



WEEKLY CROP UPDATE

UNIVERSITY OF DELAWARE COOPERATIVE EXTENSION

Volume 24, Issue 20

August 5, 2016

Vegetable Crops

Vegetable Crop Insects - Joanne Whalen, Extension IPM Specialist; jwhalen@udel.edu

Cole Crops

As soon as plants are set in the field, be sure to sample for cabbage looper and diamondback larvae. A treatment will be needed before larvae move into the hearts of the plants. You should also watch for the first Harlequin bugs in cole crops. In general, most of the "worm" materials are not effective on Harlequin bugs. The pyrethroids have provided control in years past.

Lima Beans

As soon as pin pods are present, be sure to watch carefully for plant bug and stinkbug adults and nymphs. Also be sure to begin sampling the earliest planted fields for corn earworm. A treatment will be needed for corn earworm if you find one corn earworm larvae per 6 foot-of-row.

Peppers

Depending on local trap catches, sprays should be applied on a 7 to 10-day schedule once pepper fruit is $\frac{1}{4}$ - $\frac{1}{2}$ inch in diameter. Be sure to check local moth catches in your area by calling the Crop Pest Hotline (302-831-8851) or visit our website at <http://agdev.anr.udel.edu/trap/trap.php>. You will also need to consider a treatment for pepper maggot. Be sure to also watch carefully for beet armyworm larvae since they can quickly defoliate plants. In addition, be sure to use a material that provides beet armyworm control -

the pyrethroids have not provided control of this insect in past years.

Snap Beans

You will need to consider a treatment for corn borer and corn earworm populations in processing and fresh market snap beans. Sprays are needed at the bud and pin stages on processing beans for corn borer control. As earworm trap catches increase, an earworm spray may also be needed at the pin stage. You will need to check our website (<http://agdev.anr.udel.edu/trap/trap.php>) or call the Crop Pest Hotline (302-831-8851) for the most recent trap catches to help decide on the spray interval between the pin stage and harvest for processing snap beans.

<http://extension.udel.edu/ag/insect-management/insect-trapping-program/ecb-and-cew-moth-catch-thresholds-for-processing-snap-beans/>

Once pin pods are present on fresh market snap beans, a 7 to 10-day schedule should be maintained for corn borer and corn earworm control.

Sweet Corn

Continue to sample all fields through pre-tassel stage for whorl feeders. A treatment should be applied if 12-15% of the plants are infested with larvae (regardless of the species). The predominant whorl feeder continues to be the fall armyworm. Since fall armyworm (FAW) feed deep in the whorls, sprays should be directed into the whorls and multiple applications are often needed to achieve control. FAW can also be a problem in silk stage sweet corn, especially

in outbreak years. The first silk sprays will be needed as soon as ear shanks are visible. Be sure to check both blacklight and pheromone trap catches since the spray schedules can quickly change. Trap catches are generally updated on Tuesday and Friday mornings on our website (<http://agdev.anr.udel.edu/trap/trap.php>) and the Crop Pest Hotline (302-831-8851). Information on scouting sweet corn and how to use the trap catch information can be found at <http://extension.udel.edu/ag/insect-management/insect-trapping-program/action-thresholds-for-silk-stage-sweet-corn/>. You should also watch for aphids and apply sprays before populations explode. Be sure to refer to the commercial production recommendations for materials labeled on sweet corn for aphid control.

<http://extension.udel.edu/ag/vegetable-fruit-resources/commercial-vegetable-production-recommendations/>.

Watermelon Fruit Disorders in 2016 - *Gordon Johnson, Extension Vegetable & Fruit Specialist; gcjohn@udel.edu*

There are a number of fruit disorders in watermelons that are being found in Delmarva fields at this time. One of the most common is sunscald or sunburn on fruits. This occurs when fruits are exposed to direct sunlight, especially on extremely hot days. Rind surfaces can reach temperatures exceeding 140 °F. This kills rind cells and results in the sun burnt spots where the cells have died. Fruits with little or no vine cover are at most risk. Also at greater risk are watermelons with dark colored rinds.

Another disorder that is being found is water soaking or water belly in fruits. This occurs where excess water accumulates at the bottom of the fruit, leaving a water soaked appearance in the flesh when cut open. Water accumulates during cloudy weather when transpiration from fruits is low. This year we have also seen water soaking in fruits in fields where foliage has deteriorated. In this situation, water is still being translocated in the xylem but there is limited transpiration through the leaves. Watermelon fruits are still transpiring, but due to the nature of the fruit (thick rind, waxy

surface); transpiration is lower than in leaf tissue, leading to water buildup in the fruit.

Another water related disorder is watermelon splitting during handling. In fruits with excess water, the high turgor pressure makes the fruit susceptible to splitting as it is handled (i.e. harvested into busses or trucks, grading, and placing in bins). Even small drops will lead to these splits. This year as growers were irrigating heavily due to the high heat, the potential for excess water in fruits was much higher, especially in certain varieties.

Irregular ripening has been a problem in some fields this year. The main cause in early fields was the variable growth during cold May weather with some stunted plants taking more time to grow out. In addition, many fields required considerable replanting also delaying maturity. Another causes of irregular ripening is deteriorating vine health. Loss of foliage or stem tissue due to diseases such as gummy stem blight or insect or mite feeding on leaves and stems can reduce the amount of sugars available to translocate into the fruit. In a field, variability in vine health therefore would lead to variability in fruit ripening. This may also be the case where severe storms have damaged fields in some areas. Potassium may also be an issue. Potassium is important in fruit ripening and low or variable potassium levels may lead to irregular ripening. In fields with pre-plant potassium applications only, heavy irrigation could leach potassium out of the root zone, creating lower than normal levels in the soil and potential deficiencies leading to irregular ripening.

In our variety trial, we are seeing higher than normal levels of hollow heart. Hollow heart is an internal split or void in the flesh of the watermelon between the 3 carpels or fruit sections. Research at the University of Delaware strongly points to inadequate pollination as a major factor in hollow heart. Hollow heart is generally more severe in the crown set. Varieties vary considerably in their susceptibility to hollow heart. Dense fleshed (crisp) varieties, mini, and personal type watermelons have lower hollow heart incidence. Factors that would influence pollination such as cold weather during fruit set or delayed male flower production on pollenizers

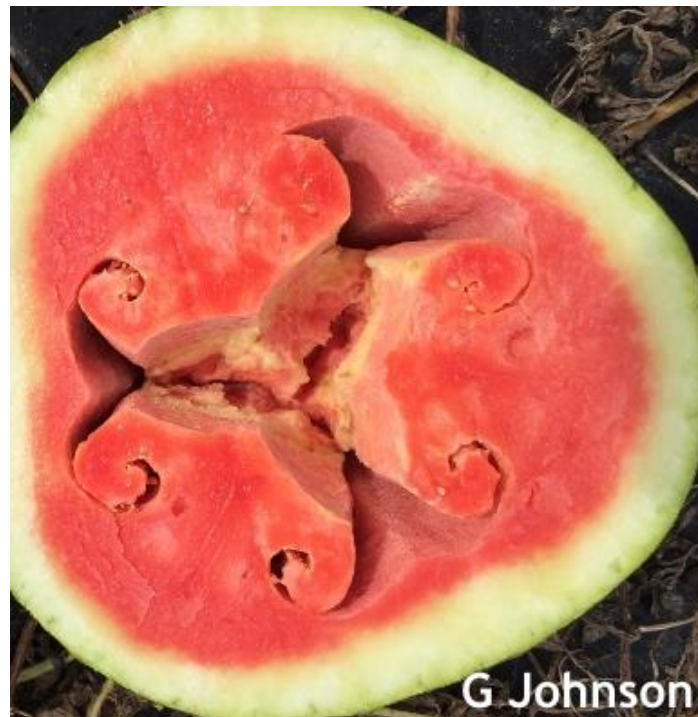
will increase hollow heart potential in susceptible varieties.

We have also seen higher incidence of separation in the locules of watermelon fruit in our variety trials. This is seen as half-moon shaped gaps in the seed cavity areas.

In addition, we are seeing higher incidence of white and yellow tissue in fruits. Areas of the fruit flesh have hardened and may be white or yellow in color. This tissue will be chewy when eaten. This disorder often is associated with vascular traces that have become hardened. This is very similar to white tissue in tomato fruits. In tomatoes, low fruit potassium has been associated with white tissue. This may also be the case in watermelons; however, research is needed to confirm this. Yellow tissue also forms in hollow heart gaps and locular gaps.



Severe hollow heart in a watermelon fruit caused by limited pollen during pollination.



Hollow heart, half-moon locular separation and yellow tissue.

Vegetable Crop Disease Update - *Kate Everts, Vegetable Pathologist, University of Delaware and University of Maryland; keverts@umd.edu*

Downy mildew is active in both Maryland and Delaware on cucumber and cantaloupe (muskmelon). Muskmelon was first reported in the past week.

Powdery mildew is also present on cucurbit crops. Stay on a good fungicide management program.

Late blight is also present in four counties in Maryland, including on the shore adjacent to Delaware. Recent hot weather has slowed the spread of late blight, however as we move into a period of cooler temperatures and longer nighttime dew periods, late blight is likely to increase in prevalence again.

Gummy stem blight on watermelon (Fig. 1A) and melon (Fig. 1B) and anthracnose on watermelon (Fig. 2, note leaf also has gummy stem blight lesions) are also widespread.



Figure 1. Gummy stem blight on watermelon (A) and muskmelon (B)



Figure 2. Anthracnose (and gummy stem blight) on watermelon.

Dickeya dianthicola Update - Nathan Kleczewski, Extension Specialist - Plant Pathology; nkleczew@udel.edu and Andy Wyenandt, Specialist in Vegetable Pathology, Rutgers University; wyenandt@aesop.rutgers.edu

The potato season is winding down and growers should be thinking about what they will do next season as far as sourcing potatoes. Unfortunately, there is a lot of misrepresentation of *Dickeya dianthicola* being presented to potato growers in the region. Some examples are as follows:

1. *Dickeya* is not a significant problem.

The truth is, to date this pathogen has been detected in potato seed in 11 states, originating from 2 sources, from numerous suppliers. There is no current policy in place designed specifically for regulating and/or controlling Dickeya dianthicola in potato seed, although such policy has been presented in the past.

2. *Dickeya* is Blackleg.

This is like saying Jay Cutler and Tom Brady are the same because they are both quarterbacks. Dickeya is Dickeya, not Blackleg. Dickeya is seed-borne, Blackleg is mostly soil-borne. Blackleg is caused by other 'pecto' or soft rot bacteria. Dickeya causes disease at much lower levels (fewer bacteria needed to cause disease) than blackleg. Typical disinfection works for blackleg, but do not work for Dickeya.

3. *Dickeya* is endemic and caused by the current environment.

Dickeya dianthicola only has been reported as causing significant problems in potato since 2015. What sudden environmental shift has caused such a widespread outbreak of this disease over this time over such a wide, environmentally diverse region? Even without proper testing available, it would have been noticed enough by potato growers to cause concern/raise alarms and likely would have been observed much more frequently if it had been established at significant levels for several decades.

4. The disease is less severe 2016 than in 2015.

Dickeya is being tested for and reported more often in 2016 now that it has been brought to the attention of potato growers.

5. Varieties differ in susceptibility to *Dickeya*.

Dickeya has been detected in different lots of the same variety from different suppliers in 2016. Dickeya has also been confirmed in different varieties from the same supplier in 2016.

The best method for keeping your potato operation *Dickeya*-free is to adopt your own 0% *Dickeya*-tolerance policy.

Agronomic Crops

Agronomic Crop Insects - Joanne Whalen, Extension IPM Specialist; jwhalen@udel.edu

Alfalfa and Grass Hay Crops

Continue to watch for defoliators in grass hay crops and alfalfa. True armyworm, yellow striped armyworm and fall armyworm can all attack hay crops. We continue to hear about low levels of fall armyworm in fields, both locally and in states to our south. In addition to checking labels for rates, be sure to check for all restrictions including, but not limited to, comments on control under high populations and size of larvae; days to harvest and forage/silage restrictions. No thresholds are available in our area but areas to the south indicate that a treatment should be considered if you find three to four larvae per square foot. Controls should be applied before significant defoliation occurs. If fields are ready to harvest, harvesting is suggested rather than applying an insecticide

Field Corn

As expected, we are starting to see an increase in aphid populations, especially in the earliest planted fields. In many cases, populations are spotty within fields or are only found on field edges. Although there are no treatment thresholds for aphids in corn past tasseling, as a general guideline, you may consider a foliar application when most of the plants are infested (>80 percent), and aphids have exceeded 500-1,000 per plant. An insecticide may be warranted if aphid honeydew and sooty mold are evident above the ear leaf and plants have not reached hard dent (R5). Here are some additional considerations developed by entomologist in the Midwest that can help to make a treatment decision:

1. Are 80 percent of the plants infested with aphids?
2. Do most of the ears have aphids? What about the ear leaf and above?

3. How long has the field been infested and is the density increasing?
4. Do you see honeydew or sooty mold on the stalk, leaves or ear?
5. Are you seeing winged aphids or nymphs with wing pads? That may be a sign of migration out of the field.
6. Is the field under drought stress?
7. Do you see any bloated, off-color aphids? Natural fungi can quickly wipe out aphids. In addition are beneficial insects/parasitized aphids present.
8. What is the corn growth stage? Fields reaching hard dent should be past the point of justifying a treatment.
9. Some insecticides have a long pre-harvest interval so be sure to check the label.

Soybeans

We continue to see a mix of defoliators (grasshoppers, Japanese beetles, bean leaf beetles, yellow striped armyworm and green cloverworm) in full season and double crop soybeans. It is also time to start checking for corn earworms in soybeans. The first small larvae have been detected in fields in Sussex County. Although our local overwintering population was lower again this year, there are reports from the south of heavy populations that can make it to our area as migratory moths on weather fronts. Before pods develop, corn earworm larvae can feed on soybean leaves so you should include them in the mix when scouting for defoliators. Once pods are present, a treatment decision should be made for corn earworm using the Corn Earworm Calculator - developed in VA and NC (<http://www.ipm.vt.edu/cew/>) - since it will provide the best decision making information based on the actual treatment cost and bushel value you enter.

We continue to see an increase in native stinkbug populations (native green and brown) in the earliest planted fields. Economic damage from stinkbugs occurs during the pod development and pod fill stages. You will need

to sample for both adults and nymphs when making a treatment decision. Available thresholds are based on beans that are in the pod development and fill stages. As a general guideline, we are using a new threshold in the Mid-Atlantic Region --- 5 stink bugs per 15 sweeps. This is the threshold for soybeans produced for grain. If you are producing soybeans for seed, the threshold is still 2.5 per 15 sweeps

You will also need to continue to watch for spider mites in full season and double crop fields. With the hot, dry weather last week, populations were starting to increase. With the recent rains and increased humidity, we did see populations crash in some but **not all fields**. You should be aware that we now have 2 new miticides labelled on soybeans in Delaware: **Agri-Mek SC and Zeal SC (NOTE: these are the only formulations registered for use on soybeans)**. Be sure to read the labels for all restrictions, including but not limited to, rates, adjuvants, number of applications, and growth stage restrictions.

Zeal SC -
<http://www.cdms.net/ldat/ldCCK003.pdf>

Agri-Mek SC -
<http://www.cdms.net/ldat/ld9NL020.pdf>

New Pesticide Registration for Zeal - Joanne Whalen, Extension IPM Specialist;
jwhalen@udel.edu

Zeal SC - (Valent) - Spider Mite Control on Soybeans - This miticide was recently registered for spider mite control in soybeans. **NOTE - this is the only labeled formulation of etoxazole available for use on soybeans.** The supplemental label must be in your possession at the time of application. Please be sure to read the label for rates and all use restrictions.
<http://www.cdms.net/ldat/ldCCK003.pdf>

Soybean Disease Update - Nathan Kleczewski, Extension Specialist - Plant Pathology;
nkleczew@udel.edu

The UD Field Crop Pathology team surveyed numerous fields of full season and double cropped soybeans this week. Most full season beans were past R3 and starting the critical grain fill process. The most common diseases encountered were brown spot (Figure 1) and Downy mildew (Figure 2). Remember that brown spot is a fungal disease that overwinters in the soil and develops under very wet conditions. As a result, it is often only observed in the lower canopy in most fields and seasons. Symptoms include small, angular, brown lesions with yellow halos. Over time the leaves may turn yellow and defoliate. Brown spot typically is not yield-limiting, but if you think it may be impacting your yield in some full season fields, rotation and variety selection will help to reduce the initial amount of inoculum in these fields. In general, varieties with good levels of frogeye leaf spot resistance also have decent brown spot resistance.



Figure 1. Brown spot on soybeans is common, and often observed in the lower canopy. Seldom does it reach the upper third of the canopy, which contributes the majority of carbohydrates for grain fill. When you open the canopy, you may observe leaves with small, angular lesions with bright yellow borders as well as yellow senescing leaves.

The second most common disease we have observed, particularly in areas with heavier soils or irrigated beans, is soybean downy mildew. This is not the same pathogen as the downy mildew we encounter in lima beans or cucurbits and is not in the same zip code in terms of

ability to damage the crop. Growers likely will observe symptoms in the mid-canopy at this point in time where more moisture may be held for longer periods and temperatures may be slightly cooler. Symptoms include small, light green/yellow colored spots or flecks on the upper leaf surface that will have a fuzzy grey/white growth underneath. No management for downy mildew should be needed.



Figure 2. Small yellow flecks characteristic of downy mildew on soybeans. On the underside of leaves you should notice fuzzy growth. This is not the same as the downy mildew in cucurbits, which is caused by a complete different organism.

We observed only light frogeye leaf spot in a couple of fields. This disease can be problematic if it starts early and makes its way into the upper canopy during grain fill. Over the last 3 years, we have seen few instances where chemical intervention might have been required. Lesions of frogeye leaf spot are irregular and have a purplish hue (Figure 3). The centers of the lesions are grey and when flipped over you will see dark fuzzy patches at the center of the lesions. Developing tissues are the most susceptible to frogeye leaf spot, so you likely will see it in layers on plants. Frogeye leaf spot can be confused with herbicide damage that you can observe in some double crop beans at this time.

Things you should ask yourself if you see symptoms that look like frogeye leaf spot in your double crop beans: 1) Has the canopy closed? Frogeye needs extended periods of free water on the foliage to grow and develop. 2) Are the lesions small or are some large and diffuse? Large, spreading lesions are not characteristic of frogeye leaf spot. 3) Do I see fuzzy growth coming from the lesions on the leaf underside,

or are lesions white and papery? 4) Are symptoms spreading to new tissues over time?



Figure 3. Frogeye leaf spot lesions in a soybean field. Note the purple margins and purplish centers. If the leaf is flipped over, particularly early in the morning when humidity is high, you may observe fuzz growing from the centers of the lesions. It is easy to confuse frogeye leafspot for other issues, especially when plants are small and can show symptoms of herbicide damage. Consider the environment, patterns, and lesion size/shape. If you are not positive, send samples to the UD Plant Diagnostic clinic for a professional assessment.

As with brown spot, if frogeye leafspot has been an issue for you, select varieties rated well for resistance to this pathogen and rotate problematic fields to a non-host such as corn for at least one full season. Practices that help bury or decompose old soybean residue will also be beneficial. Fungicide sprays at R3 have been shown to be the most economical where Frogeye leaf spot has reached potentially yield-limiting levels. Unfortunately we do not have any thresholds for this disease in our area because it does not cause enough damage on a yearly basis to allow for this at the current point in time.

Lastly, we have had a couple of reports of charcoal rot in soybeans over the past 10 days. Charcoal rot is a root/stem disease caused by a fungus with a wide host range. When plants are stressed, particularly water or nutrient-stressed, the fungus is able to colonize roots and grow into the stems. The first symptoms are chlorotic or wilted plants, often in the drier parts of the field (compacted or sandier areas). Typically symptoms are not observed until the plant has put on enough foliage to significantly increase water demand, so affected plants often are not observed until after R3. If you scrape the base of

the stem, you may observe small black dots with the aid of a hand lens (Figure 4). If the lower stem is sliced it likely will have a grey color to it and be speckled with these same small black dots. These dots, called microsclerotia, are characteristic of the fungus. Black lines in the stem are caused by another fungus and are not due to charcoal rot, despite what is stated in older diagnostic guides.

As far as management is concerned, double cropped beans should have fewer issues with charcoal rot as they are typically smaller and in the vegetative stages of growth during the hottest months of the season. Irrigation will minimize problems in full season beans. In dryland fields, no till may improve soil moisture and minimize stress. Other practices, such as avoiding excessive seeding rates and rotation to crops such as small grains and corn can help reduce initial inoculum present in the soil. Fungicides will not help with charcoal rot management.



Figure 4. Symptoms of charcoal rot in a soybean stem. Note the black specks. Image from <https://ag.purdue.edu>

Factsheets on frogeye leaf spot and other information on soybean disease management, such as the Delaware Field Crop Disease Management Guide, can be found on the University of Delaware Field Crops Pathology website located at <http://extension.udel.edu/ag/plant-pathology-and-diseases/commercial-field-crops/>. Other information on soybean diseases in Delaware can be found at the Field Crop Disease Management Blog

<http://extension.udel.edu/fieldcropdisease/category/soybean/>. If you need help identifying diseases on your plants, send a sample to Nancy Gregory at the University of Delaware Plant Diagnostic Clinic.

2016 Small Grains Variety Trial Results - Victor Green; vmgreen@udel.edu

Results from the 2016 small grains variety trial have been posted on the UD Extension website. The link is <http://extension.udel.edu/ag/field-crop-resources/variety-trials-corn-hybrids-small-grains-soybeans/>

Announcements

Free Webinars in August, Sponsored by the Mid-Atlantic Women in Agriculture

8/10: Grant Writing for Agriculture Businesses - Grants are available for research, expansion of your operation, and training. This session will help identify resources for service providers and farmers looking for funding, review some grant programs targeted at farmers, and explain grant writing dos and don'ts.

8/24: Food Safety and Liability - Learn about the legal claims a litigant can assert in a food borne illness case, defenses that can be asserted to avoid liability and techniques that can be implemented to reduce the cost and exposure to food borne illness liability. Also included will be an overview of the section of the Food Safety Modernization Act (FSMA) applicable to fruit and vegetable farmers known as the Produce Rule.

To register:

<http://www.eventbrite.com/e/wednesday-webinars-registration-11452674257>

Webinars begin at noon EST. Duration is approximately 1 hour. For optimal performance we suggest using Internet Explorer as your web browser and connecting via Ethernet connection instead of wireless (wireless will work, but a hard line is more stable)

See website for more information and other upcoming topics: <https://extension.umd.edu/womeninag/webinars>

If you do not have access to high speed internet and would like to participate in one of the above webinars, contact Tracy Wootten at wootten@udel.edu.

Weather Summary	
Carvel Research and Education Center Georgetown, DE	
Week of July 28 to August 3, 2016	
Readings Taken from Midnight to Midnight	
Rainfall:	
2.29 inch: July 28	
0.13 inch: July 29	
0.04 inch: July 31	
0.26 inch: August 1	
Air Temperature:	
Highs ranged from 91°F on July 28 to 79°F on August 3.	
Lows ranged from 74°F on July 31 to 66°F on August 3.	
Soil Temperature:	
82.7°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

Cooperative Extension Education in Agriculture and Home Economics, University of Delaware, Delaware State University and the United States Department of Agriculture cooperating. Distributed in furtherance of the Acts of Congress of May 8 and June 30, 1914. Delaware Cooperative Extension, University of Delaware. 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.

Reference to commercial products or trade names does not imply endorsement by University of Delaware Cooperative Extension or bias against those not mentioned.