WEEKLY CROP UPDATE
UNIVERSITY OF DELAWARE COOPERATIVE EXTENSION

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Vegetable Crops

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

Cucurbits

Striped cucumber beetles continue to be active a bit later than usual. I treated some watermelons a week ago at Carvel with a foliar spray and was a bit surprised to find as many new beetles migrating in this week as I did. The good news is that as vines get larger (vining off the plastic), they become pretty resilient to beetles. Purdue's threshold is 5 beetles per plant at this stage, and a recent student finished a project indicating that by using this threshold and reducing insecticide applications, there were greater pollinator visits in large experimental plots well stocked by bees, resulting in a significantly greater yield. It will be some time before striped cucumber beetle is a threat for rind-feeding.

Two spot spider mites are building up in fields, still at fairly low levels. We use an action threshold of 1-2 mites per crown leaf or 50% of plants with an infested leaf on young plants, although this threshold has not been rigorously tested. Keep in mind, there may be isolated hot spots that develop in the field or along field edges. Once plants start setting fruit, they divert more of their resources to those fruits and spider mites typically increase at a faster rate.

Another defoliator that we do not have a threshold for is **thrips**. The underside of a thrips-infested leaf will start silvering and then bronzing. You will also see small black spots in the affected area – those are fecal pellets. Last year, thrips populations built up to large numbers and probably warranted a treatment, at least in my melons. Once there is greater than a moderate amount of thrips feeding, a treatment might be advisable. Such a level may or may not happen this year. Pyrethroids may or may not be effective on them. Assail should be. Some of our best thrips materials, Radiant and Harvanta, are also very good worm products and it might be better to use them targeting Lepidopteran pests. Speaking of worm pests, we are seeing worms developing on foliage, including **yellow striped armyworm**. Note their presence, but unless plants are being significantly defoliated by them or there are rinds to protect, they should not be a threat yet.

Squash bugs and **squash vine borer** are active. You can scout for squash bug by looking for coppery egg masses underneath of leaves. A treatment is advised once you find 1 egg mass per plant, and those eggs begin hatching. While inspecting leaves, look also on the leaf petioles for the single, dark brown, cushion-shaped egg of squash vine borer. Alternatively, pheromone traps for squash vine borer are available. Generally, on susceptible squashes, treatments are done prophylactically to protect vines. Be sure to scout squash treated with pyrethroids (and especially those treated multiple times) for aphid flare ups.

Sweet Corn

Traps in our moth trapping network are checked Mondays and Thursdays by Richard Monaco.

Within 24 hours, data should be uploaded to the UD Pest Management Insect Trapping website. Thursday trap counts were generally down, possibly due to cooler night temperatures this week. It is possible that counts will increase in the coming days with warmer weather, be sure to check the trapping website Monday afternoon or Tuesday morning to confirm. Pyrethroid survivorship in our vial tests this week is 22%. This year we have added 6 pairs of European corn borer pheromone traps to several of our trapping locations. So far, we have yet to capture a single moth. Thursday counts are as follows:

Trap Location	BLT - CEW	Pheromone CEW
	3 nights total catch	
Dover	1	36
Harrington	0	2
Milford	0	40
Rising Sun	1	4
Wyoming	0	17
Bridgeville	0	20
Concord	1	21
Georgetown	0	5
Greenwood	2	16
Laurel	0	14
Seaford	0	--

Pollen Supply and Sex Expression Affects Fruit Set in Cucurbits – *Gordon Johnson, Extension Vegetable & Fruit Specialist;* gcjohn@udel.edu

Most cucurbit crops including cantaloupes, watermelons, squashes, pumpkins, and cucumbers produce separate male and female flowers (cantaloupes have some perfect flowers). The male flower produces the pollen that must be transferred to the female flower in adequate amounts to set fruit - male flowers must open in synchrony with female flowers and insect pollinators must be active to produce fruits.

Often, fruit set in cucurbits is poor early in the season. In zucchini, yellow squash and other summer squashes, male flowering may be delayed resulting in aborted fruit due to lack of pollen. In contrast, pumpkins that are over-fertilized with nitrogen will see excessive vine growth and delayed female flower formation.

Early in the season some varieties of squash produce a lot of female flowers, which cannot get pollinated until some male flowers appear. Low temperatures and high light intensity promote this female sex expression; female flowers rather than male flowers.

In a Georgia study looking at planting dates over several seasons, the researchers found that pistillate (female) flower counts were more stable than staminate (male) flower counts over a wide range of planting dates for the summer squash cultivars studied. They concluded that that squash staminate and pistillate flower counts fluctuate readily under various field environments.

Research has also shown that growth regulators can affect sex expression in squash.
In squash plants, male flowers normally form first, while at later stages of reproductive development male and female flowers are initiated in alteration. However, it is well established that treatment with ethylene can cause more female flowers develop when the plants are treated with ethephon (an ethylene releasing agent) and they start to form earlier in development. In contrast, treatment of squash with Gibberellins will increase the number of male flowers and provide for a higher male to female ratio.

In gynoecious pickles, mostly female flowers are produced, thus monoecious pollenizer plants that produce male flowers must be mixed in to produce adequate pollen for fruit set. Seed companies provide cucumber seed blends that contain 85% to 90% gynoecious seed and 10% to 15% monoecious seed. These blends ensure that the optimal proportion of male to female flowers are present in a planting, resulting in good pollination levels and high fruit yields.

In seedless watermelons (triploids), male flowers do not produce viable pollen. Therefore diploid (monecious) pollenizer plants must be planted together with the seedless watermelons to provide adequate pollen for fruit set. Research has shown that a ratio of 3:1 seedless to

pollenizer plants provides adequate pollen for good fruit production.

Aborted yellow squash at the ground level due to no male flowers present.

Yellow squash with male and female flowers in synchrony.

There are many other reasons for poor fruit set in cucurbits, such as inadequate pollinating insects, water stress, heat stress, diseases, and insect damage, however, growers should consider flowering and pollen production as another possible cause for lack of fruit set.

To manage fruit set, choose varieties that more consistently produce male and female flowers under different environments. For early plantings, plantings in high tunnels, or plantings under row covers, consider using parthocarpic varieties if available. Parthenocarpy is the production of fruit without pollination. Some zucchini and cucumber varieties are parthenocarpic or may exhibit parthenocarpy when male flowers are not present.

Golden Glory yellow zucchini exhibits a high level of parthenocarpy.

Parthenocarpic pickling cucumber. There are several parthenocarpic cucumber varieties and types available for growers.

Plan Now for Late Summer and Fall Harvests – *Gordon Johnson, Extension Vegetable & Fruit Specialist;* gcjohn@udel.edu

Plantings for late summer and fall harvested vegetables will be underway in the next few weeks. Timing these plantings can be a challenge, especially where multiple harvests are needed. Plantings from early July through the beginning of September may be made, with cutoff dates depending on the crop, variety, and season extension methods such as row covers, low tunnels, and high tunnels. These plantings can be divided into 2 groups: 1) warm season vegetables for harvest up to a killing frost and 2) cool season vegetables for extended harvest in the fall.

The three main factors influencing crop growth and performance in the fall are daylength, heat units, and frost or freeze events. A few days difference in planting date in the summer can make a big difference in days to maturity in the fall.

Warm season vegetables for fall harvest include snap beans, squash, and cucumbers. July plantings of sweet corn can also be successful to extend seasons for farm stands. Mid-July plantings of tomatoes and peppers also are made for late harvests, particularly in high tunnels.

Cool season vegetables for fall harvest include cabbage, Brussels sprouts, broccoli, and cauliflower; the cole crop greens, kale and collards; mustard and turnip greens; turnips for roots; spinach; beets; lettuce; leeks; green onions; and radishes.

To extend harvest in the fall, successive plantings are an option. However, days between plantings will need to be compressed. One day difference in early August planting for a crop like beans can mean a difference of several days in harvest date. Another option to extend harvest in the fall is with planting different maturing varieties at the same time. This is particularly successful with crops such as broccoli and cabbage where maturity differences of more than 30 days can be found between varieties.

Another way to get later harvests is to use row covers or protecting structures (high tunnels). This can allow for more heat accumulation and will aid with protection against frost and freezes. Decisions on what type or combination of covers/protection to use and when to apply the protection will influence fall vegetable maturation and duration of harvest. In general, plantings of cool season crops can be made 30-45 days later in high tunnels than in outside production.

A final factor for summer planting for fall production is on planting cutoff dates. For example, a crop such as cucumber may produce well with an August 2 planting but poorly with an August 8 planting; broccoli has a wider planting window than cauliflower; turnip greens have a wider planting window than kale.

Planting Windows for Fall Harvested Warm Season Vegetables (harvested September through Frost):

Snap Beans: July 10 through August 10

Lima Beans: June 15 through July 20

Cucumbers: July 10 through August 7 (high tunnel transplanted up to September 1)

Peppers: Transplant up to July 10 (high tunnel up to July 30)

Pumpkins and Winter Squash: Direct seed through June 30 (July 10 for short season varieties)

Summer Squash: Direct seed July 15 through August 15 (high tunnel up to September 1)

Sweet Corn: Direct seed July 1 through July 30

Sweet Potatoes: Plant slips up to June 30

Tomatoes: Transplant July 20 through July 5 (high tunnel up to July 30)

Planting Windows for Fall Harvested Cool Season Vegetables (harvest September – December)
Note: For transplants, seed 3-6 weeks prior to desired planting date (8 weeks for leeks and onions).

Beets: Direct seed July 1 through August 10

Swiss Chard: Direct seed July 15 through August 20 (high tunnel up to September 30)

Broccoli: Transplants July 15 – August 20

Brussels Sprouts: Transplants June 20-July 10

Cabbage: Transplants July 1 – August 20

Cauliflower: Transplants July 20 through August 10

Kale: Transplants July 15 through August 30, Direct seed July 1 through August 15 (high tunnel up to September 30)

Collards: Direct seed July 15 through August 15

Arugula: Transplants July 15 through August 30, Direct seed July 1 through August 15 (high tunnel up to September 30)

Carrots: June 20 through July 10 (high tunnel through September)

Turnip Greens: August 1 through September 10 (high tunnel up to September 30)

Turnip Roots: August 1 through August 30 (high tunnel up to September 20)

Mustard Greens: August 1 through September 10 (high tunnel up to September 30)

Leeks: Transplant July 20 through August 10

Lettuce (full head stage): Direct seeded August 1 through August 20 Lettuce (full head stage): Transplants August 10 through August 30

Lettuce (baby stage and cut salad mix): Direct seed August 1 through September 15 (high tunnel up to October 15)

Onion (green bunching): Direct seed July 1 through August 30 (high tunnel through September 30)

Parsley: direct seed July 15 through August 15 (high tunnel through September 15)

Radishes (salad): Direct seed August 1 through September 30 (high tunnel through November 30)

Radishes (Daikon): Direct seed August 1 through September 10 (high tunnel up to September 30)

Spinach: Direct seed August 10 through August 30 (high tunnel up to September 30)

Mid-August planted broccoli for fall harvest on white plastic mulch. Harvested different varieties from the beginning of October to the middle of November.

Alert! Cucurbit Downy Mildew in the Region

- *Jake Jones, Extension Agriculture Agent, Kent County*; jgjones@udel.edu

Cucurbit downy mildew was found in pickling cucumbers in Federalsburg, Maryland on Thursday, June 17, 2021. One day prior it was found in New Jersey in pickling cucumbers. With the disease now on the Delmarva Peninsula the annual epidemic has begun, almost three weeks earlier than in 2020. The disease thrives in cool, wet weather and the disease cycle can progress from initial infection to production of sporangia in as little as 5-7 days. Preventative fungicides

should be applied to both resistant and non-resistant cucumber varieties to protect yield and are much more effective than curative sprays. Another reason curative sprays are not recommended is the risk of fungicide resistance developing. Rotating modes of action (FRAC Codes) and tank-mixing with a protectant fungicide is important for both short-term and long-term success in managing this disease. See Table 1 for a list of effective fungicides from the Mid-Atlantic Commercial Vegetable Production Recommendations. Orondis, Ranman, Zing!, and Bravo were some of the most efficacious fungicides in regional bioassays.

Symptoms of the disease in cucumber start as angular, water-soaked lesions on the underside of leaves and progress to chlorotic and necrotic angular lesions. Dark sporulation is a diagnostic sign of cucurbit downy mildew and can be seen with a hand lens or with your naked eye (Figure 1). Cucumbers are usually the first cucurbit crop infected with different clades of pathogen causing the disease in other cucurbit crops later in the season.

Figure 1. Angular, sporulating lesion of cucurbit downy mildew in cucumber.

Table 1. Cucurbit Downy Mildew Fungicides, from the Mid-Atlantic Commercial Vegetable Production Recommendations.

Code	Product Name	Product Rate	Active Ingredient(s) (*=Restricted Use)	PHI (d)	REI (h)	Bee TR
The following are the most effective products. Sprays should be applied on a 7-day schedule. Under severe disease conditions spray interval may be reduced IF the label allows. ALWAYS tank mix these products with a protectant fungicide (listed below):						
49+40	Orondis Ultra 2.33SC	5.5 to 8.0 fl oz/A	oxathiapiprolin + mandipropamid	0	4	--
49+M05	Orondis Opti 3.37SC	1.75 to 2.5 pt/A	oxathiapiprolin + chlorothalonil	0	12	--
21	Ranman 400SC	2.10 to 2.75 fl oz/A (**do not** apply with copper; see label)	cyazofamid	0	12	L
28	Previcur Flex 6F	1.2 pt/A	propamocarb HCl	2	12	N
43	Presidio 4SC	4.0 fl oz/A (caution: pathogen is now less sensitive to Presidio)	fluopicolide	2	12	L
M05+22	Zing! 4.9SC	36.0 fl oz/A	chlorothalonil + zoxamide	0	12	N
M05+27	Ariston 42SC	3.0 pt/A	chlorothalonil + cymoxanil	3	12	--
11 + 27	Tanos 50DF	8.0 oz/A	famoxadone + cymoxanil	3	12	--
27	Curzate 60DF	3.2 oz/A	cymoxanil	3	12	N
40	Forum 4.17SC	6.0 fl oz/A	dimethomorph	0	12	N
40 + 45	Zampro 525SC	14.0 fl oz/A	dimethomorph + acetoctradin	0	12	--
22	Elumin 4SC	8.0 fl oz/A	ethaboxam	2	12	--
***TANK-MIX WITH* protectant fungicides:**						
M03	mancozeb 75DF	3.0 lb/A	mancozeb	5	24	N
M03+22	Gavel 75DF	1.5 to 2.0 lb/A	mancozeb + zoxamide	5	48	--
M05	chlorothalonil 6F	1.5 to 3.0 pt/A	chlorothalonil	0	12	N

Fruit Crops

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

We recently have had wet weather in many parts of Delmarva. Excess moisture can cause problems in fruit crops due to fruit cracking.

Of the fruit crops, sweet cherries and certain plums are the most sensitive to excess moisture. Cracking due to excess moisture is a major reason that we have problems growing sweet cherries on Delmarva. It is not the uptake of water through the plant root system that causes the cracking; it is the absorption of water through the fruit cuticle that causes the fruit splitting. The theory is that as a cherry or plum ripens and accumulates sugars fruit exposed to extended periods of wetness from rain, dew, or high humidity conditions will absorb water through the fruit skin and swell until the fruit cracks. Some cherry and plum varieties are more susceptible to cracking than others.

Growers of sweet cherries in the east often lose large portions of their crop due to fruit cracking. In the past, the tools that growers have used are to physically remove water from cherry fruit surfaces using helicopters or blower sprayers. Use of calcium chloride sprays prior to rain events act to reduce the osmotic potential of rainwater. Chemical barriers have also been tried to prevent water movement into the fruit with varying success. There has been great interest in the use of high tunnels with dwarf sweet cherries to control cracking by eliminating wetness on fruit surfaces with these plastic covers.

Similar skin cracking can occur in nectarines and peaches. When the skin of these fruits stays wet for an extended period near ripening, the fruit can absorb so much moisture that it cracks. This is a problem for growers that do “tree ripe” fruit. Earlier harvest and ripening off the tree can help control this problem.

Some blueberry varieties are also susceptible to fruit cracking at ripening. Research has shown that both fruit absorption of water and internal water accumulation from root uptake cause this cracking.

Japanese plum variety highly susceptible to fruit cracking in wet weather.

Agronomic Crops

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

Alfalfa
Now that most of the alfalfa has been cut, scout the regrowth for **potato leafhopper**. Remember, once hopperburn is observed, yield has already been damaged. In our alfalfa recommendations there is a threshold table, similar to that for alfalfa weevil, taking plant height, control cost, and value of the hay into account. Generally, leafhopper abundance needs to be between 20 – 30 for plants less than 8 inches tall, and greater than 60 for taller plants. Pyrethroids work well for leafhopper.

Corn
Continue scouting corn for **stink bugs**. Generally, they are going to be concentrating near the ear-zone, where the ear would emerge. Stink bugs will hide in leaf axils, so a sharp eye is necessary. They also like to flip over to the opposite side of the plant to avoid being seen. North Carolina and Virginia revised threshold guidance last year given research efforts from

2016 onward. You do not need to treat if you have less than 4 bugs per 100 plants, and a treatment is advisable when there are greater than 10 stink bugs per 100 plants. You can find the full threshold table here: https://corn.ces.ncsu.edu/stink-bug-management-in-corn/.

Soybean

The earliest planted soybean is now in flower. During the reproductive stages, defoliation thresholds decrease to 15-20% defoliation. Make sure that it is 'new' defoliation and not old injury. Currently active defoliators include **bean leaf beetle**, **grasshoppers**, **bean leafroller**, **thrips**, and the occasional **spider mite**, all generally at low enough levels to not warrant a treatment. For grasshoppers, we did a spray trial last July on a grasshopper population using low to mid-rates of pyrethroids and they did not provide satisfactory control. If treating for grasshopper, use a high label rate or consider using Prevathon or Vantacor (chlorantraniliprole) or a diamide premix like Besiege or Elevest. All three of these chemicals should be mixed with methylated seed oil for grasshopper control, per label guidance.

Hops Scouting – *David Owens, Extension Entomologist*, owensd@udel.edu

This week I had the chance to visit a hopyard in Newark. Both potato leafhoppers and mites were active. Thresholds in hops from other states are 2 leafhoppers per leaf and 2-5 mites per leaf. The mite threshold is the most problematic because of the potential for isolated hot spots to develop. Look at a couple of leaves per plant, from at least 5 plants per row or per variety. Focus on leaves about 3 feet from the ground. Portal's label indicates it has activity against potato leafhopper in other crops but is not labeled for leafhopper in hops.

Resources for 2021 Corn and Soybean Fungicide Recommendations – *Alyssa Koehler, Extension Field Crops Pathologist*; akoehler@udel.edu

Other than a few cases of *Pythium* spp. in corn, we have observed very little disease in field crops so far this season. As growth progresses, we will continue to monitor for common foliar diseases. In fields where a fungicide application may be needed, the Crop Protection Network has multiple resources to aid in selection of fungicide products. The Corn Disease Working Group has recently updated the 2021 Fungicide Efficacy for Control of Corn Diseases. In soybeans, the North Central Regional Committee on Soybean Diseases (NCERA-137) has updated recommendations for 2021 Fungicide Efficacy for Control of Soybean Foliar Diseases. Each of these tables provide rating of product performance across multiple diseases based on trials conducted by Extension specialists across the country.

CROP PROTECTION NETWORK
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Fungicide mode of action groups:
Group 11 QoI Strobilurins
Group 3 DMI Triazoles
Group 7 SDHI

Efficacy categories:
NR=Not Recommended; P=Poor; F=Fair; G=Good; VG=Very Good;
E=Excellent; NL = Not Labeled for use against this disease;
U = Unknown efficacy or insufficient data to rank product

Fungicide Efficacy for Control of Corn Diseases Table (03/2021)

	Active ingredient (%)	Product/Trade name	Rate/A (fl oz)	Anthracnose leaf blight	Common rust	Eyespot	Gray leaf spot	Northern corn leaf blight	Southern rust	Tar spot[1]	Harvest restriction[2]
11	Azoxystrobin 22.9%	Quadris 2.08 SC, multiple generics	6.0 - 15.5	VG	E	VG	E	G	VG	NL	7 days
11	Headline 2.09 EC/SC	Headline 2.09 EC/SC	6.0 - 12.0	VG	E	E	E	VG	VG	NL	7 days
11	Aproach 2.08 SC	Aproach 2.08 SC	3.0 – 12.0	VG	VG-E	VG	F-VG	VG	G	G[3]	7 days
3	Flutriafol 20.9%	Xyway LFR 1.92 SC Xyway 3D 2.5 SC	LFR: 7.6-15.2 3D: 5.8-11.8	NL	U	NL	VG-E	VG	NL	NL	N/A
3	Propiconazole 41.8%	Tilt 3.6 EC, multiple generics	2.0 - 4.0	NL	VG	E	G	G	F	NL	30 days
3	Prothioconazole 41.0%	Proline 480 SC	5.7	U	VG	E	U	VG	G	NL	14 days
3	Tebuconazole 38.7%	Folicur 3.6 F, multiple generics	4.0 - 6.0	NL	U	NL	U	VG	F	NL	36 days
3	Tetraconazole 20.5%	Domark 230 ME	4.0 – 6.0	U	U	U	E	VG	G	G-VG[3]	R3 (milk)
11 3	Azoxystrobin 13.5% Propiconazole 11.7%	Quilt Xcel 2.2 SE, multiple generics	10.5 - 14.0	VG	VG-E	VG-E	E	VG	VG	G-VG[3]	30 days
7 11 3	Benzovindiflupyr 2.9% Azoxystrobin 10.5% Propiconazole 11.9%	Trivapro 2.21 SE	13.7	U	U	U	E	VG	E	G-VG	30 days
3 11	Cyproconazole 7.17% Picoxystrobin 17.94%	Aproach Prima 2.34 SC	3.4 – 6.8	U	U	U	E	VG	G	G-VG[3]	30 days
3 11	Flutriafol 19.3% Fluoxastrobin 14.84%	Fortix 3.22 SC Preemptor 3.22 SC	4.0 -6.0	U	U	U	E	VG	VG	G-VG[3]	R4 (dough)
3 7	Flutriafol 26.47% Bixafen 15.55%	Lucento	3.0-5.5	U	U	U	VG-E	VG	VG	G[3]	R4
3 11	Flutriafol 18.63% Azoxystrobin 25.30%	TopGuard EQ	5.0-7.0	U	F	U	VG	G	G	G-VG[3]	7 days
3 11	Mefentrifluconazole 17.56a5 Pyraclostrobin 17.56%	Veltyma	7.0-10.0	U	U	U	VG-E	VG-E	VG	G-VG	21 days
3 11 7	Mefentrifluconazole 11.61% Pyraclostrobin 15.49% Fluxapyroxad 7.74%	Revytek	8.0-15.0	U	U	U	VG-E	VG-E	VG	G-VG	21 days
3 11	Prothioconazole 16.0% Trifloxystrobin 13.7%	Delaro325 SC	8.0-12.0	VG	E	VG	E	VG	G-VG	G-VG	14 days
3 7 11	Prothioconazole 14.9% Trifloxystrobin 13.1% Fluopyram 10.9%	Delaro Complete[4] 3.83 SC	8.0-12.0	U	U	U	E	U	VG	G-VG	35 days
7 11 3	Pydiflumetofen 7.0% Azoxystrobin 9.3% Propiconazole 11.6%	Miravis Neo 2.5 SE	13.7	U	U	U	E	VG-E	VG	G-VG	30 days
11 7	Pyraclostrobin 28.58% Fluxapyroxad 14.33%	Priaxor 4.17 SC	4.0 – 8.0	U	VG	U	VG	VG-E	VG	G-VG[3]	21 days
11 3	Pyraclostrobin 13.6% Metconazole 5.1%	Headline AMP 1.68 SC	10.0 - 14.4	U	E	E	E	VG	G	G-VG	20 days
11 3	Trifloxystrobin 32.3% Prothioconazole 10.8%	Stratego YLD 4.18 SC	4.0 - 5.0	VG	E	VG	E	VG	G	NL	14 days
3 11	Tetraconazole 7.48% Azoxystrobin 9.35%	Affiance 1.5 SC	10.0-14.0	U	G-VG	U	G-VG	G-VG	G	G[3]	7 days

Indicates product with mixed fungicide classes

[1]Fungicide application timing is extremely important and needs to be made near the onset of the tar spot symptoms. Efficacy ratings based on limited site locations from 2018 to 2020. [2]Harvest restrictions are listed for field corn harvested for grain. Restrictions may vary for other types of corn (sweet, seed or popcorn, etc.), and corn for other uses such as forage or fodder. [3]A 2ee label is available for several fungicides for control of tar spot, however efficacy data are limited. Check 2ee labels carefully, as not all products have 2ee labels in all states. [4]Delaro Complete is not labeled for use on corn in all states as of January 2021. This information is provided only as a guide. It is the applicator's legal responsibility to read and follow all current label directions. Reference in this publication to any specific commercial product is for general information only, and does not constitute an endorsement or recommendation by the CDWG. Individuals using such products assume responsibility for their use in accordance with current directions of the manufacturer. Members or participants in the CDWG assume no liability resulting from the use of these products.

CROP PROTECTION NETWORK
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Fungicide mode of action groups:
Group 11 QoI Strobilurins
Group 3 DMI Triazoles
Group 1 MBC Thiophanates
Group 7 SDHI Carboxamides
Group 29 2,6-Dinitro-anilines

Efficacy categories:
P=Poor; F=Fair; G=Good; VG=Very Good; E=Excellent;
NL = Not Labeled for use against this disease; NR=Not Recommended;
U = Unknown efficacy or insufficient data to rank product

Fungicide Efficacy for Control of Soybean Diseases Table (03/2021)

	Active ingredient (%)	Product/Trade name	Rate/A (fl oz)	Aerial web blight	Anthracnose	Brown spot[2]	Cercospora leaf blight[3]	Frogeye leaf spot[4]	*Diaporthe* (Pod and stem blight)	Soybean rust	Target spot	White mold[5]	Harvest restriction[6]
11	Azoxystrobin 22.9%	Quadris 2.08 SC, multiple generics	6.0 – 15.5	VG	VG	P-G	P	P	U	G-VG	P-F	P	14 days
11	Fluoxastrobin 40.3%	Aftershock 480 SC, Evito 480 SC	2.0 – 5.7	VG	G	P-G	P	P	U	U	U	NL	30 days, R5
11	Picoxystrobin	Aproach 2.08 SC	6.0 – 12.0	VG	G	P-G	P	P	U	G	U	G[9]	14 days
11	Pyraclostrobin 23.6%	Headline 2.09 EC/SC	6.0 – 12.0	VG	VG	P-G	P	P	U	VG	P-F	NL	21 days
3	Cyproconazole 8.9%	Alto 100SL	2.75 – 5.5	U	U	VG	F	F	U	VG	U	NL	30 days
3	Flutriafol 11.8%	Topguard 1.04 SC	7.0 – 14.0	U	VG	VG	P-G	G-VG	U	VG-E	P	F	21 days
3	Propiconazole 41.8%	Tilt 3.6 EC, multiple generics	4.0 – 6.0	P	VG	G	NL	F	NL	VG	U	NL	R5
3	Prothioconazole 41.0%	Proline 480 SC	2.5 – 5.0	NL	NL	NL	NL	G-VG	NL	VG	U	F	21 days
3	Tetraconazole 20.5%	Domark 230 ME	4.0 – 5.0	NL	VG	VG	P-G	F-G	U	VG-E	P	F	R5
7	Boscalid 70%	Endura 0.7 DF	3.5 – 11.0	U	NL	VG	U	P	NL	NL	U	VG	21 days
7	Inpyrfluxam 31.25%	Excalia SC	2.0	E	NL	NL	NL	NL	NL	U	NL	NL	R5
1	Thiophanate-methyl	Topsin-M, multiple generics	10.0 – 20.0	U	U	U	F	VG	U	G	U	F	21 days
29	Fluazinam 40.0%	Omega 500 DF	0.75 – 1.0 pts	NL	NL	NL	NL	NL	NL	NL	U	G	R3
11, 3	Azoxystrobin 25.3%, Flutriafol 18.63%	Topguard EQ 4.29 SC	5.0 – 7.0	VG	U	VG	U	G-VG	U	E	P	U	21 days
11, 3	Azoxystrobin 18.2%, Difenoconazole 11.4%	Quadris Top 2.72 SC	8.0 – 14.0	U	U	G-VG	P-G	VG	F-G	VG	P	NL	14 days
11, 3	Azoxystrobin 19.8%, Difenoconazole 19.8%	Quadris Top SBX 3.76 SC	7.0 – 7.5	VG	U	G-VG	P-G	VG	F-G	VG	F-G	U	14 days
11, 3	Azoxystrobin 7.0%, Propiconazole 11.7%	Quilt 1.66 SC, multiple generics	14.0 – 20.5	U	U	G	F	F	U	VG	P	NL	21 days
11, 3	Azoxystrobin 13.5%, Propiconazole 11.7%	Quilt Xcel 2.2 SE	10.5 – 21.0	E	VG	G	F	F	U	VG	P	NL	R6
7, 11, 3	Benzovindiflupyr 2.9%, Azoxystrobin 10.5%, Propiconazole 11.9%	Trivapro	13.7 – 20.7	E	U	G-VG	P-G	F-G	G	VG-E	U	NL	14 days, R6
3, 11	Cyproconazole 7.17%, Picoxystrobin 17.94%	Aproach Prima 2.34 SC	5.0 – 6.8	VG	U	G	P-G	F-G	U	VG-E	F-G	NL	14 days
7, 3	Fluopyram 17.4%, Prothioconazole 17.4%	Propulse 3.34 SC	6.0 – 10.2	NL	NL	U	NL	U	U	U	NL	G	21 days

Indicates product with mixed fungicide classes

[1] Multiple fungicides are labeled for soybean rust only, powdery mildew, and Alternaria leaf spot, including tebuconazole (multiple products) and myclobutanil (Laredo). Contact fungicides such as chlorothalonil may also be labeled for use. [2] In areas where QoI-fungicide resistant isolates of the brown spot pathogen are present, QoI fungicides may result in poor disease control. [3] Cercospora leaf blight efficacy relies on accurate application timing, and standard R3 application timings may not provide adequate disease control. Fungicide efficacy may improve with earlier or later applications; however, efficacy has been inconsistent with some products. Fungicides with a solo or mixed QoI or MBC mode of action may not be effective in areas where QoI or MBC resistance has been detected in the fungal population that causes Cercospora leaf blight. [4] In areas where QoI-fungicide resistant isolates of the frogeye leaf spot pathogen are not present, QoI fungicides may be more effective than indicated in this table. [5] White mold efficacy is based on R1-R2 application timing, and lower efficacy is obtained at R3 or later application timings, or if disease symptoms are already present at the time of application. [6] Harvest restrictions are listed for soybean harvested for grain. Restrictions may vary for other types of soybean (edamame, etc.) and soybean for other uses such as forage or fodder [7] Delaro Complete is not labeled for use on soybean in all states as of January 2020. [8] Stratego YLD has a supplemental label (2ee) for white mold on soybean only in IL, IN, IA, MI, MN, NE, ND, OH, SD, WI. [9] Rating is based on two applications of a 9 fl oz/A rate of Aproach at R1 and R3.

Many products have specific use restrictions about the amount of active ingredient that can be applied within a period of time or the amount of sequential applications that can occur. Please read and follow all specific use restrictions prior to fungicide use. This information is provided only as a guide. It is the responsibility of the pesticide applicator by law to read and follow all current label directions. Reference to products in this publication is not intended to be an endorsement to the exclusion of others that may be similar. Persons using such products assume responsibility for their use in accordance with current directions of the manufacturer. Members or participants in the NCERA-137 group assume no liability resulting from the use of these products.

Table continued on next page

CROP PROTECTION NETWORK
A Product of Land Grant Universities

Fungicide mode of action groups:
Group 11 QoI Strobilurins
Group 3 DMI Triazoles
Group 1 MBC Thiophanates
Group 7 SDHI Carboxamides
Group 29 2,6-Dinitro-anilines

Efficacy categories:
P=Poor; F=Fair; G=Good; VG=Very Good; E=Excellent;
NL = Not Labeled for use against this disease; NR=Not Recommended;
U = Unknown efficacy or insufficient data to rank product

Table continued from previous page

Fungicide Efficacy for Control of Soybean Diseases Table (03/2021)

	Active ingredient (%)	Product/Trade name	Rate/A (fl oz)	Aerial web blight	Anthracnose	Brown spot[2]	Cercospora leaf blight[3]	Frogeye leaf spot[4]	*Diaporthe* (Pod and stem blight)	Soybean rust	Target spot	White mold[5]	Harvest restriction[6]
7 3	Bixafen 15.5% Flutriafol 26.47%	Lucento 4.17 SC	3.0 – 5.5	VG	U	VG	F-G	VG	U	VG-E	F-G	U	21 days
11 3	Fluoxastrobin 14.84% Flutriafol 19.3%	Fortix SC, Preemptor SC	4.0 – 6.0	U	U	G-VG	P-G	G-VG	U	U	P	U	R5
11 3	Trifloxystrobin 13.7% Prothioconazole 16.0%	Delaro 325 SC	8.0 – 11.0	VG	U	VG	U	G-VG	U	U	NL	NL	21 days
7 11 3	Fluopyram 10.9% Trifloxystrobin 13.1% Prothioconazole 14.9%	Delaro Complete[7] 3.83 SC	8.0 – 11.0	U	U	VG	U	U	U	U	NL	U	21 days
7 3	Pydiflumetofen 6.9% Difenoconazole 11.5%	Miravis Top 1.67 SC	13.7	VG	U	VG	F-G	VG	G	VG-E	F-G	U	14 days
11 7	Pyraclostrobin 28.58% Fluxapyroxad 14.33%	Priaxor 4.17 SC	4.0 – 8.0	E	VG	G-VG	P-G	P-F	U	VG-E	F-G	P	21 days
7 11 3	Fluxapyroxad 14.33% Pyraclostrobin 28.58% Tetraconazole 20.50%	Priaxor D 4.17 SC, 1.9 SC	4.0 each component	VG	U	VG	P-G	F-G	G	VG-E	F-G	P	21 days, R5
11 3	Trifloxystrobin 13.7% Prothioconazole 16.0%	Stratego YLD 4.18 SC[8]	4.0 – 4.65	VG	VG	G	F	F-G	U	VG	P	NL	21 days
11 3	Azoxystrobin 9.35% Tetraconazole 7.48%	Affiance 1.5 SC	10.0 – 14.0	U	VG	VG	F	F-G	U	U	P	NL	14 days, R5
11 3	Fluoxastrobin 17.76% Tetraconazole 17.76%	Zolera FX 3.34 SC	4.4 – 6.8	U	U	U	U	F-G	U	U	U	U	30 days, R5
1 3	Thiophanate-methyl 21.3% Tetraconazole 4.2%	Acropolis	20.0 – 23.0	NL	U	U	U	VG	U	VG-E	U	U	R5
7 11 3	Fluxapyroxad 7.74% Pyraclostrobin 15.49% Mefentrifluconazole 11.61%	Revytek	8.0 – 15.0	VG	U	VG	F-VG	VG	U	VG-E	F-VG	P	21 days

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General

Guess The Pest! Week 11 Answer: Bagworm! – *David Owens, Extension Entomologist*, owensd@udel.edu

Congratulations to John Hochmuth for correctly identifying last week's challenge as a young bagworm. This is the best time to treat for bagworm, particularly in windbreak trees that have had them previously.

This from Brian Kunkel in the Ornamentals Hotline:

First instars feed in the "dunce cap" stage. Named because the bag is carried in an upright position relative to the caterpillar. Scout for this life stage throughout June because eggs hatch over a 3-4-week period. There is one bagworm generation per year. Smaller bagworms are more susceptible to products that have less impact on generalist arthropod predators.
Physically removing bagworms is one method of control; however, this can get too labor intensive or impractical depending on the size or number of the plants or the size of the bagworm population. Companion plants encourage parasitoids to remain in the area to attack bagworm pupae. Pesticide applications targeting early instars are generally more effective than targeting larger bagworms. Products available for control include Acelepryn, Dipel, Confirm, Orthene, Tempo, Permethrin Pro, or other pyrethroids.


B Kunkle, University of Delaware

Guess The Pest! Week 12 – *David Owens, Extension Entomologist*, owensd@udel.edu

Get out your field guides and practice your pest management knowledge by clicking on the GUESS THE PEST logo or following this link: http://www.udel.edu/008255 and submitting your best guess. For the 2021 season, we will have an "end of season" raffle for a scouting toolkit for one lucky winner, and five winners will be sent a small jar of locally produced honey. Remember, you can't win if you don't play!

What critter made this on the bottom of a leaf?

Go to http://www.udel.edu/008255
to Guess the Pest!

Announcements

Pesticide Safety Exam Reviews

Beginning in March the Delaware Department of Agriculture Pesticide Section will provide a Pre-Certification Pesticide Core Exam Review. This review will provide essential information, covering laws, equipment, personal safety and more to help you prepare for the core certification exam.

The core exam is for private pesticide applicators and a prerequisite for all commercial pesticide applicators.

2021 Pesticide Exam Dates
Wednesday, June 23, 2021
Wednesday, August 11, 2021
Wednesday, September 29, 2021
Wednesday, November 17, 2021

Schedule for Exam/Review Dates
Core Exam Review: 9 – 11:30am
Lunch Break
Pesticide Testing for ALL: 1 – 4pm

You may choose to test in the afternoon of the review or on another testing date.

Sign up is free!
Log into your account on dda.force.com/pesticide then click on Exam Registrations.

For more information on this training course and testing please contact Amanda Strouse at amanda.strouse@delaware.gov or 302-698-4575.

Extension302 Podcast

Episode 19: Got Dairy?

Featuring Charmayne Busker of Jenamy Farms

Milk, cheese, butter...ice cream! What's not to love about local dairy? The Extension302 team sits down with Charmayne Busker and our own Dan Severson to explore their favorite topic.

To listen, go to:
https://www.udel.edu/academics/colleges/canr/cooperative-extension/about/podcast/

COVID-19 Vaccination Opportunities in Delaware

COVID-19 vaccination is currently available to Delawareans ages 12+ at numerous sites throughout the state. Some sites require an appointment and others offer walk-in hours. Information about vaccine sites and appointments is online at https://coronavirus.delaware.gov/vaccine/where-can-i-get-my-vaccine/.

Mental Health First Aid Training

What is this training about?
The Mental Health First Aid training is an 8 hour evidence based program that introduces participants to risk factors and warning signs of mental illnesses, builds understanding of their impact, and overviews common ways to help and find support. Using interactive educational methods, you'll learn how to offer initial help in a mental health crisis and how to connect with the appropriate level of care. You will also receive a list of community healthcare providers and national resources, support groups, and online tools for mental health and addictions treatment and support.

What is the training format?
The course will be offered in two parts. The first part is offered online in a self-study format, takes about 2 hours, and needs to be completed before the live session. The second part will be offered live and virtually via a Zoom connection. This session will be held from 9am-3pm. You will receive the link for the self-paced session and Zoom info for the live session after you have registered. You need to register by the dates listed below to be able to attend the schedule live Zoom training date.

Why attend?
In Delaware our agriculture community is facing many stressors. Those who are in the position to consult and aid them need to know the signs, symptoms and strategies to best serve them. Farm family members also need to know how best to help their loved ones. This training is being taught by instructors from the Delaware Mental Health Association.

A certificate of completion is provided to attendees who attend all 8 hours of the training.

There are four dates for the Zoom session. Seating is limited. Please choose only one:

Mental Health First Aid Zoom Sessions with Registration Links

Friday, July 30, 2021 9 a.m.–3 p.m.
Register by June 30
https://www.pcsreg.com/mental-health-first-aid-training-july-2021

Friday, September 24, 2021 9 a.m.–3 p.m. Register by August 24

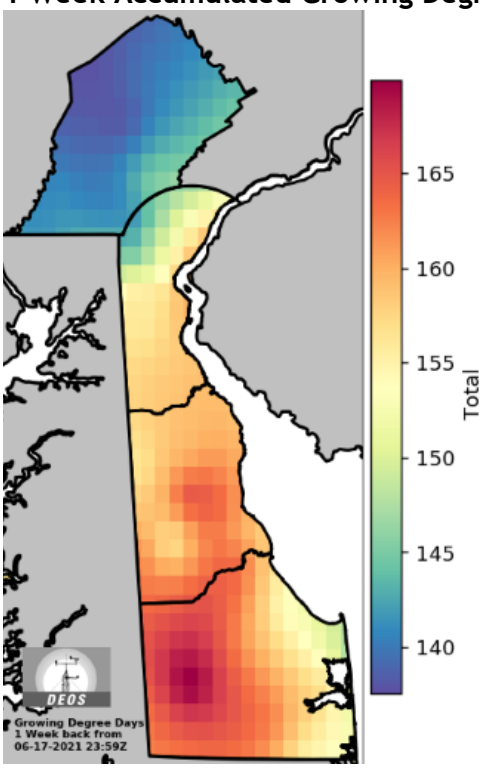
https://www.pcsreg.com/mental-health-first-aid-training-sept-2021

Friday, October 5, 2021 9 a.m.–3 p.m. Register by September 5
https://www.pcsreg.com/mental-health-first-aid-training-oct-2021

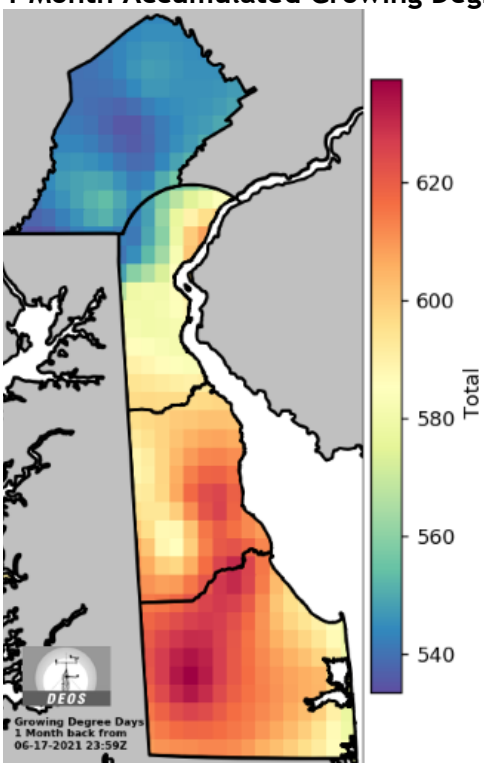
This training is underwritten by the Sustainable Coastal Communities Project, Delaware Farm Bureau and University of Delaware Cooperative Extension. These organizations are equal opportunity providers.

New Weather Summary!

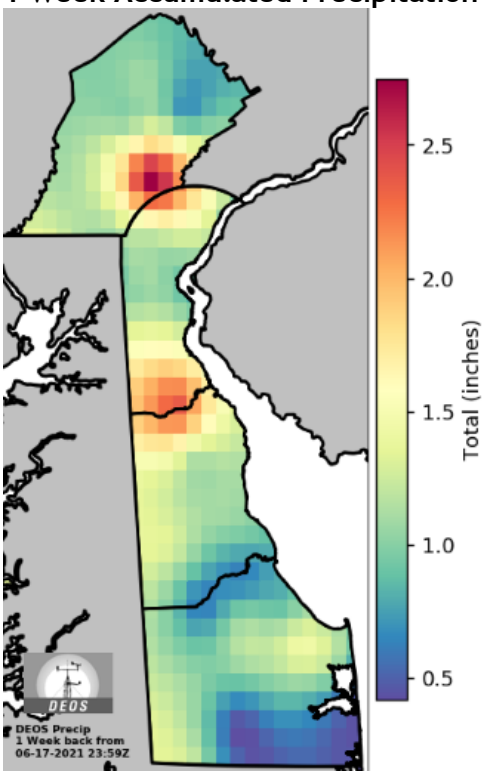
1 Week Accumulated Growing Degree Days



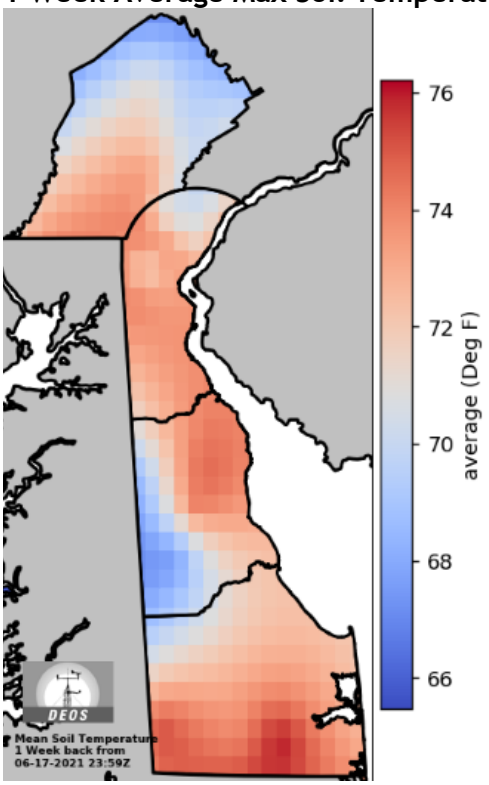
1 Month Accumulated Growing Degree Days



1 Week Accumulated Precipitation



1 Week Average Max Soil Temperature



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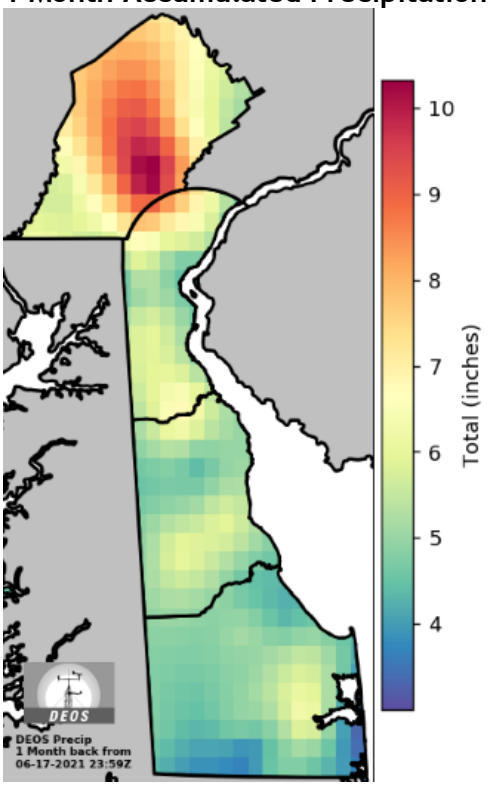

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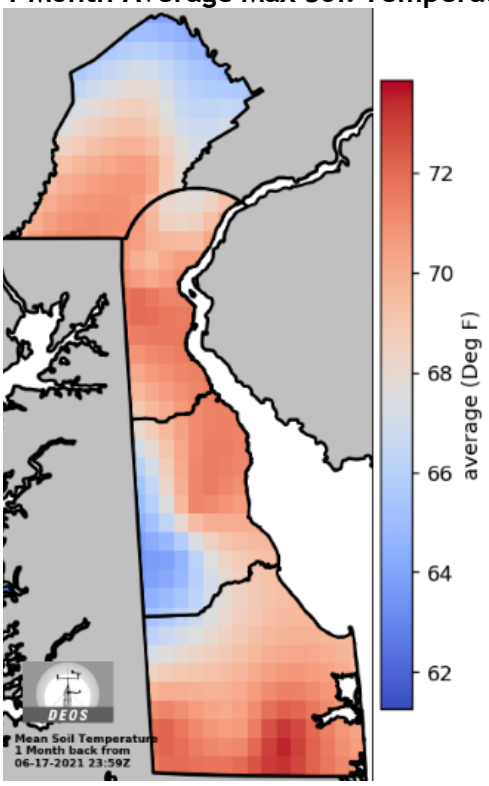

These weather maps are generated from DEOS weather station data and are part of a new Ag Weather website that is under development. Your feedback is welcome!
Thanks!! Emmalea (emmalea@udel.edu)

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