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

Asparagus
Continue scouting for asparagus beetle eggs on emerging spears.

Greenhouses
Be scouting for aphids and spider mites on transplants. Be sure to check labels before making any application decisions. Some labels are specifically for greenhouse application, others specifically state not for greenhouses, and still yet others are silent, even if the active ingredient is the same. Your state's Department of Agriculture or county extension agent can give you guidance on how to interpret this last category. Some of the earliest transplants will soon be set outside to harden off. For infested transplants, this is a very convenient time to treat them because an application can be made using far less product and water and in much less time.

Linear Bed Foot Method for Determining Fertilizer Needs for Vegetable Crops on Plastic Mulch

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

In the Mid-Atlantic Commercial Vegetable Production Recommendations, fertilizer recommendations are given on a per acre basis. For crops grown on plastic mulch, the most common bed spacing between rows is used and recommendations are based on linear bed foot (LBF) values.

The LBF system can be used to express fertilizer rates for any fertilizer delivery method with mulched beds, including production systems using bed placed fertilizers. In the production systems that rely on the drip irrigation system to deliver water and fertilizers, the LBF fits closely because growers already know the total length of drip tubing in an acre. LBF can also take into account areas for drive rows used for sprayers such as in watermelons or cantaloupes.

The following are LBF values that fertilizer recommendations are based on in the Mid-Atlantic on plastic mulch:

Cucumbers: 7,260 linear bed ft./acre (6-foot bed spacing, 2 rows per bed)

Eggplant: 7,260 linear bed ft./acre (6-foot bed spacing, one row per bed)

Muskmelons and Mixed Melons: 7,260 linear bed ft./acre (6-foot bed spacing, 1 row per bed)

Peppers: 7,260 linear bed ft./acre (6-foot bed spacing, 2 rows per bed)

Summer Squash: 7,260 linear bed ft./acre (6-foot bed spacing, 2 rows per bed)

Tomatoes: 7,260 linear bed ft./acre (6-foot bed spacing, one row per bed)

Watermelons: 6,222 linear bed ft./acre (7-foot bed spacing, one row per bed)

If bed widths are different then adjustments should be made to fertilization rates and if unplanted drive rows are used then rates per acre will also be reduced.

To make these adjustments you need to know the following:

Real-estate acre: Farm land (land area) that occupies 43,560 square feet. This term also may be called "gross acre" and refers to the land area used for crop production, including the cropped land plus the land used for drive rows, field rows roads and drainage ditches.

Cropped area: The portion of the real-estate acre used solely for crop production. Alternatively, the cropped area is the land remaining after uncropped land, such as drive or access roads, have been subtracted from the real-estate area. If the entire area is used for crop production, then the cropped area is equal to the real-estate area. Otherwise, the cropped area is less than the real-estate area.

Some watermelon examples:

1) Crop is grown on 8-foot bed centers, not 7-foot: Total bed feet would be 43,560/8 or 5,445 LBF.

Fertilizer would be reduced by 6,222-5,445=777/6,222 = 12.5% so if the recommendation is 125 lbs of N per acre you would reduce that by 16 lbs (109 lbs N per acre).

2. A drive row is placed after every 8 beds on 7 foot centers. The cropped area is 8/9 or 89%. So the LBF would be 11% less. If the recommendation is 125 lbs/acre N, then the actual amount applied would be 0.89*125 or 111 lbs of N per acre.

For more information on Linear Bed Foot for fertilizer recommendations go to this University of Florida fact sheet: https://edis.ifas.ufl.edu/pdffiles/ss/ss51600.pdf

Much of the information used in this article was taken from this publication.

Potato Tuber Physiological Age, Sprouting and Emergence

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

I recently received a question about variable potato sprouting in the field. While field and planting conditions, soil temperatures, seed piece handling all have an effect, another factor is seed age.

Potato tuber physiological age will determine seed piece sprouting. The physiological age is affected by harvest conditions, calendar (chronological) age, and storage conditions.

During seed tuber storage, the main influence on physiological aging is temperature. Higher storage temperatures cause greater physiological aging, colder storage keeps seed potatoes in a young stage.

In general seed potatoes can be divided into old and young physiological groups. Physiologically older aged seed emerges earlier, grows faster, yields higher early, and yields less later than physiologically young unaged seed. Physiologically young seed has more vigor, produces higher yields of larger tubers than old seed and is ideal under long production seasons.

To age seed, store at 38°F then before planting store for 2 to 6 weeks at 55-60°F. To hold young seed, store at 38°F and warm to 45°F just before cutting and plant in soil about the same temperature as the tubers.

Field Characteristics of Physiologically Young and Old Seed

Characteristic	Young Seed	Old Seed
Emergence	slower	faster
Stand	greater	lesser
Early Vigor	greater	lesser
Foliage	more	less
Stems/Plant	less	more
Tuber Formation	later	earlier
Formation Period	longer	more uniform
Tuber Number	less	more
Tuber Bulking	longer	shorter
Tuber Sizing	larger	smaller
Senescence	later	sooner
Early Harvest Yield	lower	greater
Late Harvest Yield	greater	lower

When large tubers are desired, young seed that produce few sprouts should be considered. For early fresh market, older seed may be more desirable to get a higher yield early and a quicker vine senescence. Older seed also may be more desirable where a smaller tuber is sought.

Edema Problems in Greenhouse Tomatoes – *Jerry Brust, IPM Vegetable Specialist, University of Maryland*; jbrust@umd.edu

An odd problem was seen in tomato plants being grown for harvest in a greenhouse that showed blister or callus-like growths, usually along veins that first appeared on the underside of older leaves (Fig. 1). Leaves also showed unusual curling and other odd distortions on the top side of the leaf (Fig. 2). In addition, there can be spots of necrotic leaf tissue. Leaves with a great deal of this blistering were brittle with the leaf often cracking with any type of handling. Karen Rane from the diagnostic lab recognized these symptoms as edema (or sometimes spelled oedema). Edema is caused by the buildup of excess water in the root and conditions unfavorable for transpiration, usually caused by high humidity. When the tomato plant cells get too much water the cells will expand faster than they can get rid of the water leading to split and cracked tissue. Extensive edema can severely decrease the leaf's photosynthetic capability and lead to senescence. Other research has looked at poor or low light sources that affect the plants ability to expel excess water. So basically overwatering, high humidity and low or poor light are the major causes for the development of edema. Therefore, avoid overwatering plants in the greenhouse especially during cool temperatures when they should be kept slightly on the dry side. Keep humidity levels below 70% by enhancing airflow around the plants and by spacing the plants farther apart. Though more complicated, research has shown that increasing light quality by providing a more "full-spectrum" of light output, with significantly more short wavelength energy (i.e., UV light), will also decrease the occurrence of edema.

Figure 1. Underside of tomato leaf showing swollen tissue caused by edema

Figure 2. Top side of distorted tomato leaf with edema

Fruit Crops

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

Tarnished plant bug were observed in large numbers at plots in Georgetown this past week. Tarnished plant bug feed on flowers and developing fruit, causing cat facing, deformity, and button berries. The nymphs are small and lime green, adults are mottled brown and a little bit smaller than a pencil eraser. Scout for tarnished plant bug by shaking 30 flower trusses or clusters (6 groups of 5 across the field) on a dark sheet or on the black plastic where the nymphs will be more easily seen. Count the number of infested flower clusters (not number of nymphs). A variation on the sampling method

is to first sample 15 flower clusters. If 0 clusters are infested, you do not need to spray but if 3 or more are infested, control is justified. If between 0-3, check 5 more flower clusters. The complete sequence can be found here: https://ag.umass.edu/fruit/fact-sheets/strawberry-ipm-tarnished-plant-bug. There are a plethora of materials that can be used for plant bugs, including Malathion, Brigade, Danitol, Brigadier, Assail, Cormoran, Transform, Closer, Apta, and Beleaf. The best OMRI approved material is Azera, a mixture of azadirachtin and pyrethrin.

In addition to tarnished plant bug, sample for spider mites if you haven't already done so. Thresholds during the flowering and fruiting stage are 15 – 20 mites per leaflet. Take 10 mid-canopy leaflets (not the full leaf) per acre and count mites. If you count between 150 and 200 mites, a treatment is generally justified.

Imidan for Blueberry Stem Gall Wasp – *David Owens, Extension Entomologist,* owensd@udel.edu

Imidan 70-W (Gowan) label now has a 2ee recommendation for use at its current rate for use on blueberry stem gall wasp, which can be found here: http://www.cdms.net/ldat/ld7DS001.pdf.

Agronomic Crops

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

Small Grains
Insect pest populations in small grains are very quiet right now. Natural enemies are present in most fields in good numbers to suppress aphids. Grass sawfly has been reported, but in very low numbers. As a reminder, grass sawfly thresholds are less than that of true armyworm. It is green, with prolegs on every abdominal segment.

Cereal leaf beetle populations have been very low the last several years. We have been scouting for cereal leaf beetle for the last few seasons to validate a degree day model for peak egg lay developed by Virginia Tech and NC State. Due to their low populations, we need your help with this project. Below is a google form, if you see cereal leaf beetle eggs or larvae, please consider letting us know via the form. Thanks! https://docs.google.com/forms/d/e/1FAIpQLSfXJimm0MNei91wfgU4wLEMHfOJu0s7r_f6LDPX51hhTmazEg/viewform?usp=sf_link

Corn and Soybeans
Planting has begun for corn and soybean. Scout for slug presence or injury, either by using a shelter trap or by sifting through soil residue. High risk fields include no-till, high residue fields. Vertical tillage before planting, row cleaners, trash wheels, and closed seed slots all help reduce slug damage. For corn, the decision to spread baits can be made after the corn has begun emergence, whereas for soybean, the decision-making is much more complicated.

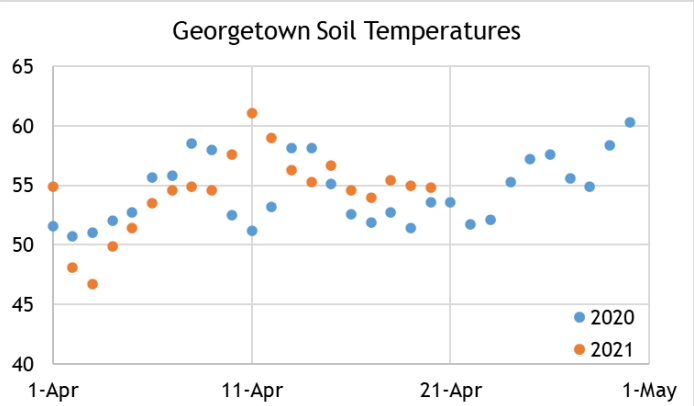
Mid-April Soil Temperatures and Growing Degree Days - *Jarrod O. Miller, Extension Agronomist,* jarrod@udel.edu;*Cory Whaley, Sussex Co. Agriculture Agent,* whaley@udel.edu; *Jake Jones, Kent Co. Ag Agent,* jgjones@udel.edu; *Dan Severson, New Castle Co. Ag Agent,* sverson@udel.edu

In Georgetown, warmer days have kept soil temperatures a few degrees higher than in 2020, but cooler nights have kept temperatures below 60°F since last week. While 50°F is the baseline for corn germination, having soil temperatures above 60°F will allow emergence within 10 days. Over the next week we will continue to have mild days but cooler nights, so we can expect soil temperatures to remain about where they are. Based on 2020, soil temperatures did not begin to rise above 60°F consistently until early May.

Corn emergence takes up to 120 growing degree days (GDD) to emerge. Since April 15th, we have accumulated 15 GDD in Newark, 20 in Dover, and only 16 in Georgetown. The cooler weather in Georgetown can probably be attributed to the rainfall moving across lower Delaware, but not observed in the northern half of the state. At this time last year, Newark had 0 GDD, while

Georgetown and Dover both had 6, so overall temperatures are a little warmer than last year.

Keep up with your regional conditions through DEOS (http://www.deos.udel.edu/).



Wheat and Barley Disease Updates

– *Alyssa Koehler, Extension Field Crops Pathologist*; akoehler@udel.edu

Across much of the region, barley is approaching or at heading and wheat is ranging from Feekes 7-9. There have been a few reports of scattered powdery mildew, but nothing at levels warranting a fungicide application. In barley, flowering begins just before the spike emerges from the boot. While florets are not as susceptible, *Fusarium* can infect the glumes and produce DON. DON accumulation is the primary concern, especially for malting barley acreage. The Fusarium Risk Tool http://www.wheatscab.psu.edu/ has the west part of the state at low risk, while coastal areas are at medium to high (Figure 1). If making a fungicide application to manage FHB in barley, the optimum stage to protect barley glumes is when the spike is fully emerged from the boot and florets are exposed (Figure 2). In 2020, a trial was conducted in Violetta malting barley looking at three timings of Miravis Ace application in comparison to Prosaro and Caramba. FHB incidence and severity were reduced by all fungicide treatments (Figure 2). Due to the timing of flowering, spraying barley a little early is usually better than spraying late. In wheat, ideal application is Feekes 10.5.1 (anthesis), when yellow anthers are visible in the center of the spike. While application of Miravis Ace at 10.3 in wheat can reduce disease, lowest DON has been observed with application at 10.5.1 or up to 4-6 days after 10.5.1.

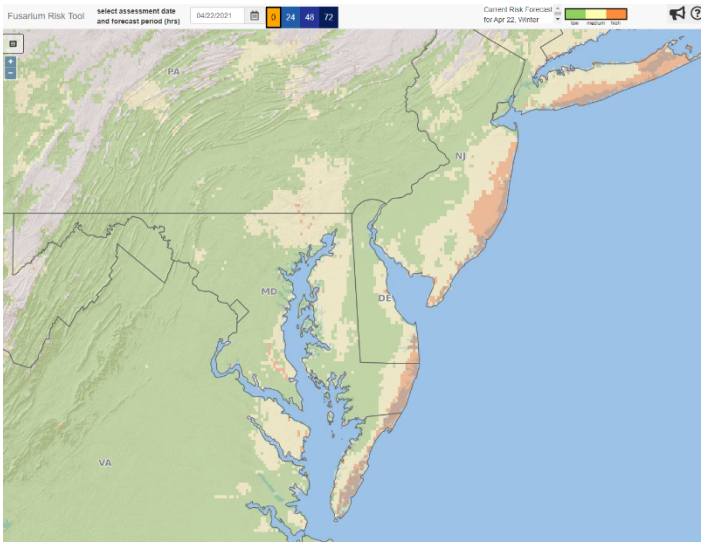


Figure 1. Fusarium Risk Tool Prediction for April 22, 2021

Figure 2. Stages of barley at or near spike emergence, with the furthest right spike at optimum stage for fungicide application.

Summary of 2020 Malting Barley Fungicide Efficacy Trial

Carvel Research and Education Center Georgetown, DE
2020 Malting Barley Fungicide Trial

Treatment	Moisture[z]	Test Weight	Yield (Bu/A)[y]	FHB % Incidence[x]	FHB % Severity[w]
Caramba anthesis[v]	11.8 a	46.5 bcd	96.9 b	19.0 a	0.31 a
Miravis Ace 10.3	12.2 a	45.7 bcd	102.1 b	12.0 a	0.15 a
Miravis Ace anthesis	12.5 a	47.6 ab	105.6 ab	16.0 a	0.23 a
Miravis Ace 4 days after anthesis	11.9 a	48.0 ab	102.9 b	16.0 a	0.2 a
Prosaro anthesis	12.0 a	45.0 cd	100.0 b	23.0 a	0.36 a
Control	11.8 a	44.6 d	86.7 c	53.0 b	1.17 b
p-value	0.19	0.005	0.0012	0.0006	0.0015
LSD (α=0.05)	1.5	3.5	4.4	4.8	4.25

[z] Means followed by the same letter are not significantly different based on Fisher's Least Significant Difference (LSD; α=0.05)
[y] Plots were harvested 6/10/20 and yield adjusted to 13.5% Moisture
[x] Fusarium Head Blight Incidence was visually assessed 5/26/20 as the % of 20 wheat heads per plot displaying symptoms
[w] Fusarium Head Blight Severity was visually assessed 5/26/20 as the average amount of symptoms present on 20 wheat heads per plot
[v] All fungicide treatments included the non-ionic surfactant Induce at 0.125% v/v. 10.3 application occurred on 4/14/20, 10.5.1 on 4/19/20, 10.5.1 +4d on 4/23/20

Variety: Violetta
Planting Date: 10/4/19
Planting Population: 1.5 mil sd/A

General

True Armyworm and Black Cutworm Trap Report – *David Owens, Extension Entomologist*, owensd@udel.edu

Armyworm flight is low in most locations. We do not know how counts will correlate to actual pressure in the field. Many thanks to Maryland extension agents Emily Zobel and Maegan Perdue and UD extension entomologist emeritus Joanne Whalen.

Location	Number of Nights	Total Catch TAW	Total Catch BCW
Willards, MD	7	9	17
Salisbury, MD	6	0	6
Laurel, DE	7	2	11
Seaford, DE	7	7	7
Sudlersville, MD	7	1	2
Harrington, DE	9	2	0
Smyrna, DE	7	192	16
Middletown, DE	7	85	14

Spotted Lanternfly Hatching, Kent and New Castle Counties Quarantined – *David Owens, Extension Entomologist,* owensd@udel.edu

Spotted Lanternfly eggs are beginning to hatch in Kent County. As a reminder, Kent and New Castle Counties are under a DDA quarantine, meaning that businesses will need to train employees on what to look for and avoid moving nymphs or adults on equipment, goods, and plant material. Businesses are required to obtain lanternfly permits, and other states may require them as well. You can find more information on DDA's spotted lanternfly website, which also has links to the permitting training materials for businesses and compliance checklists for other individuals: https://agriculture.delaware.gov/plant-industries/spotted-lanternfly/.

Guess The Pest! Week 3 Answer: Seedcorn Maggot – *David Owens, Extension Entomologist,* owensd@udel.edu

I admit, I'm not sure what happened to my form. I know I updated it, but must not have hit the submit button. The beans in the photo are being attacked by seedcorn maggot. The rest of the photo is pretty clear what is going on. Affected seedlings often have a swollen stem where the maggots are trying to burrow in. These beans were planted in a field we purposefully have baited to attract flies by incorporating fallow weeds and chicken manure at 360 degree days (base 39) and spreading bone and meat meal over the plot at planting.

Guess The Pest! Week 4 – *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 is this agriculturally important, bright charismatic pest on a cedar tree?

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, May 5, 2021
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 17: What is a Master Gardener?

The Master Gardener concept originated in Washington State in 1972 as a strategy for handling an overload of home gardening questions and Delaware launched its own program in 1986. Today, our state has nearly 300 Master Gardener Volunteer Educators who volunteer more than 20,000 hours each!

Find out how you can become a Delaware Master Gardener with this information-packed episode featuring Carrie Murphy (UD Extension Agent) and Megan Pleasanton (Delaware State University Extension Educator)!

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

Managing and Processing Meat Animals for Consumers

Three-week interactive webinar series for small ruminant and cattle producers. Be prepared to fabricate a sheep and/or a goat

Presenter: Dr. Stacy M. Scramlin Zuelly, Assistant Professor and Meat Scientist, Purdue University

Tuesday April 27, 2021 6:30 p.m.
Meat Animal Producers: Understanding Your End Product

Tuesday, May 4, 2021 6:30 p.m.
Pasture to Plate: Why Animal Management Matters to Meat

Tuesday, May 11, 2021 6:30 p.m.
Small Ruminant Fabrication

Topics
- Meat cuts overview
- Working with meat processors
- Market considerations for your products
- Lamb carcass fabrication
- Meat quality assessment
- Livestock management impact on product quality

Register Here

For more information contact:

Dr. Kwame Mathews
Small Ruminant Specialist
Delaware State University Cooperative Extension
kmatthews@desu.edu

Mr. Daniel Severson
New Castle County Extension Agent
University of Delaware Cooperative Extension
severson@udel.edu

Ms. Susan Garey
Extension Agent, Animal Science
University of Delaware Cooperative Extension
truehart@udel.edu

Weather Summary

Carvel Research and Education Center Georgetown, DE

Week of April 15 to April 21, 2021

Rainfall:

0.17 inch: April 15
0.51 inch: April 19
0.01 inch: April 20
0.06 inch: April 21

Air Temperature:

Highs ranged from 74°F on April 21 to 57°F on April 19.

Lows ranged from 50°F on April 15 to 39°F on April 17 and April 18.

Soil Temperature:

55.4°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