



WEEKLY CROP UPDATE

UNIVERSITY OF DELAWARE COOPERATIVE EXTENSION

Volume 29, Issue 4

April 16, 2021

Vegetable Crops

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

Asparagus

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

Greenhouses

Be sure to scout greenhouses for signs of two spotted spider mite and aphids. Two years ago, I had aphids attack my melon transplants in the greenhouses, and last year spider mites were observed on melon transplants in greenhouses. Mitigating spider mites before they are planted in the field will save time and expense later in the season.

Minimum Soil pH for Vegetables - Gordon Johnson, Extension Vegetable & Fruit Specialist;
gcjohn@udel.edu

The following are minimum pHs for various vegetable crops.

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

Below these pH levels, crop performance will be affected, and yields will be reduced. Lime should be applied immediately if soil pH has dropped to these values. Target pHs for vegetable crops can be found in Table B1 in the [Mid-Atlantic Commercial Vegetable Production Recommendations](#).

Before Laying Plastic, Check the Soil pH -
Gordon Johnson, *Extension Vegetable & Fruit Specialist*; gcjohn@udel.edu

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

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

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

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

Another issue is with the use of nitrogen fertilizers with ammonium or urea which are acid forming. Ammonium is found in ammonium sulfate, ammonium nitrate, mono and di-ammonium phosphate, and urea ammonium nitrate solutions. Urea is found in UAN and as straight urea. Urea has the short-term effect of increasing pH, but once ammonium is released in the soil from the reaction of the urea, the long-term effect will be to reduce pH.



Purdue University Vegetable Crops Hotline

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

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

In plasticulture beds, the use of these acid forming fertilizers or soil amendments during

bed formation or with fertigation through the drip tape will lower soil pH: if the bed pH is marginal to begin with (5.3-5.6) it can be lowered over the season to below the critical pH of 5.2 and cause problems with the growing crop.

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

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

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

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

Most of the sulfur in the upper part of the soil is held in organic matter. Upon mineralization, sulfur is found in the soil as the sulfate ion (SO_4^{2-}) which has two negative charges. The sulfate ion is subject to leaching, especially in sandy textured soils (loamy sands, sandy loams). It does accumulate in the subsoil but may not be available for shallow rooted vegetables.

Sulfur can be added by using sulfate containing fertilizers such as ammonium sulfate, potassium sulfate, and K-mag (sulfate of potassium and magnesium). It is also a component of gypsum (calcium sulfate). In liquid solutions, ammonium thiosulfate is often used as the sulfur source. Sulfur is also found in manures and composts. For example, broiler litter has about 12-15 lbs of sulfur per ton.

In vegetable crops, sulfur removal is generally in the 10-25 lb/A range. Mustard family crops (cole

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

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

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

Odd Damage to Greenhouse Watermelon Transplants - Jerry Brust, *IPM Vegetable Specialist, University of Maryland;*
jbrust@umd.edu

There have been several reports of odd-looking damage to watermelon transplants being grown in greenhouses these past couple of weeks. The damage does not appear to be cold damage per se, but more of a strange environmental/weather one. Watermelon transplants, along with some other vegetables, began showing dark pitted lesions on their cotyledons (Fig. 1). The marks looked bad and alarmed several growers as to what was going on. There were some indications that the damage was abiotic, (i.e., it was not caused by a disease or insect pest or any living organism). The first was that only the cotyledon leaves were damaged, all true leaves were clean. The cotyledon leaves tend to be more sensitive to any possible phytotoxic sprays that may be applied. The second was that the damage to the cotyledons was only one-sided. The top side of the leaf had the dark spots, but the underside of the same leaf just had some pitting caused by the damage on the top side of the leaf (Fig. 2). The third indication was that tomato seedlings in the greenhouse also developed similar necrotic spotting as the watermelon around the same

time. Most of growers had all applied a spray treatment recently that they had applied for many years without any problems, but the environmental conditions at the time of this recent application resulted in a phytotoxic response from the plants. Although we had these 3 indicators that it was very unlikely to be a bacterial disease we still went ahead and had them tested by Karen Rane, Director of the UMD Diagnostic clinic. No disease was found.

Finally, there have been other samples and reports from GH growers of: necrotic lesions on watermelon leaves that were not a disease or insect damage (Fig. 3), poor seed germination of tomatoes and peppers and odd and poor growth of tomato, pepper and some cucurbit transplants. There unfortunately have not been any definitive answers found as to what the causes are and what can be done about them, although I greatly suspect they are all associated with environmental factors. These occurrences over the last couple of weeks demonstrate how weather can affect our crops even in greenhouses in ways that are unexpected and hard to figure out at times.



Figure 1. Watermelon cotyledon leaves with brown lesions

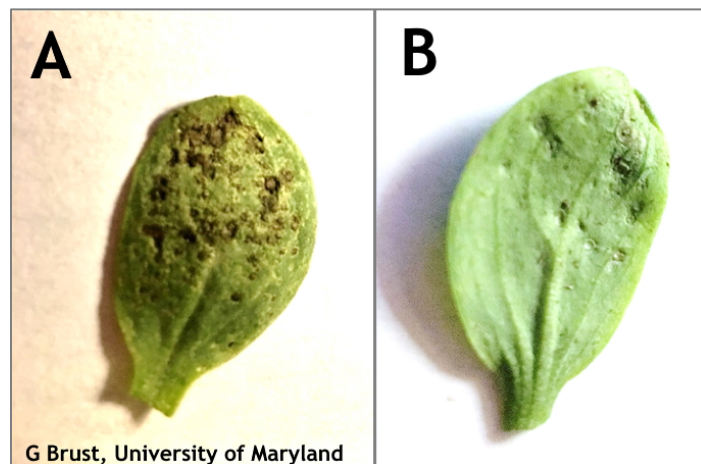


Figure 2. Top-side of cotyledon leaf with brown lesions (A), and underside of same leaf (B).



Figure 3. Necrotic (not-disease) spots on watermelon transplants

Fruit Crops

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

There has been an increase in interest in planting fruits in Delaware. This is a positive trend that matches the interest in buying local and can also provide local fruit to the steady influx of visitors in the region.

Success with tree fruits, blueberries, grapes, brambles, and other long-term perennial fruits begins with selecting a proper site. I have visited too many sites where growers have lost expensive planting material because of poor locations and poor planning. Landowners most often are not buying properties with fruit planting in mind and many properties just are not suitable for fruit.

The most common issue with planting fruit is that of high seasonal water tables. When water rises in winter, it can saturate part of the root zone of the fruit plant and roots will then die due to lack of oxygen. Roots injured by waterlogging are also then more susceptible to root rot pathogens. Fruit plants with water damaged roots also have fewer effective roots which can make them more susceptible to other plant stresses such as drought. In the end, these fruit plants will die prematurely, have shorter life spans or will be less productive.

The best time to evaluate a site for the height of the seasonal water table is in late winter. Find the lowest elevation in the property being evaluated and dig a hole 6 feet deep using a posthole digger. If any free water is found in the hole then the site is not suitable for most deep rooted perennial fruits such as tree fruits and grapes. With brambles and blueberries water should not be found within 4-5 feet of the surface in these observation holes. Also examine the soil that comes out of the borings. If you see considerable amount of gray colored soil, this is an indication of water saturation. Do these borings throughout the property and map your site and avoid planting fruits on any areas with high water tables.

Another problem with water saturation and roots can be perched water tables. This is when an impervious soil layer does not allow water to drain and a saturated area develops above that layer. If perched water tables are found, the area is again not ideally suited for fruits. Subsoiling can fracture these layers if done properly but the layers may reform in a few years.

In high water table soils, it may be possible to grow some fruits such as brambles or blueberries by creating high mounds to grow on. In this case,

the growing area is elevated 2-4 feet by moving soil to create a mounded ridge where fruit is planted. While this is possible, it is expensive and must be done in such a way that water does not collect between the mounds.

Another issue with fruit siting is air drainage. Our last 2 winters have had sub-zero conditions which can cause problems with winter kill in some grapes and brambles and bud damage in some tree fruits. Lower areas where cold air drains to also are more susceptible to late frost damage to flowers in the spring, particularly in peaches, nectarines, apricots, and plums. All sites should be evaluated for air drainage by doing elevations on the property. Fruit should be planted on the highest elevations and frost pockets should be avoided. Frost pockets are easily seen by looking where frost is found during late spring frost events. On Delmarva, an issue we have is that some areas are just completely flat, with low elevation. These areas will not allow for air to drain and can also have issues with cold air accumulating.

Soil pH is an issue with blueberry establishment. Blueberries require a soil pH of 4.5-4.8. Most of our soils have much higher pHs and the soil must be acidified before blueberries can be planted. This can take 1-2 years using sulfur as the acidifying agent.

Sites should also be evaluated for nematodes, soil pests that can be damaging to fruit roots, before planting.

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

Be sure to scout strawberry plantings for spider mites. 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.

Agronomic Crops

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

Alfalfa

Continue to scout alfalfa fields, even if they had been previously treated, for alfalfa weevil. Larvae continue hatching. As a reminder, alfalfa weevil thresholds are based on plant height, value of hay, and control costs. Our insect control guide is also based on pure stand alfalfa: <https://www.udel.edu/academics/colleges/canr/cooperative-extension/sustainable-production/pest-management/commercial-field-crop-pest-management/alfalfa/>. Thresholds are not applicable in mixed stands with 50% or less alfalfa.

Corn/Soybean

Now that the first field crops have gone into the soil, be mindful of slug populations. All life stages are currently active. Pennsylvania suggests a threshold of 1 per square foot under a shelter trap. I suspect this may be a bit on the low side for our area, but it underscores the importance of watching the emerging stand like a hawk. Be especially wary on no-till fields with a history of slugs and fields with brassica cover crops. For corn, we can make a rescue treatment, but be advised there are no established defoliation thresholds.

Small Grains

The first cereal leaf beetle adults have been observed in small grain in very low numbers. Aphid populations are generally low, and natural enemies are present, which should suppress their populations.

Insecticide Update: Sefina for Sugarcane Aphid - David Owens, *Extension Entomologist*, owensd@udel.edu

Sefina (afidopyropen, IRAC group 9D) from BASF now has a supplemental label for sugarcane aphid control in sorghum at a rate of 6.0 fl oz.

Our Insect Pest Management 2020 Campaign summary is available at our research extension and demonstration results webpage. It and other year summaries can be found here: <https://www.udel.edu/academics/colleges/canr/cooperative-extension/sustainable-production/pest-management/insect-management-reports/>.

Fusarium Risk Tool Available for 2021 Season - Alyssa Koehler, *Extension Field Crops Pathologist*; akoehler@udel.edu

Wheat is in the jointing stage and we are a few weeks out from thinking about management for Fusarium Head Blight. The Fusarium Risk Tool <http://www.wheatcab.psu.edu/> is live for the season and is a resource you can use to help predict FHB risk. There have been some updates to the system since last season. When you enter to the tool, you will see the risk based on the current date. There is a calendar icon that allows you to look back in time by selecting a different day of interest. You can also now set the forecast period for current (0), 24, 48, or 72 hrs from the time you are looking.

Currently most of the state and country are at low risk. High humidity, heavy dew, rain, and night temperatures above 50°F favor FHB infection. A menu icon in the upper left corner allows users to customize model predictions to account for using wheat varieties with different levels of genetic susceptibility to Fusarium head blight (Figure 1). In the top right corner you will see a microphone that, when clicked on, will show national and regional commentary from state extension pathologists (Figure 2).

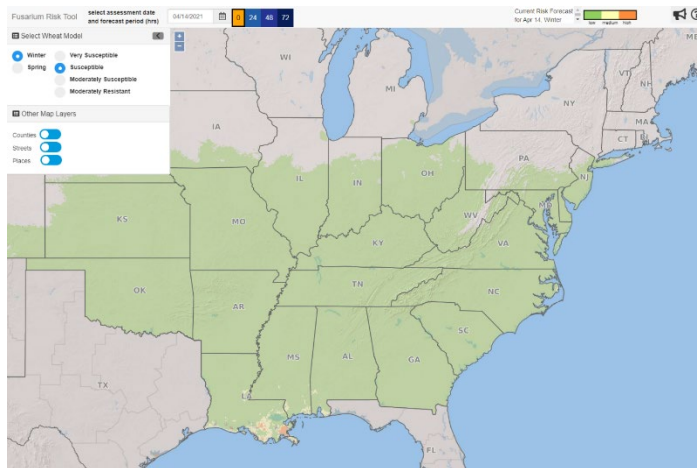


Figure 1. Fusarium Risk Tool model on April 14, 2021. The menu in the upper left corner allows for customization of genetic susceptibility to FHB. <http://www.wheatcab.psu.edu/>

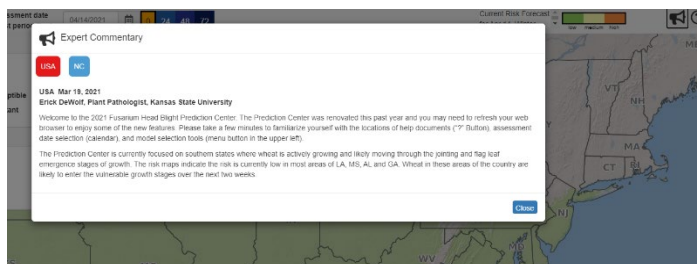


Figure 2. Clicking on the microphone icon in the upper right corner will bring up commentary for the US or individual state updates that have been posted.

Soil Temperatures Remain Steady - Jarrod O. Miller, Extension Agronomist, jarrod@udel.edu and Cory Whaley, Agriculture Agent, whaley@udel.edu

So far in April soil temperatures are on a linear rise and have reached 60° F in Georgetown (Figure 1). In 2020 temperature also rose through mid-April, before falling due to colder snap. This year the weather outlook is mild over the next 10 days (62-70° F), but soil temperatures will probably remain where they currently are, particularly if cloudy nights occur, which keeps soils from losing heat through radiation.

Soil water content has been falling (Figure 2), even with some of our recent rainfall. As we have seen most of the winter, 2021 has been a little wetter than 2020, but spring is bringing

drier weather. We have a few showers predicted but the outlook for planting on time is still good.

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

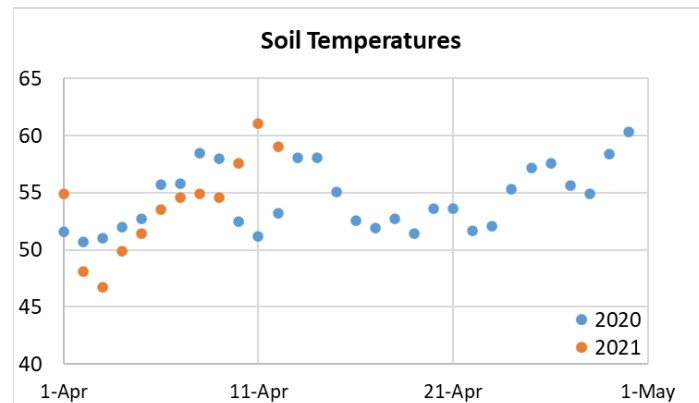


Figure 1. Soil temperatures at Georgetown in 2020 and 2021

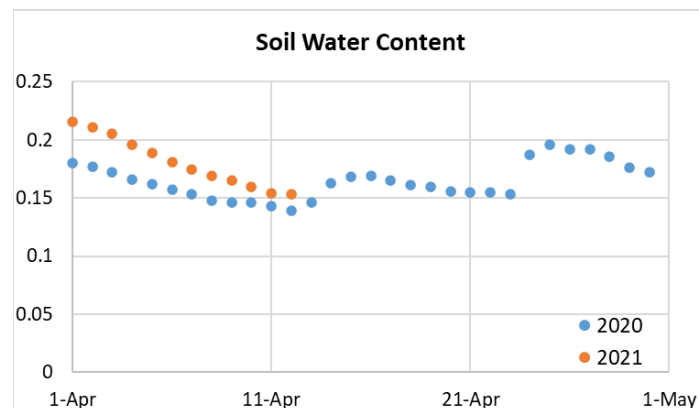


Figure 2. Soil water content in 2020 and 2021.

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	8	14	1
Salisbury, MD	9	3	3
Laurel, DE	5	---	7
Seaford, DE	5	14	7
Sudlersville, MD	7	1	1
Harrington, DE	4	13	8
Smyrna, DE	6	203	16
Middletown, DE	7	14	0

Thoughts on Spraying Burndown Herbicides

- Mark VanGessel, Extension Weed Specialist;
mjv@udel.edu

We all want our herbicides to work NOW and to be 100% effective. As the old saying goes, you can have it done fast, effective, or cheap/convenient - pick two because all three are probably not achievable. This time of year I get calls about how fast specific herbicides take to work and when is the best time to spray.

You will not find a definitive answer on when to spray burndown applications. My rule of thumb is: 1) the wheat should be growing, and weeds are putting on growth; 2) temps are close to 60ish and 2) there is not an expected severe change in weather pattern the following 24hrs. Often in early spring, farmers are spraying to “beat the weather” and then temps drop and products do not work as well.

Another thought is how often does the treatment “not work” and how often we are not patient enough. Herbicides that rely on translocation work slow this time of year, don’t expect full results for at least 14 days for these types of herbicides (i.e. glyphosate, 2,4-D, dicamba, Harmony Extra, Canopy EX).

Contact herbicides require full sunlight for optimum control (i.e. paraquat, Sharpen, Liberty) and there is little we can do about this. Tankmixing paraquat with a triazine herbicide (atrazine, simazine, or metribuzin) can enhance its performance in the spring.

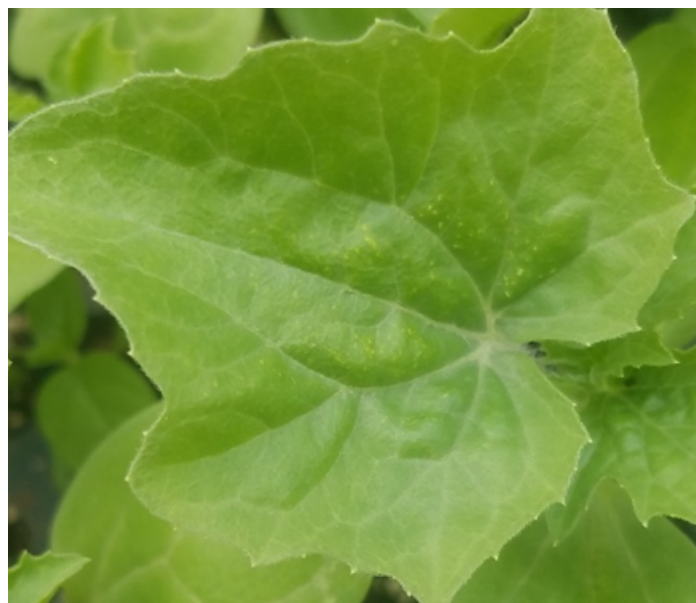
If weather is questionable, it is often better to wait for improved conditions than trying to get the field treated. With all that said, and working

around windy conditions (or lack of wind in the case of temperature inversions) and rain, that gives us limited time in March and April to spray. So it is tough to expect a “one and done” approach for burndown treatments. Be sure to allow adequate time for the products to work as well as time to retreat or plan on treating in sequence with an application early for the most problem weeds and follow-up at planting with a second application.

Guess The Pest! Week 2 Answer: Spider

Mites - David Owens, Extension Entomologist,
owensd@udel.edu

Congratulations to Bob Leiby for correctly identifying the cause of the whitish yellow speckles on the leaf as feeding injury caused by two spotted spider mite. This is a common greenhouse invader, especially when winter annuals have been allowed to grow around the inside perimeter of a greenhouse, allowing spider mites a host for overwintering before crawling onto new transplants. Last year, we observed extremely large populations of spider mite early in melon fields, most likely because plants had mites in the greenhouse.



Guess The Pest! Week 3 - 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!

When getting eager to see how my snap beans are doing, I dug up these two seeds. The one on the right looks healthy, but the one on the left has a bit more swelling and some gray discoloration. The field was tilled 2 weeks ago, and beans planted 1 week ago. What might be going on?



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 16: Ag Day 2021: One World, One Health

For many decades thousands of people headed to the University of Delaware's south campus on the last day of April to celebrate Ag Day. This year's theme is "One World, One Health" and will highlight college-wide research on this concept. Find out how you can enjoy the many speakers, tours and activities virtually from Monday, April 19 - Saturday, April 24!

To listen, go to:

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

The Basics of Video Editing Software Series

Two virtual trainings presented by DSU Cooperative Extension & Northeast SARE

Tuesday, April 20, 2021 6:00-7:00 p.m.

Premiere Pro

Presenter: Andy Chamberlin, Agricultural Engineering Technician & Outreach Professional, The University of Vermont

Thursday, April 22, 2021 1:00-2:00 p.m.

iMovie

Presenter: Jason Challandes, Regional SARE Educator, Delaware State University

Register for either or both here:

<https://forms.gle/FADMAzGERYScc8TW9>. Email jchallandes@desu.edu if you have any questions.

Cooperative Education in Agriculture, Youth Development, and Home Economics. Delaware State University, University of Delaware and the United States Department of Agriculture cooperating, Dr. Dyremple B. Marsh, Dean and Administrator. It is the policy of the Delaware Cooperative Extension System that no person shall be subjected to discrimination on the grounds of race, color, sex, disability, age, or national origin.

Embedded Racism on the Farm: Labor Law, Immigration, and the Fight for Farmworkers' Rights

Thursday, April 22, 2021 6:00-7:30 p.m. ET
Online

The next installment in Vermont Law School's Embedded Racism in the Law virtual panel series features attorneys and organizers who serve and advocate on behalf of farmworkers. Join us as we examine how the legacy of discriminatory Jim Crow-era policies persists in agricultural workers' intentional exclusion from labor protections and discuss how farmworkers and their advocates are fighting to improve working conditions, immigration status, and access to justice.

Featuring: **Laurie Beyranevand**, Professor and Director, [Center for Agriculture and Food Systems](#)

(moderator); **Iris Figueora**, Director of Economic and Environmental Justice, [Farmworker Justice](#); **Abel Luna**, [Migrant Justice](#); and **Juan Perea**, Curt and Linda Rodin Professor of Law and Social Justice, [Loyola University Chicago School of Law](#).

[Register here](#)

We hope you can join us! Please feel free to contact mmcdonough@vermontlaw.edu with any questions.

Weather Summary

Carvel Research and Education Center Georgetown, DE

Week of April 8 to April 14, 2021

Rainfall:

0.02 inch: April 9
0.29 inch: April 11
0.01 inch: April 12
0.26 inch: April 14

Air Temperature:

Highs ranged from 78°F on April 11 to 57°F on April 12.
Lows ranged from 57°F on April 11 to 39°F on April 14.

Soil Temperature:

57.2°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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