



WEEKLY CROP UPDATE

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Vegetable Crops

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

Asparagus

Continue to scout for asparagus beetle adults and eggs. Feeding by beetles can disfigure spears. Depending on the market, the presence of eggs on the spears can make them unmarketable. As a general guideline, a treatment is recommended if 2% of the spears are infested with eggs or if 5% of the plants are infested with adults. In addition, in recent years multiple applications are often needed to control this insect pest and avoid damage so early detection is needed.

Melons

Be sure to scout all melons for aphids, cucumber beetles, and spider mites. We are seeing an increase in lady beetles in some fields that are helping to keep aphid populations in check. The first cucumber beetles are starting to be found in the earliest planted cantaloupe fields. As soon as we get a few consecutive days of warm, sunny weather, populations can explode so be sure to scout carefully since damage occurs quickly. Since beetles can continue to re-infest fields as well as hide under the plastic, multiple applications are often needed to achieve control.

Peppers

Be sure to sample any early planted fields for thrips and corn borers. On young plants, corn

borer larvae can bore into the stems and petioles. In areas where peppers are isolated or corn is growing slowly, moths are often attracted to young pepper plants. Therefore, you should watch for corn borer moths laying eggs in all fields. As a general guideline, treatment may be needed if there is no corn in the area or you are using rye strips as windbreaks. You should also look for egg masses on the leaves.

Snap Beans

Continue to sample all seedling stage fields for leafhopper and thrips activity. The thrips threshold is 5-6 per leaflet and the leafhopper threshold is 5 per sweep. If both insects are present, the threshold for each should be reduced by one third. In addition, bean leaf damage is showing up in early planted fields so be sure to watch for adult beetles. Damage appears as circular holes in leaves and significant defoliation can quickly occur. As a general guideline, a treatment should be considered if defoliation exceeds 20% prebloom.

Sweet Corn

Continue to sample for cutworms and flea beetles. As a general guideline, treatments should be applied if you find 3% cut plants or 10% leaf feeding. In order to get an accurate estimate of flea beetle populations, fields should be scouted mid-day when beetles are active.

Stand Reductions and Replant Decisions - *Gordon Johnson, Extension Vegetable & Fruit Specialist; gcjohn@udel.edu*

Heavy rains after planting and cool temperatures have caused stand reductions in some sweet corn plantings. When stands are reduced, vegetable growers must decide whether or not to replant.

Replanting should only be done if the profit potential will be greater with the new planting. Considerations will include:

- Extra costs for seed and chemicals, planting cost, and labor cost
- Yield effects of later planting
- Delayed harvest and potential effects on following rotations or double cropping
- Herbicide issues and weed management in the replanted crop

The yield potential of the replanted crop must be high enough to cover the extra costs compared to keeping the crop plus at least 10% more profit potential.

Start with evaluating the yield potential of the crop with the reduced stand. There are often guides on how to evaluate reduced stands. Emmalea Ernest did a series of studies looking at yield reductions in processing sweet corn. She found the following:

“the varieties Overland and GSS 1453 were able to compensate for stand loss in terms of tonnage and, even more so, in terms of cut corn yield—even with population densities that were 40% of standard planting density. Of these two varieties, Overland had higher overall yields in the trials. SS Jubilee Plus also compensated well for reduced stand. Protégé compensated for stand loss up to 60% of standard population density, but produced significantly lower yields in terms of cut corn and tonnage at 40% of standard population density. GSS 2259P did not compensate for stand loss effectively and probably should not be used for early supersweet plantings where risk of stand loss is high. GSS 2259P produced its highest yields in terms of tonnage and cut corn at 120% of the standard population density (27,900 plants/A) which suggests that it should be planted at a higher density to obtain maximum yield.” See

<http://extension.udel.edu/weeklycropupdate/?p=5323> for more information

She also looked at gaps in stands and saw no differences in yield between evenly reduced stands and those with irregularly spaced gaps with lengths of up to 6.5 ft. Based on the results of these experiments, yield loss from stand reduction can be estimated based solely on plant population density, without consideration for unevenness in spacing if gap sizes are less than 6.5 ft.

Another important decision is delayed planting in following crops. Early crops can be double cropped after (such as early processing sweet corn followed by soybeans) and if replanted, this may eliminate double cropping potential or reduce double crop yields.

The following are replant considerations for different vegetable crops:

Processing sweet corn - for most varieties, replanting is not warranted unless stands drop below 50%.

Fresh market sweet corn - replanting is usually not economical but yield of marketable corn will be significantly reduced.

Lima beans - lima beans can compensate for stand reductions as much as 50%. Replanting rarely is recommended unless seed quality was very poor and remaining seedlings are of low vigor.

Snap beans - snap beans compensate for stand reductions of up to 50%. Replanting is not usually economical.

Pickles - cucumbers compensate for lower populations by increased branching and fruiting on branches. Yield reductions may be limited but once-over harvest scheduling is confounded by have more fruits of different ages on the plant. Replanting may be needed if stands are reduced by more than 35%.

Transplanted vegetables - replacement of dead, injured, or low vigor plants can be done up to a week after transplanting. Delays past that point will end up with too much light competition from older plants. After that point, consider replacing whole blocks, field sections, or row portions instead of individual plants.

Poor Quality Watermelon Transplants -
Gordon Johnson, Extension Vegetable & Fruit Specialist; gcjohn@udel.edu

As watermelon planting season gets into full swing, we are starting to see some issues with transplants, both shipped from the south and grown locally. Problems include:

- Overgrown and past prime transplants. Often plants will already be flowering, they may be stretched or excessively root bound. Transplants kept in shipping units too long are the most likely to exhibit these symptoms. Fortunately, watermelons will regrow and yield well, even from overgrown plants. However, the plants often take longer to produce fruit because plants must recover and start to regrow, which will take 1-2 extra weeks. Existing flowers will abort.
- Wire stemmed transplants or transplants with stem damage. These are transplants where the outer part of the stem has deteriorated and only the inner core remains or that have lesions on the stems. These plants will not perform well and may die. Wire stem or stem damage can be caused by diseases such as *Pythium* or *Rhizoctonia*, from secondary infections where cotyledons have dropped off, or from physical injury.
- Mites and/or aphids. Mites and aphid infestations can occur in the greenhouse and be taken out into the field.
- Fungal and bacterial diseases. See prior WCU articles for potential diseases to look out for such as gummy stem blight or bacterial fruit blotch.

Seed Maggots Bad in Some Fields This Spring - *Jerry Brust, IPM Vegetable Specialist, University of Maryland; jbrust@umd.edu*

This cool spring has been good weather for a pest of early planted seeds and bulbs—the seed corn maggot *Delia platura* (SCM) and other seed maggots such as Cabbage maggot *Delia radicum* (it prefers to feed on cole crops) and Onion maggot *Delia antiqua* (it feeds on crops in the onion family). The seed corn maggot is one of the earliest seed maggots in a field and it has a huge host range of seeds and plants that it

attacks. Many of our previous springs were unseasonably warm and at times dry, two conditions that do not favor the maggots and is why we did not see a lot of damage in those years. The seed maggots overwinter as pupae in the soil and in early spring (usually early March for SCM and mid-April for onion maggot), the adults emerge. Adults are elongated and dark greyish-brown, with wings that overlap their bodies when they are at rest (fig. 1). Large swarms of flies can be seen in the spring flying over newly tilled fields. The flies mate within 2-3 days after emerging and lay eggs in soil that has a great deal of decaying organic matter, which includes any rotting vegetation or manure as well as germinating seeds or newly set transplants—SCM flies are not finicky and will target the artificial media in the root balls of transplants. The eggs hatch in 2-4 days in temperatures as low as 50°F. The larvae develop over a large temperature range: 50-90°F. However I have found that the flies do not like to lay eggs in soil that has reached 71°F at a 4-inch soil depth for 2-3 days in a row. Therefore, once soils warm up the flies tend not to lay eggs any more. Larvae or maggots are yellowish-white, about ¼ inch in length, legless with head-ends that are wedge-shaped (Fig. 2). The maggots complete their entire development within the soil by burrowing into seeds or feeding on cotyledons emerging from seeds. The pupae are brown, oval-shaped capsules ¼ inch in length (Fig. 2). Generally, seed corn maggots complete their life cycle within three weeks and have 3-4 generations. It is the first generation that causes the most crop damage in our area.

Seed maggots cause damage by burrowing into seeds or cotyledons and hollowing them out. Although it can take 5 maggots per snap bean seed to cause significant damage, once the seed has been opened up by the maggots the seed becomes much more susceptible to invasion from soil borne pathogens. The maggots also can burrow into the bulb or stem of transplants such as watermelon or cantaloupe as well as cole crops, garlic, onions, etc. (Fig. 3).

University of Massachusetts has a good publication on maggots and lists the Growing Degree Days for emergence of the flies in the spring, found at:
<http://extension.umass.edu/vegetable/articles/>

[cabbage-and-onion-maggot-flies](#). There is a good report on growing degree days in the IPM report from May 12, 2012. It is available at: <http://ipmnet.umd.edu/landscape/LndscpAlerts/2012/12May11L.pdf>. Peak flights for seed corn and cabbage maggots already have occurred with peak flight for onion maggots just about ready to occur.

Management: As most of you know there is no rescue treatment once maggots are found in the seed or plant. Fields with moist, heavy-textured soil usually have the worst problems. To reduce the appeal of a field to egg-laying adults, disc or plow early in the season to incorporate residues from the previous crop and allow time for residues to completely decompose before planting. Destroy any weed growth. Avoid planting a crop following root crops or cole crops such as cabbage and cauliflower or after fall tomatoes. Ensure rapid seed germination by planting in moist soil not very deep when weather conditions are good. Later-season plantings may avoid the early season infestation of this pest. For crops like onions or garlic, row covers can be used as soon as transplants are put in the field. Plants can remain covered until the ground warms. Diazinon as a broadcast application before planting can be used with some vegetables (be sure to check the label for each crop and see the [2014 Mid-Atlantic Commercial Vegetable Production Recommendations](#)).



Figure 1. Adult seed maggot fly



Figure 2. Immature stages



Figure 3. SCM larvae in cantaloupe stem

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

As for all crops, good disease management principles should be used for tomato diseases. These practices include field rotation with nonrelated crops, site selection, and the use of organic amendments such as cover crops to improve soil quality. Extensive research shows that a hairy vetch cover crop will help suppress disease development on tomato. Use raised beds and use trickle irrigation if possible to avoid excessive leaf wetness. Staking plants also aids in air movement around plants. Select cultivars with tolerance or resistance to disease when possible, and heat treat seed to manage bacterial diseases.

A good fungicide program should begin when plants are 6 inches tall, with protectant products. An early season conventional program for disease protection includes products such as mancozeb + copper applied twice and then alternated with mancozeb + a strobilurin product (Cabrio, Quadris or Priaxor). If bacterial spot or speck have been problems in the past, Actigard can be added at a low rate (0.33 oz/A) on alternate weeks for better control.

Once harvest is close, be especially careful of products that have a long PHI (pre-harvest interval). During harvest products such as Endura + chlorothalonil could be rotated with Quadris Top. Recent tomato trials from around our region have shown that several new products have good efficacy on tomato diseases and can be incorporated into programs. Priaxor looked good on Septoria, Fontelis and Quadris Top looked good on early blight.

Be sure to scout for specific diseases such as timber rot. If this disease is a recurring problem in your fields, make sure to keep Endura in your program. It is a good material for early blight and also has efficacy on timber rot. You also should consider use of Contans to drive down the inoculum in your field (though it is most effective when applied 3 - 4 months in advance of disease).

The disease late blight has also been a problem in Delaware and Maryland in recent years. You can anticipate its occurrence by monitoring the USABlight website (<http://www.usablight.org/>) throughout the growing season. There are many good fungicides for managing late blight (see the [Mid-Atlantic Commercial Vegetable Production Recommendations](#)). Revus Top and Tanos have efficacy on both late blight and early blight.

Beware of High Tunnel Salt Build Up! - Rose Ogutu, Horticulture Specialist, Delaware State University rogutu@desu.edu

What causes high salt build up?

The soluble salts can be nitrate nitrogen and potassium that are valuable soluble fertilizers. The salts may also be calcium and magnesium from fertilizers or from hard water. Calcium and

magnesium may be present at levels that will indicate high salts but not at levels detrimental to plant growth unless the nutrient balance is off the recommended levels. There is also the limited chance that the salts are undesired sodium and chloride from irrigation water or compost or municipal leaves. Effects of high salt build up can show as early as the 4th year of your high tunnel (HT) production.

Remember that it does not rain nor snow inside the high tunnels and the most commonly used drip irrigation does not allow for adequate leaching. Despite the silt nature of Delaware soils, generally characterized as very deep, well-drained, moderately rapidly permeable soils, a few high tunnel growers have started noticing the problem. Prolonged high evapotranspiration rates, frequent irrigation (including, perhaps, using high EC water), adding various materials to the soil (sometimes, the same material is added over and over again), short rotations, shallow tillage and shallow-rooted crops, minimal freeze-thaw mediated soil mixing, and few episodes of natural soil flooding - can allow excess salinity to become a problem. This is true for organic, sustainable and conventional HT growers.

How can you tell?

Evidence of salinity includes symptoms like necrosis of leaf margins, less vegetative growth, reduced root growth, and reduced seed germination for directly seeded plants. Carrots and beans are sensitive and will show symptoms sooner. Low pepper yields may signal high salts.



Clockwise from top right: salt injury on a bean, pepper and cantaloupe

show severe injury

Determining the status of your high tunnel from the soluble salts results

It is important for a HT grower to request a soluble salt test if it is not included in the routine soil test. Note that a Sodium (Na) mineral soil test is different from a soluble salt test. The soil sample has to be taken carefully. Normally, the top 0.5 to 1 inch of soil in high tunnels can have twice the nutrient levels of a sample taken from the top 6" that includes the surface layer (normal recommended sampling method).

8-16	Excessive	<i>Salt-tolerant plants will grow; most others show severe injury</i>
16+	Very Excessive	<i>Very few plants will tolerate and grow</i>

Electrical conductivity is used to measure soluble salt concentration and is measured in millimhos per centimeter (mmhos/cm) or decisiemens per meter (dS/m).

A water extract is done on a your soil sample and soluble salts may be reported for a 1 soil to 2 water dilution/extraction or a 1 soil to 5 water dilution/extraction or for a saturated medium extract (SME) which is like a soupy paste. The SME is used for greenhouse growing media and is being recommended at times for high tunnel soils. The table below shows what the numbers mean.

Adapted from Ray E. Lamond and David A. Whitney, Management of Saline and Sodic Soils, Kansas State University, May 1992 and Agricultural Analytical Services Laboratory, The Pennsylvania State University.

Interpretation of Results Based on a SME Extract

Saturation extract (mmhos/cm)	Salt Rank	Interpretation and possible effects
0-2	Low	<i>Very little chance of injury on all plants</i>
2-4	Moderate	<i>Sensitive plants and seedlings of others may show injury</i>
4-8	High	<i>Most non-salt tolerant plants will show injury; salt sensitive plants like carrots, beans and seedlings will</i>

A soluble salt result reading 4.0mmhos/cm and above should raise your eyebrows!

Whether you are using organic or inorganic sources of plant nutrition, soil soluble salt levels should be monitored. A study at the Penn State High Tunnel Research facility showed that a baseline soil soluble level at 0.15mmhos/cm increased to 0.3mmhos/cm after 2 years with application of 1 inch of compost. Applying 2 inches of compost can lead to increases of approximately 5.5 to 13 times, yearly.

Minimizing the potential for, and remediating the high salt problem

Successful approaches to minimizing the potential for salinity problems are multi-faceted and involve testing soil, irrigation water and soil additives.

- **Check the salinity of your irrigation water.** Any high tunnel farmer needs to have a complete irrigation water analysis to predict possible effects on the tunnel soil. Additional information about how we manage high irrigation water hardness and bicarbonate alkalinity will be explained in a future issue.

When using trickle irrigation, apply to maintain favorable soil moisture conditions. Table C-4 on page C3 of the [2014 Mid-Atlantic Commercial Vegetable Production Recommendations](#) lists the maximum number of hours for trickle irrigation systems to apply 1 to 1.5 inches of water based on soil texture.

- **Leach your soil (Wait a minute- you are washing away plant nutrients too!).** This can be

done periodically by putting a lot of water through the soil over the course of a day, or can be done with each watering by watering more than you need to. One can use leaching fraction to determine the extra amount of water you need to apply on top of what's needed for irrigation in order to send excess salinity below the rootzone. A leaching fraction of 40% is recommended. As a general guideline for leaching out soluble salts from the top foot of soil, apply 6 inches of water to leach about 50% of the salts, apply 12 inches to leach about 80% of the salts and 24% to leach about 90% of the salts.

You will need to replace nutrients that have been washed away with the salts so do not leach soluble salts if you don't need to.

The salts that move down to the lower soil profile and may gradually return over time dependent on watering practices. That can be a good thing if the salts are excess nitrogen and potassium, not so good if sodium and chloride.

Taking the cover off the tunnel and allowing rain in is an option. You however need 3 inches or more of rain within 7 to 10 days. Overhead irrigation can also accomplish this.

Flooding seems problematic when considering soil biology and soil structure but it has been done.

- **Select fertilizers with low salt indexes and limit the use of organic nutrient sources containing animal manure.** Base compost selection and rates of addition on analyses that include both the total nutrient analysis and the soluble nutrients (SME) soil test. Sometimes you need to stop fertilization for a while in a non-leaching system like a stationary high tunnel, it is very important to not over apply fertilizers and to be cautious with the use of compost. Manure based compost, particularly dairy or poultry compost are not recommended except for initial soil building prior to construction or in very small quantities if soil tests indicate low phosphorus or potassium levels. Compost varies dramatically in soluble nutrient content.

- **Move the HT to a different location.** This would be easier with movable HTs.

- **Add biochar** - but you need to know your soil. Biochar is like a sponge. It very aggressively absorbs water. Likewise, it can absorb nutrients or other constituents out of your soil. Biochar has a liming effect. This could be good or it could be bad. It really depends on your situation. Knowing how to apply it, how much of it to apply, and under what circumstances to apply it is not widely known or clearly understood.

- **Add peat.** Peat is rich in humus and gives an acid reaction. Humic acids are effective in absorption of various metal ions.

- **Mulch your crop.** Plastic mulches used with drip irrigation effectively reduce salt concentration from evaporation.

- **Plant winter greens or winter rye,** which will help reduce the residual nitrogen in the soil.

References

Elsa Sánchez. Penn State University Dealing With High Soluble Salt Levels in High Tunnels.

<http://extension.psu.edu/plants/vegetable-fruit/fact-sheets/salts-in-high-tunnels/> Assessed May, 14, 2014.

Montri. A. and J. Biernbaum. 2009. Management of the Soil Environment in High Tunnels. HortTechnology 19:34-36.

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Fruit Crops

Spittle Bugs Found in Some Strawberry Fields - Jerry Brust, *IPM Vegetable Specialist*, University of Maryland; jbrust@umd.edu

Several strawberry growers have seen the meadow spittlebug (*Philaenus spumarius*) in their strawberries this year. The spittlebug is an annoying pest on strawberries that under extremely high numbers can stunt plants and reduce berry size. But they are more of a nuisance, especially to u-pick growers as the pickers object to being wetted by the insect excretion (the spittle) even though it is harmless.

Spittlebugs can be recognized by the white masses of foam found on leaves, petioles, and stems of plants (Fig. 1). The yellow-green nymphs produce this covering to protect themselves from predators and desiccation (Fig. 2). Initially the nymphs feed at the base of the plants, but later move up to more tender foliage. Feeding may cause leaves to become wrinkled and dark-green. Although fruit may be stunted under heavy spittle bug populations, yield loss rarely occurs. High spittlebug populations are often correlated with weedy (including legume cover crops like clover) fields, so proper weed control is important. Nymphs feed for five to eight weeks before entering the adult stage. Newly emerged adults (called froghoppers) are bright green and darken over time to a dull brown. They are very active and readily jump when disturbed. Adults are present on foliage May through November but do not produce any spittle. Adults lay white to cream-colored eggs in the stems and leaves of plants from July through October. These eggs will overwinter and hatch next spring. There is one generation per year in Maryland.



Figure 1. Spittle on stems of plants



Figure 2. Spittlebug nymphs are seen under the spittle (arrows).

Treatment is rarely necessary for spittlebugs, but u-pick growers need to keep populations to

one spittle mass per square foot through prebloom to placate customers. It will be necessary to spread plants and inspect the crowns as well as leaves and stems. Control is considered at one spittlebug per square foot for u-pick operations and 5-6 per square foot (a high population) for everyone else. Aphid control products such as Assail, Nuprid, etc. will control spittlebugs too.

Section 18 for Brown Marmorated Stink Bug (BMSB) Management on Stone and Pome Fruit Approved - Joanne Whalen, Extension IPM Specialist; jwhalen@udel.edu

As indicated last week, EPA approved our Section 18 request for the use of 2 dinotefuran products (Trade Names: Venom from Valent U.S.A. Corporation; Scorpion from Gowan Company, LLC) to control BMSB on stone and pome fruits. Last week we posted the Venom label. A copy of the Scorpion label is online at: <https://extension.udel.edu/weeklycropupdate/files/2014/05/DE-Scorpion-35SL-pome-and-stone-fruit-approved-4-29-2014.pdf>.

Please contact either David Pyne at the Delaware Department of Agriculture (David.Pyne@state.de.us) or Joanne Whalen (jwhalen@udel.edu) for more information.

Agronomic Crops

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

Alfalfa

The first leafhoppers have migrated into the state so be sure to sample on a weekly basis after the first cutting. Once plants are yellow, yield loss has already occurred. The treatment thresholds are 20 per 100 sweeps on alfalfa 3 inches or less in height, 50 per 100 sweeps in 4-6 inch tall alfalfa and 100 per 100 sweeps in 7-11 inch tall alfalfa.

Field Corn

Depending on the location in the state, we can find low levels of both cutworm and slug damage, mainly in no-till corn fields. It is

important to check all fields for cutworms, even where at planting treatments were used. The treatment threshold is 3% cut plants in spike to 3-leaf stage corn. In some cases you will need to check fields twice a week to be sure you do not miss an economic population. In addition to cut plants, be sure to watch for leaf feeding, which can be an indication of the potential for significant cutting damage and yield loss.

(<http://www.ent.iastate.edu/imagegal/plantpath/corn/bcutworm/1287bwcholes.html>)

Small Grains

We continue to find armyworms, grass sawfly, aphids, and cereal leaf beetle (CLB) larvae and in some cases CLB adults still laying eggs in barley and wheat fields. Population levels remain variable throughout the state so scouting fields will be the only way to determine if an economic level is present. Although armyworm can attack both wheat and barley, they can quickly cause significant losses in barley. Heavy defoliation of the flag leaf can result in significant economic loss. Armyworms generally begin head clipping when all vegetation is consumed and the last succulent part of the plant is the stem just below the grain head. Larvae can feed on the kernel tips of the wheat, resulting in premature ripening and lower test weight. We continue to see an increase in aphid numbers so you will also need to watch for aphids feeding in the heads of small grains. The treatment threshold is 15-25 aphids per head with low beneficial insect activity.

Soybeans

Seed corn maggot could be a potential problem in no-till soybeans, especially if we see an extended period of cool and wet weather. It could also be a problem in conventional soybeans where a cover crop is plowed under immediately before planting or where manure was applied. All of these situations are attractive to egg-laying flies. Control options are limited to commercial applied seed treatments containing an insecticide and one hopper box material containing permethrin (Kernel Guard Supreme). Labels state early season protection against injury by seed corn maggot. No rescue treatments are available for this insect pest.

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

Corn and soybeans are getting planted at a decent pace. If you've had your seeds in the ground for a few days and those fields have had more than 2-3 inches of rain, then now might be a good time to assess seed treatments. Seedlings with brown roots or coleoptiles/cotyledons are not likely to make it. Healthy looking seedlings should be gently replanted and allowed to carry on with their afternoon. Cool/ wet soils tend to be impacted by Pythium, whereas warmer wet soils often have issues with Fusarium or Rhizoctonia. Phytophthora hasn't been an issue for us in field crops, particularly soybean, as it has been in other regions of the United States. Diseased seedlings can be sent to your diagnostic clinic for disease confirmation.

Small Grain Disease Update and Head Blight Update - Nathan Kleczewski, Extension Specialist - Plant Pathology; nkleczew@udel.edu

Small Grains Disease Update

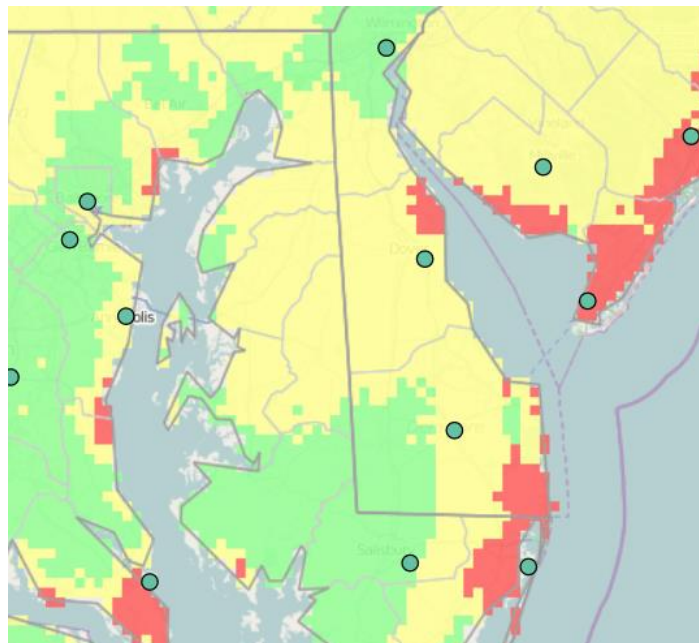
Diseases remain hard to find in the majority of fields. When they do occur they are in the lower canopy. I have not seen any difference between fields or research plots sprayed with fungicides at flag or earlier and those without. It is likely that the penetrating cold temperatures dinged the primary source of inoculum, pushing the disease progress curve back. In addition, the cool, windy spring kept plants short and canopies dry. Temperatures are now warmer and fields can hold more humidity and that's likely why we are now seeing things increase. In variety trials those varieties with the most powdery mildew are just barely present on the F-2 leaves. Read below for information on recent humid and wet weather as it pertains to flowering small grains.

Reminder to Sign Up for Head Blight Updates
Please remember to sign up for scab alerts and check the Delaware/Maryland Scab commentary on the FHB prediction Center website often. Now is the time to be making decisions pertaining to scab sprays as fields are getting ready to flower or are flowering in some cases. Remember the disease triangle- we need

the pathogen on the host at a susceptible stage, AND the right environment. The extremely humid weather we had on Wednesday and Thursday was favorable for spore release and infection of flowering wheat. This resulted in an increase in the scab risk on 5/15. Heavy rains are expected Thursday evening through Friday, which will likely further increase scab risk in many areas of Delaware and Maryland. Luckily most people were not caught by surprise this year and already had lined up fungicide applications. **The following is my commentary from the FHB prediction center website from 5/14/13:** <http://www.wheatcab.psu.edu/>

“Delaware and parts of Maryland are now in a moderate to high risk level for scab. I expect this risk to continue through the weekend with heavy rains expected tonight and Friday. Fields entering flowering are at the highest risk for scab. The best fungicides for scab are Prosaro, Caramba, and Proline. Do not apply products containing a strobilurin (e.g. Approach Prima, Quilt, Stratego, Headline, Quadris, etc) as strobilurins have been associated with elevated DON levels when applied to the head and scab occurs. There is a 5-6 day window after the majority of a field is flowering and conducive weather occurs to make a fungicide application and maximize efficacy. Ground rigs should have nozzles angled at least 15 degrees in the forward direction and apply at least 10 gallons per acre, with 15-20 being optimal. Aerial applicators should apply at 5 gallons per acre. Shoot for 300 to 350 micron droplet size. Prosaro, Caramba, and Proline will control foliar diseases.”

Any important updates will also be posted on the Field Crops Disease Management Blog: <http://extension.udel.edu/fieldcropdisease/>

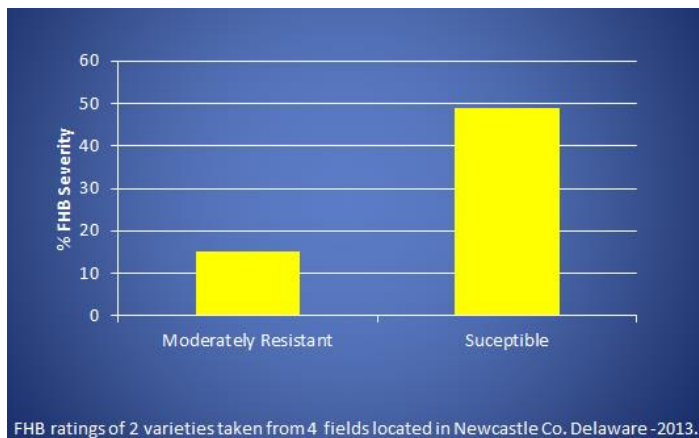


The FHB risk map as of 5/15/2015 at 10:45 am.

Understanding Moderately Resistant Varieties and Head Blight in Wheat - Nathan Kleczewski, Extension Specialist - Plant Pathology; nkleczew@udel.edu

Over the past 5-6 years much progress has been made in producing varieties with moderate resistance to Fusarium head scab. Advancements in biotechnology and agricultural genomics have enabled university and industry researchers to produce varieties with better, more consistent resistance than those of the days when I had a much thicker, fuller head of hair. In addition, the newer moderately resistant varieties still yield well in the absence of head scab. This is an active area of research, and better varieties continue to be released.

Below is an example of what planting a resistant variety can do. Last June an astute grower asked me to assess his wheat for scab. Below are the head scab severity ratings across fields planted with a moderately resistant and a susceptible variety.



FHB severity is one thing, but the most important part of FHB management is **keeping mycotoxins at acceptable levels**. If you want the best price for your grain, you want DON below 2ppm. Anything above that will likely get docked and in some cases loads can be rejected when levels are excessive. Interestingly, you can have symptoms of FHB, but your DON levels may not be high. DON results from the activity of the fungus, so the particular strain, chemotype, and environment all play a role in how much DON is produced. Thus, when you choose a variety you want one that helps keep DON in check. A quick look at the University of Maryland variety trial results for FHB provides an excellent example of the impacts of resistance on mycotoxins. These nurseries provide a more or less, “worst case” scenario for scab, with constant misting and FHB-infested corn kernels distributed throughout the nursery. **The following is a brief summary of the 2012 and 2013 results:**

Year	DON Level (ppm)	
	Average of 5 Least Resistant Varieties (Maximum)	Average of 5 Most Resistant Varieties (Minimum)
2012	17.6 (highest 20)	2.8 (lowest 1.0)
2013	20.0 (highest 24.4)	4.7 (lowest 3.9)

Results from the UMD head scab variety evaluations is located at: <http://www.psla.umd.edu/extension/extension-project-pages/small-grains-maryland>

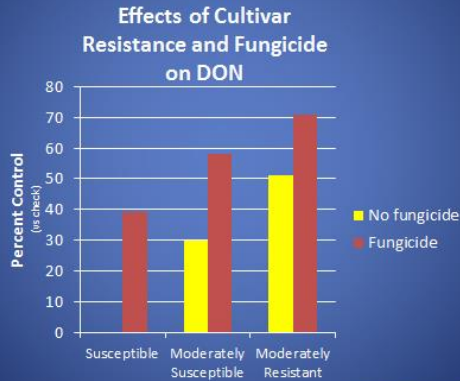
Due to how the resistance works, and an array of additional environmental, host, and pathogen factors, the apparent resistance can vary a bit

from year to year or site to site. Overall, the resistance we see in our newer varieties is stable across environments or years, meaning, moderately resistant varieties consistently have much lower levels of DON than susceptible varieties. On average, moderately resistant varieties can cut down your DON by 50% compared to a susceptible variety. As you can see above, sometimes the difference can be far greater when you compare across many varieties. Take a minute and visit the UMD variety trial link posted above. You will notice that some of our popular varieties don't perform so well in terms of DON. **Where do your varieties fall?**

Let's consider the worst case scenarios for DON based off of the UMD variety trials in the following example. I've mentioned that on average, our best fungicides for scab, applied when conditions favor scab as fields enter flowering, get you on average 42-45% reduction in DON. If you planted the worst variety from the 2013 trials under those conditions you still would have around 13ppm DON **AFTER** making a fungicide application. Now if you had planted the most resistant variety and made a fungicide application, you would be around 2ppm DON. That's right at the threshold. When you start with a resistant variety, and add in a fungicide such as Prostaro, Caramba, or Proline around flower when conditions are conducive for FHB, it increases the likelihood that you will not have loads outright rejected and improves your chances of selling your grain at a premium.

To finish, I want to show you, again, the results of 40 FHB management trials conducted over 7 states from 2007-2010. This work was published in 2012 in Plant Disease. As you can see, fungicide use on a susceptible variety gets you almost halfway there. However, it's when you use a moderately resistant variety and a properly timed fungicide (if the environment is favorable for FHB) that you really can start to see a benefit.

Management of FHB through IPM



FHB, like most plant diseases, requires an integrated approach to manage it. It is not like powdery mildew or leaf rust. Read my article on [disease resistance from last week's WCU](#) to find out some reasons why this is the case. What we have for management is not perfect and we continue to look how to best manage the disease. We've come a long way from the, "rotate and plow" mindset of 10-15 years ago and no doubt will continue to make progress in managing this difficult to control disease in the future.

Announcements

DSU High Tunnel Workshop & Field Day

Thursday, May 29, 2014 10:00 a.m. - 3:00 p.m.
Delaware State University
Smyrna Outreach Center
884 Smyrna-Leipsic Road
Smyrna, DE

Delaware State University will be having a High Tunnel Workshop and Field Day. The featured speaker will be Dr. Lewis W. Jett, who is the State Extension Vegetables and small fruit Crops Specialist, West Virginia University and a leading expert in high tunnels and season extension.

Talk Topics:

- Scheduling takeover crops (2nd warm season crop)
- Growing into the fall: what works and what doesn't
- Heat management in the high tunnel
- IPM in High tunnels

- High tunnel production economics

Attendees will earn 1 Delaware pesticide recertification credit.

For more information, to register for this free workshop (lunch included), or for assistance due to disabilities contact:

Dr. Rose Ogutu at rogutu@desu.edu or 302-857-6397.

or

Jason Challades at jchallandes@desu.edu or 302-388-2241

Registration is open until May 22, 2014.

Small Fruit Educational Meeting and Tour

Thursday, July 10, 2014 5:00-8:00 p.m.
University of Delaware
Carvel Research & Education Center
16483 County Seat Highway
Georgetown, DE 19947

This meeting will highlight our extension IPM program addressing Spotted Wing Drosophila monitoring and management in small fruits as well as ongoing variety testing and other research with blueberries, blackberries and grapes.

- Tour the blueberry variety trial, mulch and soil amendment experiments.
- See and sample berries from the blueberry variety trial.
- Tour the primocane fruiting blackberry trial and sample berries from the trial.
- Tour the wine and table grape trial.

Dinner will be provided.

Please pre-register before July 3 by contacting Karen Adams at (302) 856-7303 or adams@udel.edu.

Pea Twilight Meeting

Thursday, June 12, 2014 6:00-8:00 p.m.
Carvel Research and Education Center
16483 County Seat Highway
Georgetown, DE 19947

Meeting will include a tour of the late pea variety trial and preliminary results from the early pea trial. Extension Specialists will present updated management information and will be on hand to answer questions.

There will be refreshments following the tour.

Please call Karen Adams at (302)856-7303 or adams@udel.edu by Monday, June 9 if you plan to attend.

Spring Pasture Walk

Wednesday, May 28, 2014 6:30 -8:30 p.m.
Rick and Kim Vincent
3427 Burnite Mill Rd.
Harrington, DE 19952

AGENDA

Welcome and Introductions

Extension Staff, University of Delaware Cooperative Extension

Current Pasture/Grazing Management

15 minutes

Rick and Kim Vincent, Farm Owners

Pasture Plant Species ID

20 minutes

Dr. Richard Taylor, Extension Agronomist

Soil Fertility and Pasture Health

30 Minutes

Dr. Richard Taylor, University of Delaware Extension Agronomy Specialist

Weed ID and Weed Control in Pastures

30 minutes

Quintin Johnson, Weed Science Extension Agent, University of Delaware Cooperative Extension

Soil Sampling Techniques, Sample Submission, Testing Options

30 minutes

Bill Rohrer, Owner and Manager, AgroLab

DE NM Credits- 1.25 Pesticide Credits- Pending

Please contact Susan Gary at (302)730-4000 or truehart@udel.edu by the May 27 to register.

UD Summer Pasture Walk

Wednesday, June 4, 2014 6:30-9:00 p.m.
University of Delaware
Webb Farm
508 S. Chapel St.
Newark, DE

Come and learn about pasture management and renovation practices used on the University of Delaware's Webb Farm. Hear about soil sampling techniques and how to properly submit your soil sample. Get help with plant and weed identification and weed control advice. Particulars on Bermudagrass establishment, management and soil fertility will also be covered. Natural Resource Conservation Service will also share information on relevant cost share programs. Experts will be on hand to answer specific questions.

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

AGENDA

Welcome and Introductions

15 minutes

Dan Severson, University of Delaware Cooperative Extension

Tour of Pastures and Pasture Management, Pasture Renovation Techniques at Webb Farm

30 minutes

Larry Armstrong, University of Delaware Webb Farm Manager

Soil Fertility, Plant ID, Bermudagrass Establishment

30 Minutes

Dr. Richard Taylor, University of Delaware Extension Agronomy Specialist

Weed ID and Weed Control in Pastures

30 minutes

Quintin Johnson, University of Delaware Cooperative Extension

Soil Sampling Techniques and How to Properly Submit Your Sample

30 minutes

Karen Gartley, University of Delaware Plant and Soil Science Research Manager

Overview of NRCS Programs

15 minutes

Marianne Hardesty, New Castle County NRCS District Conservationist

Credits: DE Nutrient Management and Pesticide credits will be offered.

To register or request more information, please call our office at (302)831-2507. Please call to register by May 30.

Weather Summary	
Carvel Research and Education Center Georgetown, DE	
Week of May 8 to May 14, 2014	
Readings Taken from Midnight to Midnight	
Rainfall:	
0.11 inch: May 12 0.02 inch: May 14	
Air Temperature:	
Highs ranged from 86°F on May 12 to 63°F on May 14.	
Lows ranged from 62°F on May 10 to 55°F on May 8, 9, 12, 13 and 14.	
Soil Temperature:	
67.2°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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