



WEEKLY CROP UPDATE

UNIVERSITY OF DELAWARE COOPERATIVE EXTENSION

Volume 25, Issue 10

June 2, 2017

Vegetable Crops

Spring Biofumigants for Late Spring Planted Vegetables? -Gordon Johnson, Extension Vegetable & Fruit Specialist; gjohn@udel.edu

In fields with heavy vegetable rotations that have built up diseases (including nematodes), or fields known to have soil borne pest problems in the past, use of a biofumigant mustard or rapeseed crop planted in March ahead of late spring planted vegetables can help to reduce disease levels.

Mustard family plants produce chemicals called glucosinolates in plant tissue (roots and foliage). These glucosinolates are released from plant tissue when cut or chopped and then are further broken down by enzymes to form chemicals that behave like fumigants. The most common of these breakdown products are isothiocyanates. These are the same chemicals that are released from metam-sodium (Vapam) and metam-potassium (K-Pam), commonly used as chemical fumigants.

You should plant biofumigant rapeseed or mustard as soon as the ground is fit in March. They take 50 days to produce full biomass. Planting rates are 15 lbs/ A for most biofumigant mustards and 7-10 lbs/a for rapeseed. Add 60-80 lbs of nitrogen per A to grow the crop (the higher N level on sandy soils). Mustards are not winter hardy; however, biofumigant rapeseed is and can be fall or spring planted.

The goal is to produce as much biomass of the biofumigant crop as possible. This requires that

you have a good stand, fertility, and sufficient growing time. The more biomass that is produced and that is incorporated, the more chemical is released.

The plant material must be thoroughly damaged so that enzymes can convert glucosinolates into isothiocyanates. This means that you need to chop the material as much as possible and work it into the soil as quickly as possible, so as not to lose the active compounds to the air. A delay of several hours can cause significant reductions in biofumigant activity. The finer the chop, the more biofumigant is released. A flail mower is ideal.

The material should be incorporated as thoroughly as practical to release the biofumigant chemical throughout the root zone of the area that is to be later planted to vegetables. Poor distribution of the biofumigant crop pieces in the soil will lead to reduced effectiveness.

Sealing with water (or plastic for smaller areas) after incorporation will improve the efficiency (as with all fumigants). Soil conditions should not be overly dry or excessively wet.

Allow 10-14 days after incorporation before planting the next crop.

A March 15 planting will be ready to incorporate in mid-May and can be planted with the vegetable crop in late May (around Memorial Day). April 1 plantings be ready 2 weeks later.



Kodiak biofumigant mustard ready to incorporate.



Pacific Gold biofumigant mustard ready to incorporate



Caliente biofumigant mustard ready to incorporate



Dwarf Essex rapeseed a biofumigant option for fall or spring (it will overwinter)

Hail Damage Showing Up in Scattered Vegetable Fields - Jerry Brust, IPM Vegetable Specialist, University of Maryland; jbrust@umd.edu

This has been a strange spring weather pattern we have been having. It has been cloudy and wet for the last 10 days or so and on top of all that we have had isolated down pours with hail. In some fields growers were not aware of the hail that had passed through and wonder now what could have caused the type of damage they are seeing in their crop. The damage on tomatoes and onions that I saw was from pea-size hail (Figures 1 and 2). The damage to tomatoes was always one-sided or even a quarter of a side of the tomato that was not covered by foliage. There was some tomato foliar damage, but not much. The noticeable and important damage was to the developing fruit. Developing vegetable fruit is often more sensitive to damage from hail than the stems and even leaves which are more durable and can take some small hail damage. Onion leaves were more beat up, but the bulbs all looked good in the fields I visited. In cucurbit fields the damage again was usually on only one side of the fruit with much lighter damage to stems and leaves (Fig. 3). If you have not had a chance to check

out your vegetables or fruit, be sure to do so in the next few days to get an idea of how much, if any, damage occurred.

If you do have hail damage be sure your fungicide spray coverage is thorough and that plants are at least sufficient if not better in nutrient levels. This may be a good time to try some biostimulants that are purported to help plants overcome stressful conditions. Be sure to treat only some or half of your damaged plants to see if the biostimulant worked or not. Damaged fruit should be removed from plants as it will be unmarketable, but will continue to drain the plant's resources until it is removed.



Figure 1. Hail damage to tomato on only one side of fruit by pea-size hail



Figure 2. Hail damage to onions



Figure 3. Hail damage to zucchini on only one side of fruit and light damage to stems

Late Blight in the Eastern US - *Kate Everts, Vegetable Pathologist, University of Delaware and University of Maryland; keverts@umd.edu*

Late blight, was recently found in both North Carolina and southern Virginia. The infected potato plants have been sent to Cornell University where they are currently being typed for pathogen clonal lineage. Once this information is available, we will have a better idea of whether mefenoxam (Ridomil and related products) will be effective.

Here in Delaware and Maryland, scout the crop carefully for signs or symptoms of disease. Our weather has been conducive, however the pathogen has not been reported here, yet.

MELCAST for 2017 - *Kate Everts, Vegetable Pathologist, University of Delaware and University of Maryland; keverts@umd.edu*

We began our yearly dissemination of MelCast for watermelons on Friday, June 2.

MelCast is a weather-based spray advisory program for watermelon developed at Purdue University. The program uses hours of leaf wetness and temperature during leaf wetness periods to determine when a fungicide should be applied. Weather information is used to calculate how favorable weather is to the development of gummy stem blight or anthracnose. The output of the program is an "environmental favorability index unit" (EFI) for

each day. The EFI values are added together. Once the threshold of 30 EFI is reached, a fungicide application is recommended. After the fungicide application, begin adding the EFI again from zero. If two weeks elapse and you have not accumulated 30 EFI, spray anyway. Also, add 2 EFI for each overhead irrigation event. We currently run MelCast for three locations in Delaware (Coverdale Crossroads, southeast of Laurel, and southwest of Laurel) and five locations in Maryland (Galestown, Hebron, Salisbury, Waldorf and Woodbine). Use EFI values for the location that is nearest to your farm.

To use MelCast on your farm, please call Karen Adams (302-856-7303) or Sheila Oscar (410-742-8788) and give us your name and e-mail address. More details about how the program works are available at our Disease Forecasting Web page, which is at:

<http://extension.umd.edu/mdvegetables/vegetable-plant-diseases/disease-forecasting>. In addition, we post the MelCast Advisory online three times a week.

Potato Late Blight Update #6 - June 1, 2017 - Nathan Kleczewski, Extension Specialist - Plant Pathology; nkleczew@udel.edu; @Delmarplantdoc

Late blight was reported 5/29 near the North Carolina and Virginia border. Weather has been conducive for disease. A protective fungicide application for late blight protection is recommended. I have included Early Blight P values as well. A P value of 300 is the threshold for early blight fungicide application.

Greenrow - May 1, 2017

Frederica			
Date	DSV	Total DSV	P Value
5/30-6/1	5	22	244
5/25-5/30	3	17	225
5/23-5/25	4	14	179
5/15-5/23	7	10	161
5/4-5/15	3	3	104
5/1-5/4	0	0	30

Notes: Season severity of **18 severity values** indicates the need for the first fungicide application. An accumulated severity of **7 after fungicide application identifies the need for a subsequent fungicide application.** You can personalize your late blight forecasts for specific fields, sign up for email or text alerts, and enter in management information at <http://blight.eas.cornell.edu/blight/>.

Real time fungicide application timing tables for locations within Delaware can be accessed at <http://blight.eas.cornell.edu/blight/DE>

See the 2016 Commercial Vegetable Production Recommendations-Delaware for recommended fungicides: <http://extension.udel.edu/ag/vegetable-fruit-resources/commercial-vegetable-production-recommendations/>

Any suspect samples can be sent to the Plant Diagnostic Clinic or dropped off at your local Extension office. Dr. Nathan Kleczewski can also be contacted at nkleczew@udel.edu or 302-300-6962.

The website USABlight tracks tomato and potato late blight across the nation and can be found here: <http://usablight.org/>. Information on scouting, symptomology, and management can also be found on this website.

Postemergence Herbicides for Sweet Corn - Mark VanGessel, Extension Weed Specialist; mjv@udel.edu

Options for postemergence weed control in sweet corn is limited. Be sure to consider what weeds are present and how big they are, the size of the sweet corn, what is to be planted after the sweet corn, and how long until harvest. Most herbicides that have the most flexible herbicide rotations, also have fairly limited spectrum of control. Postemergence options for grasses include Armezon/Impact, Laudis, and Accent. For broadleaves, Cadet or Basagran will control a limited number of species and typically only very small plants. Armezon/Impact, Laudis, and Callisto will control a fair number of broadleaf weeds (and control is improved with addition of a little atrazine); all are safe on most processing sweet corn hybrids grown locally; and so check

the rotational crops and consider the preharvest interval to help make the final selection.

Agronomic Crops

Field Crop Insect Update - Bill Cissel,
Extension Agent - Integrated Pest Management;
bcissel@udel.edu

Alfalfa

Begin sampling alfalfa for potato leafhoppers weekly until final harvest. Ten sweep net samples should be taken in 10 random locations throughout the field when the alfalfa is dry. The threshold for alfalfa 3" or less is 20 leafhoppers per 100 sweeps, 4-6" tall is 50 per 100 sweeps, 7-10" tall is 100 per 100 sweeps and greater than 11" is 150 per 100 sweeps. If the field is more than 60 percent bud stage or if it has experienced "hopper burn", the alfalfa should be cut instead of sprayed.

For more information on the identification, biology, and management of potato leafhoppers, please review our fact sheet:

<http://extension.udel.edu/factsheets/potato-leafhopper-control-in-alfalfa/>

Here is a link to our Insect Control in Alfalfa Recommendations (pure stands only):

<https://cdn.extension.udel.edu/wp-content/uploads/2012/05/18063238/Insect-Control-in-Alfalfa-final-for-2017.pdf>

Field Corn

Continue to sample fields for slug injury. Here is a link to information from previous WCU articles on slug management in corn:

<http://extension.udel.edu/weekycropupdate/?p=10303>



As barley matures, watch for true armyworm movement into neighboring corn fields. Fields planted into a small grain cover crop, pastures, and weedy fields are also at an increased risk for true armyworm infestations. The threshold for true armyworms in corn is 25% infested plants with larvae less than 1". Once the larvae move into the whorls and if they are larger than 1", control will be difficult. Worms greater than 1.25" have completed their feeding.

Here is a link to our Field Corn Insect Management Recommendations for Chemical Control Options:

<https://cdn.extension.udel.edu/wp-content/uploads/2012/05/13055805Insect-Management-In-Field-Corn-final-20171.pdf>

Soybeans

Continue to sample fields for slugs and other defoliators. This past week, I have seen several fields with grasshopper injury. Soybeans can typically withstand a decent amount of defoliation before yield losses occur, however, if stands are being reduced, an insecticide application may be warranted. A treatment may also be needed if you are finding one grasshopper per sweep and greater than 30% defoliation. (Note: once plants reach bloom and pod fill stages, the threshold for defoliation is reduced to 15%).

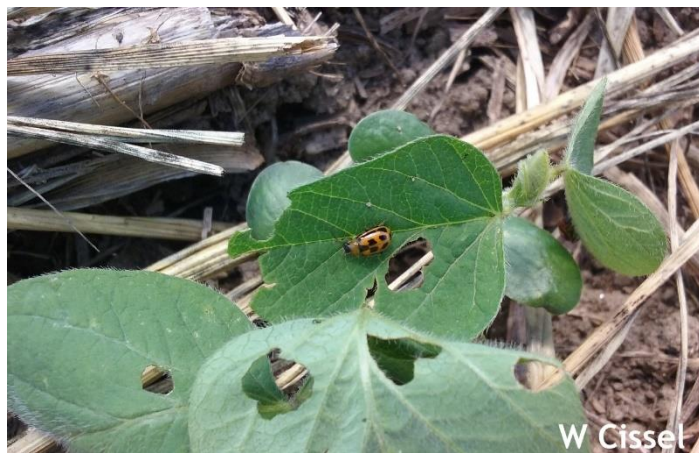


Grasshopper feeding injury on seedling soybeans. Notice the irregular shaped holes and leaf feeding from the leaf margins, a good indication of grasshopper feeding.



Another example of grasshopper feeding injury on seedling soybeans. Again, note the irregular shaped holes and leaf feeding from the leaf margins.

In addition to grasshoppers, also keep an eye out for bean leaf beetle damage (chewing on cotyledons and small round holes in unifoliate and trifoliate leaves). This can often be confused with slug damage so look for slime trails, slugs, and beetles. The threshold for bean leaf beetles is 2 per ft of row and 25% stand reduction from emergence to 2 trifoliate. After 2 trifoliate, the threshold is 2-3 per plant and 30 percent defoliation.



Bean leaf beetle feeding injury. Bean leaf beetles will often drop from the plants when disturbed and are excellent at hiding in crop residue.



Slug injury on soybean unifoliate leaves. In some cases, this damage can look similar to damage from bean leaf beetles so when diagnosing the cause, be sure to look for slugs, slug slime trails, and for beetles.

Here is a link to our Soybean Insect Management Recommendations:

<https://cdn.extension.udel.edu/wp-content/uploads/2012/05/18063934/Insect-Control-in-Soybeans-2017-final.pdf>

Small Grains

I continue to hear reports of wheat and barley fields that have reached threshold for true armyworms. If you haven't been scouting your fields, be sure to do so. With barley harvest approaching, make sure you review label restrictions for days to harvest before making an application.



Link to last week's article on true armyworm in small grains:

<http://extension.udel.edu/weeklycropupdate/?p=10413>

Grass sawfly and true armyworm fact sheet:

<http://extension.udel.edu/factsheets/grass-sawfly-and-true-armyworm-management-in-small-grains/>

Small Grain Insecticide Recommendations:

<https://cdn.extension.udel.edu/wp-content/uploads/2012/05/18063827/Insect-Control-in-Small-Grains-final-2017.pdf>

Hail Damage and Fungicide Use in Field

Crops - Nathan Kleczewski, *Extension Specialist* - *Plant Pathology*; nkleczew@udel.edu; @Delmarplantdoc

With recent hail in the region, some growers may be wondering about the use of certain fungicides (specifically some containing **strobilurin** active ingredients (QoI FRAC group 11) for the mitigation of plant stress or to protect the plant against wounded plant tissues. Some people consider fungicides for hail-damaged crops because it is believed that hail can either increase infection of fungal pathogens or increase plant stress and therefore disease. Furthermore it is believed that the potential physiological effects of strobilurins allow for plants to recover from hail damage and limit potential yield losses. It is important to note that the fungi that infect field crops do not require wounds to infect and cause disease. It is also important to note that bacterial diseases, which potentially could increase with wounding of plant tissues, *will not be controlled by these fungicides*.

What does the research say? Researchers from the University of Illinois conducted a two year field study using simulated hail damage (via string mowers) at the V12 stage followed by foliar fungicides containing either **pyraclostrobin** or **azoxystrobin** (both strobilurins). Overall, the study showed that the fungicides did not provide any yield benefit to hail-damaged corn. A link to the study can be found here:

<http://apsjournals.apsnet.org/doi/abs/10.1094/PDIS-94-1-0083>.

A study at the University of Wisconsin examined different corn hybrids and fungicides for their reaction to **anthracnose**. During the course of the study hail naturally damaged the corn in the trial. Although the hail did reduce yields, fungicides did not improve plant health or result in improved yields. A soybean trial that was conducted at the same time and also damaged by hail showed no differences between fungicide treated plots vs. untreated controls. A write-up of these studies can be found here:

http://www.apsnet.org/meetings/Documents/2010_Meeting_Abstracts/a10ma201.htm

Other research looking at timing of hail damage to corn and soybean and various pesticides was conducted by researchers at Iowa State. Results of their studies indicate that hail damage to soybean at R4 caused less yield loss than hail damage at R1. In corn, hail damage at R2 caused more yield loss than hail damage at VT. Fungicide application, either immediately following injury or applied several days afterwards, did not have an effect on yield. These studies were recently published in *Plant Health Progress*- located when you search under the keyword "hail"

www.plantmanagementnetwork.org/

Fungicides are effective at controlling fungal diseases and their benefits are realized when used in situations where fungal diseases are likely to limit crop productivity. They will not help with bacterial diseases, such as **Goss' wilt**, **bacterial stalk rot**, or **bacterial leaf streak**. The current studies indicate that the application of fungicides for **mitigation of hail damage** does not appear to significantly improve yields over untreated controls. If you do choose to apply a fungicide to hail damaged crops this year, it would be a good idea to leave an untreated strip in the field to allow for a comparison of treatment effectiveness at the end of the growing season.

Have You Checked Your Corn for Weed Control? - Mark VanGessel, *Extension Weed Specialist*; mjv@udel.edu

Everyone is behind and trying to make up for lost time. Before you get too far into planting more fields, be sure to check your early-planted crops. We have had a fair bit of rain to move the herbicides out of the root zone and with warmer weather, we could be getting another flush of weeds over the next week. This is particularly true if you have fields with Palmer amaranth in them. So be sure to stay on top of the fields with Palmer amaranth in them.

Early Postemergence Herbicide Applications for Soybeans - Mark VanGessel, *Extension Weed Specialist*; mjv@udel.edu

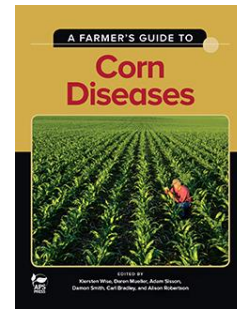
I have been asked about weed control options for soybeans that were planted and did not get any preemergence herbicides applied before the soybeans have emerged. Glyphosate or Liberty can be used on Roundup Ready or Liberty Link soybeans, but spraying early will require herbicides with residual control. A few of the preemergence herbicides are labeled for application after emergence, but they will not control emerged weeds (this includes Anthem Maxx, Dual, Outlook, Warrant, and Zidua). The postemergence herbicides with residual control include Classic, FirstRate, fomesafen (Reflex), Pursuit or Raptor. Classic, FirstRate, Pursuit and Raptor are all group 2 herbicides and there are biotypes of redroot pigweed, Palmer amaranth, and common ragweed that are resistant to this group of herbicides. Refer to the Mid-Atlantic Field Crop Weed Management Guide for more information.

General

Guess the Pest! - Bill Cissel, *Extension Agent - Integrated Pest Management*; bcissel@udel.edu

Congratulations to Roger Schmick for identifying the disease in this past week's Guess the Pest and for being selected to be entered into the end of season raffle for \$100 not once but five times. Everyone else who guessed correctly will also have their name entered into the raffle.

Roger will also receive a FREE copy of A Farmer's Guide to Corn Diseases. Click on the Guess the Pest logo below to participate in this week's Guess the Pest! For Guess the Pest # 9, we will also be giving away A Farmer's Guide To Corn Diseases (\$29.95 value) to one lucky participant.



<http://www.plantmanagementnetwork.org/book/cornfarmersguide/>

Guess the Pest Week #8 Answer: Stagonospora Glume Blotch - Nathan Kleczewski, *Extension Specialist - Plant Pathology*; nkleczew@udel.edu; @Delmarplantdoc





Stagonospora glume blotch is our most common fungal disease on wheat grown in the region. The pathogen survives and thrives in residue. During warm, wet periods, spores are produced on the residue, which spread onto nearby small grains. Disease progress is fairly slow, and it can take nearly two weeks for new spores to be produced after foliage has been colonized. The disease can infect the glumes, which can be particularly impactful in terms of reducing yield and grain quality. On the glumes, infection typically is observed as black lesions which turn grey over time. Black spots or bumps can be viewed within these grey lesions. This separates glume blotch from other causes of darkened heads, such as bacterial infections, black point, viruses, and varietal traits. On leaves, lesions generally have a “cat’s eye” shape, and can coalesce and expand. Stagonospora glume blotch is most severe when infections of the flag leaf and glumes occur. Management starts with the selection of a variety with good to excellent resistance to glume blotch. Resistant varieties are extremely effective, and if planted, can reduce the need for additional fungicide applications during disease-favorable seasons. Fungicides applied between flag leaf emergence and flowering will be the most efficacious in managing this disease. Practices that reduce residue can further reduce local outbreaks.

Guess the Pest # 9



Guess the Pest! What pest caused this damage?

To submit your guess click the Guess the Pest logo below or go to:

https://docs.google.com/forms/d/e/1FAIpQLSfUPYLZnTRsol46hXmgqj8fvt5f8-JI0eEUHb3QJaNDLG_4kg/viewform?c=0&w=1



Announcements

New Soybean Field Crop Guide Available

A new Soybean Field Crop Guide is available. The guide was developed by UD and VT to assist growers in identifying and managing important soybean diseases in the mid-Atlantic. This guide can be acquired in print from your county extension office or downloaded from this site

<http://reader.mediawiremobile.com/USB/issues/200013/viewer>.

Twilight Tailgate Session

Thursday, June 8, 2017 6:00 p.m.

UD Cooperative Extension Research Demonstration Area

3/4 mile east of Armstrong Corner on
Marl Pit Road -Road 429
Middletown DE

Join your fellow producers and the UD Extension team for a discussion of this year's demonstration trials and current production issues. Other topics will include nutrient management, pest management and weed management.

Bring: A tailgate or a lawn chair.

Credits: DE Nutrient Management (1) and Pesticide (1) credits .

We will wrap up with the traditional ice cream treat.

Please call our office at (302) 831-2506 or email sharonlu@udel.edu to register by Thursday, June 1, for additional information, or if you require special needs assistance.

Dan Severson, Extension Agent – Agriculture, New Castle County Cooperative Extension

The meeting is free and everyone interested in attending is welcome. If you have special needs in accessing this program, please call the office two weeks in advance.

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.

Growing Farmers Workshops

Coverdale Farm Preserve is a 356-acre farm and nature preserve located in Greenville, DE. We are pleased to offer a series of free hands-on workshops for farmers of all levels of experience and scale of operation. Registration is required. *To register please contact Michele Wales: michele@delnature.org.*

Spring 2017 Series: Protected Culture Growing includes the use of greenhouses, high tunnels, low tunnels, hoop houses, and caterpillar tunnels. Both high and low tech options are designed to help defend your crops against the extremes of nature from torrential rains, parching drought, scorching heat, and frigid cold. Protected Culture Growing extends your seasons, brings harvests earlier in spring and later in fall to your customers, and can be used on acres of open field to urban raised bed gardens. Engage in hands-on workshops that take you from construction to production targeting key topics for your growing success.

Troubleshooting in High Tunnels

Wednesday, June 21, 6:00pm – 8:00pm

Keep your plants thriving and productive. Learn to identify common pests including insects, plant diseases, nutrient deficiencies. Discover preventative strategies, steps, and solutions to compromising conditions in order to maximize yields.

Energize Delaware Farm Program

If you want to reduce your energy costs, the Energize Delaware Farm Program can benefit you! The program offers loans up to \$400,000 and grants up to \$100,000 per farm for qualified applicants.

The program provides:

- Energy audits provided by EnSave, Inc.
- Preliminary renewable energy assessments
- Cash incentives for qualifying equipment
- Project installation support
- Low-interests loans
- Support accessing additional financial assistance

The program is offered on a first-come, first-served basis with limited funding, so call EnSave at (800) 732-1399 today to get started!

Visit the Energize Delaware Farm Program website at:
<https://www.energizedelaware.org/energize-delaware-farm-program>

Small Ruminant Workshop: Fecal Egg Counting AND FAMACHA©

Saturday, June 24, 2017 9:00 a.m.–3:00 p.m.
DSU Outreach and Research Center
844 Smyrna Leipsic Rd
Smyrna, DE 19977

Learn Parasite Control

Internal parasites are a major health problem affecting sheep and goats. This workshop is designed to help producers learn the basics of selective internal parasite control. Join us as we provide hands-on training to certify producers in the use of FAMACHA© score card and fecal egg counts.

Lunch is included.

Cost: \$25 (check or money order*)

Register online:

<https://www.surveymonkey.com/r/7NL7XRC>

Limited to 25 attendees. Pre-register by June 10, 2017.

Presented jointly by:

Delaware State University	University of Delaware
Kwame Matthews	Susan Garey
	Daniel Severson

*Make checks or money orders payable to:
Delaware State University

Mail to:

Dr. Kwame Matthews
Cooperative Extension
Small Ruminant Program
Delaware State University
1200 N. Dupont Hwy
Dover, DE 19901

or deliver at the door.

For more information, for registration payments, or for assistance due to disabilities contact Dr. Matthews at (302) 857-6540

<https://www.facebook.com/DSUSmallRuminantProgram>

Weather Summary

Carvel Research and Education Center Georgetown, DE

Week of May 25 to May 31, 2017

Readings Taken from Midnight to Midnight

Rainfall:

0.76 inch: May 25
0.38 inch: May 28
0.09 inch: May 29
0.20 inch: May 30
0.01 inch: May 31

Air Temperature:

Highs ranged from 79°F on May 31 to 68°F on May 29 and May 30.

Lows ranged from 62°F on May 31 to 55°F on May 25.

Soil Temperature:

69.2°F average

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

Weekly Crop Update is compiled and edited by Emmalea Ernest, Associate Scientist - Vegetable Crops with assistance from Don Seifrit.

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