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

Cucumbers
Continue to scout all fields for cucumber beetles and aphids. Fresh market cucumbers are susceptible to bacterial wilt, so treatments should be applied before beetles feed extensively on cotyledons and 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. With the warm weather this past week, we are starting to see an increase in aphid activity. A treatment should be applied for aphids if 10 to 20 percent 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. The treatment threshold for aphids is 20% infested plants with at least 5 aphids per leaf. Be sure to also watch for beneficials. With recent hot weather, be sure to watch for an increase in spider mite activity. The threshold for mites is 20-30% infested crowns with 1-2 mites per leaf. Acramite (one application only), Agri-Mek, bifenthrin, Danitol, and Oberon are labeled on melons for mite control. Zeal was also labeled this year for spider mite control on melons but it can not be applied by air. Also, it is considered ovicidal/larvacidal but will not control adult populations (http://www.cdms.net/LDat/ld7DK010.pdf). We continue to find high numbers of cucumber beetles. Since beetles can continue to re-infest fields as well, as hide under the plastic, multiple applications are often needed. Foliar products labeled for cucumber beetle control on melons include a number of pyrethroids, Assail, Lannate, Sevin, and Thionex. Venom 70SG also has a 2ee label for cucumber beetle control on cucurbits (http://www.cdms.net/LDat/ld76N019.pdf). Be sure to check all labels for rates, precautions and restrictions, especially as they apply to pollinators.

Peppers
Continue to sample for thrips. Population levels have increased this past week. 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 7-10 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 (in state: 1-800-345-7544; out of state: 302-831-8851) or visiting our website at (http://ag.udel.edu/extension/IPM/traps/latest blt.html). You should also continue to check fields for aphids. A treatment may be needed prior to fruit set, if you find 1-2 aphids per leaf for at least 2 consecutive weeks and beneficial activity is low.
Potatoes
Continue to scout fields for Colorado potato beetle (CPB), corn borers (ECB) and leafhoppers. Low levels of the first aphids have also been found.

Snap Beans
Continue to sample all seedling stage fields for leafhopper and thrips activity. Both insects can be found in seedling stage snap beans. As a general guideline, 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. 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. 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. Since trap catches can change quickly, be sure to check our website for the most recent trap catches and information on how to make a treatment decision in processing snap beans using trap catches (http://ag.udel.edu/extension/IPM/traps/latestblt.html and http://ag.udel.edu/extension/IPM/thresh/snapbeanecbthresh.html).

Sweet Corn
Continue to sample seedling stage fields for cutworms and flea beetles. You should also sample all fields from the whorl through pretassel stage for corn borers and corn earworms. Both species can now be found feeding in whorls and tassels of sweet corn. A treatment should be applied if 15% of the plants are infested with larvae. We continue to see high earworm catches, especially in the Bridgeville, Harrington, Georgetown, Laurel, Seafood and Wyoming areas. The first silk sprays will be needed for corn earworm as soon as ear shanks are visible. Be sure to check both blacklight and pheromone trap catches since the spray schedules can quickly change. Trap catches are generally updated on Tuesday and Friday mornings (http://ag.udel.edu/extension/IPM/traps/latestblt.html and

Downy Mildew on Cucurbits - Kate Everts, Vegetable Pathologist, University of Delaware and University of Maryland; keverts@umd.edu and Andy Wyenandt, Assistant Extension Specialist in Vegetable Pathology, Rutgers University; wyenandt@aesop.rutgers.edu

Downy mildew outbreaks are confined to Florida, southern Georgia and Texas at this time. We hope that downy mildew will not be transported here for several months. However, now is a good time to learn a little more about this disease and the tools available for its management.

One of the biggest questions each summer is when to start spraying for cucurbit downy mildew control. The downy mildew pathogen does not overwinter here, so rotation is not effective in managing this disease. In a normal year, the disease has to work its way north from cucurbit crops grown in the South, and there need to be weather patterns favorable to the disease which spread it to our region. The best approach for determining when to spray for downy mildew will be to stay aware of weather patterns and to scout on a regular basis. As cucurbit crops begin to develop a canopy make sure to scout on a regular basis, especially if wet weather has been around for a few days. Use resistant cultivars, if possible, apply broad spectrum fungicides in early season and scout for downy mildew. When downy mildew appears in our region, apply targeted fungicides.

The downy mildew pathotype that is of greatest concern in the mid-Atlantic is virulent (causes disease) on cucumber. Within that cucumber pathotype are strains that have overcome the resistance that was bred into the processing crop and that are insensitive to several fungicides, such as Ridomil. This strain (or strains) is the one that has caused large yield losses since 2004.
In addition to differences in the ability of pathotypes to cause disease on different cucurbits (for example: pumpkin, cucumber and watermelon) they also differ in their sensitivity to fungicides. For example the strain of downy mildew that caused the epidemics on processing cucumber recently is not controlled with Ridomil Gold. Likewise, chemical trials have indicated that the new fungicide Revus is more effective on downy mildew on pumpkin than on downy mildew on cucumber.

A longer and more complete article on downy mildew on cucurbits is online at http://mdvegdisease.umd.edu/Disease%20Management/index.cfm. It includes information on fungicides. To track the progress of Downy mildew in the eastern US and to keep up with reports of downy mildew from other states please visit North Carolina State University’s Cucurbit Downy Mildew Forecasting Center at: http://www.ces.ncsu.edu/depts/pp/cucurbit.

Understanding and Controlling Damping-Off

- Andy Wyenandt, Assistant Extension Specialist in Vegetable Pathology, Rutgers University; wyenandt@aesop.rutgers.edu

With the extremely hot weather and hit or miss downpours lately, damping-off can be very common this time of year. Damping-off can kill seedlings before they break the soil line (pre-emergent damping-off) or kill seedlings soon after they emerge (post-emergent damping-off). Common pathogens that cause damping-off include Pythium, Phytophthora, Rhizoctonia and Fusarium species. Although all four pathogens are associated with damping-off, the conditions which favor their development are very different. In general, Phytophthora and Pythium are more likely to cause damping-off in cool, wet soils. While, Rhizoctonia and Fusarium are more likely to cause damping-off under warmer, drier conditions. In general, Pythium tends to kill seedlings before they emerge whereas Rhizoctonia and Fusarium tend to kill seedlings after they emerge. There are exceptions to the rule, but none the less, all damping-off pathogens can cause serious losses if not controlled properly. Control of damping-off depends on a number of factors. First, is recognizing the conditions which may be leading to the problem (i.e. weather, greenhouse growing conditions) and second, identifying the pathogen causing the problem. Why is this so important? The fungicides applied to prevent or control damping-off are specific in the pathogens they control. Fungicides used to control Pythium or Phytophthora won’t control the other damping-off pathogens.

Why is this? The biology of the fungus and the mode of action of the fungicide dictates fungicide efficacy. For example, Ridomil Gold and Ultra Flourish (mefenoxam, FRAC code 4) and Previcur Flex (propamocarb, 28) helps control the ‘water molds’ (Pythium and Phytophthora) where Terraclor (PCNB, 14), Rovral (iprodione, 2) and Quadris (azoxystrobin, 11) helps control damping-off caused by Rhizoctonia. Therefore, it is extremely important to know which pathogen is causing the damping-off problem and which fungicide to properly apply. Always refer to the fungicide label for crop use, pathogens controlled and application rates.
Disease Severity Value (DSV) Accumulation as of June 11, 2008 is as follows:
Location: Broad Acres, Zimmerman Farm, Rt. 9, Kent County
Greenrow: April 27

<table>
<thead>
<tr>
<th>Date</th>
<th>LATE BLIGHT</th>
<th>EARLY BLIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>Daily DSV</td>
<td>Total DSV</td>
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<tr>
<td>5/16 - 5/17</td>
<td>6</td>
<td>27</td>
</tr>
<tr>
<td>5/18 - 5/21</td>
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<td>32</td>
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</tr>
<tr>
<td>6/2 - 6/4</td>
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<td>36</td>
</tr>
<tr>
<td>6/4 - 6/5</td>
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<td>40</td>
</tr>
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<td>2</td>
<td>42</td>
</tr>
<tr>
<td>6/6 - 6/7</td>
<td>1</td>
<td>43</td>
</tr>
<tr>
<td>6/7 - 6/11</td>
<td>0</td>
<td>43</td>
</tr>
</tbody>
</table>

* P days: We use the predictive model WISDOM to determine the first fungicide application for prevention of early blight as well. 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. To date, 307 P-days have accumulated at the site. The 300 P-day threshold has been exceeded so fungicides for early blight should now be applied if not already done.

The Spray Recs column in the table is also generated by the WISDOM software program. This recommendation combines the DSV accumulation for late blight as well as the P-day accumulations for early blight and computes a spray recommendation. This is presented as a guide only. Spray decisions should be made with local conditions in mind and this information can help to determine if disease conditions are favorable.

If pink rot or leak is a concern and no pink rot fungicide was applied at planting consider applying one of the following when potatoes are nickel-sized and repeating 14 days later. Apply in as much water as possible (20-30 gal/A): Mefanoxam/chlorothalonil (Ridomil/Bravo or Flouranil) 2 lb/A, or Ridomil Gold/MZ 2.5 lb/A, or Ridomil Gold/Copper 2 lb/A. If Platinum/Ridomil Gold was applied at planting the label allows one foliar application of one of those products at tuber initiation if conditions warrant.

For specific fungicide recommendations, see the 2008 Delaware Commercial Vegetable Production Recommendations Book.
Food Safety Concerns with Fresh Produce on the Front Pages Again - Produce Safety for Growers - Gordon Johnson, Extension Ag Agent, Kent Co.; gcjohn@udel.edu

Salmonella related illnesses traced to fresh tomatoes have been in the news. This has prompted increased scrutiny of the safety of fresh fruits and vegetables. The suspected cause of the recent outbreak is contaminated wash water and the temperature of the wash water in packing plants. Salmonella (and other foodborne illness causing pathogens, such as E. coli) can enter produce, such as tomatoes under certain temperature conditions related to the produce and the wash water. According to the FDA, “The temperature of the wash water should be 10 degrees Farenheit warmer than the tomato temperature to prevent infiltration. Cold water causes air cells in the tomato to contract and create a vacuum drawing water into the tomato.” While we do not have any large tomato packers in Delaware, growers large and small should still be aware of ways to reduce the risk of contamination of fresh produce. Some key considerations:

- Manures and animal feces/droppings are a major source of contamination - make all efforts to avoid any contact between raw manures or animal wastes with produce.

- Irrigation water can be a source of contamination, especially ponds and streams. Well contamination is less likely, but is possible. Test irrigation sources for Coliform bacteria. Make efforts to eliminate animal access or other contamination of these water sources. Overhead irrigation is more likely a source of contamination than drip irrigation.

- Most pathogens harmful to humans are carried by other animals (fowl; reptiles; amphibians; mammals, such as dogs, cats, deer, raccoons, etc). Exclude as many animals as possible from the fields.

- Any animal materials (waste, carcasses, etc.) should be removed immediately from the field if possible (and practical).

- Workers who come in contact with live animals, animal carcasses, or animal waste materials should wash their hands before they continue working.

- Animal manure applied as fertilizer should not be applied to fields any less than 90 days before harvest for produce not in contact with the soil. Manure must be incorporated. Otherwise, manures should be composted before use to kill pathogens. Be aware of land use near the field. Avoid establishing fields near animal operations or waste handling facilities.

- Produce that falls to the ground should not be harvested for fresh market.

- Minimize animal contact in packing facilities or areas where produce is handled or stored and where produce handling equipment is stored.

- Cull out vegetables showing bruises or decay symptoms as a preventive measure. Ideally, harvest workers should not handle culls. Culls should be removed by a separate worker, if possible, so as not to contaminate sound produce.

- Containers used in the field and for produce transportation should all be kept clean until used. If any of the containers are reusable, they should be cleaned regularly with more frequent washings if they become overly soiled. Store empty containers away from non-sanitary conditions (near waste receptacles, animal-infested areas, etc.).

- If practical, harvest containers should not be allowed to touch the ground in the field (or in storage), as this may transfer pathogens from the soil to the produce.

- Any commodity that grows on or in proximity to the ground should have extra care taken to control soil contaminants, particularly at harvest time.

- Practice animal and insect control in and around packing facilities. Cleaning and sanitation of packingline equipment is critical. Clean with detergent and physical labor (such as scrubbing or pressure washing, etc.). Use sanitizers of
various types to kill microbes on clean surfaces: walls, cooler coils, ceilings, etc., as appropriate.

- If using a dump tank or hydrocooling system, sanitizers (e.g., chlorine) used to reduce vegetable pathogens may help control human pathogens as well (must be labeled for this use). Wherever possible, drain and clean tanks daily. Be sure to rinse out any cleaning solutions before re-filling the tank. Vegetables should not be allowed to sit in water for extended periods of time. Monitor water temperatures. Water that is too cold can cause infiltration into vegetables.

- Keep employees who are ill away from produce. Employees who handle produce should not have open wounds or sores. Workers who handle fresh produce should wash hands frequently and hand washing should be emphasized when using toilet facilities.

- Keep produce cool to reduce pathogen multiplication.

- Keep store rooms and vehicles clean.

Information was taken from the Southern Regional Fresh Produce Food Safety Training Program.

A great source with links to publications on the topic of produce safety for growers can be found at this web site at North Carolina State University: http://henderson.ces.ncsu.edu/content/foodsafety.

Agronomic Crops

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

**Alfalfa**
Continue to sample for potato leafhoppers on a weekly basis. In addition to adults, we have started to find the first nymphs. The nymphs can cause damage very quickly so sample fields on a weekly basis. Once plants are yellow, yield loss has already occurred. The treatment thresholds are 20 per 100 sweeps on alfalfa 3 inches or less in height, 50 per 100 sweeps in 4-6 inch tall alfalfa and 100 per 100 sweeps in 7-11 inch tall alfalfa.

**Field Corn**
Armyworms can be found moving out of small grains and into adjacent field corn. Remember, worms must be less than 1 inch long to achieve effective control. The treatment threshold for armyworms in corn is 25% infested plants with larvae less than one-inch long. Large larvae feeding deep in the whorls will be difficult to control.

**Grass Hay Fields**
Please note that in addition to Warrior and Mustang MAX, Intrepid also has a label for armyworm control in grass hay fields. Please see the label for use rates and restrictions (http://www.cdms.net/LDat/ld61K032.pdf).

**Soybeans**
Be sure to sample fields in the seedling stage for bean leaf beetles, grasshoppers and thrips. We continue to see an increase in activity for all three insect pests. Significant grasshopper population pressure can be found in both no-till and conventional soybean fields. As barley is harvested and soybeans are planted, these fields will be especially 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 prebloom stage. As a general guideline, a treatment may be needed for bean leaf beetle if you observe a 20 - 25% stand reduction and/or 2 beetles per plant from cotyledon to the second trifoliate stages. The Iowa State economic threshold for cotyledon stage is four beetles per plant. Once plants reach the V1 and V2 stages, their thresholds increase to 6.2 (V1 stage) and 9.8 (V2 stage) beetles/plant. These treatment thresholds should be reduced if virus is present or you suspected virus the previous season. As far as thrips, information from North Carolina indicates that “soybean thrips and other thrips species can feed and reproduce on the leaves and buds of
soybean seedlings. Their feeding creates bleached-out lesions along the leaf veins and gives a silvery/bronzed appearance to the leaf surface when damage is severe. These insects are very small (less than \( \frac{1}{10} \) inch) and are torpedo shaped. While thrips always occur on soybean seedlings, it is only during outbreak years that they cause concern. In particular, during dry weather and on earlier planted full-season soybeans, thrips populations can explode when plants are growing slowly. Under these circumstances thrips injury will occasionally kill seedlings. Other stressors, such as nutrient deficiencies and herbicide injury, can add to thrips damage and cause plant loss. Yellowing can occur from thrips but there are also a number of other factors that can cause yellowing so it is important to scout fields to identify what is causing the yellowing. Although no precise thresholds are available, as a general guideline, treatment may be needed if you find 4-8 thrips per leaflet and plant damage is observed.

In addition to these 3 insect pests, you should also start looking carefully for spider mites. There were reports of spider mites on volunteer soybeans before the rains and unfortunately they have probably survived. Early detection and control is needed to achieve spider mite suppression. In addition to dimethoate and Lorsban, we now have Hero labeled on soybeans. The bifenthrin component in this mix is the material that will provide spider mite suppression. However, to be effective it should be applied before mites explode. Please refer to the label for use rates and restrictions - you will need the high rate for spider mite control. It should also be noted that the label states do not make applications less than 30 days apart (http://www.cdms.net/LDat/ld80Q005.pdf).

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**Agronomic Crop Diseases** - Bob Mulrooney, Extension Plant Pathologist; bobmul@udel.edu

**Wheat**

The wheat crop is made and now drying down. There was a late season disease that popped up that was not seen until now. Sharp eyespot is a disease that is caused by *Rhizoctonia cerealis* and causes stunting and “whiteheads” when it is severe. It can cause areas in the field that vary in size to be stunted and mature prematurely. As with take-all, the best control for sharp eyespot is rotation of at least one year out of small grains. The disease begins on the outer leaf sheath near the base of the plant. Lesions on the stems are light-brown to straw-colored with a sharply defined dark brown border. This disease could be confused with take-all but there is generally little root rot associated with sharp eyespot. Generally the disease is not severe enough to warrant control measures other than rotation with legumes or other nonhost crops.

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**Scab** or head blight is present at varying levels in some fields and others have none. Fortunately for most growers, scab was not as bad as it could have been this year. There were some fields, mostly in Kent County so far, where scab is severe and growers should check for scab and...
adjust their combines accordingly. See the last issue for more info on scab.

**Corn**

*Pythium root rot* has been the most common problem we have seen in the lab so far this season. With corn under water earlier in many places these conditions are extremely favorable for *Pythium* root rot. Seed treatments with metalaxyl or mefanoxam (Apron, Apron MAXX, Apron XL and others) should provide good control. Corn treated with Dynasty alone would not be effective under severe conditions for *Pythium* and should be combined with an Apron product for optimum disease control.

Seedling *anthracnose* was also diagnosed this week. Seedling anthracnose often occurs when corn follows corn especially in no-tillage systems. Initially, small watersoaked spots are seen and become tan with red or red brown borders as they age. Eventually the small hairs or setae of the fungus can be seen with a hand lens in the center of the lesions. Anthracnose rarely causes any loss at this stage of growth and the plants grow out of the initial infections, which can recur later in the season if the weather is favorable for anthracnose leaf blight. Burying crop residues may be helpful in reducing these early season infections but do little or nothing in reducing the late season leaf blight and stalk rot phase of anthracnose.

**Soybean Rust Update** - Bob Mulrooney, Extension Plant Pathologist; bobmul@udel.edu

Soybean rust has been found once again in Leon County, Florida, on kudzu. Soybean rust was reported on kudzu in Mobile County, Alabama on June 7th. The disease had previously been found on kudzu in Mobile earlier this year but those infected plants were destroyed. Since the beginning of 2008, soybean rust has been reported on kudzu in one county in Alabama; ten counties in Florida (two of these counties had reports on coral bean and snap bean); three counties in Louisiana; one county in Mississippi, and three counties in Texas. Reported infected kudzu sites in many counties have been destroyed. Rust was also reported in three states (5 municipalities) in Mexico on yam bean and soybean. These too have been destroyed or are no longer active, except for the recent find in Chiapas. Soybean sentinel plots have been established throughout the Gulf Coast region, and in many parts of the lower Midwest. Additional rains throughout most of the soybean growing region could favor rust development especially in locations in the South near sources of infected plants.

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**Grain Marketing Highlights** - Carl German, Extension Crops Marketing Specialist; clgerman@udel.edu

**Commodity Prices Ratchet Up on Crop Production Concerns**

New crop corn and soybean futures prices moved to new life of contract highs in yesterday's trading due to crop development problems from late plantings and wet weather in the Corn Belt. At this point in time, both acreage planted and yield potential for '08 U.S. corn and soybean production are being viewed by commodity traders as relatively unknown. The row crop production concerns are having an impact on commodity prices across the board. Currently, Dec '08 corn futures are trading at $7.44/bushel; Nov '08 soybean futures are trading at $15.03/bushel; and July '08 SRW wheat is trading at $8.59 per bushel. The extreme volatility in these markets continues to play havoc with projecting price direction from a technical perspective and, ultimately, in making informed grain sales decisions.

This may turn out to be the year that Options on Agricultural Futures play an important role in farmer's grain marketing decisions. Toward that end, an Options Webinar is being offered on Tuesday, June 17th from 1:00 pm to 2:00 p.m. ET. The webinar is being sponsored by Farm Journal Media; the University of Delaware; and the Northeast Center for Risk Management Education. Topics to be covered include:

- Put Option Basics - Carl German, Extension Crops Marketing Specialist, University of Delaware
- How to Choose the Right Put Option - Brian Grete, Senior Market Analyst, Pro Farmer
How to Hire a Broker (human or electronic) - John Phipps, Farmer and Host, U.S. Farm Report

To register for the webinar go to www.agweb.com, look for and click on the icon that reads Free Put Options Essentials Webinar - June 17th Noon to 1:00 p.m. Central Time. Please Note, the time for the webinar in the Eastern Time Zone is 1:00 p.m. to 2:00 p.m. ET.

For technical assistance on making grain marketing decisions contact Carl L. German, Extension Crops Marketing Specialist

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**Announcements**

**Put Options Essentials Webinar**

Tuesday, June 17, 2008    1:00 – 2:00 p.m.

**Topics:**
Put Options Basics
*Carl German, Extension Crops Marketing Specialist, University of Delaware*

How to Choose the Right Put Option
*Brian Grete, Senior Market Analyst, Pro Farmer*

How to Hire a Broker (Human or Electronic)
*John Phipps, Farmer and Host, U.S. Farm Report*

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This webinar is being sponsored by Farm Journal Media; the University of Delaware; and the Northeast Center for Risk Management Education.

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**For Current Agricultural Information from the UD Kent Co. Extension Office Visit**

[www.kentagextension.blogspot.com](http://www.kentagextension.blogspot.com)

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**Weather Summary**

**Carvel Research and Education Center Georgetown, DE**

**Week of June 5 to June 11, 2008**

**Readings Taken from Midnight to Midnight**

**Rainfall:**
0.01 inch: June 5

**Air Temperature:**
- Highs ranged from 99°F on June 10 to 75°F on June 5.
- Lows ranged from 75°F on June 10 to 61°F on June 6.

**Soil Temperature:**
81°F average.
(Soil temperature taken at a 2” depth, under sod)

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](http://www.rec.udel.edu/TopLevel/Weather.htm)

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**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.

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