WEEKLY CROP UPDATE
UNIVERSITY OF DELAWARE COOPERATIVE EXTENSION

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Vegetable Crops

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

Cole Crops
Continue to sample for cabbage looper, diamondback larvae, beet and fall armyworms and Harlequin bug. Although the pyrethroids will provide control of Harlequin bugs they are not effective on beet armyworm or diamondback. Be sure to scout and select controls options based on the complex of insects present in the field.

Lima Beans
Continue to scout for stink bugs, lygus bugs, and corn earworm. A treatment will be needed if you find one corn earworm larvae per 6 ft.-of-row. Soybean loopers have been detected in a few fields. Remember that they are a migratory pest, difficult to control and pyrethroid resistance has been documented in states to our south. If they are present in the mix, you will need to select a material labeled for soybean loopers. Be sure to check the label for rates, restrictions (including plant back/rotational crop restrictions) and days from last application to harvest.

Peppers
At this time of year, corn borer, corn earworm, beet armyworm and fall armyworm are all potential problems in peppers. Be sure to select the material that will control the complex of insects present in the field. Be sure to check local corn borer and corn earworm moth catches in your area by calling the Crop Pest Hotline (302-831-8851) or our webpage at http://agdev.anr.udel.edu/trap/trap.php.We are starting to see aphid populations increasing, especially in fields where pyrethroids have been used on a weekly basis. Labeled materials are only effective if applied before populations explode.

Snap Beans
At this time, you will need to consider a treatment for both corn borer and corn earworm. You should also watch for beet armyworms and soybean loopers. Sprays are needed at the bud and pin stages on processing beans for worm control. With the diversity of worm pest that may be present in fields, be sure to scout fields and select materials that will control the complex of insects present. You will need to call the Crop Pest Hotline (302- 831-8851) or check our website for the most recent trap catches to help decide on the spray interval between the pin stage and harvest for processing snap beans

http://agdev.anr.udel.edu/trap/trap.php

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

Sweet Corn
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/ .

Cover Crop Decisions for Vegetable Growers Part 2

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

Vegetable growers should take time to revisit their rotations and plans for the next growing season. Decisions on fall rotational crops or cover crops will need to be made soon.

Start by listing your goals. Some possible goals for vegetable rotations include:

● *Returning organic matter to the soil.* Vegetable rotations are tillage intensive and organic matter is oxidized at a high rate. Cover crops help to maintain organic matter levels in the soil, a critical component of soil health and productivity. Brassicas and winter legumes provide the most biomass followed by ryegrasses and then rye.

● *Providing winter cover.* By having a crop (including roots) growing on a field in the winter you recycle plant nutrients (especially nitrogen), reduce leaching losses of nitrogen, reduce erosion by wind and water, and reduce surface compaction and the effects of heavy rainfall on bare soils. Cover crops also compete with winter annual weeds and can help reduce weed pressure in the spring.

● *Providing fall and early winter cover and then winter killing.* The use of winter killed cover crops are very useful when early spring (March or April) plantings of vegetable crops such as potatoes, peas, cole crops, early sweet corn, or early snap bean crops are being planned. By winter killing, cover crop residue is more manageable and spring tillage and planting can proceed more quickly.

● *Reducing certain diseases and other pests.* Cover crops help to maintain soil organic matter. Residue from cover crops can help to increase the diversity of soil organisms and reduce soil borne disease pressure. Some cover crops may also help to suppress certain soil borne pests, such as nematodes, by releasing compounds that affect these pests upon decomposition. One system would be planting mustards in August or early September, tilling them into the soil to provide some biofumigation in October, and then planting a small grain crop for winter cover. Spring planted mustards can also work ahead of later spring planted vegetables.

● *Providing nitrogen for the following crop*. Leguminous cover crops, such as hairy vetch or crimson clover, can provide significant amounts of nitrogen, especially for late spring planted vegetables. Hairy vetch is particularly well suited for no-till systems and can provide full nitrogen requirements for crops such as pumpkins and partial requirements for crops such as sweet corn, tomatoes, or peppers.

● *Improving soil physical properties.* Cover crops help to maintain or improve soil physical properties and reduce compaction. Roots of cover crops and incorporated cover crop residue will help improve drainage, water holding capacity, aeration, and tilth. The use of large tap rooted cover crops such as forage radish or oilseed radish are particularly well adapted to these uses.

● *Setting up windbreaks in the fall for spring planted vegetables*. Small grain crops will overwinter and grow tall enough in to provide wind protection for spring planted vegetables. Rye has been the preferred windbreak because tall types are still available and it elongates early in the spring. While barley is also early, tall varieties are not generally available. Wheat and triticale are intermediate and later.

● *Developing no-till, bio-strip-till, and bio-bed preparation systems.* There is much opportunity to increase the amount of no-till and bio-tillage systems. The key will be selecting the right cover crop for the desired system. Rye, crimson clover, subclover, tillage radish, spring oats, and other cover crops have been used successfully for no-till vegetables. One innovative system that uses a combination of winter killed covers and standard covers is bio-strip-till. In this system, a high biomass cover crop such as rye or vetch is planted with strips of forage or oilseed

radish in rows where spring planting will occur. Another system uses rye strips with forage radish planted where the beds will be next year.

Cover crop planting windows vary with crop and timely planting is essential to achieve the desired results. There are many cover crop options for late summer or fall planting including:

Small Grains
Rye is often used as a winter cover as it is very cold hardy and deep rooted. It has the added advantage of being tall and strips can be left the following spring to provide windbreaks in crops such as watermelons. Rye makes very good surface mulch for roll-kill or plant through no-till systems for crops such as pumpkins. It also can be planted later (up to early November) and still provide adequate winter cover. Wheat, barley, and triticale are also planted as winter cover crops by vegetable producers.

Spring oats may also be used as a cover crop and can produce significant growth if planted in late August or early September. It has the advantage of winter killing in most years, thus making it easier to manage for early spring crops such as peas or cabbage. All the small grain cover crops will make more cover with some nitrogen application or the use of manure.

To get full advantage of small grain cover crops, use full seeding rates and plant early enough to get some fall tillering. Drilling is preferred to broadcast or aerial seeding.

Ryegrasses
Both perennial and annual ryegrasses also make good winter cover crops. They are quick growing in the fall and can be planted from late August through October. If allowed to grow in the spring, ryegrasses can add significant organic matter to the soil when turned under, but avoid letting them go to seed.

Winter Annual Legumes
Hairy vetch, crimson clover, field peas, subterranean clover, and other clovers are excellent cover crops and can provide significant nitrogen for vegetable crops that follow. Hairy vetch works very well in no-till vegetable systems where it is allowed to go up to flowering and then is killed by herbicides or with a roller-crimper. It is a common system for planting pumpkins in the region but also works well for late plantings of other vine crops, tomatoes and peppers. Hairy vetch, crimson clover and subterranean clover can provide from 80 to well over 100 pounds of nitrogen equivalent. Remember to inoculate the seeds of these crops with the proper Rhizobial inoculants for that particular legume. All of these legume species should be planted as early as possible – from the last week in August through the end of September to get adequate fall growth. These crops need to be established at least 4 weeks before a killing frost.

Brassica Species
There has been an increase in interest in the use of certain Brassica species as cover crops for vegetable rotations.

Rapeseed has been used as a winter cover and has shown some promise in reducing certain nematode levels in the soil. To take advantage of the biofumigation properties of rapeseed you plant the crop in late summer, allow the plant to develop until early next spring and then till it under before it goes to seed. It is the leaves that break down to release the fumigant-like chemical. Mow rapeseed using a flail mower and plow down the residue immediately. Never mow down more area than can be plowed under within two hours. Note: Mowing injures the plants and initiates a process releasing nematicidal chemicals into the soil. Failure to incorporate mowed plant material into the soil quickly, allows much of these available toxicants to escape by volatilization.

Turnips and mustards can be used for fall cover but not all varieties and species will winter over into the spring. Several mustard species have biofumigation potential and a succession rotation of an August planting of biofumigant mustards that are tilled under in October followed by small grain can significantly reduce diseases for spring planted vegetables that follow.

More recent research in the region has been with forage radish. It produces a giant tap root that acts like a bio-drill, opening up channels in the soil and reducing compaction. When planted in late summer, it will produce a large amount of growth and will smother any winter annual weeds. It will then winter kill leaving a very

mellow, weed-free seedbed. It is an ideal cover crop for systems with early spring planted vegetables such as peas. Oilseed radish is similar to forage radish but has a less significant root. It also winter kills. Brassicas must be planted early – mid-August through mid-September – for best effect.

Cover Crop Mixtures

There is significant interest in cover crop mixtures to the point where 6 – 8 different species are being mixed together. As fall cover crop season is upon us, there are a number of considerations that growers interested in using mixtures should be aware of.

Cover crop species are commonly grouped into six major categories: 1) cool season grasses; 2) cool season legumes; 3) cool season broadleaves 4) warm season grasses; 4) warm season legumes; and 6) warm season broadleaves. In theory, a successful mixture will combine species from as many categories as practical based on the planting season. For late summer/fall planting we will be limited to 1, 2, and 3 above.

In addition, cover crop species can also be placed into groups based on the benefits they offer. This includes nitrogen fixation, nutrient (particularly nitrogen) uptake and recycling, compaction reduction, disease suppression, biofumigation, weed control, biomass accumulation, use as a mulch, winter killing to facilitate early spring plantings, and other benefits.

The first step in creating a mixture is to list the available species that can be used for the time of the year. For example, for late summer and fall planting this would include small grains (wheat, barley, rye, winter oats, triticale), ryegrasses, rapeseed, winter annual legumes (crimson clover, hairy vetch, winter hardy field peas, subclover, many other clovers). If winter killed crops with extended fall growing seasons are desired then radishes, mustards, and spring oats would be examples of selections.

The second step would be to list what soil health attributes or other cropping system needs should be prioritized. For example, if a mulch for no-tilling vegetables into next spring is a priority then high biomass cover crops that decompose more slowly such as cereal rye or triticale should be in the mixture. Conversely, if early spring planting is the goal then winter killed cover crops should be in the mixture. If compaction needs to be addressed then radishes or other species in the Brassica family should be in the mix. If nitrogen fixation is a priority then a high N fixing potential legume such as hairy vetch should be included.

The final step would be to develop seeding rates for each mixture component. This is critical because too much of one component can outcompete other components and limit their survival or limit their usefulness in the mixture. Unfortunately there is little actual science to guide seed rate determinations for complex mixtures. A number of seed companies supply mixtures and can be consulted.

An example of a potential September seeded cover crop mixture for Delaware with many winter hardy species is: rapeseed, ryegrass, cereal rye, crimson clover, and hairy vetch. A multi-species example with combinations of winter killed and winter hardy species is: radish, mustard, spring oats, triticale, crimson clover, and field peas.

Growers will need to do some experimentation on their own farms with different mixtures and seeding rates to determine what works best for their farm, growing conditions, and rotations.

Why So Little Yellow Shoulders in Tomatoes this Year?

– *Jerry Brust, IPM Vegetable Specialist, University of Maryland*; jbrust@umd.edu

Normally at this time of year I'd be writing about how bad yellow shoulders and other fruit ripening problems are in Maryland tomatoes (Fig. 1). But this has been a strange season with May weather in March and March weather in May, which caused a great deal of catfacing problems this year. However, except for a few fields in a few places there have been far fewer troubles with tomato yellow shoulders or fruit ripening problems than we normally see this time of year—at least for now.

Why is this? The one big thing I have found is that when I randomly take petiole samples from fields I visit they have come back with potassium levels at or above 3.5% with some fields at 6% in mid-July. This is extraordinary, normally potassium (K) levels drop precipitously after the plant puts on a heavy fruit load in July. The levels drop down to somewhere around 2-3% in July when they were at 4-6% just a month earlier. This drop in K is not enough to show up as a deficiency in the plant, but shows up in problems with fruit ripening. Even in my tomato research plots, where I have seen K levels drop over the last 10 years to an average of 1.8% in July and August, K levels were at 6% or above this July and early August.

So why was there no or just a small drop in K values this season in many of our tomato fields? I'd like to think that is was all the talks that we have given over the years about making sure your K levels do not drop in tomatoes and this is what I tell my bosses. But that unfortunately does not explain it. Since the small drop in K is happening over a fairly large area across many types of production systems I have to think it is environmentally induced. Exactly what in this strange year's weather patterns allowed plants to continue to take up K in the amount the plant and fruit needed is something I'll be looking at in weather data over the next few months. If nothing else this odd season does show that if K levels are maintained in tomatoes through fruiting there is a corresponding reduction in fruit ripening problems.

Figure 1. Typical yellow shoulders problem

Agronomic Crops

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

Soybeans

We continue to find a variety of defoliating insects in soybeans. Over the past week, we saw a significant increase in defoliation from green cloverworm, cabbage looper and soybean looper in both full season and double crop fields. As a reminder, soybean loopers are not effectively controlled by the pyrethroids so materials labeled for soybean loopers including Besiege, Blackhawk, Radiant or Steward will be needed. The highest labeled rate is generally needed for soybean looper control.

Once again we are finding a few fields with whiteflies; however, populations are not as high as in past years. Problems generally occur in drought stressed fields so be sure to watch for increases in populations. Whiteflies are related to aphids (that is they are in the same order of insects) and so can cause yellowing on the leaves if populations are high enough. The following links provides pictures of whiteflies and some additional comments regarding whiteflies in soybeans.

http://bulletin.ipm.illinois.edu/article.php?id=832
http://ipcm.wisc.edu/blog/2012/07/questions-about-whiteflies-in-soybean/

Continue to watch for stink bugs in all fields during the pod development and pod fill stages. We continue to see an increase in populations, especially green stink bugs. You will need to sample for both adults and nymphs when making a treatment decision. 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.

Corn earworm populations still remain low in most fields throughout the state. However, we are seeing a significant increase in moth catches in some of our pheromone traps and black light trap catches in states to our south are seeing a

sharp increase. There are also reports of heavy populations in soybeans in some areas of VA. Since population levels will vary from field to field, the only way to know if you have an economic level will be to scout all fields. Once pods are present, the best approach to making a decision on what threshold to use for corn earworm is to access the Corn Earworm Calculator developed at Virginia Tech (http://www.ipm.vt.edu/cew/) which estimates a threshold based on the actual treatment cost and bushel value you enter.

We have just started to find a few soybean aphids in fields throughout the state. Remember, this aphid is more of a problem when the weather remains cooler. The economic threshold for soybean aphid established in the Midwest is 250 aphids per plant. Populations should be increasing and most of the plants should be infested (>80 percent) in order to justify an application. This threshold is appropriate until plants reach mid-seed set (R5.5). Spraying at full seed set (R6) has not produced a consistent yield response in the Midwest.

Soybean Disease Update – Stem Canker –

Nathan Kleczewski, Extension Specialist – Plant Pathology; nkleczew@udel.edu

We have observed stem canker at low levels in soybean fields throughout Delaware. Stem canker is caused by fungal pathogens that infect and girdle the stems, restricting water and nutrient movement throughout the plant. This action results in premature death or poor grain fill of affected plants. Symptoms first start as red/brown lesions at the nodes of plants near the reproductive phase of growth. These lesions are surrounded by green tissues above and below the lesions (Figure 1).

Over time, the lesions expand, turn blackish in color, and become sunken. These sunken lesions are called cankers, hence the clever, original, and highly innovative disease name. Several cankers may be present on a plant, and may grow together to form large areas of affected stem tissues. As these lesions age clusters of black fruiting bodies are found within the lesions, which, if viewed from the side with a hand lens, project outward from the stem (Fig 2)

Figure 1. Examples of stem canker symptoms on soybean stems. Note the presence of green tissue above and below the lesions. Image obtained from Wise et al. 2015. Scouting for Soybean Stem Diseases. Crop Protection Network.

Figure 2. Stem canker lesions may contain patches of black fungal fruiting bodies with long "beaks." These structures can produce spores

that can cause secondary infections of plant nodes on the plant or surrounding plants. Secondary spread of the pathogen has not been shown to affect disease development or impact yield.

In addition to symptoms on the stems, affected plants will present foliar symptoms, due to restriction of water to the canopy as well as the movement of a fungal toxin, produced by the pathogen, which accumulates in the foliage. Toxin accumulation results in leaves with interveinal chlorosis, meaning that the veins remain green and the tissue between the veins turns yellow to brown (Figure 3). This symptom is shared with other soybean diseases you may encounter such as Sudden Death Syndrome (SDS). The stem discoloration distinguishes this symptom from SDS or other issues such as Soybean Vein Necrosis Virus, compaction, or nutrient deficiencies. Shepard's cooking, or bending, of the upper stems may also occur.

Figure 3. Foliar symptoms of stem canker are similar to SDS and other issues in soybeans. The presence of lesions on the stems help distinguish stem canker from other diseases such as SDS.

Severe infections from stem canker occur when the plants are infected during the vegetative growth (V1-V7). Infection is favored during extended periods (1-4 days) of moderate temperatures (72-86°F) and wet weather. Severely affected seedlings infected in the early vegetative stages may die rapidly. However, many times symptoms may not be evident until the plant reaches the reproductive phase due to the fungus existing asymptomatically within tissues prior to causing symptoms. This is also known as the latent period of the pathogen.

Once symptoms are noted, within season management with fungicides will not save affected plants as the fungus is already established within tissues. In addition, secondary spread is not likely to impact yields, as this occurs later in the season, and dispersion of spores from fruiting bodies is limited to 3-6 feet from the source. After the growing season the fungus persists in soybean residues, which serve as sources of the pathogen in the subsequent growing season.

Management of stem canker is achieved through implementing several cultural practices. First, rotate your soybeans with other non-host crops for 1-2 years, such as corn, small grains, or vegetables. Second, promote residue decomposition in affected fields if possible. Third, plant high quality, certified seed of varieties with resistance to stem canker. Fourth, avoid planting soybeans excessively early as this may coincide with weather conditions that favor severe infections of soybeans at the vegetative stages of development. Double cropped soybeans are unlikely to suffer from significant stem canker issues in most instances. Fungicide sprays targeted at the early vegetative stages are most efficacious. However, they are unlikely to be needed if the aforementioned cultural practices are being followed. Fields containing susceptible varieties planted into soybean residue that have had stem canker issues confirmed by a reputable diagnostic clinic in the recent past, are most likely to have issues with stem canker in a particular growing season.

More information on stem canker on soybean can be found at the NCSRP website at: http://soybeanresearchinfo.com/pdf_docs/StemCanker_CPN1006.pdf

Announcements

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

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.

Farm Transfer Communication Webinar
The Farm Whisperer
by David Specht

Tuesday, November 29, 2016 7:00 p.m.

More details to follow.

For more information - contact Dan Severson – severson@udel.edu or Laurie Wolinski – lgw@udel.edu.

New Concepts in Pasture and Grazing Management

Wednesday, September 7, 2016
9:00 a.m. – 4:00 p.m.
&
5:30 p.m. – 8:00 p.m.
University of Maryland Eastern Shore
Princess Anne, Maryland

DAY SESSION

9:00 a.m.
Welcome

9:15 a.m.
Benefits of a Year-Round Rotational Grazing System and Improved Forage Varieties
Sheep & Goats—Dr. Enrique Nelson Escobar, UMES
Beef Cattle—Eddie Draper, Wye Angus Facility
Horses—Shannon Dill, UME

10:00 a.m.
Sericea Lespedeza and Bermudagrass—Promising New Forages for the Mid-Atlantic Region
Dr. Don Ball, Auburn University/Professor Emeritus

11:00 a.m.
Establishing and Managing Pasture for Increased Production and Improved Soil Health
Dr. Jarrod Miller, UME

11:15 a.m.
Break

12 noon
USDA Grazing Program Assistance
Dr. Terron Hillsman, USDA-NRCS

12:30 p.m.
Lunch

1:00 p.m.
Ways to Extend Grazing and Reduce Stored Feed Needs
Dr. Don Ball, Auburn University/Professor Emeritus

2:00 p.m.
Timelines for Planning a Year-Round Grazing System in the Mid-Atlantic Region
Dr. Les Vough, NRCS/Retired

2:45 p.m.
See it in Action! The UMES Year-Round Rotational Grazing Demonstration Project Pasture Walk

4 p.m.
Adjourn

EVENING SESSION

5:30 p.m.
Forage Profit Strategies
Dr. Don Ball, Auburn University/Professor Emeritus

6:30 p.m.
See it in Action! The UMES Year-Round Rotational Grazing Demonstration Project Pasture Walk

8 p.m.
Adjourn

To register, visit https://www.eventbrite.com/e/pasture-grazing-management-tickets-25299935789. The registration fee, which includes educational materials and lunch for the full day session, is $20 per person. The fee for the evening session is $5 per person. ***The registration deadline is September 2.***

For more information about the New Concepts in Pasture and Grazing Management Workshop, contact Michele Howard at 410-651-6070 or by email at mlhoward@umes.edu. Workshop sponsors include University of Maryland Extension and the University of Maryland Eastern Shore Small Farm Outreach Program.

Weather Summary

Carvel Research and Education Center Georgetown, DE

Week of August 11 to August 17, 2016

Readings Taken from Midnight to Midnight

Rainfall:

0.40 inch: August 16
0.65 inch: August 17

Air Temperature:

Highs ranged from 95°F on August 14 to 90°F on August 11.

Lows ranged from 79°F on August 13 to 72°F on August 17.

Soil Temperature:

84.5°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