WEEKLY CROP UPDATE
UNIVERSITY OF DELAWARE COOPERATIVE EXTENSION

Volume 25, Issue 11 **June 9, 2017**

Vegetable Crops

Spring Broccoli is a Challenge in Our Region

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

Growing spring broccoli to acceptable commercial quality standards is a challenge on Delmarva. We are currently conducting a spring broccoli variety trial at the University of Delaware Georgetown research farm with 21 commercial varieties and several experimental lines to evaluate adaptation of these varieties for spring planting.

Temperature variability is the main challenge for spring broccoli. Broccoli is a cool season plant and is best adapted to areas with consistent temperatures during head development where days are warm, not hot, and nights are cool. On Delmarva, high temperatures during head initiation in the spring leads to abnormal floret development. Temperatures more than 88°F can cause damage to florets in sensitive varieties. More heat tolerant varieties have been developed and are being tested our spring trials.

This spring has been cool in general; however, there was a 3-day heat spike over 90°F starting on May 17 that may have challenged some broccoli plantings. In our April 2 transplanted broccoli, we are seeing significant variability in head quality and head disorders between varieties. A second planting was made on April 15 with initial harvest on June 9 and quality so far has been good on earlier varieties.

So far this June has been cool and development has been slowed in broccoli, avoiding another common problem of rapid bolting in high temperatures in spring broccoli in our region. High temperature in later head development causes broccoli to advance so quickly that the crop often flowers before it can be harvested. This reduced harvest window can be a challenge to manage as heads can go from marketable to unmarketable in as little as 24 hours when temperatures are in the 90s.

The following are pictures of quality issues seen in our 2017 spring broccoli trials:

Uniform, well domed head with small beads and good commercial quality in this variety.

Head with uneven bead development, a problem in some varieties this spring.

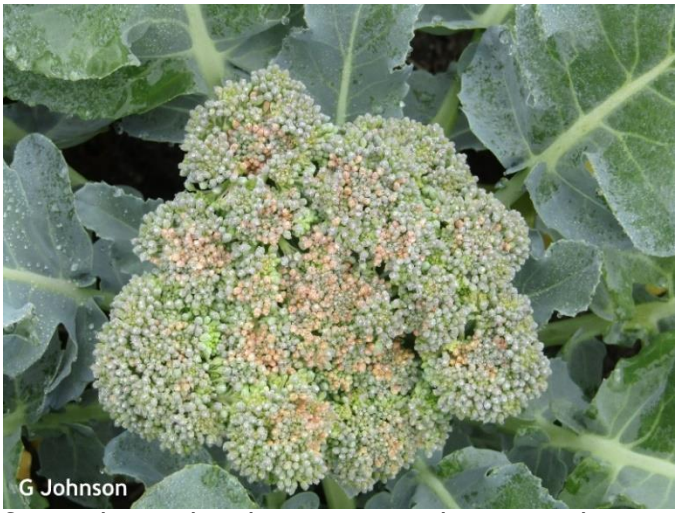
Uneven floret development and leaf bracts rendered this head unmarketable in this variety.

Lighter blue-green variety showing uneven floret development in this variety. While this head is marketable is is not of highest quality.

Open beads and some brown bead caused heads to be unmarketable in several varieties this spring.

Uneven floret development in this broccoli variety placed most heads as second grade.

Uneven floret development and brown bead in a variety with most heads unmarketable.



Severe brown bead on a variety that is poorly adapted for spring planting.


This variety had high percentage of hollow stem but heads were of high quality.

Results of spring trials with pictures will be posted on our UD vegetable program website after trials have been completed.

Powdery Mildew in Peas – *Kate Everts, Vegetable Pathologist, University of Delaware and University of Maryland*; keverts@umd.edu

Pea powdery mildew is currently widespread on Delmarva. This disease occurs throughout the US. The pathogen can overwinter in debris, on alternate hosts, or (less commonly) be seedborne. Because the pathogen is widespread, high disease severity occurs when conditions are favorable. Powdery mildew is favored by nights with dew, moderate temperatures (68-75F), and low light intensity. These conditions have prevailed in Maryland and Delaware for the last several weeks. Powdery mildew infestations can lead to uneven ripening of the crop, and yield loss (fewer peas per pod, lowered pea weight, etc.). Quality losses also occur. Several pea cultivars that are resistant to powdery mildew are available, and should be used if possible. Fungicides that are registered for management of powdery mildew include sulfur, which needs to be applied at 3 to 10 lbs/A, and Endura and Priaxor. These fungicide treatments can be costly because two applications at a 10 day interval may be needed.

Potato Late Blight Update #7 – June 8, 2017 – *Nathan Kleczewski, Extension Specialist – Plant Pathology*; nkleczew@udel.edu; @Delmarplantdoc

Late Blight was reported 5/29 near the NC –VA border. Weather has been conducive for disease. A protective fungicide application for late blight protection is recommended.

Greenrow - May 1, 2017

Frederica			
Date	**DSV**	**Total DSV**	**P Value**
6/1-6/8	**4**	**26**	**302**
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.

Check for Wilted Potatoes Next Week - *Nathan Kleczewski, Extension Specialist - Plant Pathology*; nkleczew@udel.edu; @Delmarplantdoc

Forecasts indicate that next week will be extremely hot and dry, which is perfect weather for *Dickeya* symptoms to flare up in mature plants. Unlike blackleg caused by *Pectobacterium*, *Dickeya* thrives in warmer temperatures. Therefore, if you have fields that you suspect may have issues, these problems likely will become more pronounced next week, as the bacteria reproduce and grow within the roots and vascular tissues. Plants may rapidly wilt, and the main stem may have a black sheen on the outside near the soil line. The inside of the affected stem will likely be dry and corky, not macerated and wet. If you notice any symptoms like these feel free to contact myself or your county Extension agriculture agent and we can send off samples to confirm the cause of the issue. **Please note that copper sprays will have no effect on the disease or its spread.**

Agronomic Crops

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

Alfalfa

Continue to sample alfalfa for potato leafhoppers. Sample weekly starting seven days after the first cutting 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

As small grains mature, 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

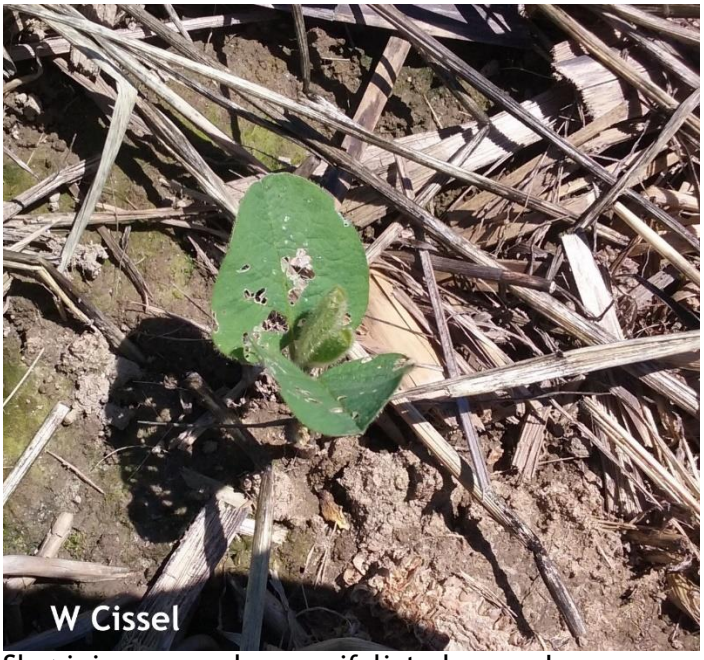
Continue to sample fields for slugs and other defoliators. The past several weeks, I have seen several fields with grasshopper and bean leaf beetle feeding injury. Soybeans can typically withstand a decent amount of defoliation before yield losses occur, however, if stands are being reduced, an insecticide 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.

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

Pythium in Corn - *Nathan Kleczewski, Extension Specialist – Plant Pathology*; nkleczew@udel.edu; @Delmarplantdoc

Pythium is a common pathogen we encounter in corn fields throughout Delaware. The pathogen colonizes roots, causing decay of feeder roots. This decay reduces water and nutrient uptake by the seedling and can cause seedling death. Many times seedlings will grow out of initial infections, and no subsequent impacts are noted. However, on occasion the root decay is so severe that seedlings die before emergence or soon after emergence. One way to determine if Pythium may be involved in an emergence or stand issue is to dig out a few affected plants. If the roots are brown and slough off easily in-between your fingers, Pythium may be the culprit. Confirmation can be carried out for you by submitting a sample of the affected root system to the UD Plant Diagnostic Clinic.

As with most seedling diseases, any environmental factor that reduces emergence will favor Pythium development. Most important is the amount of free water in the soil. Pythium thrives in water soaked conditions, as this allows the fungus to grow and produce specialized motile spores, as well as causes stress to the plant, weakening it and allowing for colonization of the pathogen with limited interference. There are numerous species of Pythium that can attack seedling roots, and all of them have different temperature optima. For this reason, water is the key factor impacting Pythium development on corn. Seed treatments containing metalaxyl, mefanoxam, or ethaboxam may provide some benefit in fields that tend to hold water. However, seed treatments will not protect flooded plants nor will they provide protection for more than 2 weeks. Planting into warm, well drained soils that favor rapid emergence is the best way to minimize Pythium issues in your corn.

Figure 1. Corn seedlings showing characteristic symptoms of Pythium infection.

Seedling Diseases in Soybeans - *Nathan Kleczewski, Extension Specialist – Plant Pathology*; nkleczew@udel.edu; @Delmarplantdoc

Soybeans grown in Delaware and Maryland can succumb to various diseases early in the growing season. These diseases typically are favored by conditions that slow soybean emergence and favor pathogen growth, such as wet weather immediately following planting. There are several pathogens that can kill soybean seedlings, but in our area *Fusarium* is the most commonly encountered issue, followed by *Rhizoctonia*. To manage seedling diseases, plant soybeans when the daily soil temperatures at the 4 inch depth average at least 65˚F or more. Consider seed treatments for seed lots that have less than 85 percent germination (by the warm germination test). There are many commercial seed treatments available that may help with stand establishment, and can help improve stands in some circumstances. Treat seed with a fungicide if germination is lower than 85 percent. Seed with germination below 75 percent generally should not be treated or used for seed. Many of the newer seed treatments have low use rates and must be applied by certified seed treatment applicators. Remember that seed treatments can help with seedling emergence and provide some additional protection for about 2 weeks after planting. These products will not be effective for managing diseases that can infect roots later in growth (e.g. brown stem rot) or provide any protection against foliar diseases later in the growing season. Below is a table from the mid-Atlantic field crop disease management guide, which Dr. Hillary Mehl and myself help produce through Virginia Tech. The table provides general performance of fungicide active ingredients against some causal agents of seedlings that you may encounter. These are not commercial trade names, and some seed treatments contain multiple fungicide modes of action. The guide can be downloaded from the University of Delaware Commercial Field Crops Webpage under the "Useful Links" heading at http://extension.udel.edu/ag/plant-pathology-and-diseases/commercial-field-crops/

Table 3.4 - Fungicide Efficacy for Control of Soybean Seedling Diseases

Fungicide active ingredient	Pythium sp.[1]	Phytophthora root rot	Rhizoctonia sp.	Fusarium sp.[1,2]	Sudden death syndrome (SDS) (Fusarium virguliforme)	Phomopsis sp.
Azoxystrobin	P	NS	E	G	NR	G
Carboxin	U	U	G	U	NR	U
Chloroneb	U	P	E	P	NR	P
Ethaboxam	E	E	U	U	U	U
Fludioxonil	NR	NR	G	F-E	NR	G
Fluopyram	NR	NR	NR	NR	VG	NR
Fluxapyroxad	U	U	E	G	NR	G
Ipconazole	P	NR	F-G	F-E	NR	G
Mefenoxam	E	E	NR	NR	NR	NR
Metalaxyl	E	E	NR	NR	NR	NR
PCNB	NR	NR	G	U	NR	G
Penflufen	NR	NR	G	G	NR	G
Prothioconazole	NR	NR	G	G	NR	G
Pyraclostrobin	P	NR	F	F	NR	F
Sedaxane	NS	NS	E	NS	NR	G
Thiabendazole	NS	NS	NS	NS	U	U
Trifloxystrobin	P	P	F-E	F-G	NR	G

[1] Products may vary in efficacy against different *Fusarium* and *Pythium* species.
[2] Listed seed treatments do not have efficacy against *Fusarium virguliforme*, causal agent of sudden death syndrome.

Comments on Dicamba-Resistant Soybeans – *Mark VanGessel, Extension Weed Specialist*; mjv@udel.edu

Dicamba-resistant soybeans have been planted in the region, many without intending to spray with the low-volatility formulations of dicamba. If you have planted these soybeans and intend to spray with Xtendimax, Engenia, or Fexapan, be sure you have read and fully understand the labels; the labels are very specific. A few items to remember:

• Refer to the various websites for most up to date tankmixes, adjuvants, nozzles, and requirements for drift aids

→www.engeniatankmix.com

→www.xtendimaxapplicationrequirements.com

→http://www.dupont.com/products-and-services/crop-protection/soybean-protection/articles/tank-mix.html

• While these products have reduced drift and volatility potential, the active ingredient is the same; and if it comes in contact with susceptible plants, injury can be severe

• As temperature increases, the risk for off-target movement also increases

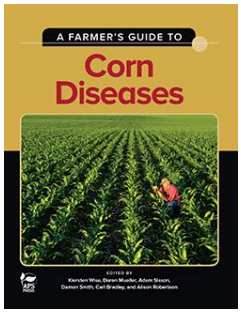
• These products will not control large weeds, labels recommend application to weeds 4 inches or less in height

• Be a good neighbor, when in doubt leave it out

General

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

Congratulations to Mona Steele for identifying the insect damage 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. Mona 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 #9
Answer is…Bean Leaf Beetle

Bean leaf beetles attack soybeans throughout the entire growing season. Their color varies and can be red, tan, green, or orange. The number of black spots on their wing covers also varies from several to none (four spots is common). The one distinct characteristic that they all have regardless of color or number of spots is the black triangle located behind the thorax.

Bean leaf beetles will feed on cotyledon leaves as the plants emerge and can reduce stands. As the soybeans continue to develop, they will also damage unifoliate and trifoliate leaves. 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% defoliation. As the plants mature and the leaves begin to senesce, they will feed on the soybean pods, removing the green tissue and leaving a thin white membrane over the seed. This damage may result in "moldy beans" depending on the weather conditions prior to harvest.

Guess the Pest # 10

What is this insect?

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.

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.

Organic Farming of Specialty Crops and Field Day

Tuesday June, 27, 2017 8:30 a.m.-1:30 p.m.
Delaware State University
Outreach & Research Center
884 Smyrna-Leipsic Road, Smyrna, DE

Presented by DSU Cooperative Extension, Small Farms Program

Field Day Focus:
Get the most out of your high value crops!

•Cover crops, sweet potato
•EQIP program and organic farming
•Farmer perspective

Developing High Yielding Varieties of Small Fruits
Dr. Nicholi Vorsa, Rutgers University

Diagnosing Problems with Highbush Blueberries and Managing Nutrition
Dr. Gary Pavlis, Rutgers University

The State of High Tunnel Production in Delaware
Dr. Rose Ogutu, DSU

Participants will tour the farm!

To register, for assistance due to disabilities, or for more information, contact Lekha Paudel: (302) 857-7796; Lnpaudel@desu.edu. This workshop is free but RSVP required by Monday June 19, 2017.

Cooperative Extension Education in Agriculture, 4-H and Home Economics, Delaware State University, University of Delaware and United States Department of Agriculture cooperating, Dr. Dyremple B. Marsh, Dean and Administrator. It is the policy of Delaware Cooperative Extension that no person shall be subjected to discrimination on the grounds of race, color, sex, disability, age, or national origin.

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

2017 UD Weed Science Field Day

Wednesday, June 28 8:30 a.m.
University of Delaware
Carvel Research and Education Center
16483 County Seat Highway, Georgetown, DE

The 2017 Weed Science Field Day will be held **Wednesday**, **June 28** at the University of Delaware Research and Education Center, Route 9 (16483 County Seat Highway), Georgetown, DE. The day will begin with **registration beginning at 8:30** at the Grove near the farm buildings and new office building on the north side of the road. We will start to view the plots at 8:45 am. Coffee, juices, and donuts will be provided. We will also provide sandwiches for lunch. Pesticide credits and Certified Crop Advisor continuation credits will also be available.

Dr. Charlie Cahoon, VA Tech, will hold a field day on Tuesday, June 27th at the Painter Research Facility

Weather Summary

Carvel Research and Education Center Georgetown, DE

Week of June 1 to June 7, 2017

Readings Taken from Midnight to Midnight

Rainfall:

0.30 inch: June 5
0.01 inch: June 6

Air Temperature:

Highs ranged from 86°F on June 4 to 65˚F on June 7.

Lows ranged from 64˚F on June 5 to 52˚F on June 7.

Soil Temperature:

72.1˚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.