WEEKLY CROP UPDATE
UNIVERSITY OF DELAWARE COOPERATIVE EXTENSION

Volume 21, Issue 12 **June 14, 2013**

Vegetable Crops

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

Cucumbers
With the recent rainy weather, we have seen fluctuating cucumber beetle populations; however, higher populations are still present in fields with a history of problems. Fresh market cucumbers are susceptible to bacterial wilt that is vectored by the beetles, so treatments should be applied before beetles feed extensively on cotyledons and the first true leaves. Although pickling cucumbers have a tolerance to wilt, a treatment may still be needed for machine-harvested pickling cucumbers when 5% of plants are infested with beetles and/or plants are showing fresh feeding injury. A treatment should be applied for aphids if 10 to 20% of the plants are infested with aphids with 5 or more aphids per leaf.

Melons
Continue to scout all melons for aphids, cucumber beetles, and spider mites. When fields are blooming, it is important to consider pollinators when making an insecticide application (http://extension.oregonstate.edu/catalog/pdf/pnw/pnw591.pdf).

Peppers
As soon as the first flowers can be found, be sure to consider a corn borer treatment. Depending on local corn borer trap catches, sprays should be applied on a 7 to 10-day schedule once pepper fruit is ¼ - ½ inch in diameter. Be sure to check local moth catches in your area by calling the Crop Pest Hotline (instate: 800-345-7544; out of state: 302-831-8851) or visiting our website at http://agdev.anr.udel.edu/trap/trap.php .

Potatoes
Continue to scout fields for Colorado potato beetle (CPB) and leafhoppers. Adult CPB as well as the small and large larvae can now be found. A treatment should be considered for adults when you find 25 beetles per 50 plants and defoliation has reached the 10% level. Once larvae are detected, the threshold is 4 small larvae per plant or 1.5 large larvae per plant. As a general guideline, controls should be applied for leafhoppers if you find ½ to one adult per sweep and/or one nymph per every 10 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. As a general guideline, once corn borer catches reach 2 per night, fresh market and processing snap beans in the bud to pin stages should be sprayed for corn borer. Sprays will be needed at the bud and pin stages on processing beans. After the pin spray on processing beans, the spray schedule will be determined by a combination of both moth catches and field scouting. 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/

Once pins are present on fresh market snap beans and corn borer trap catches are above 2 per night, a 7-10 day schedule should be maintained for corn borer control

Sweet Corn
Continue to sample seedling stage fields for cutworms and flea beetles. You should also sample whorl through pre-tassel stage corn for corn borers and corn earworms. A treatment should be applied if 15% of the plants are infested with larvae. The first silk sprays will be needed for corn earworm as soon as ear shanks are visible. Be sure to check both black light and pheromone trap catches since the spray schedules can quickly change. Trap catches are generally updated on Tuesday and Friday mornings (http://agdev.anr.udel.edu/trap/trap.php and http://extension.udel.edu/ag/insect-management/insect-trapping-program/action-thresholds-for-silk-stage-sweet-corn/). You can also call the Crop Pest Hotline for the most recent trap catches (in state: 800-345-7544; out of state: 302-831-8851).

Soil Compaction in Vegetable Fields

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

Peas are very unforgiving of delays in harvest and a crop can go from useable to unusable in 24 hours. This means that harvesting must often go on when soils are wet. 2013 has been wet during pea harvest and fields that are harvested during wet periods will likely have ruts and compaction that will affect rotational crops that follow. As other vegetable crops are harvested, from cabbage to snap beans, soil compaction will also be a concern. Soil compaction limits root development and root function and will reduce yield potential in vegetable crops.

There are two processes at play when soils are compacted by equipment. The first is destruction of soil structure. In most Delaware soils, our surface soil structure is granular or crumb in nature and consists of small aggregates. It takes considerable time and good cropping practices to build up soil structure. When ruts are cut in soils, this structure is destroyed, making soils denser. Excessive tillage also destroys soil structure.

A second compaction process is the compression of soil particles, pushing them closer together. This happens with equipment traffic across fields. The heavier the loads carried by equipment passing over soils, the more the compaction. With large equipment and heavy axle loads, significant soil compaction is expected; the heavier the weight on an axle, the more the compaction. A pea/shelled bean harvester weighs about 30 tons with approximately 10 tons per axle. Equipment under 10 tons per axle have much less potential to compact soils than those of 10 tons or greater. It is interesting to note that there is less weight per axle with a pea harvester than with large grain combines and grain carts. Other equipment factors affecting compaction include tire size, tire pressure and operating speeds. Wider tires or dual tires will distribute weight over larger areas, reducing deep compaction but increasing the amount of area with shallow compaction. Higher tire pressures will result in more deep soil compaction and slower speeds will also result in more compaction. It is interesting to note that tracked equipment, while being able to cross wetter fields, can cause as much or more compaction than wheeled equipment.

In wet soil, there is less resistance to soil particle movement and soil is more “plastic”. This means that potential for compaction is greater in wet soils than dry soils. While vegetable growers often do not have a choice and must harvest in wet conditions, other crop operations can sometimes wait until soil conditions are more favorable. A good example would be planting lima beans after peas. Waiting a day or two for soils to dry will improve yield potential by reducing compaction. In addition, lima beans actually have better yield potential as planting progresses later in June.

In managing rutted and compacted fields, ruts should be lightly tilled to refill the ruts with soil

and the fields should be chisel plowed. Note major areas with deep compaction to address in the future. Subsoiling in the fall is a short term solution to deep compaction. The use of forage radish cover crops has shown great potential to reduce shallow and deep compaction.

Angular Leaf Spot on Watermelon – *Kate Everts, Vegetable Pathologist, University of Delaware and University of Maryland*; keverts@umd.edu

This week I have received three watermelon samples that appear to be angular leaf spot. I wrote about this disease on cucumber and squash in the May 31 WCU because it had occurred on zucchini. Angular leaf spot is fairly common on cucumber, squash, and muskmelon, however it is uncommon on watermelon in the field. When I have seen it in Maryland or Delaware in the past, it has been in greenhouses. Past experience with the strains that have appeared here on Delmarva is that conditions after transplanting to the field, which are typically hot and dry, usually do not favor angular leaf spot development. However conditions this year differ. The current cool wet weather is highly favorable for angular leaf spot.

Symptoms of angular leaf spot are a chlorotic halo and may appear "shiny" (due to bacteria on the lesion surface). Small irregular lesions expand and become angular. On watermelons the borders are chlorotic. Older lesions may turn brown, dry and tear to produce a tattered appearance.

The disease may be seedborne. In addition it has a wide host range and can also survive as an epiphyte on several weeds. The pathogen spreads from plant to plant in splashing rain, irrigation, or mechanically (such as on hands, windblown sand, or equipment). There are several bacteria (*Pseudomonas viridiflava*, *P. syringae* pv. *lachrymans*, and possibly others) that cause similar symptoms and vary in their ability to cause damage.

It is important to have the disease identified. The symptoms look similar to anthracnose. However the fungicides used to manage the two diseases are different. If angular leaf spot is confirmed in the field, applications of fixed copper plus mancozeb will minimize spread. Also avoid working field when foliage is wet.

Upper and lower surface of leaf with symptoms of angular leaf spot.

Angular leaf spot. Note the angular tan appearance of lesions, and the "shine" on the cotyledons.

Pea Root Rots, Wilts, and Stem Decay –

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

Wet seasons such as 2013 increase the potential for root rots, wilts, and stem decay in peas. Root Rots are most prevalent in fields with significant compaction or with waterlogged soils. Root rots may be caused by one or more soil borne pathogens including Aphanomyces, Pythium, and Fusarium, Thielaviopsis, Ascochyta/Phoma, Rhizoctonia, and *Sclerotinia sclerotiorum*.

It may be difficult to determine which organism is causing root rots in advanced stages and plants may have several pathogens attacking them at the same time. In addition, nematodes may also be part of the root disease complex on peas.

The following are descriptions of the common pea diseases affecting roots or causing wilts or lower stem decay from the "Crop Profile for Peas in Delaware" http://www.ipmcenters.org/cropprofiles/docs/DEgreenpeas.pdf and "Root Rots of Peas" from the University of Illinois http://web.aces.uiuc.edu/vista/pdf_pubs/911.pdf.

Aphanomyces Root Rot

"Aphanomyces root rot is caused by the fungal pathogen *Aphanomyces euteiches* f. sp. *pisi*, although other soil-borne organisms contribute to the disease complex. Oospores can remain dormant in the soil for years. When conditions are favorable, the spores germinate and pass through several life stages before developing into hyphae that can grow through host plant tissue. Infection can occur at all temperatures favorable for pea development. Once pea roots are infected, the mycelium of the fungus begins to decay the root tissue. As roots decay, the oospores return the soil to serve as inoculum in years to come. Characteristic symptoms include water-soaking, softening, and slight discoloration of the taproot and lower stems of infected plants. The outer root tissue of infected plants can be easily sloughed off. Symptoms develop faster at warmer temperatures."

"Aphanomyces root rot, or common root rot, is one of the most destructive diseases of peas. It occurs in most pea producing regions of the U.S., including the Mid-Atlantic. In the Northeast, average annual yield loss to this disease is about 10%, though losses in individual fields may be up to 100%. Wet soil conditions and poor drainage are associated with higher rates of infection. The disease is most damaging in years when a cool, wet spring is followed by an early, warm summer with low rainfall."

Fusarium Wilt

"Fusarium wilt of peas is caused by the soil-inhabiting fungal pathogen *Fusarium oxysporum* f. sp. *pisi*. Near-wilt, a related disease, is caused by a different race of the same pathogen. Both diseases can be introduced from soil borne pathogens, but the symptoms and control strategies for the diseases differ somewhat. The fungus can survive in the soil as long as 10 years as chlamydospores and by association with the roots of non-host crops. The fungus penetrates the roots of peas and may colonize the vascular system of non-resistant varieties. The pathogen spreads in contaminated soil, seed, and plant debris, and can be transported from field to field by wind and water. Soil temperature, pea cultivar, and soil type can affect the rate of disease spread.

"Fusarium wilt is characterized by yellowing of the lower leaves and a general stunting of the plants. Leaf margins curl downward and, in some cases, the stem becomes swollen and brittle at the soil line. A discoloration of internal root tissue also occurs. At soil temperatures above 68°F, the disease progresses rapidly, plants may be killed, often in small patches (depending upon the race of the fungal pathogen). These dead plants serve as a reservoir of inoculum for spread of the disease. One of the outcomes of Fusarium wilt infection is uneven maturity among plants in the field, which leads to yield loss and reduced quality of produce. The symptoms of near wilt are similar, but the disease's progress and plant death generally occurs more slowly than in Fusarium wilt. Some races of the fungus are widely distributed and can kill 1-3% of plants in infected fields. Because warm soil temperatures are conducive to the spread of inoculum, damage can vary

significantly from year to year and the most severe losses occur in late peas."

Fusarium Root Rot
Fusarium root rot is caused by the soil borne organism *Fusarium solani* f. sp *pisi.* "Fusarium root rot affects mainly the taproot with infection starting close to where the seed is attached. Reddish brown streaks form in the primary and secondary roots and later merge. The external portion of the stem shows brick red, dark reddish brown, or chocolate-colored lesions. The advancing lesion may be wedge-shaped with the point upward. The central part of the taproot is a deep red. Plant growth is stunted, the foliage turns grayish, then yellow, the lower leaves wither, and the plant eventually dies. The lower stem is often girdled, causing the plant to fall over. *Pythium ultimum* is often found in Fusarium-infected roots and vice versa."

Ascochyta Blight
"Three species of related fungal pathogens cause important diseases of peas. *Ascochyta pisi* causes leaf and pod spot; *Mycosphaerella pinodes*, the perfect stage of *A. pinodes*, causes blight; and *Phoma medicaginis* var. *pinodella,* causes foot rot. All of these diseases are characterized by lesions on leaves, stems, blossoms and pods, and by discoloration of the hypocotyl, cotyledons, and roots. All of these pathogens are soil-borne and persist to a greater or lesser degree in or on soil and plant debris; *A. pisi*, however, is primarily carried on or in the seeds. Infested seeds may be infected and develop into weak, stunted plants that are unproductive or die. Leaf lesions vary in appearance, depending on the fungal species involved and on the geographic region. Stem lesions of *Mycosphaerella pinodes* can cause girdling. When flowers are infected by one of these species, sepals may become girdled, killing the developing pod or resulting in distorted pods. Leaves of infected plants become desiccated on all but the highest nodes. Root infection is often limited to the primary roots, but in some cases lateral roots are also destroyed. *A. pisi* is the most common in Delaware"

"It is difficult to estimate yield loss attributed directly to Ascochyta diseases. *Phoma medicaginis* var. *pinodella,* which causes foot rot, is the most serious of these pathogens."

For control use fungicide treated seed. Follow a crop rotation scheme that provides at least 2 years without peas. Deeply incorporate crop debris immediately after harvest before the fungus can be dispersed by wind or rain.

Pythium Root Rot
"Pythium commonly causes seed rot as well as pre- and post-emergence damping-off of pea. Root rot of older plants also occurs, and often results in root-pruning that significantly reduces root length. Damage is most common in wet soils and is characterized by soft rot. Roots infected with Pythium are typically light brown in color and soft and watery to the touch. Infected plants are frequently stunted and pale green to yellow in color. Although it primarily causes a seed rot, damping-off, and seedling root rot, *Pythium ultimum* can cause a watery, soft decay of older plants in wet soils at an optimum temperature of 64° to 75°F."

Rhizoctonia Root Rot
"Rhizoctonia root rot can attack plants at any stage of growth. Seeds may turn dark brown and decay. Water-soaked, then reddish brown to brown lesions form in the seedling epicotyl and hypocotyl. The growing point may die as it emerges from the soil. Seedlings damp-off or recover to produce a normal plant. On older plants, scurfy, reddish brown, sunken lesions form on the underground stem and roots. The stem may be girdled causing severe plant stunting and yellowing. The brown, thread-like filaments (mycelium) of the causal fungus may be seen with a hand lens on the surface of the lesion or canker."

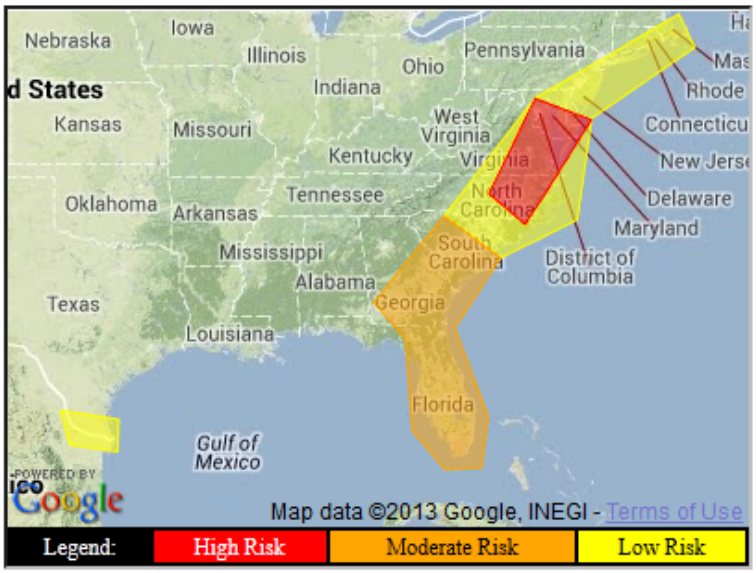
Cucumber Downy Mildew Update

- *Nathan Kleczewski, Extension Specialist – Plant Pathology*; nkleczew@udel.edu and *Kate Everts, Vegetable Pathologist, University of Delaware and University of Maryland*; keverts@umd.edu

Cucumber Downy Mildew has been reported in a research farm in Johnson County, North Carolina. Recent storms have likely facilitated in the movement of the pathogen into the area.

Forecasting models located at http://cdm.ipmpipe.org/ indicate that the pathogen is likely to spread to Delaware and Maryland. Growers should consider applying fungicides protectively to prevent severe losses resulting from the disease. Fungicide recommendations can be found in the Cucurbit Downy and Powdery Mildew Article found in this issue of WCU or at the University of Delaware website http://extension.udel.edu/ag/vegetable-fruit-resources/commercial-vegetable-production-recommendations/.

Risk prediction map for Day 1: Monday, June 10



HIGH Risk for cucurbits in eastern NC, eastern VA, and most of MD and DE. Moderate Risk for FL (except the panhandle), southern and eastern GA, and most of SC. **Low Risk surrounds the High risk area in the mid-Atlantic states, extending from northern SC northeastward through NJ, Long Island, and far southern New England. Low Risk also near the TX source.** Minimal Risk to cucurbits otherwise.

Effectively Managing Cucurbit Downy Mildew in the Mid-Atlantic and Northeast Regions in 2013

- *Meg McGrath (Cornell), Beth Gugino (Penn State), Kate Everts (Univ. Maryland), Steve Rideout (Virginia Tech), Nathan Kleczewski (Univ. Delaware), and Andy Wyenandt (Rutgers)*

Producing a high-quality cucurbit crop necessitates effectively managing downy mildew. This foliar disease is common in the mid-Atlantic and northeast because the pathogen produces a large quantity of asexual spores that are easily dispersed long distances by wind, which enables it to spread widely. Although the pathogen cannot survive between growing seasons where winter temperatures kill cucurbit crops, it moves throughout the eastern USA each year via its asexual spores. The pathogen does not affect fruit directly; however, affected leaves die prematurely which results in fewer fruit and/or fruit of low quality (poor flavor, sunscald, poor storability).

The most important component of an effective management program for downy mildew is an effective, properly-timed fungicide program. The key is to apply mobile fungicides targeted to the pathogen starting when there is a risk of the pathogen being present in your area. Locally systemic (or translaminar) fungicides are needed to manage the disease on the underside of leaves. Because these fungicides have targeted activity towards oomycete pathogens like downy mildew and Phytophthora blight, different fungicides must be used to manage other diseases, such as powdery mildew.

Resistant varieties are another tool for managing downy mildew. Resistance was the main tool for cucumbers until a new strain of the pathogen developed. Since 2004, varieties with this resistance, which include most hybrids, have provided some suppression of the new strains,

but substantially less than the excellent suppression that was achieved against strains present before 2004. However, these resistant varieties are still considered a worthwhile component of an integrated program. Fortunately, a new source of resistance has been found and cucumber varieties with these new genes for resistance are being developed. Seminis Vegetable Seeds is one company developing new varieties. The first ones released in 2012 did not have the resistance successfully incorporated and did not exhibit greater suppression of downy mildew than previously developed resistant varieties.

Fungicide Program
Alternate among targeted, mobile fungicides from different FRAC groups and apply with a protectant fungicide to manage resistance development and to help avoid control failure if resistance occurs. Remember to comply with label use restrictions. The pathogen has demonstrated the ability to develop resistance to fungicides, thus a diversified fungicide program applied to resistant varieties when possible is critical for success.

When to Apply Fungicides
An important resource for determining when fungicide applications are warranted is the NCSU Cucurbit Downy Mildew Forecasting (CDM ipmPIPE) website at http://cdm.ipmpipe.org. The forecasting program monitors where downy mildew is currently active and predicts where the pathogen likely will be successfully spread and cause disease based on the current and forecasted weather conditions. The risk of downy mildew occurring throughout the eastern USA is forecast and posted three times a week (Monday, Wednesday, and Friday). Forecasts enable timely fungicide applications based on the risk of disease development. Growers can subscribe to receive customizable alerts by e-mail or text message. Information on the cucurbit hosts affected is also available. This is important because the pathogen exists as pathotypes that differ in their ability to infect different cucurbits. All pathotypes can infect cucumber; while only some can also infect melons and squashes. Success of the forecast system depends on knowledge of where downy mildew is occurring; therefore prompt reporting of outbreaks by growers is critical.

Recommended Downy Mildew Specific Fungicides
Use in alternation and tank mixed with a protectant fungicide. Label directions for some products state to begin use before infection or disease development. The forecasting program helps ensure this is accomplished and lets you know when your crops are at risk. The updated FRAC Guidelines and Efficacy Table for cucurbits is now available.

Ranman (FRAC code 21). Use organosilicone surfactant when water volumes are less than 60 gallons per acre. REI is 12 hr. PHI is 0 day. Apply no more than 6 times in a season with no more than 3 consecutive applications.

Previcur Flex (28). This fungicide is more systemic than others and has good activity for downy mildew, but it is not effective for Phytophthora blight, which usually is also a concern in cucurbit crops. REI is 12 hr. PHI is 2 days. Apply no more than 5 times in a season.

Zampro (40 + 45) and *Revus* (40). While in the same fungicide chemical group, these products may have a slightly different mode of action, thus there may be benefit to using one early in a season-long fungicide program and then switching to the other product later in the program. REI is 12 hr. PHI is 0 day. Apply no more than 3 times (4 for Revus) in a season with no more than 2 consecutive applications (none with Revus). Revus must be applied with a spreading/penetrating type adjuvant. Revus has exhibited differential activity among cucurbit types. It is very effective for downy mildew in pumpkin but not in cucumber and therefore it is not recommended for use in cucumber.

Curzate (27) or *Tanos* (11 + 27). These have some curative activity (up to 2 days under cool temperatures) but limited residual activity (about 3-5 days). They can be a good choice when a fungicide application is not possible at the start of a high risk period when temperature is below 80 F. Apply another targeted fungicide 3-5 days later. Both must be tank-mixed with a protectant. REI is 12 hr. PHI is 3 days. Apply no

more than 4 times in a season (6-9 for Curzate depending on rate); no consecutive applications of Tanos are permitted. Curzate is not labeled for Phytophthora blight.

Gavel (22). This is the only product that consists of a targeted fungicide (zoxamide) and a protectant fungicide (mancozeb). REI is 48 hr. PHI is 5 days. Apply no more than 8 times in a season. Some cantaloupe varieties are sensitive to Gavel. Workers must be notified that a dermal sensitizer was applied both orally and by posting at entrance to treated area for 4 days.

Presidio (43). Until recently, Presidio had been the most effective fungicide in several university fungicide evaluations*. Control was moderate to poor in several fungicide efficacy trials conducted in the eastern USA (FL to NJ) in 2011 and especially in 2012 suggesting that resistance likely has developed. In sharp contrast, Presidio was highly effective in trials conducted in OH and MI in 2012, providing 91-100% control versus 12-43% control in trials in the eastern USA. This finding indicates the pathogen population in the mid-west differs from that in the east. Until resistance develops in the mid-west, in production areas where the pathogen could come from the south or the mid-west, such as western to central NY and PA, growers will want to use the CDM ipmPIPE forecast website to determine where the pathogen is originating as this will dictate the utility of including Presidio in the fungicide program.

**Presidio and other fungicides were tested alone in these experiments, which is neither a labeled nor recommended commercial use pattern for these fungicides; it is done in efficacy evaluations to determine if resistance affects control.*

It is prudent where Presidio is included in the fungicide program to use it judiciously with limited applications in a good rotation program. Presidio has a long rotational interval of 18 months for non-labeled crops, which can be a constraint on production. The label has been expanded and now includes all cucurbits, fruiting vegetables, leafy vegetables, brassica (head and stem), bulb vegetables, sweet potatoes and root vegetables (except carrot, sugar beet, potato). REI is 12 hr. PHI is 2 days. Apply no more than 4 times in a season with no more than 2 consecutive applications. Presidio must be applied with another fungicide.

Recommended Protectant Fungicides
Chlorothalonil and mancozeb are the main protectant fungicides for downy mildew. Copper is not as effective. Dithane has a supplemental label that includes pumpkin, winter squash and gourd.

No Longer Recommended
Resistance to mefenoxam and metalaxyl and to strobilurins is sufficiently common that fungicides with these active ingredients (e.g. Ridomil and Cabrio), which used to be highly effective, are now ineffective and should not be applied for managing downy mildew.

In summary, to manage downy mildew effectively in cucurbit crops: 1) select resistant cucumber varieties, 2) sign-up to receive alerts about downy mildew occurrence and routinely check the forecast web site to know where the disease is occurring and what crops are affected, 3) inspect crops routinely for symptoms beginning at the start of crop development, and 4) apply targeted fungicides tank-mixed with protectant fungicides weekly and alternate among available chemistries based on FRAC code, starting when there is a risk of downy mildew for the specific crop based on the CDM ipmPIPE forecast. Add new fungicides to the program when they become available; substitute new for older product if they are in the same FRAC group.

Please Note: The specific directions on fungicide labels must be adhered to -- they supersede these recommendations, if there is a conflict. Note that some products mentioned are not yet registered for use on cucurbits. Check labels for use restrictions. Any reference to commercial products, trade or brand names is for information only; no endorsement is intended.

2013 Fungicide Resistance Management Guidelines for Cucurbit Downy Mildew and Powdery Mildew Control in the Mid-Atlantic & Northeast regions of the United States

Fungicide	Active Ingredient(s)	FRAC Code*	Risk Rating**	Management Required***	Powdery Mildew	Downy Mildew	General Fungicide Resistance Management Guidelines****
Kocide 3000 or OLF	fixed copper(s)	M1	L	N	+		FRAC code M fungicides are low risk, protectant fungicides. Use alone, or tank mix with high-risk fungicides to improve control
Microthiol or OLF	sulfur	M2	L	N	++		
Manzate, Dithane or OLF	EBDC	M3	L	N		++	
Gavel	zoxamide + mancozeb	M3 + 22	L - M	N		++	
Bravo, Echo or OLF	chlorothalonil	M5	L	N	++	++	
Topsin M	thiophanate methyl	1	H^R	Y	+		Select fungicides with at least ++ rating. Rotate among fungicides with different FRAC codes. Tank mix high risk fungicides with FRAC code M product if the product is not formulated with a FRAC code M fungicide.
Rally	myclobutanil	3	M^R	Y	++		
Procure	triflumizole	3	M^R	Y	++		
Folicur	tebuconazole	3	M	Y	++		
Inspire Super	difenconazole + cyprodinil	3 + 9	H	Y	+++		
Ridomil Gold Copper	mefenoxam + copper	4 + M1	H^R + L	Y		+	
Ridomil Gold Bravo	mefenoxam + chlorothalonil	4 + M5	H^R + L	Y		+	
Fontelis	penthiopyrad	7	M	Y	+++		
Luna Experience*	fluopyram + tebuconazole	7 + 3	M	Y	+++		When resistance is qualitative (FRAC code 1 and 11 fungicides), resistant pathogen strains are completely insensitive and cannot be controlled with the fungicide.
Quadris	azoxystrobin	11	H^R	Y	+	+	
Cabrio	pyraclostrobin	11	H^R	Y	+	+	
Flint	trifloxystrobin	11	H^R	Y	+		
Reason	fenamidone	11	H	Y		+	
Pristine	pyraclostrobin + boscalid	11 + 7	H^R	Y	+	+	
Luna Sensation*	trifloxystrobin + fluopyram	11 + 7	H	Y	+++		With quantitative resistance (FRAC Code 3 fungicides), pathogen strains exhibit range in fungicide sensitive and efficacy depends on level of insensitivity. Better control can be obtained with high label rates and tight spray intervals.
Tanos	famoxadone + cymoxanil	11 + 27	M	Y		+	
Quintec	quinoxyfen	13	H	Y	+++++		
Ranman	cyazofamid	21	M - H	Y		+++	
Gavel	zoxamide + mancozeb	22 + M3	M + L	Y		++	
Curzate	cymoxanil	27	L - M	Y		++	
Previcur Flex	propamocarb HCL	28	L - M	Y		+++	
Alliete	aluminum tris	33	L	Y		+	*Luna fungicides are labeled for watermelon only.
Phosphonates	phosphorous acid salts	33	L	Y		+	
Forum	dimethomorph	40	L - M	Y		+	
Revus	mandipropamid	40	L - M	Y		+	
Presidio**	fluopicolide	43	H	Y		+/++++	**Presidio has exhibited poor control when the pathogen originated from the southeast.
Zampro	ametoctradin + dimethomorph	45 + 40	M	Y		++++	
Torino	cyflufenamid	U6	M	Y	+++++		

Efficacy Ratings: + = poor (not recommended), ++ = poor to good, +++ = good, ++++ = very good, +++++ = excellent

* FRAC code: M = multi-site mode of action (MOA), numbered groups = fungicides with similar MOA

** Risk Ratings: L = low risk, M = moderate risk or H = high risk for fungicide resistance to develop

*** Risk management required according to fungicide label

**** See fungicide label for specific crops, rates and instructions on use

^{R} = resistance known; (+) control failures detected in the mid-Atlantic and Northeast regions

Fungicides with the same color belong to the same FRAC code

Pea Harvest Hampered by Rains – *Gordon Johnson, Extension Vegetable & Fruit Specialist;* gcjohn@udel.edu

Pea harvest has been hampered by heavy rains and wet soils over the last week with more rain in the forecast. In warm weather, peas progress quickly, gaining from 10-30 tenderometer units per day. Delays due to wet conditions have meant bypassing some fields that matured past marketable grades. In addition, wet soils have led to the bypassing of low areas and increased rutting of fields. Compaction by traffic on wet soils during pea harvest will be a problem in succeeding crops.

Windbreak Advantage Very Evident this Year – *Gordon Johnson, Extension Vegetable & Fruit Specialist;* gcjohn@udel.edu

Fresh market vegetable growers have seen a large advantage to windbreaks this year, especially when used between every row. Plantings with extensive windbreaks are earlier (less heat loss with cool evening winds) and have much less direct wind damage to plants than field with windbreaks only in drive rows or without windbreaks. Planning for effective windbreaks starts in summer with identifying fields for next year's crops and planting small grains early enough in the fall to get a good stand and put on growth earlier in the spring. Rye is still the preferred windbreak because it is taller and comes to full height earlier in the spring. Barley and winter oats make much less effective windbreaks due to their shorter stature (they have been bred for shorter height to reduce lodging). Wheat and triticale are intermediate in height but reach full height later than rye. Spring oats could be used to protect later plantings but will be ineffective for early crops because full height is not reached until late May.

While earliness is not a concern for summer plantings, wind protection still may be. Crops for summer windbreaks include sudangrass, forage sorghums, sorghum/sudangrass crosses, pearl millet, foxtail millet, teff, Japanese millet, and sunhemp.

Potato Disease Advisory #7 – June 14, 2013 - *Phillip Sylvester, Kent Co., Ag Agent*; phillip@udel.edu

Location: Art and Keith Wicks Farm, Rt 9, Leipsic, Kent County
Greenrow: May 5

Date	DSV	Total DSV	Accumulated P-Days	Spray Interval Recommendation
5/15 – 5/20	11	32		5-days
5/20 – 5/23	2	34		5-days
5/23 – 5/27	5	39		5-days
5/27 – 5/30	0	39		10-days
5/30 – 6/6	2	41	251	10-days
6/6 – 6/7	10	51	261	5-days
6/7 – 6/9	10	61	280	5-days
6/9 – 6-13	4	65	314	7-days

Late Blight
The threshold of 18 DSVs has been exceeded. Sixty-five (65) DSV's have accumulated so far for any potatoes that established green row (approximately 50% emergence) prior to and since May 5. Favorable conditions have lowered the spray interval recommendation to seven (7) days. Late blight was reported in greenhouse tomatoes in Morgan County, WV over 7 days ago. The website USABlight tracks tomato and potato late blight across the nation and can be found here: http://usablight.org/ Continue to scout your

fields regularly for symptoms. Any suspicious samples can be sent to the UD Plant Diagnostic Lab or dropped off at your local Extension office. See the 2013 Commercial Vegetable Production Recommendations-Delaware: http://extension.udel.edu/ag/files/2012/03/Potatoes.pdf

Early Blight
We are using the predictive model WISDOM to determine the first fungicide application for prevention of **early blight**. The model predicts the first seasonal rise in the number of spores of the early blight fungus based on the accumulation of 300 physiological days (a type of degree-day unit, referred to as **P-days**) from green row. We have now **exceeded** 300 **P-days** as of Thursday, June 13. Airborne Early blight inoculum should rise 5-10 days after accumulating 300 P-days. A fungicide for early blight control is recommended. Commercial fungicide recommendations can be found in the 2013 Delaware Commercial Vegetable Recommendations Guide at http://extension.udel.edu/ag/files/2012/03/Potatoes.pdf

Tomato Pith Necrosis Found in High Tunnels

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

In the last week I have seen tomatoes from different counties in Maryland that had the same unusual disease symptoms, called tomato pith necrosis. Although most of the problem tomatoes were from high tunnels, we might expect to see the same problem from tomato fields starting in late June or early July. Tomato pith necrosis is caused by the soilborne bacterium *Pseudomonas corrugata.* Pith necrosis has occurred infrequently in Maryland over the past few decades. The disease usually is found in early planted tomatoes when night temperatures are cool, but the humidity is high, and plants are growing too rapidly **because of excessive nitrogen** application. Once night temperatures warm up, the plants usually outgrow the problem. We have had a cool spring with many cool nights in May and, at times, high humidity. In the field, diseased plants occur randomly with initial symptoms often being seen as the first fruit clusters reach the mature green stage. Symptoms include chlorosis (yellowing) of young leaves and shoots followed by wilting of the infected shoots in the upper part of the plant canopy (Fig. 1). This wilting is usually associated with internal necrosis at the base of the stem. Black streaking may be apparent on the surface of the main stem, which often splits (Fig. 2). When the stem is cut open along its length (Fig. 2) or cross-wise (Fig. 3) the pith will be discolored, and may have hollow areas (Fig. 4). There is often prolific growth of adventitious roots in the stems with discolored pith, and the stems may appear swollen.

There is not much that can be done for control of pith necrosis. The best practice is prevention by avoiding the use of **excessive amounts of nitrogen** in tomato, especially early in the season when nights are still cool. There is some evidence that the pathogen may be seedborne, but more research is needed on the epidemiology and management of this disease.

Figure 1. Yellow leaves and wilting of infected stem caused by tomato pith necrosis

Figure 2. Darkened pith caused by tomato pith necrosis

Figure 3. Darkened pith caused by tomato pith necrosis

Figure 4. Dark discoloration, hollow areas in the stem and adventitious roots starting in stem with tomato pith necrosis

Fruit Crops

Update on SWD Trapping – *Joanne Whalen, Extension IPM Specialist*; jwhalen@udel.edu

As of last week, we had not detected any SWD in our four trapping locations. However, the first suspects were found in Maryland last week and states to our north have started to detect flies in traps. We did find this pest in Delaware during the 2012 season and maggots were found infesting bramble crops. Be sure to consider this pest when making treatment decisions in small fruit, grapes and stone fruit. For more information on monitoring, identification and control of this insect pest be sure to check the following link: http://www.northeastipm.org/about-us/publications/ipm-insights/spotted-wing-drosophila-in-the-northeast//

Section 18 for Brown Marmorated Stink Bug Management on Apples, Peaches and Nectarines Approved – *Joanne Whalen, Extension IPM Specialist*; jwhalen@udel.edu

Our Section 18 request for the use of three bifenthrin products (Brigade WSB – FMC Corporation; Bifenture EC and Bifenture 10DF – both from United Phosphorus) to control BMSB on

apples, peaches and nectarines has been approved by EPA. This use expires on Oct 15, 2013. You must have a copy of the label in your possession before making an application. Please see the following two links -- the authorization letter from EPA http://extension.udel.edu/weeklycropupdate/files/2013/06/DEBifenthrinBMSBAuthorizationLtr.pdf and the Bifenture labels (the two formulations from United Phosphorus) http://extension.udel.edu/weeklycropupdate/files/2013/06/Section18BifentureBMSBDE2013.pdf. We will post the Brigade label as soon as it is available. 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.

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

Fruit trees commonly set more fruit than they will carry and chemical, mechanical, or hand thinning is done to reduce fruit loads, increase fruit size, and limit alternate year bearing. Natural fruit drop also occurs and is often called "May Drop" or "June Drop". This is often accompanied by some leaf drop, especially in stone fruits.

Natural fruit drop is a result of unfertilized or poorly fertilized seeds, cold injury, competition between fruits, or shading. Poor pollination may be a result of cold, rainy weather during bloom in self-fertile fruits such as peaches or poor insect pollinator activity during flowering in insect pollinated fruits such as apples. In stone fruit, some fruit that is not fertilized will remain on the plant for 25-50 days after bloom and then will drop before pit hardening starts.

Another wave of natural fruit drop occurs in late May or early June. This fruit drop is due to competition between fruit for sugars stored and produced by the tree. A tree can only carry a certain load of fruit and will naturally drop smaller and weaker fruit during this period. However, thinning should have been accomplished before this competitive fruit drop occurs. Having fruit remain on the plant until natural competitive drop will use up food reserves in the plant and reduce the size potential of remaining fruit. Fewer cells will have been produced by the fruit remaining on the plant and therefore fruit size will not be recovered.

Another cause of fruit drop is cloudy weather during the period 5 to 7 weeks after bloom. A continuous 4 day period of cloudy days during this period will also cause fruit to drop. In addition, defoliation due to disease such as peach leaf curl, chemical injury such as copper fungicide damage, or severe storms can cause fruit drop during this critical period.

Agronomic Crops

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

Soybeans

Be sure to sample the earliest planted fields for bean leaf beetles, potato leafhoppers, thrips, grasshoppers, green cloverworm and spider mites. Grasshoppers are present, especially in no-till fields. As soon as the weather turns hot and sunny we could see a significant increase in activity. As barley and wheat are harvested and soybeans are planted, these fields will be susceptible to attack and grasshopper feeding can often cause stand loss. If stand reductions are occurring from plant emergence to the second trifoliate, a treatment should be applied. Although no precise thresholds are available, a treatment may be needed if you find one grasshopper per sweep and 30% defoliation from plant emergence through the pre-bloom stage. Numerous products are labeled for grasshopper control in soybeans. *Be sure to check all labels carefully before combining insecticides and herbicides since there are a number of restrictions, including cautions on phytotoxicity.*

By now, all should also be aware of another potential soybean insect pest, the Kudzu bug. It was not found in Delaware surveys in 2012; however, it has been found in a larger geographic area in Virginia already this season. This pest can cause significant yield loss. The

good news is that the southern region entomologists have done an excellent job of developing effective sampling and decision making guidelines. Please refer to the following link for pictures of adults and nymphs as well as management strategies http://www.kudzubug.org/index.html.

Sooty Mold on Barley and Wheat - *Nathan Kleczewski, Extension Specialist – Plant Pathology*; nkleczew@udel.edu

We have seen black heads on barley and wheat throughout Delaware (Fig. 1). The black heads are due to sooty head molds, a group of opportunistic fungi including *Cladosporium*, *Epicoccum*, and *Alternaria*. The presence of sooty molds indicates that damage from some other factor has occurred (e.g. frost, scab, sharp eyespot, take-all, insect damage). Sooty molds increase in prevalence when wet weather delays grain harvest. There are no viable options for control at this point and specific control measures are rarely justified.

Figure 1. Wheat with black sooty mold.

Impact of Flooded and Saturated Soil Conditions on Field Crops - *Richard Taylor, Extension Agronomist;* rtaylor@udel.edu

Across the state, most areas have been experiencing an intense period of very high rainfall with another line of storms moving through New Castle County as I write this article. We've had a number of growers asking about the possible impact of the heavy rain and saturated soil conditions on their crops.

Let's take a look at the corn crop first. Roaming the state yesterday, I saw corn that ranged from just a few leaves and less than six inches tall to corn as much as chest high. Young corn which is less than stage V6 (six fully visible leaf collars) is most susceptible to submergence injury as well as to the numerous diseases such as seedling blight, common smut, and crazy top that become greater risks during periods of flooding.

Dr. Bob Nielsen at Purdue University has written a comprehensive review of the effects of flooding on young corn and the document is available at the following web address: www.agry.purdue.edu/ext/corn/news/timeless/pondingyoungcorn.html. According to Dr. Nielsen, young corn can tolerate flooding up to about 4 days, with greater survivability when temperatures are cool. When temperatures are above the mid-60s F, corn tolerance decreases to less than 2 days of submergence. Usually within a few days to a week, you can cut open plants and gain an idea of whether they are still alive or not. One of the major reasons for stand loss is the depletion of soil oxygen levels which can fall to negligible after 48 hours of flooding. Sustained submergence leads to considerable stand loss, leaving growers to consider their options for replanting. Unfortunately, replanting this late in the growing season often will not be profitable to growers and alternatives should be considered.

Another factor that can affect corn that survives is the loss of soil nitrogen (N). Between emergence and the V6 growth stage about 5% of the N that the crop takes up will be obtained by the corn plant but from V8 to silking as much as 60% of the crop's N will have been taken up and stored. Flooding can lead to denitrification which is the loss of the nitrate form of N from the soil as the anaerobic soil bacteria use that compound as an electron acceptor to metabolize energy and grow. These bacteria are active primarily when soil oxygen levels are very low, there is organic matter available to the bacteria, and nitrate-N is present in the soil. The bacteria convert the nitrate to nitrogen gas (N_2), nitrous oxide (N_2O), or nitric oxide (NO) all of which are

gases and are easily and quickly lost from the soil to the atmosphere. Where manure has been applied, there could be enough mineralization to supply the crop's N needs later in the summer; but where commercial fertilizer has been applied and enough time has passed for that N to be converted to the nitrate form, soil N levels might not be adequate to carry corn through the growing season. Areas of corn that survived saturated soil conditions should be watched carefully over the next couple of weeks for typical N deficiency symptoms (yellowing of the lower or older leaves usually forming an inverted V shape on the leaf). Photo 1 shows an example of the inverted V-shape and the yellow to orange color characteristically seen.

If you do find you need to replace some of the N lost by denitrification, remember to have your nutrient management consultant make adjustments to your nutrient management plan and write out the justification for the additional N fertilizer. Also take note that the use of a manure source does not mean that the same situation will not occur in fields fertilized with manure. If the mineralization process is about completed, the manure's organic N could have been completely converted to nitrate N and lost via denitrification. Consult your nutrient management consultant or county Extension Agriculture Agent for more information.

Photo 1. Inverted-V shaped symptom of N deficiency on field corn. The point of the V is nearest the corn stalk and the symptom can range from a pale yellow to almost orange but as the color depends the center of the leaf begins to die or turn necrotic.

Other field crops that are at risk are soybeans and small grains. In some areas, small grains have lodged from the heavy rainfall and high winds. I've seen this especially in New Castle County and this will slow harvest when the crop and fields dry out enough to permit us to proceed with the small grain harvest. A major risk with winter wheat for some of the fields I've observed is that the crop is so flattened that many plants will be unable to properly photosynthesize and this will reduce the yield potential in these fields. Many seed heads are showing damage from either frost or scab already, so shading and the problem of picking up the crop during combining will add to the yield reduction we can expect.

Soybeans can be injured by flooding conditions or by prolonged saturated soil conditions although they can survive underwater for a week or more under ideal conditions. When I worked in Louisiana, Dr. Jim Griffin and I conducted tests to see how long soybeans could be flooded without impacting yield potential. We noted a number of factors that affected how well a soybean crop tolerated flooding. The most important factors that determine the fate of flooded soybean fields were: 1) duration of the flooding, 2) temperature during the flood, 3) rate of drying after the flooding event, and 4) growth stage of the crop during the flood. Other researchers have found these same factors are important in determining whether yield losses occur.

From our research and that of others, we can generally state that yield losses are seldom noted in fields flooded for 48 hours or less. Four days or more of flooding stresses the crop, delays growth, causes the loss of some N fixing nodules, and causes the plants to be shorter with fewer nodes. Flooding for 6 days or more can depress yields significantly, while flooding for a week or more may result in significant (or entire) losses of stand. One paper that I read about was by Scott et al. 1989 and these researchers found that losses on heavy soils (clay soils) that were flooded were 1.8 bushels per acre per day when soybean plants were at the

V4 growth stage but for a silt loam soil this loss was only 0.8 bushels per acre per day. Losses when the soybean crop was at the reproductive stage were considerably higher for both soil types.

As a final note to this article, I would like to encourage anyone who feels that they need to put equipment on either planted fields or fields that have yet to be planted to think about the potential for damage to these fields. Just yesterday as we drove by one unplanted field, I made a comment how it was foolish to be out planting soybeans in the field with as wet as the soil was. An hour later as we drove back to town past the same field, my statement proved to be prophetic as the tractor and planter were mired in mud down to the axils and unlikely to be rescued until the field dries out. Please keep in mind your basic agronomy principles that say that soil should not be worked and cannot adequately support equipment when it's too wet, especially when the moisture content is above field capacity.

Weed Control Options for Double Cropped Soybeans

– *Mark VanGessel, Extension Weed Specialist*; mjv@udel.edu

With small grain harvest underway, there are some questions about preplant weed control in the double cropped soybeans. This has always been a challenging question, but with the presence of herbicide-resistant weeds, it has become even more complicated. Larger plants that have been cut off or damaged by the combine are going to be less susceptible to herbicides and achieving 100% control will require a lot of environmental factors falling in your favor.

A non-selective burndown herbicide and a residual herbicide for broadleaf weeds are needed for most situations. Remember you want to start "clean" and if the field has weed seedlings already present, they will have a growth advantage over that of the soybeans. In situations where grasses are present, glyphosate will be the best choice.

Residual products such as Canopy, Valor XLT, Envive, Prefix, and the Authority products are all options. I list these products because they either do not have active ingredients that are Group 2 (ALS-inhibiting herbicides) or they do not rely only on Group 2 products. Since most of the small grain fields where treated with Group 2 herbicides (Harmony Extra, Osprey, PowerFlex, Finesse, etc.) it is good to diversify your herbicide mode of action. If your soybean planting is delayed, remember that Prefix, Valor XLT, Envive, Canopy, and the Authority products have a ten-month rotation to field corn.

Liberty Link soybeans are a nice tool for double cropped soybeans because they allow for a different mode of action and Liberty 280 has some activity on marestail (see below) and it is effective on small Palmer amaranth plants. Liberty 280 is going to be more effective as a herbicide sprayed over the top of emerged soybeans (postemergence) than as a burndown herbicide.

Control of horseweed (marestail) preplant is going to be quite challenging. I do not recommend 2,4-D because it is not effective on these large and damaged plants and due to the risk of off-target movement. I do not have experience with Sharpen under these conditions, but it can be used on medium textured soils at 1 oz/A, or 1.5 oz/A with a 14-day interval before planting. The Sharpen label recommends horseweed height at 6 inches tall, and that is before it is cut off by the combine. Likewise, Liberty 280 will injure or suppress large horseweeds but often not kill them. Products with chlorimuron such as Canopy, Envive or Valor XLT will suppress horseweed plants if used at the full rate (although probably will not kill them). Another complicating factor is that there are biotypes of horseweed that are resistant to chlorimuron in the region.

Palmer amaranth that is resistant to glyphosate is also going to be an issue. Glyphosate will not control these plants so a product that is very effective for postemergence of Palmer amaranth is needed. Options include Synchrony XP, Canopy, Envive, Valor XLT, or Pursuit/Extreme. Gramoxone (paraquat) also is an option. The grasses that are not controlled with Gramoxone

could control with early postemergence application of Select or Poast or glyphosate. After the beans are planted your options for postemergence control of Palmer amaranth would include Reflex or Blazer. If you used any of those Group 2 products mentioned earlier for burndown (Canopy, Valor XLT, Pursuit etc.) do not use another Group 2 herbicide postemergence.

Harvest Aids for Small Grains – *Mark VanGessel, Extension Weed Specialist*; mjv@udel.edu

A number of glyphosate products such as Roundup and Touchdown are labeled as harvest aids for winter wheat and barley. Check the label of other formulations of glyphosate to be sure the product you use is labeled as a harvest aid. Applications must be made after the hard-dough stage and at least 7 days prior to harvest. Aim is labeled as well, but the spectrum of control is limited to velvetleaf, morningglory, pigweeds, and few other weeds. Apply at least 3 days before harvest. Use of 2,4-D (or products containing 2,4-D) is generally not recommended as a harvest aid due to its volatility, and potential damage to the crop during application.

I am not aware of any paraquat formulation labeled as harvest aid for small grains.

Announcements

Maryland Grape Growers Association 2013 "Summer Field Day" Viticulture Workshop

Saturday, June 15 8:30 a.m. - 5:00 p.m.
Harford Vineyard and Winery
1311 West Jarrettsville Road
Forest Hill, Maryland

This hands-on learning opportunity will provide current and future vineyard owners, operators, and managers throughout the mid-Atlantic region with the latest information on Integrated Pest Management, insect recognition and control, equipment safety, and much more.

In addition to a walking tour and current situation assessment of the vineyard, the program will include a number of sessions on topics important to grape growers in Maryland.

Pre-registration for the Summer Field Day is open through June 6 at a cost of $35 for current MGGA members and $45 for non-members. On-site "at-the-door" registration begins at 8:30am at a cost of $45 for current MGGA members and $55 for non-members. A continental breakfast will be provided. Please bring your lunch, beverages, and a lawn chair. Clothing and shoes appropriate for a day in the vineyard are recommended and adequate sun protection is strongly encouraged.

To pre-register online, and for more information including mail-in forms, a detailed agenda, driving directions, etc., please visit http://www.marylandgrapes.org.

Water Management Workshop

Tuesday, June 25 6:00-8:00 p.m.
Student Outreach Research Center
884 Smyrna Leipsic Rd Smyrna, DE 19977

Cost: Free

At this workshop, you will gain knowledge on reading water samples, how to amend your farm water, and learn of anything harmful to your livestock or plants that may be resting in your wells. **1.75 Nutrient Management Credits** will be offered at this event.

Register with Megan Pleasanton: (302) 857-6438 or mpleasanton@desu.edu

Soil Management Workshop

Wednesday, June 26 6:00-8:00 p.m.
Student Outreach Research Center
884 Smyrna Leipsic Rd Smyrna, DE 19977

Cost: Free

At this workshop, you will get the chance to lean about soil management. This includes how to take and read a soil sample, soil identification, soil texture, soil health and fertility, how to amend your soil and much more! **1.75 nutrient management credits** will be offered at this event.

Register with Megan Pleasanton: (302) 857-6438 or mpleasanton@desu.edu

2013 University of Delaware Cooperative Extension Horticulture Short Course: Pest and Beneficial Insect Walks

June 26, 2013 4:00-6:00p.m.
UD Carvel Research & Education Center
Sussex County Extension Office
16483 County Seat Hwy.,
Georgetown, DE
Cost: $15

Tour the grounds of the Sussex County Extension Office in Georgetown to identify insects, diseases and beneficial insects in the landscape.

Instructors: Nancy Gregory, Brian Kunkel, Carrie Murphy, and Tracy Wootten

Register with Tracy Wootten: (302) 856-7303 or wootten@udel.edu

2013 University of Delaware Weed Science Field Day

Wednesday, June 26, 2013
University of Delaware
Research and Education Center
(old office building)
16686 County Seat Highway
Georgetown, DE 19947

Registration begins at 8:15 at the Grove near the farm buildings. We will start to view the plots at 8:45 am. A variety of herbicide programs for conventional tillage and no-till production are being evaluated. Many of the registered corn, soybean, and sorghum herbicides are being tested, herbicide evaluation for watermelon, sweet corn and other vegetables are also be included.

CCA CEUs will be offered along with DE Pesticide credits.

To register, please call Karen Adams at 302-856-7303 ext. 540 or adams@udel.edu. For more information, contact Dr. Mark VanGessel at 302-856-7303 or mjv@udel.edu.

On Target Application Academy

Wednesday, June 26 3:00-5:00 p.m.
University of Delaware
Research and Education Center
(old office building)
16686 County Seat Highway
Georgetown, DE 19947

Looking for more information on spray nozzle technology?
Are your nozzles the best match for your herbicides?
Are you doing all you can to keep the spray on the intended site?

This program was developed and will be delivered by Dr. Bob Wolf for growers who self-apply herbicides and custom applicators. The On Target Application Academy is a one-of-a-kind educational opportunity to provide growers extensive hands-on training for better awareness of herbicide application practices to achieve the most effective weed control possible with today's emerging product and equipment innovations, and help mitigate spray drift – which is a continuous area of focus for the agricultural industry. Dr. Wolf recently retired as Professor Emeritus from Kansas State University where he worked as a Professor and Extension Specialist in Application Technology in the Biological and Agricultural Engineering Department. Wolf's main responsibility at Kansas State was to conduct an extension and research program in all areas of chemical/pesticide application with a particular emphasis on nozzle technology.

This workshop is sponsored by BASF. There is no registration fee.

More information can be found at: http://www.agro.basf.us/stewardship/on-target-stewardship.html or contact Mark VanGessel (302) 856-7303.

2013 Wye Weed Science Field Day

Thursday, June 27, 2013
Wye Research and Education Center
Queenstown, MD

There will be a morning tour at the Wye Research and Education Center. CCA CEUs will be offered along with MD Pesticide credits.

For more information, contact Dr. Ron Ritter at 301-405-1329 or by email rlritter@umd.edu.

Delaware Soybean Board Tour

Thursday, August 22, 2013

Tour sponsored by the Delaware Soybean Board

More details in the next Weekly Crop Update.

Respect the Rotation

Thursday, August 22 4:00-6:00 p.m.
UD Research and Education Center
Georgetown, DE

Respect the Rotation is an initiative to elevate the importance and adoption of herbicide diversity and integrated weed management.

Rotate Modes of Action
Reduce the selection pressure of a single mode of action by using multiple modes of action during both the growing season and from year to year.

Rotate Crops
Crop rotation diversifies weed management tools.

Rotate Herbicide-Tolerant Traits
Alternate herbicide-tolerant (HT) traits and/or use HT trait stacks for more efficient herbicide rotation.

Overreliance on a single weed-control method causes resistant weeds to develop and puts the herbicide-tolerant system used and the ability to grow a crop in a specific field in jeopardy. When resistant weeds develop, farmers face the additional costs required to control them—unplanned herbicide applications, intense manual labor, and in extreme cases, total crop loss. Integrated Weed Management practices help to preempt these issues and result in successful management of resistant weed populations. Field plots and demonstrations on rotations for integrated weed management will be discussed.

Supported by Bayer CropScience and in collaboration with Delaware Soybean Board.

For more information contact Mark VanGessel (302) 856-7303

Organic and Sustainable Agriculture Field Tour

Wednesday, September 4, 2013

Hold this date for a late afternoon or evening field day highlighting research and demonstration projects for organic and sustainable agricultural production. More details to follow.

Weather Summary

Carvel Research and Education Center Georgetown, DE

Week of June 6 to June 12, 2013

Readings Taken from Midnight to Midnight

Rainfall:

0.01 inch: June 7
0.08 inch: June 8
0.02 inch: June 10
0.02 inch: June 11

Air Temperature:

Highs ranged from 84°F on June 12 to 75°F on June 6.

Lows ranged from 70°F on June 11 to 54°F on June 6.

Soil Temperature:

73.4°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, Extension Associate – 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.