

The University of Maryland Extension Agriculture and Natural Resources Profitability Impact Team proudly presents this bi-weekly publication for the commercial vegetable and fruit industry.

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Field Observations from Southern Maryland

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- ✓ Transplanting of warm season crops continues, with most crops in the ground now.
- ✓ There have been some cases of root rots especially in those fields planted early with wetter soils.
- ✓ The first squash and zucchini are coming off now.
- ✓ High tunnel harvest is well underway.
- ✓ Early sweet corn is starting to tassel and form ears.
- ✓ Cucumber beetles can now be observed in the field, especially near the base of the plant and under the plastic near the planting hole.
- ✓ Timber rot continues to be a problem in tomato high tunnel production.
- ✓ Root maggots have also been a persistent problem, especially with wet conditions.

Spring Vegetable Crop Update

Vegetable Crop Insects –
Joanne Whalen, Extension IPM Specialist
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Melons

May 18, 2012

Continue to scout all melons for aphids, cucumber beetles, and spider mites. In many fields, lady beetle populations are high and have helped to keep aphid populations in check. We continue to find cucumber beetles, especially in cantaloupe fields. Populations can explode so be sure to scout carefully since damage can occur 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 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. For the most recent trap catches, you can check our website at <http://ag.udel.edu/extension/IPM/traps/latestblt.html> or call the Crop Pest Hotline (in state: 1-800-345-7544; out of state: 302-831-8851).

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 1/3. In addition, be sure to watch for bean leaf beetle. 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. A treatment will be needed if 5% of the plants are infested with beetles. On the earliest planted fields, be sure to watch for larvae feeding in the whorls. A treatment should be applied if 15% of the plants are infested. Corn earworms can also be found in light traps and pheromone traps. You can call the Crop Pest Hotline for the most recent trap catches (in state: 1-800-345-7544; out of state: 302-831-8851) or check our website at <http://ag.udel.edu/extension/IPM/traps/latestblt.html>

Vegetable Disease Alert: Spinach Foliar Diseases; Tomato & Potato Late Blight & Cucurbit Downy Mildew

Kate Everts, Vegetable Pathologist,
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May 23, 2012



Figure 3. Anthracnose lesions are tan necrotic (dead) spots on spinach leaves.

Spinach Foliar Diseases

Downy mildew of spinach has been found in the mid-Atlantic. This disease is not common in Maryland or Delaware, but I do see it occasionally. Symptoms begin with light spots on the upper surface of the leaf, followed by purple to grey fungal growth on the lower leaf surface (Figure 1).



Figure 1. Downy mildew sporulation on spinach leaves.

White rust (*Albugo occidentalis*) occurs more frequently in Maryland and Delaware. White rust symptoms begin with light green areas on the upper surface of the leaves. However in the case of white rust, the sporulation on the underside of the leaves is white, not grey (Figure 2). A third common spinach disease is anthracnose (Figure 3). Anthracnose is characterized by small tan lesions on leaves. Scout your spinach plantings and determine whether a disease is present. See the Commercial Vegetable Recommendation Guide for several effective fungicide options. Read the labels carefully because some fungicides applied at high temperatures may be phytotoxic, and many available and effective products, if used improperly, will result in resistance development. Alternate fungicide classes within a spray program, and follow resistance management guidelines on the label.



Figure 2. White rust infected leaves with chlorotic (yellow) lesions on the upper surface and sporulation on the under surface.

Late Blight on Potato and Tomato

Late blight has been found on potato in central New Jersey. The grower was applying preventative fungicides, however lesions occurred in a part of the field that the sprayer missed. All potato and tomato crops are susceptible to this disease. Growers should scout and apply preventative fungicides to protect their crops. Chlorothalonil, mancozeb or Polyram can be applied to potato and chlorothalonil, Gavel, or mancozeb can be applied to tomato. Complete coverage of the field is extremely important. Once late blight has been found close to a growers' field, switch to a fungicide that is late blight specific. More information on available fungicides for this disease can be found at:

<http://mdvegdisease.umd.edu/files/Maryland%20complete%20book%202012.pdf>

Controlling late blight in organic systems is extremely difficult. Organic growers should apply a protectant such as copper to their crop. Serenade, Sonata and Sporotec are OMRI listed, and labeled for late blight. (However, there are very few research trials on efficacy of these products). It is critical to apply these materials with adequate coverage and at short spray intervals.

Downy Mildew on Cucurbits

Cucumber growers should monitor their crops for downy mildew. Symptoms of downy mildew on cucumber are angular yellow to tan lesions on the upper surface of the leaf and brown to black sporulation on the lower surface (Figure 4).

Downy mildew was found a second time last week in North Carolina on greenhouse grown cucumbers. This outbreak may have started two months ago. Although there are no reports north of the Carolinas, it is extremely troubling that downy mildew is present there so early in the season. Growers should scout their fields and monitor the Cucurbit Downy Mildew IPM PIPE site: <http://cdm.ipmpipe.org/> for the progress of the disease. Preventative fungicide applications should begin when disease occurrence is predicted in our region.



Figure 4. Downy mildew on cucumber leaf. Angular necrosis on upper leaf surface and dark sporulation on lower leaf surface.

MELCAST Fungicide Scheduling for Watermelon

Kate Everts, Vegetable Pathologist,
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Gummy stem blight (caused by *Didymella bryoniae*) is the most important foliar disease of watermelon in Maryland and Delaware. The disease affects leaves (Fig. 1), stems and vines of watermelon, resulting in fewer and smaller fruit. Anthracnose (Fig. 2), which is caused by *Colletotrichum orbiculare*, also occurs yearly. In MD and DE, yield losses due to gummy stem blight and anthracnose of 20 to 100% would occur in the absence of effective fungicidal control.

Beginning in 1997 the DE IPM, MAR-DEL Watermelon growers, Maryland Vegetable growers, and other grant funds have supported dissemination of a weather-based fungicide application program for watermelons, Melcast. Melcast is a weather-based spray advisory program for watermelon developed at Purdue University. The program uses hours of leaf wetness and temperature during leaf wetness periods to determine when a fungicide should be applied. In MD and DE, we have slightly modified Melcast so that fungicides are scheduled earlier. As a result, fungicides scheduled by Melcast, successfully manage anthracnose and gummy stem blight. Growers that use Melcast report reducing their fungicide applications by two per season compared to standard schedules. Six research trials were conducted over three years in our region to evaluate Melcast. In four of those trials yield was the same when sprays were applied according to Melcast compared to weekly applications. In one trial yield was higher, and in one trial yield was lower, when sprayed according to Melcast in comparison to weekly sprays.

Since our original trials of Melcast, several newer and highly effective fungicides have been registered for gummy stem blight and anthracnose. We are testing Melcast again with these effective materials. To use Melcast on your farm, please call Karen Adams at (302)856-7303 and give us your name and Fax number or e-mail address.

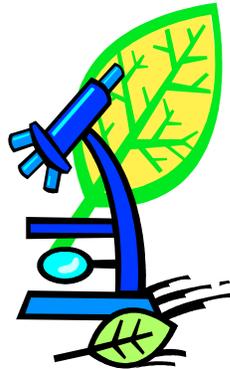
More details about how the program works are available at our Disease Forecasting Web page: <http://mdvegdisease.umd.edu/forecasting/index.cfm>



Figure 1. Large dark brown foliar lesions of gummy stem blight.



Figure 2. Anthracnose lesions on cucurbits are angular in appearance. Tiny black spots can be seen through a hand lens in the tan centers of lesions.



Tissue Testing and Petiole Sap Testing for Vegetables

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Recommended fertility programs for vegetable crops are given in the Commercial Vegetable Production Recommendations publication for Delaware and surrounding states at: <http://aq.udel.edu/extension/vegprogram/publications.htm>

While these recommendations should be the base of a fertility program, additional monitoring of plant nutritional status is recommended, especially for highly managed crops such as those grown in plasticulture where fertilizers can be injected through the drip irrigation system.

Tissue testing involves taking samples from the plant at various times during the growth period, most commonly leaves, and sending them to a laboratory for mineral nutrient analysis. Petiole sap testing involves taking leaf petioles and expressing the sap which is then tested for nitrate and/or potassium using portable meters.

When taking tissue samples specific procedures should be followed to obtain reliable results. The following are recommendations from the University of Florida. "The sample is a whole leaf sample and it should not contain any root or stem material. For sweet corn or onions, the leaf is removed just above the attachment point to the stalk or bulb. For compound leaves (carrots, peas, tomatoes, etc.), the whole leaf includes the main petiole, all the leaflets and their petiolules. For heading vegetables, it is most practical to take the outermost whole wrapper leaf. When sampling particularly young

plants, the whole above-ground portion of the plant may be sampled."

Most commonly the most recently matured leaves (MRML) are used for analyses. Most-recently-matured leaves (MRML) are leaves that have essentially ceased to expand and have turned from a juvenile light-green color to a darker-green color.

"A proper leaf sample should consist of about 25 to 100 individual leaves. The same leaf (i.e., physiological age and position) should be removed from each sampled plant. Plants damaged by pests, diseases, or chemicals should be avoided when trying to monitor the nutrient status of the crop. Individual plants, even side-by-side, may have a considerably different nutrient status. Therefore, by sampling a sufficiently large number of plants, the error due to this variability can be minimized. More accuracy in determining the actual nutrient status is derived from a larger sample size."

"Samples are often contaminated by fungicides, nutrient sprays, soil, or dust. Data obtained from contaminated leaf samples will be misleading. Decontamination of some dust or soil is best accomplished by quickly rinsing in a dilute non-phosphate detergent solution (2%) followed by two distilled water rinses. Tap water should not be used because it can be high in certain nutrients such as Ca, Fe, Mg, or S. Leaf samples should be washed quickly to minimize the leaching of certain nutrients (especially K) from the leaves."

"Following rinsing, the sample should be blotted dry with absorbent paper. The samples should be air-dried for several hours before shipment. If a plant analysis mailing kit is not available, the samples should be wrapped in fresh absorbent paper and placed in a large envelope (plastic bags must not be used). The sample should be shipped or delivered immediately to the soil and plant analysis laboratory. An air-dried sample, if loosely packed to avoid rotting, will last two to three days before decomposition begins."

"If the samples must be held for any length of time before shipping, they should be dried at 150°F in a ventilated oven (leave the door ajar) until dry weight is constant. Once dried, the sample can be placed in a plant analysis mailing kit or a large envelope. This ensures the integrity of the sample until shipping is possible."

Petiole sap testing is useful for monitoring nitrogen and potassium and can give very quick results with the use of portable meters. The following are guidelines for petiole sap testing from the University of Florida: "For sap testing, petioles collected from most recently matured leaves (MRML) are used for analyses. Most-recently-matured leaves (MRML) are leaves that have essentially ceased to expand and have turned from a

juvenile light-green color to a darker-green color. A random sample of a minimum of 25 petioles should be collected from each "management unit" or "irrigation zone." Management units larger than 20 acres should be subdivided into 20-acre blocks. Leaves with obvious defects or with diseases should be avoided. Sampling should be done on a uniform basis for time of day (best between 10 AM and 2 PM), and for interval after rainfall or fertilization."

"Whole leaves are collected from the plant and the leaf blade tissue and leaflets are then stripped from the petiole. A petiole of several inches in length remains. Petioles are chopped into about one-half inch segments.

If analysis is not to be conducted immediately in the field, then whole petioles should be packed with ice and analyzed within a few hours of collecting. Given more extreme environmental field conditions (high temperature and bright sun), more dependable results are obtained by making measurement in the lab or office than outdoors."

"Chopped petiole pieces are mixed and a random subsample (about ¼ cup) is crushed in a garlic press, lemon press, or hydraulic press (obtainable from HACH Co., Table 4). Expressed sap is collected in a small beaker or juice glass and stirred."

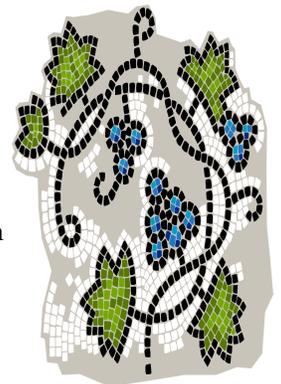
Follow the instructions for the specific meter you are using to analyze the sap. If sap has too high of concentration of nitrate or potassium for your meter, then you will need to dilute the sap to conduct the test. Information on tissue testing and petiole sap testing for vegetables including tables with recommended levels at different growth stages can be found at this site:

<http://edis.ifas.ufl.edu/ep081>.

See attachment: Table 1. Guidelines for Plant Leaf Petiole Sap Nitrate-Nitrogen and potassium testing.

Grape Tissue Sampling at Bloom

By Joe Fiola, Professor & Extension Specialist Viticulture and Small Fruit, University of Maryland;
jfiola@umd.edu



Some early varieties in many vineyards are just starting to bloom. This is a critical time for taking tissue/petiole samples to assess the nutritional status of your vines. The following are some timely considerations.

- ✓ Grape petiole analysis is recommended along with soil samples and visual observations as part of a complete nutrient management program.

- ✓ A three year cycle of sampling all of the varieties in a vineyard is typically recommended.
- ✓ Tissue/petiole analyses reveal the **actual nutrients in the vines**.
- ✓ Tissue samples are needed when doing your mandatory Nutrient Management Plan.
- ✓ Spring tissue sampling is a good time to sample, as you can make nutrient adjustments to the vineyard that will influence this year's crop quality.
- ✓ Nitrogen status is best evaluated with tissue sampling not soil sampling.
- ✓ The time to take spring tissue samples is during full bloom of a particular variety.
- ✓ Bloom time samples may show more accurate levels of boron and zinc, but are less accurate indicators of potassium status. Where bloom-time analyses indicate borderline potassium nutrient levels, a second sampling is warranted in late summer (70-100 days post bloom).
- ✓ Some specifics on sampling:
 - Each sample should be less than 5 acres; less if there are major changes in soil or topography
 - Sample different varieties separately. Samples should represent plants that are planted on the same soil type and are of the same age, variety and rootstock.
 - Vines should represent that portion of a block that is maintained under the same cultural practices, i.e. fertilizer, irrigation and vigor control practices. For example, irrigation blocks are not to be combined with non-irrigated blocks even if they are on the same soil type.
 - Do not sample vines on the border of the block or near dusty roads.
 - For the bloom-sampling period, sample the petiole of the leaf petiole **OPPOSITE** the 1st blossom/cluster (see detail on fact sheet linked below).
 - About 50-75 petioles are needed from varieties with large petioles and about 75-100 petioles are needed from varieties with small petioles.
 - Gently wash petioles with water and gentle detergent, pat dry and place in OPEN paper bag (lunch, #6 size) to dry for a few days.
 - There are many labs that can analyze tissue samples (see detail on fact sheet and list of labs linked below). Call the laboratory to determine current pricing and submission information.
 - See "Tissue Sampling for Vineyards" Information Sheet for more information: <http://www.grapesandfruit.umd.edu/InfoSheet/TissueSamplingforVineyards.pdf>



Maryland Rural Enterprise Development Center Co-Sponsors Food for Profit Class in June

Ginger S. Myers
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<http://mredc.umd.edu/>

Food for Profit is a one-day workshop designed to help you work through the maze of local and state regulations, food safety issues, and business management concepts that all must be considered in setting up a commercial food business. The course will be held at the Washington County Agricultural Education Center, 7303 Sharpsburg Pike (building door #4), Boonsboro, MD 21713 on **Wednesday, June 6, 2012 from 9:00 a.m. to 4:00 p.m.**

Registration Information:

Food for Profit will meet from **9:00 am to 4:00 pm., on June 6, 2012** at the Washington County Agricultural Education Center, 7303 Sharpsburg Pike (building door #4), Boonsboro, MD, 21713, The tuition cost of \$40 per person includes all materials and lunch. Registration is through the Penn State event on-line system at <http://www.cvent.com/d/zcq155> or by calling 877-489-1398. For further information about workshop content, contact Extension Educator Winifred McGee, wwm1@psu.edu, 717-270-4391 or Ginger S. Myers, University of Maryland Extension Specialist at gsmyers@umd.edu, 301-432-2767 x338.

On-Farm Small Flock Field Day & Educational Seminar

Sponsored by
Central Maryland Poultry
Producers Group
& Future Harvest CASA



Small flock poultry producers are invited to attend an evening field day and educational seminar hosted by Tom Albright, **Albright Farms, 15630 Old York Road, Monkton, MD 21111-2204, (410) 329-3269 on Wednesday, June 27, 2012 beginning at 6:00 PM.** *Albright Farms* are local growers of free-range beef, chicken, turkey, and many plant varieties in Baltimore County, MD. Tom Albright also handles chick orders and sourcing for the newly formed Central Maryland Poultry Producers Group.

Our program:

1. Presentations concerning varieties and growth rates on different types of meat birds.
2. Tour of the farm's poultry production system featuring Tom's own movable coop designs.
3. Membership information about joining the Central Maryland Poultry Producers Group.

At 6:00 pm a Light dinner will be provided by Albright Farms

Registration is required. Please RSVP your reservation to Tom Albright at 410-329-3269 or email: albrightfarmsinc@aol.com

At 6:35 pm Evening program begins:

Meeting is open to the public. A short meeting of Central Maryland Poultry Producers Group will be held prior to the start of the evening program. Don't miss this opportunity to learn more about the Central Maryland Poultry Producers Group and to visit a profitable and sustainable poultry production and marketing farm. Talk with the farmer and learn what makes him successful.

For additional information about the field day or about the Central Maryland Poultry Producers Group, visit the website at: www.cmdppg.com.



Ginger S. Myers
Marketing Specialist, University of Maryland Extension
Director, Maryland Rural Enterprise Development Center

VOICE: 301-432-2767 Extension: 338
FAX: 301-432-4089
EMAIL: gsmyers@umd.edu

Looking for Part-Time Summer Job On the Farm?

The Central Maryland Research and Education Center Upper Marlboro Facility is looking for an Agricultural Worker I.

This will be a full time 40hrs/week for the summer and part time on an if and when needed basis going into the fall.

Major duties will be assisting faculty, researchers and facility staff with the day to day activities of the research presently being conducted.

Minor duties will be general farm maintenance. Agricultural experience is required.

Field research experience is essential.

Knowledge of cropping systems preferably vegetable, field corn, soybean and/or small fruit production is essential.

Knowledge and experience with farm equipment is required.

Ability to perform maintenance on equipment is preferred.

Physical demands of job require that you be able to lift heavy materials, work in summer time conditions (heat, rainy days) working outside majority of the time.

Must be willing to work a flexible scheduled.

Contact: Alfred Hawkins at: ahawkins@umd.edu
Agricultural Technician
UMCP CMREC Upper Marlboro Facility
Office: 301-627-8440
Cell: 240-508-4772
Fax: 301-627-3272

Vegetable & Fruit Headline News

A bi-weekly publication for the commercial vegetable and fruit industry available electronically in 2012 from April through September on the following dates: April 12 & 26; May 10 & 24; June 7 & 21; July 12 & 26; August 16; September 6

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Article submission deadlines for 2012: April 11 & 25;
May 9 & 23; June 6 & 20; July 11 & 25; August 15; September 5

Note: Registered Trade Mark® Products, Manufacturers, or Companies mentioned within this newsletter are not to be considered as sole endorsements. The information has been provided for educational purposes only.

Table 1. Guidelines for plant leaf petiole fresh sap nitrate-nitrogen- and potassium-testing			
Crop	Crop Developmental Stage	Fresh Petiole Sap Concentration (ppm)	
		NO ₃ -N	K
Broccoli and Collard	Six-leaf stage	800-1000	NR ^z
	One week prior to first harvest	500-800	
	First harvest	300-500	
Cucumber	First blossom	800-1000	NR
	Fruits three-inches long	600-800	
	First harvest	400-600	
Eggplant	First fruit (two-inches long)	1200-1600	4500-5000
	First harvest	1000-1200	4000-5000
	Mid harvest	800-1000	3500-4000
Muskmelon	First blossom	1100-1200	NR
	Fruit two-inches long	800-1000	
	First harvest	700-800	
Pepper	First flower buds	1400-1600	3200-3500
	First open flowers	1400-1600	3000-3200
	Fruits half-grown	1200-1400	3000-3200
	First harvest	800-1000	2400-3000
	Second Harvest	500-800	2000-2400
Potato	Plants eight-inches tall	1200-1400	4500-5000
	First open flowers	1000-1400	4500-5000
	50% flowers open	1000-1200	4000-4500
	100% flowers open	900-1200	3500-4000
	Tops falling over	600-900	2500-3000
Squash	First blossom	900-1000	NR
	First harvest	800-900	
Strawberry	November	800-900	3000-3500
	December	600-800	3000-3500
	January	600-800	2500-3000
	February	300-500	2000-2500
	March	200-500	1800-2500
	April	200-500	1500-2000
Tomato(Field)	First buds	1000-1200	3500-4000
	First open flowers	600-800	3500-4000
	Fruits one-inch diameter	400-600	3000-3500
	Fruits two-inch diameter	400-600	3000-3500
	First harvest	300-400	2500-3000

Table 1. Guidelines for plant leaf petiole fresh sap nitrate-nitrogen- and potassium-testing			
Crop	Crop Developmental Stage	Fresh Petiole Sap Concentration (ppm)	
		NO ₃ -N	K
	Second harvest	200-400	2000-2500
Tomato (Greenhouse)	Transplant to second fruit cluster	1000-1200	4500-5000
	Second cluster to fifth fruit cluster	800-1000	4000-5000
	Harvest season (Dec.-June)	700-900	3500-4000
Watermelon	Vines 6-inches in length	1200-1500	4000-5000
	Fruits 2-inches in length	1000-1200	4000-5000
	Fruits one-half mature	800-1000	3500-4000
	At first harvest	600-800	3000-3500
² NR-No recommended ranges have been developed			

Footnotes

1.

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2.

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