



# WEEKLY CROP UPDATE

UNIVERSITY OF DELAWARE COOPERATIVE EXTENSION

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## Vegetable Crops

**Low pH in Plastic Mulched Beds, Manganese Toxicity in Cantaloupes** - Gordon Johnson, *Extension Vegetable & Fruit Specialist*; [gcjohn@udel.edu](mailto:gcjohn@udel.edu)

Each year we see problems with vegetable crops related to low pH in plastic mulched beds. A common scenario is a field with sandy soil (loamy sand, sandy loam) that has not been limed in the last 2 years. The starting pH of beds in his situation will usually be 5.5-6.0. Granular or liquid nitrogen fertilizers applied prior to or at bed formation and nitrogen fertilizers applied through the drip irrigation system during fertigation will commonly consist of ammonium sulfate, urea, ammonium nitrate or UAN (urea-ammonium nitrate) solutions. All of these fertilizers are acidifying because the ammonium which they contain (urea releases ammonium nitrogen as it reacts with the soil). Ammonium will convert to nitrate in the soil, a process called nitrification, and will release hydrogen (H<sup>+</sup>) ions thus dropping the pH. As a result, pH in the plastic mulched beds get progressively lower throughout the growing season. Beds with a starting pH of 5.5 can drop down into the 4s. The largest drops in pH will be in the wetted area around the drip emitter and drier areas of the bed will higher pH.

As pH drops, availability of magnesium and calcium declines while manganese availability increases, often to toxic levels. Below pH of 5.2, the chemistry of the soil changes and aluminum

is released into the soil solution at increasing levels, further acidifying the soil. This free aluminum also is very harmful to plant roots because aluminum interferes with calcium, can bind with phosphorus, can reduce magnesium uptake and can interfere with cell expansion at root tips, effectively stopping root tip development. Most of the active mineral nutrient uptake occurs in the region just behind the root tips. Without further root tip growth, nutrient uptake will become limited. Effective rooting volume is also reduced, thus placing the plant under addition stress. In severe cases, plants can die.

Manganese toxicity is a common problem in cantaloupes and other melons at low pHs (below 5.2). Symptoms in cantaloupes will initially show up as small yellow spots on upper leaf surfaces. On lower leaf surfaces you will see dead spots with water soaked rings around these dead spots. As the deficiency worsens, these leaf areas will turn brown and die.

Managing plastic mulched bed pH starts with making sure that fields are limed the fall before beds are to be made. Spring applications can also be made to the area but full lime reaction should not be expected. Manage fertilizer programs so that large pH drops do not occur. This means switching some or all of the nitrogen program to nitrate sources - calcium nitrate and potassium nitrate would be examples.

If marginal pHs are encountered after plastic is laid (below 5.8), consideration should be given to eliminating ammonium or urea containing fertilizers and switching to calcium nitrate and

potassium nitrate sources for fertigation. Both these fertilizers cause a basic reaction in soils because plant roots excrete hydroxides and carbonates as they take up the nitrate. There are few other materials that can be used to raise the soil pH through the drip system once plastic is laid. One option is potassium carbonate which is alkaline and thus will raise the pH. It is fully soluble and can be made in liquid forms.

If pH is below 5.0 it will be difficult to raise the pH enough to eliminate manganese toxicity through the drip system. Foliar fertilization can help alleviate deficiencies that occur at low bed pHs (such as calcium or magnesium). Make sure that the foliar fertilizer does not contain manganese and eliminate any manganese containing fungicides in disease control programs.

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**Potato Disease Advisory #6 - June 20, 2014** - Nathan Kleczewski, Extension Specialist - Plant Pathology; [nkleczew@udel.edu](mailto:nkleczew@udel.edu)

Date	DSV	Total DSV	Accumulated P-Days	Recommended Spray Interval
5/12-5/21	19	19	81	5-days
5/21-5/23	2	21	100	10-days
5/23-5/30	16	37	157	5-days
5/30-6/6	6	43	207	10-days
6/6-6-13	21	64	280	5-days
6/13-6/19	5	69	329	10-days

**Location:** Leipsic, Kent Count, Delaware  
**Green row:** May 12, 2013

**Late Blight**

The threshold of 18 DSVs has been exceeded. Protective fungicides are recommended. Sixty-nine (69) DSVs have accumulated so far for any potatoes that established green row (approximately 50% emergence) prior to and since May 12.

Any suspect samples can be sent to the UD Plant Diagnostic Lab or dropped off at your local

extension office. See the 2014 Commercial Vegetable Production Recommendations-Delaware for recommended fungicides: <http://extension.udel.edu/ag/vegetable-fruit-resources/commercial-vegetable-production-recommendations/>

The website USABlight tracks tomato and potato late blight across the nation and can be found here: <http://usablight.org/>. Information on scouting, symptomology, and management can also be found on this website.

**Early Blight**

The threshold of 300 P-days for early blight has been exceeded. Three hundred twenty nine (329) P-days have accumulated. Preventative fungicide applications are recommended for early blight control. Commercial fungicide recommendations can be found in the 2014 Commercial Vegetable Production Recommendations-Delaware: <http://extension.udel.edu/ag/vegetable-fruit-resources/commercial-vegetable-production-recommendations/>

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**Downy Mildew on Basil** - Nancy Gregory, Plant Diagnostician; [ngregory@udel.edu](mailto:ngregory@udel.edu) and Kate Everts, Vegetable Pathologist, University of Delaware and University of Maryland; [keverts@umd.edu](mailto:keverts@umd.edu)

Downy mildew on basil is currently widespread in the eastern U.S., after being distributed to “big box” garden centers by a major supplier. The disease has been confirmed in Sussex and New Castle counties in Delaware, and in Carroll and Montgomery counties in Maryland. Because infected plants were found in garden centers of big-box stores, it is likely that the disease has spread widely. It has also been reported this summer in VA, WV, KY, CT, TN, and WI.

**Description and Damage**

The disease is caused by a fungus-like Oomycete pathogen that only goes to basil. Symptoms include leaf yellowing, followed by dark lesions, and leaves of this popular herb become unusable. Spores are produced on the undersides of leaves, but can be confused with other fungi, dust and potting material. Therefore, confirmation is dependent on microscopic

observation. Basil downy mildew spores are produced in abundance and can be spread on by air currents, as well as on infected leaf material. The pathogen may also be seed-borne, and asymptomatic plants may develop symptoms after sale.

### Control

All sweet basil varieties are susceptible, but research is ongoing to test for sources of resistance. Control on plants in gardens may be accomplished by using phosphorus acid salts fungicides such as ProPhyt or K-Phite. The bio-rational fungicide, Actinovate, is also labeled on herbs, containing the bio-control micro-organism, *Streptomyces*. Any chemicals should be applied preventatively, according to the label, and may not provide good control once the disease can be seen sporulating on leaf tissue. (Any reference to trade names is for information only and does not imply endorsement.) Cultural practices to reduce leaf wetness and humidity should be used to help manage the disease. Light inhibits spore production, so light may be used to aid in control in high tunnels or greenhouse situations.

The pathogen probably will not over-winter in Delaware, but could over-winter in a greenhouse or sheltered location.



Basil downy mildew symptoms

### High Temperatures Could Mean Poor Fruit Set in Tomatoes - Jerry Brust, IPM Vegetable Specialist, University of Maryland; [jbrust@umd.edu](mailto:jbrust@umd.edu)

The high temperatures we will have this week with daytime highs 90°F and above and nighttime lows only getting down to 70°F in much of the mid-Atlantic for several days in a row may cause blossom drop and fruit abortion in tomatoes. Normally in tomato fields, pollination is achieved just by the action of the wind. Pollen is released from the tomato flower and falls downward onto the stigma. Without pollination flowers die and drop. This condition can affect tomatoes, peppers, snap beans, and other fruiting vegetables, but is especially prominent in tomatoes. In tomatoes, blossom drop is usually preceded by the yellowing of the pedicle (Fig. 1). Tomato flowers must be pollinated within 50 hours or they will abort. This is about the time it takes for the pollen to germinate and move up the style to fertilize the ovary. Tomato plants can tolerate extreme temperatures for short periods, but several days or nights with temperatures above 90°F (daytime) or 72°F (nighttime) will cause the plant to abort flowers and fruit (Fig. 2). At these temperatures the pollen can become sticky and nonviable, preventing pollination from occurring and causing the blossom to dry and drop. The relative humidity also plays a role in pollination, high levels (>80% RH) (which we had and will have this week) during pollen shed will cause the pollen not to be released properly resulting in poor or incomplete pollination.

There are some possible remedies to these high temperatures that could increase pollination and fruit set that the vegetable group is working on this year. One of the things I have been working on the last several years is using shade cloth that is draped over the tomato stakes when plants begin to set fruit (Fig. 3). Two years ago when we had a very hot dry summer yields were increased in the shaded areas by an average of 32%, quality and size of tomatoes increased significantly when the same variety was shaded vs. when it was not (Fig. 4). Last year when it was not very hot and we had good rainfall throughout the summer yields still increased in the shaded areas vs non shaded areas by 12-15%. I do not think a grower should go out and cover



all of their tomato fields with shade cloth, but it could be used for tomato varieties that you grow because your customers really like them, but they just do not produce well in the summer heat. There are some other trials we are conducting to help tomatoes and other vegetables come through the heat, but those results will have to wait for this winter.



Figure 1. Several flower pedicels turning yellow (arrows).



Figure 2. Aborted flowers and fruit (arrows) on tomato plant caused by high temperatures



Figure 3. Tomato plants covered with a 30% shade cloth after fruit set



Figure 4. Tomatoes in the top bin were harvested from shaded areas with white plastic mulch, tomatoes in the bottom bin were harvested from non-shaded areas with black mulch.

# Agronomic Crops

## **Anthracnose Showing Up in Some Corn Fields** - Nathan Kleczewski, *Extension Specialist* - Plant Pathology; [nkleczew@udel.edu](mailto:nkleczew@udel.edu)

The recent warm, rainy weather has been favorable for some foliar pathogens in corn, in particular, anthracnose. Foliar symptoms of anthracnose are often observed in young corn (prior to V5 in many cases). Lesions tend to be irregular, reddish-brown, and have a “target-like” appearance. If you are lucky and have a hand lens you may observe tiny black structures in the lesions with black hairs. The foliar symptoms in the lower canopy can stop in some hybrids after the V6 stage. In other hybrids, a resurgence in foliar symptoms and top dieback in the upper canopy may occur after tasseling if the environment is conducive for disease.

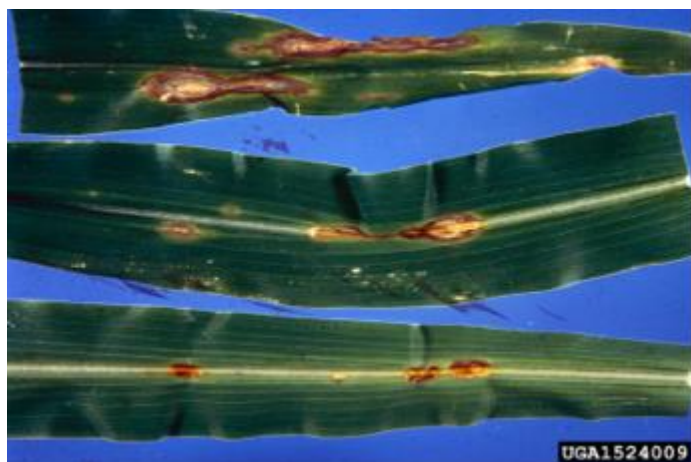


Figure 1. Foliar symptoms of Anthracnose of corn. Image obtained from [www.bugwood.org](http://www.bugwood.org).

Anthracnose overwinters in residue. It does well not only in corn residue, but also that of small grains and other grassy plant species. Spores are splashed onto the lower leaves where they infect and cause lesions. Under continued wet and warm weather the lesions will produce spores which result in additional lesions and disease. It is important to note that Anthracnose stalk rot is caused by infection of the roots but may be facilitated by mechanical damage such as hail or insect injury.

In terms of within-season management, early fungicide applications at V5 will not be helpful in

situations where the disease is present prior to this point. The stalk rot phase, which is the most damaging to the crop, is mostly caused by root infections and therefore is not likely to be impacted by fungicides. Early fungicide applications (V5/6) made prior to the onset of disease can reduce further development of Anthracnose on foliage in the lower canopy but will not likely have an impact on any disease that may develop later in the season in the upper canopy. University research trials (of various sizes) have not shown any significant yield increase when programs incorporating a V5/6 fungicide application and a VT-R1 application are compared to programs utilizing a single fungicide application at VT-R1.

If you have fields with a history of anthracnose the best management practices include integrating 1) hybrids with good resistance to anthracnose, 2) crop rotation, 3) insect management and stress mitigation, and where possible, 4) tillage to bury residue. Resistance to the foliar phase of the disease does not necessarily mean it is highly resistant to the stalk rot phase. When looking at varieties make sure to check with the seed dealer to determine how resistance was determined for a particular hybrid. Rotation away from corn for at least one year can significantly reduce early season foliar symptoms of the disease, but may not have much of an impact on top dieback or stalk rot phases of the disease.

A new factsheet with additional information on this disease and its management can be found here:

<http://extension.udel.edu/factsheet/anthracnose-leaf-blight-and-stalk-rot-of-corn/>.

### ALSO

Check out the recent post to the Field Crops Disease Management Blog titled “Getting Bins Ready for Wheat Storage” at:

<http://extension.udel.edu/fieldcropdisease/2014/06/20/getting-your-bins-ready-for-wheat-storage/>



# Announcements

## **Pest & Beneficial Insect Walks**

**Wednesday, June 25, 2014 4:00 – 6:00 p.m.**

UD Botanic Gardens  
531 S College Avenue, Newark, DE  
(meet outside Fischer Greenhouse)

Tour the grounds of the UDBG in Newark to identify insects, diseases, and beneficial insects in the landscape.

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

Cost: \$15

Credits: 2 Pest., 1 CNP

Register with Carrie Murphy, (302) 831-2506,  
[cjmurphy@udel.edu](mailto:cjmurphy@udel.edu)

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## **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](mailto:adams@udel.edu).

## **Job Posting: Agronomy Program Manager**

*Location:* University of Maryland, Wye Research and Education Center, Queenstown, MD.

*Duties:* Working with scientists, coordinate and implement research, demonstration and educational projects for agronomic crops.

*Minimum Qualifications:* BS degree, prefer 10 years of farm-related experience including 3 years research plot design and staff supervision. Salary commensurate w/experience, with base salary \$48,320.

*Details/Apply:* <https://ejobs.umd.edu/> Position #103087.

*Best consideration /closing date:* July 14, 2014.

*Contact:* Barbara South (410) 827-6202. EEO/AA.

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## **Weed Science Field Day**

Tuesday, June 24, 2014 8:15 a.m.

University of Delaware  
Carvel Research and Education Center,  
16483 County Seat Highway (Route 9)  
Georgetown, DE

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. We will provide sandwiches for lunch. Pesticide credits and Certified Crop Advisor continuation credits will also be available.

*For more information contact Mark VanGessel at 302/856-7303.*

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## **Field Day: Diagnosing Soybean Production Issues**

Tuesday, August 12, 2014

University of Delaware  
Carvel Research and Education Center  
16483 County Seat Hwy  
Georgetown, DE

The Delaware Soybean Board and University of Delaware Extension are cooperating on a field day designed to improve diagnostic skills and help troubleshoot production problems in the field. The Field Day will start in the late afternoon (exact time not yet set) and dinner will be provided.

*There is no cost to attend but please RSVP by August 5 to Karen Adams at (302) 856-7303 ext 540 or [adams@udel.edu](mailto:adams@udel.edu).*

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## Delaware Agricultural Financing Workshop "Show Me the Money"

Wednesday, August 20 5:00 p.m.-8:00 p.m.  
Harrington Fire Hall  
20 Clark St.  
Harrington, DE 19952

The Environmental Finance Center (EFC) invites Delaware farmers to a FREE event to discover information and resources to fund effective agricultural best management practices that can improve water quality while also offering benefits to your operation.

The agenda can be previewed [here](#). Two Nutrient Management credits will be available for attendees.

Free dinner will also be provided.

There is no cost to attend, but pre-registration is requested, and will open in July. Please register by August 14<sup>th</sup> at <http://events.r20.constantcontact.com/register/event?oeidk=a07e9c5i6rof26dff2a&llr=bhiq8ucab>

Walk-in's (no registration) will be accommodated as seating is available.

*Please contact us with any questions:*

*Jill Jefferson*

*Environmental Finance Center*

[jilljeff@umd.edu](mailto:jilljeff@umd.edu)

540-325-0151

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## The Mid-Season Aronia Twilight Tour

Tuesday, July 8, 2014 5:00-7:30 p.m.

Wye Research and Education Center  
124 Wye Narrows Drive  
Queenstown, MD, 21658

University of Maryland Extension Mid-Season Aronia Twilight Tour is for all Aronia growers and those

interested in growing Aronia. Various subjects will be covered including Aronia's cultivated origins and breeding potential, chemical application and equipment calibration and research updates.

A light meal will be provided.

*Anyone interested in registering can contact:*

*Andrew Ristvey at 410-827-8056 or*

*[aristvey@umd.edu](mailto:aristvey@umd.edu).*

*Please register by July 1st, 2014.*

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## Weather Summary

Carvel Research and Education Center Georgetown, DE

Week of June 12 to June 18, 2014

Readings Taken from Midnight to Midnight

### Rainfall:

0.04 inch: June 12

### Air Temperature:

Highs ranged from 94°F on June 18 to 74°F on June 12.

Lows ranged from 75°F on June 18 to 54°F on June 15.

### Soil Temperature:

77.0° F average

Additional Delaware weather data is available at [http://www.deos.udel.edu/monthly\\_retrieval.html](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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