



WEEKLY CROP UPDATE

UNIVERSITY OF DELAWARE COOPERATIVE EXTENSION

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Vegetable Crops

Vegetable Insect Updates - David Owens, Extension Entomologist, owensd@udel.edu and Bill Cissel, Extension Agent - Integrated Pest Management; bcissel@udel.edu

Watermelon

by David Owens

Two spotted spider mites continue to be an issue in fields. Now that the first melons are being harvested, there are occasional reports of rind-feeding worms of various species. There are numerous products that should provide good efficacy, but you will need high water rates because rind feeding worms are likely to be in sheltered locations. Pay attention to pre-harvest intervals and bee toxicity, apply later in the day to avoid direct contact with foragers. Cucumber beetles are also active.

Sweet Corn

Bill Cissel and David Owens

Trap counts are much higher this week in several sites, and counts below are higher than they were on Monday. As expected, earworm activity is beginning to pick up and will probably continue to climb through August. Be sure to scout pretasseling corn as well for whorl feeding earworm and potential fall armyworm. Although we are not trapping specifically for fall armyworm, they often show up in late July, and Virginia is currently capturing low numbers of them.

Sweet corn trapping data is updated by Tuesday and Friday mornings and can be accessed here: <http://agdev.anr.udel.edu/trap/trap.php>. Do

not rely on a single trap site to make spray decisions; take a look at nearby traps and note the general statewide trend. You may have more corn earworms in tassel-push/ early silk sweet corn than what some of these traps may indicate. Trap catches from Monday, Tuesday, and Wednesday night are as follows:

Trap Location	BLT - CEW	Pheromone CEW
	3 nights total catch	
Dover	1	74
Harrington	0	1
Milford	0	4
Rising Sun	4	43
Wyoming	0	27
Bridgeville	0	12
Concord	0	23
Georgetown	0	3
Greenwood	0	0
Laurel	0	36
Seaford	1	51

DDA and UD Offering Produce Food Safety Readiness Reviews to Growers

- Gordon Johnson, Extension Vegetable & Fruit Specialist; gcjohn@udel.edu and Anna Wicks, Produce Safety Inspector for the Delaware Department of Agriculture; anna.wicks@state.de.us

The Delaware Department of Agriculture and the University of Delaware On-Farm Food Safety Team and are now available to conduct On Farm Readiness Reviews to help fresh produce growers determine their readiness for a Produce Safety Rule inspection, implemented under the Food

Safety Modernization Act. Inspections will begin in 2019 for operations with over \$500,000 in annual produce sales. If you need assistance in determining if you are covered under the Produce Safety Rule, or are interested in a voluntary On-Farm Readiness Review, please contact Anna Wicks, Produce Safety Inspector for the Delaware Department of Agriculture: (302) 698-4582 or by emailing anna.wicks@state.de.us. Visit <https://de.gov/producesafety> for more information on Delaware's Produce Safety Rule Program.

Manganese Toxicity in Cantaloupes - Jerry Brust, *IPM Vegetable Specialist, University of Maryland*; jbrust@umd.edu

Growers, especially on the Eastern Shore, may already be seeing leaf symptoms on their cantaloupe plants that are often misdiagnosed as a foliar disease. However, these leaf symptoms described below indicate manganese (Mn) toxicity which is related to low soil pH.

Symptoms: Symptoms of manganese toxicity usually appear on older leaves of cantaloupe when fruit begin to net or when fruit are the size of billiard balls and there have been heavy rains. The worst symptoms appear shortly before harvest and in lower areas of the field. The best way to determine whether you have Mn toxicity is to take an affected leaf and hold it up to the sun. Tiny pin-hole sized lesions with yellow halos clustered between the veins will be visible (Fig. 1). As the lesions mature, they will coalesce, and turn brown (Fig. 2). Some cantaloupe rows often seem to be worse than adjacent rows. Affected plants frequently appear as clusters in the field. Moderately to severely affected cantaloupe plants will demonstrate poor vegetative growth and reduced or incomplete fruit maturation. The combination of all these symptoms often can be confused with several infectious diseases. Because of the symptoms growers will at times increase their fungicide sprays, which may lead to phytotoxicity problems.



Figure 1. Pin-head lesions surrounded by a halo of yellow or clear tissue.



Figure 2. Younger leaves with pin-hole lesions (red) and older leaves with pin-hole lesions coalescing to form larger necrotic areas (black).

Cause: Manganese toxicity is caused by soil pH levels that are at or below 5.8. Excess soil acidity allows manganese that is normally bound to soil particles to be released and taken up by the plant in very high concentrations, i.e., toxic levels. Manganese levels of 800-900 ppm and above in foliar tissue is usually toxic. Losses to manganese toxicity can be severe. The apparent "spread of the disease" is due to plants in the field where pH is lower developing symptoms first and plants in areas where the pH is not as low developing symptoms days or even weeks later. Growers may have had their soil tested and had spread lime in the fall but still have this problem—low pH in some parts of the field.

One of the reasons for the drop in pH even though lime has been applied is the use of pH

lowering fertilizers such as ammonium and urea. These acidifying fertilizers can have a long-term effect on soil that is cumulative and leads to lower pH levels. Ammonium sulfate, $(\text{NH}_4)_2\text{SO}_4$, can significantly lower pH, while ammonium nitrate (NH_4NO_3) and dried blood make soil moderately more acid, and urea makes soil only slightly more acid. Ammonium is made up of nitrogen and hydrogen and over time is converted to nitrate by soil bacteria, the warmer the soil, the faster the conversion. During the conversion to nitrate, nitrogen loses hydrogen and adds oxygen. The hydrogen ions are free in the water solution between soil particles to react with various substances. Plants have difficulty obtaining the nutrients they need in the proper amounts when the soil water solution has too many hydrogen ions (low pH).

Symptoms of Mn toxicity are worse when there are heavy rains because of the lack of soil oxygen, which results in changes in the availability of some nutrients like manganese. Under saturated soil conditions manganese is made more readily available to plants and in low pH soils the likelihood of manganese toxicity increases.

Magnesium (Mg) deficiency is also a possibility when pH levels drop below 5.8. In this case plants do not take up enough of the nutrient. Deficient plants exhibit interveinal chlorosis (yellowing or scorching of leaf tissue between veins) with the veins remaining green (Fig. 3). If soils are acidic and low in Mg, dolomitic lime can be used in the fall or to help right now magnesium fertilizers can be used.

Prevention: Soil acidity levels should be maintained above a pH of 6.3. Soil tests on sandy soils need to be done every year, at least for pH levels. The pH levels can change even after one year on sandy, low organic matter soils. Lime should be mixed into the soil at least several months before planting. While many plants do not grow well in acidic soils, cantaloupe is especially sensitive to the lower pH levels. Watermelon will rarely show signs of Mn toxicity even at a low pH. There is little that can be done to correct for manganese toxicity during the season. However, using fertilizers with a nitrogen source of nitrate-nitrogen (calcium nitrate and potassium nitrate) instead of

ammonium-nitrogen may help increase soil pH. Potassium carbonate also can raise soil pH. It is water soluble and can be applied through drip systems. However, correcting soil pH can be an arduous and lengthy process and it's probably too late to see a yield response in the current season if the symptoms have already been observed.



Figure 3. Magnesium deficiency in cantaloupe with interveinal scorching and veins that remain green.

Agronomic Crops

Soybean Insect Scouting Update - David Owens, Extension Entomologist, owensd@udel.edu and Bill Cissel, Extension Agent - Integrated Pest Management; bcissel@udel.edu

Continue checking fields for two spotted spider mites. Damaging hotspots have been observed in several fields. Mite associated leaf drop may look similar to general drought stress. Bean leaf beetles, Japanese beetles, green cloverworms, and grasshoppers continue to be the primary members of the defoliator complex. Other minor members present include thrips, yellow striped armyworm, bean leafrollers, and soybean leafminers. Dectes stem borers are also present, mating and doing 'premature feeding.' They will soon start laying eggs in leaf petioles. Stink

bugs are moving into reproductive stage soybean fields. Stink bugs aggregate, so there may be isolated hotspots in fields. For more information on action thresholds and recommendations, please visit:
<http://extension.udel.edu/ag/insect-management/soybeans/>.

Stressed conditions and slow canopy development set fields up for late season worm pests and also elevate the importance of defoliators. Defoliator thresholds for open canopy, late planted, and stressed beans should be 15 - 20%. I know it is a tricky balance, especially with beetle defoliators, but conserving natural enemies as much as possible is going to be important later on.

Growing Degree Days (GDD) and Rainfall Through July 17th - Jarrod O. Miller, Extension Agronomist, jarrod@udel.edu

All of our variety trials are almost finished with pollination, including some we observed in Western Maryland. Many nights have been in the upper 60s, which is good for growth, with only a few days in the low 90s. Therefore, temperatures should not be a significant negative factor in growth, unlike the lack of rain we have observed. Anything planted in late May is probably undergoing pollination, should see ideal temperatures for pollination in those fields.

V12: 870 GDD - Ear size, kernel number are being determined

VT: 1135 GDD - Pollination can begin

R1: 1400 GDD - Silking, pollination

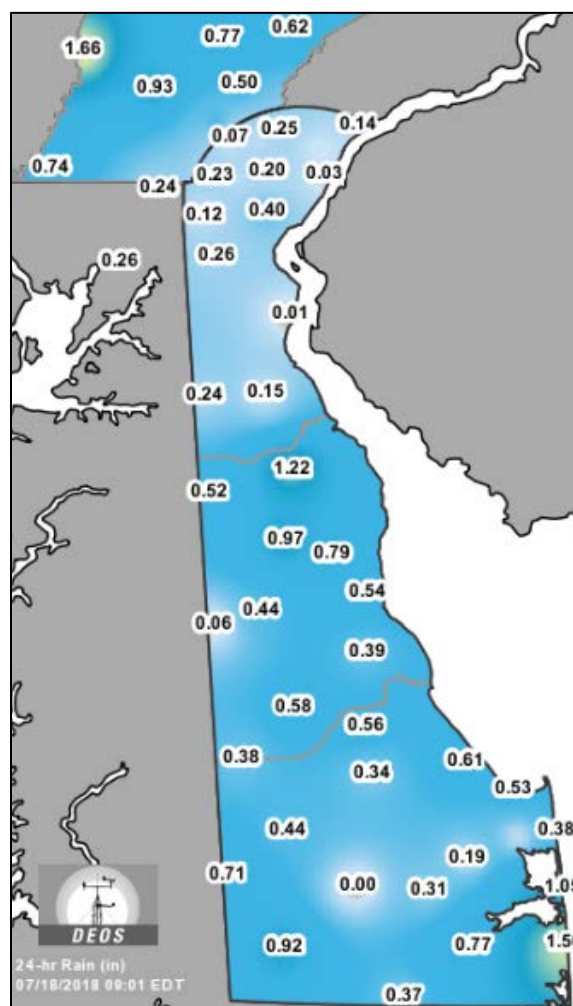
R6: 2700 - Blacklayer

Table 1: Growing degree days accumulated through July 17th from the beginning of each week.

	Sussex	Kent	New Castle
22-Apr	1790	1750	1690
29-Apr	1738	1704	1657
6-May	1630	1594	1559
13-May	1526	1488	1461

20-May	1414	1382	1368
27-May	1256	1223	1219
3-Jun	1104	1071	1069
10-Jun	981	954	955
17-Jun	845	827	826

Mid-week rainfall certainly helped, but as you can see from this [DEOS](#) image below, variability ranged from a few tenths to an inch across the state. We believe there is an error at the Georgetown station where no rainfall recorded. While Georgetown still has a total accumulation of 20 inches since late April, it's not sitting on the surface anymore. Many cornfields are starting to look like fields of agave, so if you have irrigation use it! We may get relief in some rainfall next week, but until then it is critical to have good soil moisture during pollination.



24 Hour rain fall captured on July 18th, 9 am.

General

Guess the Pest! Week #16 Answer: Spider Mite - Bill Cissel, Extension Agent - Integrated Pest Management; bcissel@udel.edu

Congratulations Jeffrey O'Hara for correctly identifying the damage in the photo as spider mite damage 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. Click on the Guess the Pest logo to participate in this week's Guess the Pest challenge!

Guess the Pest Week #16 Answer: Spider Mite



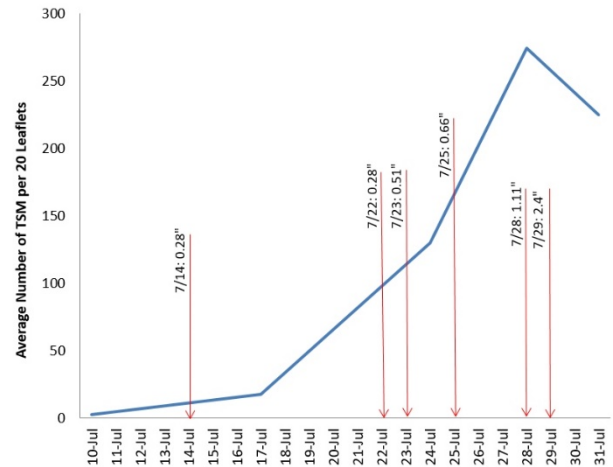
The damage in the photo is from two-spotted spider mite (TSM) feeding on soybean. Hot, dry weather favors TSM and drought can trigger outbreaks. TSM populations are held in balance by natural enemies and the weather. Under high temperatures, the amount of time required for TSM to complete its lifecycle is shortened, allowing more generations to be completed in a shorter period of time. A female TSM can produce 300 offspring in her lifetime (~30 days) and most of the individuals in the population are female. Dry conditions also diminish the activity of fungal diseases that often play a key role in keeping outbreaks from occurring.

So, if it rains, does it mean we don't need to worry about TSM? Precipitation not only favors spore formation and mite infection but also reduces plant stress. This however isn't always a silver bullet and TSM populations can continue to increase even after rain events, especially if the weather returns to being hot and dry. Cool

nights and humid conditions promote the fungal disease that infects TSM.

Below is a graph showing rain events and observed TSM populations in the untreated check from a TSM field trial conducted in Georgetown, DE in 2017:

Observed Influence of Precipitation on Two-Spotted Spider Mite Populations, 2017



Weather data obtained from the Delaware Environmental Observing System (DEOS): http://www.deos.udel.edu/data/agirrigation_retrieval.php

As you can see in the graph, TSM populations continued to increase and remained high despite rain events occurring on 7/22, 7/23, 7/25, and 7/28.

To scout for TSM, examine the underside of 5 leaflets in 10 locations for mites, noting the presence of mite eggs and the amount of leaf damage. The threshold for TSM during bloom to podfill is 20-30 mites per leaflet and 10% of plants with 1/3 or more leaf area damaged.

Concentrate scouting efforts on field edges for initial detection, especially edges bordered by grass and road ditches (it's not unusual to also find hot spots in the interior portions of the field). TSM typically develop on grasses and other plants on field borders before ballooning into fields. Once TSM are detected, scout the interior portions of the field to determine if they

have spread throughout the entire field. If only concentrated on field edges, spot treating may be an option. If spot treating on field edges, extend the treated area about 100 feet further into the field from the damaged area.

Here is a link to our Soybean Insecticide Recommendations for chemical control options if your field is at threshold for TSM:

<https://cdn.extension.udel.edu/wp-content/uploads/2018/05/02102500/Insect-Control-in-Soybeans-2018.pdf>

Guess the Pest! Week #17 - Bill Cissel, Extension Agent - Integrated Pest Management; bcissel@udel.edu

Test your pest management knowledge by clicking on the GUESS THE PEST logo and submitting your best guess. For the 2018 season, we will have an "end of season" raffle for a \$100.00 gift card. Each week, one lucky winner will also be selected for a prize and have their name entered not once but five times into the end of season raffle.

This week, one lucky participant will also win A Farmer's Guide To Corn Diseases (\$29.95 value).

You can't win if you don't play!



[What caused this damage?](#)

Announcements



The Department of Agriculture is reminding Delaware farmers to make sure your irrigation systems are not spraying water onto our state highways and roads. Wet roadways reduce pavement friction that creates a hazard for motorists, especially for motorcycle riders. Check your pivots and make adjustments. You don't want to be the cause of a crash.

Carvel Research and Education Center Field Crop Tour

Thursday, August 16, 2018 3:30-5:30 p.m.
University of Delaware
Carvel Research & Education Center
16483 County Seat Hwy
Georgetown, DE 19947

Please mark your calendars to join us for the 2018 Field Crop Tour at the University of Delaware Carvel Research and Education Center on August 16th. The crop tour will take place at the Thurman Adams Jr. Agricultural Research Farm located on County Seat Highway west of Georgetown at 3:30 pm and end at 5:30 pm, culminating with a chicken dinner. Highlights of the wagon tours will include the latest research on vegetable and agronomic crops, including precision agriculture.

*Please R.S.V.P. by **Monday, August 13th** for attendance and meal planning by calling **302-856-7303**.*

Weather Summary

Carvel Research and Education Center Georgetown, DE

Week of July 12 to July 18, 2018

Readings Taken from Midnight to Midnight

Rainfall:

0.02 inch: July 18

Air Temperature:

Highs ranged from 92°F on July 16 and July 17 to 81°F on July 12.

Lows ranged from 73°F on July 16 to 57°F on July 14

Soil Temperature:

75.0°F average

Additional Delaware weather data is available at
http://www.deos.udel.edu/monthly_retrieval.html
and
<http://www.rec.udel.edu/TopLevel/Weather.htm>

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

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