see the announcement here: <https://content.govdelivery.com/accounts/USAEPAOPPT/bulletins/28cbe3f>.

Guess the Pest! Week 7 Answer: Slug

Feeding - David Owens, Extension

Entomologist, owensd@udel.edu

Congratulations to Greg Dempsey for correctly identifying the cause as the infamous slug. Greg and the numerous other correct responders will be eligible for an end of season prize.



Slug damage can be distinguished from other pests by their irregular, slit like holes and tears on the leaf. If a particularly large slug is present, it can clip the whole plant off in a similar manner to cutworm. You may also see the silvery slime trail left behind on the plant, soil, or residue. If cutworms are in the mix, you may see a row of circular holes across the leaf first. This is caused by small cutworms that drilled into the leaf as it was still folded up.

While we are not quite yet at the point of expecting black cutworms large enough to cause cutting (we may reach this point this week in SW DE), there are other species of cutworm that overwinter as larvae and are active.

What is interesting about this picture is that, upon returning to the field this week, this plant looks fine. It pushed out new leaves and the slugs have largely left the regrowth alone. However, the back quarter of the field has large areas in it where the slugs continue to feed and are hammering the seedlings. This goes to show that the front half (some feeding, relatively fine looking plants) might not be completely representative of the entire field. Be sure to scout the whole field. You do not want to come back to this field at side dress to discover stand loss or stunted plants.

Guess the Pest! Week 8 - David Owens,

Extension Entomologist, owensd@udel.edu

Who or what has made these holes and carted off the corn? (no, it wasn't anyone with a lousy golf swing). Click on the Guess the Pest logo to enter your name, email, and your answer. The winner and answer will be revealed next week.



https://docs.google.com/forms/d/e/1FAIpQLSfU PYLZnTrsol46hXmgqj8fvt5f8-JI0eEUhb3QJaNDLG_4kg/viewform?c=0&w=1



Reading and Understanding Seed Labels (Tags) - Dan Severson, New Castle Co. Ag Agent; severson@udel.edu

Introduction

Quality of seed can vary greatly. The key to getting the best quality seed is to read and understand the information on the seed tag. Seed laws require that each lot is labeled to prevent misrepresentation of seeds offered for sale. This applies to a single species or a mixture, certified or non-certified seeds.

Understanding the seed label will allow proper decision making when planning and installing a seeding.

The Federal Seed Act

(<https://www.ams.usda.gov/rules-regulations/fsa>) and the Delaware State Seed law Title 3 Chapter 15 (<http://delcode.delaware.gov/title3/c015/index.shtml>) specify the information required on the seed tag (see example seed tag on page 3). Seed tags are issued by the official seed certifying agency for each state. The Seed Laboratory of Delaware Department of Agriculture is the official seed certifying agency for the state of Delaware. All state certification agencies comply with the minimum requirements and standards of the Association of Official Seed Certification Agencies (AOSCA) (<https://www.aosca.org/>) to insure uniform testing methods and minimum standards of seed quality. Seed labels may vary from state to state, but all labels will have some semblance uniformity since the Federal Seed Act requires some information for interstate commerce.

Components of the seed label

- Type and Variety - Cultivar/release name, species, and common name;
 - Lot number - a series of letters or numbers assigned by the grower for tracking purposes;
 - Origin - where the seeds were grown;
 - Net weight - how much material is in the container;
 - Percent pure seed (purity) - how much of the material is actually the desired seed;
 - Percent inert matter - how much of the material in the bag is plant debris or other materials that are not seed;
 - Percent other crop seeds - other non-weed seeds;
 - Percent weed seeds - seeds considered weed species;
 - Percent germination (germ) - how much of the seed will germinate readily;
 - Hard seed - seed which does not germinate readily because of a hard seed coat;
 - Dormant seed - seed which does not germinate readily because it requires a pre-treatment or weathering in the soil (Some suppliers may combine hard and dormant seed on the label.);
 - Germination test date - date should be within 12 months of the planned date for using the seed;
- The date for how long the seed can be sold varies from state and type of seed. Delaware's current time is 14 months, excluding the test date (total of 15). Most small packs of vegetable and flower seeds are marked packed for year 20?? They can only be sold for that year.
- Name and address of company responsible for analysis (seller or grower).
 - Name of restricted noxious weed seeds (with number per pound of seed);

There are 2 types of noxious weed seeds - restricted and prohibited. Restricted weed seeds are listed as seeds per pound of material in the bag. There should be no prohibited weed seeds.

The restricted weed seeds for Delaware are dodder, bindweed, wild onion, wild garlic, corn cockle, horse nettle, cheat or chess, annual bluegrass and giant foxtail.

The prohibited list of weed seeds for Delaware are Canada thistle, quack grass and johnsongrass.

The prohibited and restricted noxious weed seed for Delaware are not the same as the Noxious Weeds list. Delaware currently has six noxious weeds: johnsongrass, Canada thistle, burcucumber, giant ragweed, Texas panicum and Palmer amaranth.

<https://agriculture.delaware.gov/plant-industries/noxious-weeds/>

You may also see the following additional information on the label:

- Total Viability/Germination - this may or may not be stated. Total viability = Germination + Hard Seed + Dormant Seed. Total Viability may not equal 100%. This just means that some of the seed is not viable and will not germinate.

A typical seed label:

T. Davis Famous Seed Company 411 Information Way Moore, DE 12345 USA Phone: (123) 456-7890	
Dixie Reseeding Crimson Clover <i>Trifolium incarnatum</i>	
NET WEIGHT: 25 lbs	PURE SEED: 93.80%
LOT #: IB097	OTHER CROP: 0.00%
DATE TESTED: January 2018	INERT MATTER: 6.16%
ORIGIN: PA	WEED SEED: 0.04%
RESTRICT: 1/lb Giant Foxtail	GERMINATION: 80.00%
	HARD SEED: 0.00%
	DORMANT: 13.00%

In addition to the seed analysis label, there may be a second label indicating the certification class of seed. The most typical second label would be blue and would indicate it as CERTIFIED SEED. Certified seed is the progeny of

seed that has been handled to maintain genetic identity and purity and has been approved by a state certifying agency. Certified seed should be the first choice for any seeding project, especially when cultivars are used.

Using the Seed Label

- The total of Pure Seed, Other Crop, Inert Matter and Weed Seed should always equal 100%.
- If the purity or germination is very low, you may not want to use the seed.
- If there are noxious weed seeds, you should know what they are and whether they will be a problem on your planting site. You may not want to use this seed source because doing so risks introducing a problem.
- Always purchase and use seed based on Pure Live Seed (PLS). PLS is the amount of seed which will germinate and can be calculated using numbers from the seed label.

First, determine total viability

Viability = germination + hard seed + dormant seed

Viability is the percent of seed which will germinate, though it may not all germinate the first season. In our example, total viability = 93.00%.

Next, calculate the amount of Pure Live Seed (PLS)

$$\text{PLS} = (\% \text{ Purity} \times \% \text{ Viability}) / 100$$

In our example: $\text{PLS} = (93.8 \times 93) / 100 = 87.23\%$

PLS can be used for calculating the amount of seed you will need to buy for a planting or when calibrating the output of a drill.

$$\text{Bulk seed/acre} = (\text{lbs. PLS recommended/acre}) / \text{Percent PLS}$$

If we want to seed 10 acres at 8 lbs. PLS/acre., then

$(8 \text{ lbs. PLS/acre}) / 87.23\% = 9.17 \text{ lbs. bulk/acre}$ x
10 acres = 91.7 lbs. bulk seed needed .8723 PLS

Most native plant seed is sold on a PLS basis because germination and purity can be so variable. Always specify buying seed by the PLS pound to make sure you get the amount of seed you need. For example, percent germination rate of legumes is often lower than percent germination of grass species. Some of the cool-season turf-type grasses (fescues, orchard grass) and agronomic seed (oats, rye) are sold on the basis of bulk pounds only because germination and purity are typically very high and minimums are regulated by the Federal Seed Act.

Summary

The cheapest bag of seed is not always the best purchase. By understanding the information on the seed tag you can determine the quality of seed you are purchasing. By comparing the purity and percent germination you will be able to decide which bag of seed will produce a more successful, uniform and weed free stand.

Restricted and prohibited weeds vary by state and no seed can be sold if it contains prohibited weeds. Seed that is moved across state lines must meet the most restrictive state's requirements. By monitoring the weed species in the lot, you can control what weeds are seeded in a planting.

Always order your seed as PLS seeding rate. Purity and germination percentages found on the seed tag determine Pure Live Seed (all seeding recommendations are given in Pure Live Seed rates) from which the bulk-seeding rate is calculated.

References

Englert, J.M. 2007. A Simplified Guide to Understanding Seed Labels. Maryland Plant Materials Technical Note No. 2. USDA-NRCS National Plant Materials Center, Beltsville, MD. 3p.

Kaiser, J. 2010. Reading Seed Packaging Labels (Seed Tags). Agronomy Technical Note - MO-38. Elsberry, MO.

After You Breathe - 3 Ways to Keep Coping with the Ambiguous Losses of the Pandemic - Alexander E. Chan., Ph.D., LMFT, Extension Specialist - Mental & Behavioral Health, University of Maryland; alexchan@umd.edu

Since the COVID-19 pandemic and resulting quarantines began, social scientists have jumpstarted the coping process by labeling an experience we are all facing: *grief*. Grief may result from human losses, such as the death of a loved one, or it can result from ambiguous losses¹ like cancelled graduations, no goodbyes to your kindergarten teacher, or missing the enjoyment of prior daily routines. Both types of loss are happening right now. Anger, sadness, anxiety - these are all part of our unique responses to loss. They are like emotional weeds growing from the roots of grief. There are coping strategies for all of the symptoms of our loss. Please practice (or learn, if you haven't yet) those deep breathing techniques! However, the ongoing challenge is to make sense of our new realities - a process mental health experts call meaning-making². This process helps us cope with the mismatch³ we are experiencing now between our old views of the world (more familiar to us) and what we see now. Here is how you begin the work:

1. Think about how you want to emerge from this crisis. What will it say about you that you lived through this crisis? Will you have developed any new habits or ways of appreciating your daily life? Will you have learned to cook a different food? You may need to think out loud with a trusted friend, partner, or therapist on this task.

Meaning-making is both personal and *interpersonal* with others. This is not going to happen in one sitting. This is like reading a book - you pick it up for a while, then put it back on the shelf while you do other things. You can always come back to it when you are ready.

2. Support others by acknowledging their efforts, but don't let others make meaning for you. A friend may find meaning by becoming a runner, crafts person or cooking expert. You might not. That's okay. They need you to

recognize their process just as much as you need them to give credit to yours. Without this validation, the process stalls for everyone. If some of the conversations feel repetitive, that's ok. Repeatedly talking about difficult topics helps us master them rather than avoid them.

3. Welcome all emotions daily. On any given day, allow yourself to laugh, cry, and everything in between. [Mindfulness training](#) can help you non-judgmentally accept whatever emotions you are currently experiencing.

These 3 coping strategies can help address the roots of grief. However, the strategies require *ongoing attention and use*. You may repeatedly experience difficult emotions like anger, sadness and anxiety throughout the process. It is to be expected. However, each time you use one of these coping strategies, you are building up a mindset that will help you manage your life in our new reality.

Notes:

1. Boss, Pauline. *Ambiguous loss*. Cambridge, MA: Harvard University Press. 1999
2. Neimeyer, Robert A., Laurie A. Burke, Michael M. Mackay, and Jessica G. van Dyke Stringer. "Grief therapy and the reconstruction of meaning: From principles to practice." *Journal of Contemporary Psychotherapy* 40, no. 2 (2010): 73-83.
3. Harmon-Jones, Eddie. *Cognitive dissonance: Reexamining a pivotal theory in psychology*, 2nd ed. Washington, DC: American Psychological Association. 2019.



Announcements

Extension302 Podcast Episode 2: The Label is the Law

Find out how the PPE shortage is affecting farmers in Delaware and how it might be addressed. This episode features special guest Kerry H. Richards, Ph.D., Coordinator with the University of Delaware's Pesticide Safety Education Program.

<https://www.udel.edu/academics/colleges/canr/cooperative-extension/about/podcast/>



Online Sheep and Goat FAMACHA Certification Webinar

June 10 6:00-8:00 p.m.
Online

Learn Integrated Parasite Control and Get Certified in FAMACHA

Internal parasites are a major health problem affecting sheep and goats. This workshop is designed to help producers learn the basics of selective internal parasite control and covers topics such as types and kinds of parasites, dewormers, the role of pasture management, the 5 Point Check®, FAMACHA® and FEC. Join us as we provide training to certify producers in the use of the FAMACHA® score card and an integrated approach to parasite control in small ruminants.

Cost \$15.00 (to cover the cost of the FAMACHA card). Registration is required.

For questions or registration information, please contact Susan Garey, Extension Agent -Animal Science

truehart@udel.edu or Kwame Matthews, Small Ruminant Specialist kmatthews@desu.edu

Sponsored by Delaware Cooperative Extension - a joint effort between Delaware State University and the University of Delaware

Communicating with Farmers Under Stress

Thursday, June 4, 2020 10:00 a.m.-12:00 p.m.
Online

Purpose

Numerous factors cause stress for farmers and their families including financial problems, price and marketing uncertainties, farm transfer issues, production challenges and more. Especially during this time.

You want to help, but maybe are not sure what to say or do. Or maybe you find yourself having to deliver difficult news to farmers. This workshop will help you recognize and respond when you suspect a farmer or farm family member might need help.

Objectives

- Build awareness around potentially stressful conditions affecting some farmers.
- Learn stress triggers, identify signs of stress and review helpful techniques for responding.
- Learn techniques for identifying, approaching and working with farmers who may not cope with stress effectively.
- Learn where to go for additional help.

This program is free. For more information contact Maria Pippidis at pippidis@udel.edu. Registration required by June 2. You can register online [here](#).

Webinar Preparing Small Farms for Current Market Demands, Use Alternative Marketing Strategies, Farmers Markets & Farmers Health During Covid-19 Health Crisis

Wednesday, June 3, 2020 12:00 noon – 1:30 p.m.
Online

This webinar meeting is intended to provide information to small farmers (and extension agents working with small farmers) to use available resources to market their products, reach out consumers, and use alternative marketing strategies (potentials) to sustain and grow their businesses and use online business opportunities for farm sales during and after Covid-19 health crisis. We aim to provide glimpse of what small farmers can do and what is available to them and what strategies may work for their farms. Webinar also includes linking farm vitality and health with a focus on how the success of your farming operation depends on paying attention to one's own health, accessing/using the health care system and health insurance options. This webinar provides information and resources to minimize obstacles that block success in production agriculture or agriculture-related occupations targeting farmers and workers who are limited by a physical or cognitive disability, illness or injury that make it difficult to perform agricultural tasks. By sharing information and discussing solutions, we will extend ideas around the region. A brief updates on farmers market protocols for Delaware will be provided by DDA. During the Q&A session, we will identify common problems most farmers are facing, what they are planning to do, why the plan works/or doesn't, how will they stay in business and grow, and how extension programs can assist the farmers to go through this difficult time.

Agenda

12:00–12:25 p.m.

Buy Local - Demand Potential in a Challenged Food System

Dr. Gordon Johnson, Assistant Professor & Extension Specialist Fruits and Vegetables, Department of Plant & Soil Sciences, University of Delaware.

12:25-12:50 p.m.

Linking Farm Vitality & Health

Ms. Maria Pippidis, AFC FFC, County Director &

Extension Educator, FCS, University of Delaware
Cooperative Extension

12:50-1:15 p.m.

Emergency Preparedness for Farm & Family

Ms. Inetta Fluharty, WV AgrAbility Program
Specialist, West Virginia Extension Service, Farmers
Health & Business

1:15-1:30 p.m.

Brief Update on the Farmers Market Protocol for Delaware

Ms. Kathy Jackson, Communications & Marketing
Specialist II, Delaware Department of Agriculture,
Farmers' Market

*Please register at the following link & zoom link to
webinar will be e-mailed to all registered attendees!*
https://docs.google.com/forms/d/10xCfXREXfHA_KoklhGPAfZlAygr4WuehH6LdHI9Vs68/edit

This webinar is organized by Delaware State
University Cooperative Extension (contact Dr.
Gulnihal Ozbay - gozbay@desu.edu) & sponsored by
the Northeast Climate HUB.

Weather Summary

Carvel Research and Education Center Georgetown, DE

Week of May 14 to May 20, 2020

Rainfall:

0.07 inch: May 18

Air Temperature:

Highs ranged from 83°F on May 15 to 57°F on
May 20.

Lows ranged from 64°F on May 15 to 39°F on
May 14.

Soil Temperature:

61.5°F average

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

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

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