



# WEEKLY CROP UPDATE

UNIVERSITY OF DELAWARE COOPERATIVE EXTENSION

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## Vegetables

**Downy Mildew on Cucumbers** - *Bob Mulrooney; Extension Plant Pathologist; [bobmul@udel.edu](mailto:bobmul@udel.edu) and Kate Everts; Vegetable Pathologist, University of Delaware and University of Maryland; [keverts@umd.edu](mailto:keverts@umd.edu)*

There have been no reports of downy mildew in DE or MD since last week's alert went out. Since last week's report, downy mildew was discovered in Beaufort County, South Carolina as well as on cantaloupes in Samson County, North Carolina. Tuesday was a weakly moderate risk of downy mildew for Delmarva. The rest of last week was low risk. The prevailing winds were moving north, but with the clear skies and low humidity, survival and deposition of spores were not favorable. The latest forecast (July 5) is for **low risk** the remainder of the forecast period from **July 6 through Monday July 9** from the eastern NC and SC sources. There was a **strongly moderate risk** from the Midwest sources for **Thursday July 5**. In addition, there is a High Risk to cucurbits in MD west of the bay. Continue to be vigilant and scout aggressively. We are recommending that cucumber fields that have fruit less than  $\frac{3}{4}$  inch long be sprayed preventatively for downy mildew. At the minimum spray with protectants such as mancozeb, chlorothalonil or Gavel. Keep up to date by checking the forecast site.

<http://www.ces.ncsu.edu/depts/pp/cucurbit/>

### FRAC Guidelines for Downy Mildew Fungicides for Cucumber

Since the development of FRAC codes by the NA-FRAC (North American Fungicide Resistance Action Committee) it is in everyone's interest to heed the FRAC guidelines to avoid resistance to fungicides that might be prone to losing effectiveness if not applied in the right way. The best examples of the loss of fungicide effectiveness in cucurbits was the strobilurins (Quadris, Cabrio) for gummy stem blight and now they are not effective on powdery mildew on cucurbits.

#### Fungicide (FRAC CODE)

- Fixed copper (M1), Mancozeb (M3), and Chlorothalonil (M5) are all multi-site modes of action. They work well as tank mix partners and used in rotation with other fungicides with different modes of action. They are all rated low risk for resistance development.
- Gavel (M3+22) is a mix of mancozeb and zoxamide and rated low to moderate risk.
- Tanos (11+27) is a mix of fomaxodone and cymoxanil (Curzate) and rated moderate risk. Do not make consecutive sprays of Tanos alone.
- Ranman (21) is rated moderate risk. Can be used alone or tank mixed with a protectant fungicide, but not consecutively alone.
- Curzate (27) is rated low to moderate risk. Tank mix with protectant fungicide and do not apply consecutively alone.
- Previcur Flex (28) is rated low to moderate risk and can be tank mixed or used alone but not applied consecutively alone.

Potato Disease Advisory July 5, 2007 - Bob Mulrooney, Extension Plant Pathologist

Disease Severity Value (DSV) Accumulation as of July 4, 2007 is as follows:

Location: Broad Acres, Zimmerman Farm, Rt 9, Greenrow: May 2

Remember that 18 DSVs is the threshold to begin a spray program for late blight

Date	LATE BLIGHT			EARLY BLIGHT
	Daily DSV	Total DSV	Spray Recs	Accumulated P days*
6/25- 6/26	1	15	10 days	449
6/26- 6/27	0	15	10 days	454
6/27 -6/28	1	16	10 days	460
6/28- 6/29	1	17	7 days	470
6/29 - 6/30	2	19	7 days	479
6/30- 7/2	0	19	10 days	497
7/2- 7/4	0	19	10 days	516

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, 516 P-days have accumulated at the site. Note: Once 500 P-days have accumulated susceptibility increases and early blight susceptible varieties will need to be covered.

18 severity values were reached but conditions for late blight have not been favorable. There have been no reports of late blight in the region on potatoes or tomatoes. Continue fungicide applications for early blight and late blight.

Early blight and black dot. Many fields have flowered and this is a good time to consider switching to an application or two of Gem, Headline or Quadris (Amistar) for early blight susceptible varieties. This can also be helpful for late season varieties including russets if stress makes plants susceptible to black dot later. Make one or two applications at the end of flowering and repeat 14 days later. Apply mancozeb or chlorothalonil 7 days later between the two applications.

For specific fungicide recommendations, see the 2007 Delaware Commercial Vegetable Production Recommendations Book.

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**Downy Mildew on Watermelon, Pumpkin, Squash, and Muskmelon (Cantaloupe)** - *Kate Everts; Vegetable Pathologist, University of Delaware and University of Maryland; [keverts@umd.edu](mailto:keverts@umd.edu) and Bob Mulrooney; Extension Plant Pathologist; [bobmul@udel.edu](mailto:bobmul@udel.edu)*

Although downy mildew has been confirmed in cucumber in North Carolina and the Midwest, it has not yet been seen on watermelon, squash, or pumpkin. There is one confirmed case of downy mildew on muskmelon (cantaloupe) in North Carolina. We know that different pathotypes of the downy mildew organism may affect one cucurbit but not another. For example, in 2004, 2005, and 2006 downy mildew became

established on Delmarva in July on cucumber but many other crops were not affected until much later in the growing season. A good strategy on watermelon and summer squash is to apply a protectant such as mancozeb, and to apply maneb on pumpkin and winter squash. Continue to scout these crops intensively. When downy mildew is observed within the crop or reported on watermelon, squash or pumpkin in Delaware, Maryland or a neighboring state, fungicides targeted specifically for downy mildew should be applied. These products include Ranman, Previcur Flex, Curzate and Tanos and should be tank-mixed with a protectant fungicide. Gavel also has good activity and is a good choice for watermelon or summer squash, but cannot be

applied to pumpkin or winter squash because it contains mancozeb.

This approach (protectant applications of mancozeb until downy mildew is seen on the crop) also can be used for muskmelon (cantaloupe). However be aware that there is a confirmed outbreak on a muskmelon field in North Carolina and preliminary reports indicate that muskmelons are more susceptible than pumpkins or squash to the cucumber strain. While this is quite preliminary information, muskmelon growers may opt to apply the more targeted fungicides to manage downy mildew.

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**Calcium Disorders** - *Gordon Johnson, Kent County Extension Agriculture Agent;*  
[gcjohn@udel.edu](mailto:gcjohn@udel.edu)

Calcium dominates exchange sites in soils and is rarely deficient. However, a number of calcium disorders can affect crops, even in well limed soils, including:

- Blossom end rot in tomatoes, peppers, and eggplants
- Blossom end rot in watermelons
- Watercore and glassiness in melons
- Internal leaf tipburn in cabbage
- Leaf tipburn and curd defects in cauliflower
- Internal browning of Brussels sprouts
- Leaf tipburn in spinach
- Leaf tipburn in lettuce
- Leaf tipburn and deformity in strawberry
- Internal browning, hollowheart, storage disorders, and poor skin set in potatoes
- Cavity spot in carrots
- Bitter pit, cork spot, cracking, internal brownspot, and water core in apples
- Hypocotyl necrosis in beans and other legumes
- Meristem death or distortion of new growth from meristems in many plants (cupped leaves)

Calcium is taken up in quantity by the plants from the undifferentiated area right behind the root tip. Once in the root, it moves in the xylem (water conducting vessels) and is distributed in the plant. Much of this movement in the xylem occurs by exchange. Calcium is attracted to the xylem wall and must be displaced by another ion (another calcium or other cation). This process is

driven by transpiration and subsequent water movement through the xylem. Therefore, calcium movement is relatively slow compared to other nutrients that move easily in the transpiration flow. Calcium is not translocated in the phloem (plant food transport system) so it cannot move from one area of the plant to another.

Calcium has many roles in the plant from root growth control, to cell membrane function, to stomatal regulation. The main function that leads to the disorders listed above is in the formation of plant structure. Calcium is a component of cell walls and the middle lamella that cements plant cells together. Calcium provides cross linkages in the pectin-polysaccharide matrix and adds to the structural strength of plant tissues. When insufficient calcium is present, plant tissues do not form properly and they may appear deformed and in severe cases may become necrotic - tissues may die or collapse.

Because calcium moves slowly through exchange in the xylem and is dependent upon water flow, disruptions in that flow can lead to localized deficiencies in calcium. Plant organs with low transpiration rates or that are rapidly expanding such as fruits and storage roots often do not receive enough calcium to support that growth. Growing tips and meristematic areas that are rapidly laying down new cells are also at risk for calcium deficiencies when water flow is interrupted. High humidity, drought, flooding (leading to roots shutting down), root injury, compaction, and root diseases can therefore lead to calcium disorders by the reduction of water flow and calcium exchange and movement in the xylem.

Competition from other cations such as magnesium ( $Mg^{2+}$ ), ammonium ( $NH_4^+$ ), and potassium ( $K^+$ ) can also affect calcium ( $Ca^{2+}$ ) uptake and movement. In low pH soils, aluminum can interfere with calcium uptake and lead to deficiencies.

Control of calcium disorders starts with proper liming. This provides soil calcium and raises the pH to eliminate the effect of aluminum. The most important factors to control calcium

disorders are to supply a steady rate of water (through a good irrigation program), limit root damage (such as root pruning by cultivation), provide a rooting area for the plant that is free from compaction and waterlogging, and create a healthy soil environment that limits root disease potential. Above ground, planting at spacings that allow for good air movement around the plant will also help. Control fertilizer programs to limit competition between calcium and other ions (use nitrate forms of nitrogen instead of ammonium forms for example). In addition, choose varieties that are less susceptible to these calcium disorders (varieties with very large or very long fruit are more susceptible to calcium deficiencies).

There have been mixed results with foliar application of calcium and these applications should be considered a supplement to help limit these disorders and not a correction for calcium deficiencies and good soil and water management. As stated before, calcium movement is limited so it will be difficult to get calcium to where it is needed by foliar sprays except when applied to active meristematic tissue. Calcium sprays have been effective in improving quality in crops such as apples. Sidedressed calcium has been shown to have positive effects on root crops such as potatoes, particularly in sandy soils.

## Agronomic Crops

**Agronomic Crop Diseases** - *Bob Mulrooney; Extension Plant Pathologist; [bobmul@udel.edu](mailto:bobmul@udel.edu)*

### Soybean rust update

Things are pretty quiet on the soybean rust front. Soybean rust was confirmed on June 29<sup>th</sup> in a soybean sentinel plot in Assumption Parish, Louisiana. This makes six new positive rust finds in the month of June. Four of these are in Louisiana and two in Texas. With regular rainfall in Louisiana and surrounding states to the west and north, there is an increased chance of soybean rust being found north of Louisiana in the next few weeks. So far



in 2007, soybean rust has been detected in 10 counties in Florida, five counties in each of Georgia and Alabama, five parishes in Louisiana and three counties in Texas.

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**Manganese Applications with Postemergence Glyphosate** - *Mark VanGessel, Extension Weed Specialist; [mjv@udel.edu](mailto:mjv@udel.edu)*

Roundup Ready soybeans may require a postemergence application of glyphosate (Roundup, Touchdown or GlyphoMax) and a manganese application about the same time. These glyphosate products can be tankmixed with manganese with some precautions. The manganese products can bind with glyphosate in the spray tank and reduce glyphosate's effectiveness. The form of manganese has an impact. Manganese chelated with EDTA did not affect the performance of glyphosate, but other forms of manganese did. The addition of ammonium sulfate overcame the problem. Thus, when tankmixing glyphosate with manganese, use an EDTA form of manganese or add ammonium sulfate to overcome the reduced weed control. When using ammonium sulfate be sure to add the ammonium sulfate to the tank first and add the glyphosate last.

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**Roundup Ready in Double-Cropped Soybeans** - *Mark VanGessel, Extension Weed Specialist; [mjv@udel.edu](mailto:mjv@udel.edu)*

Planting soybeans following small grains is under way. Remember to start off clean with a burndown. Trying to time the Roundup or Touchdown application to provide both "burn-down" and in-crop weed control often does not work well. Timing of in-crop application of Roundup Ultra or Touchdown is not as critical as with full-season soybeans. Applications from 14 to 28 days after planting resulted in similar weed control and yield in studies conducted with the Delaware Soybean Board. Check your fields about 14 days after planting because weeds not killed with the burndown treatment will be starting to re-grow. Then the second application

can be made before the weeds become too large.

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**Grain Marketing Highlights** - *Carl German, Extension Crops Marketing Specialist;*  
[clgerman@udel.edu](mailto:clgerman@udel.edu)

### **Rain Makes Grain**

USDA released the U.S. Planted Acreage totals on Friday, June 29<sup>th</sup> in which planted acreage shifts were reported for U.S. corn, soybeans, and wheat from the March Planting Intentions report. Simultaneously, USDA released the June Quarterly Grain Stocks report. The markets responded to those reports taking corn and wheat futures prices lower and soybean prices higher. One might wonder whether the market reacted to the contents of the report, the weather, or in the case of wheat - harvest pressure. Rain events in portions of the Corn Belt have been excellent this past week. Commodity traders are likely to be deciphering both the amount of the recent rainfall in the Corn Belt and the extent of the area covered. In the meantime the fallout from Friday's reports appears to have stabilized and it is now believed that trader attention will now turn to the next 10 day forecast and areas that are garnering production concerns. The market exhibiting the biggest production concern at the moment is wheat. It is believed that corn and soybean levels would not be at their current levels if it were not for wheat futures. Further, wheat futures are believed to be overbought. Is there a correction looming on the horizon for wheat futures?

### **General Comments**

Favorable weather conditions are expected over the next six to ten days in the central and eastern Midwest. Some stressful heat is expected in the upper Midwest - particularly in Minnesota where soil moisture reserves are reported to be running low. There are reports of developing dryness in the northwest Midwest. Overall the outlook remains favorable for pollination over most of the U.S. Corn Belt.

One argument that deserves to be noted cautions traders against believing that soybeans

have to continue bidding higher to bid for acres for '08 production. The opposing view states that the way to get more soybean acres planted is to bid corn prices lower. The point in making this observation is that there are no absolutes in this business. Market rallies should be rewarded with sales and high prices should be rewarded with sales. It may be time to consider making another soybean sale for '07 new crop production and an initial soybean sale for '08 production. The same is true for '07 and '08 wheat. Currently, Dec '07 corn futures are trading at \$3.42; Dec '08 at \$3.87; Nov '07 soybean futures at \$8.85; Nov '08 at \$8.96; July '07 wheat futures are trading at \$5.92; and July '08 wheat futures are at \$5.57 per bushel. For technical assistance in making grain marketing decisions contact Carl L. German, Extension Crops Marketing Specialist

## **General**

**ATV Safety on the Farm** - *Ron Jester; Extension Safety Specialist (retired);*  
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Agricultural workers use All-Terrain Vehicles (ATVs) to inspect and maintain crops, property, livestock, and more. While versatile, ATVs pose a safety hazard if they are not operated properly. The Consumer Product Safety Commission reports that there were 125,000 ATV injuries nationwide in 2003 and almost 6,000 deaths since 1982. Protective gear, inspections, and proper handling reduce ATV hazards for agricultural workers.

Protective gear keeps you safe and in control of your ATV. Helmets certified for ATV use provide head protection and cut death risk by half; they should be secure and impact resistant, yet still allow peripheral vision. A helmet face shield, goggles, or glasses can provide eye protection from flying dirt, rocks, insects, or vegetation. Gloves and boots protect your hands and feet, and allow you to maintain a firm grip and control over the ATV. Long sleeves and pants protect exposed skin; padded and reinforced clothing is ideal.

ATV maintenance and pre-use inspections insure that you will not lose control due to a malfunction or end up walking a long distance. Tires should be in good condition and maintained at the manufacturer's recommended air pressure. The ATV should have adequate oil and fuel levels. The chain, chassis, nuts, and other connections should be checked and secured. Brakes, controls, and cables should be functional, properly adjusted, and operate smoothly.

Proper operation helps you maintain control of the ATV. You need practice and instruction on ATV handling techniques prior to field use. Learn how to shift your weight and maintain speed during turns and up/down hill maneuvers. Most ATVs are designed for a single rider, but some seat two. If you have a two-seat ATV, the vehicle weight and handling will be altered when you carry a passenger; practice before you drive in the field.

When riding, scan ahead and to the side for obstacles, uneven terrain, vehicles, people, and animals. Reduce speed to at least 15 miles per hour if you see a potential hazard. Pay attention to hazards such as guy wires and barbed wire fences; they are low profile and difficult to see. Keep the ATV off of public roads; ATVs are only allowed to cross public roads. If you must cross a road, remember that ATVs are low to the ground and may not be visible to vehicles; use extreme caution. Lights, reflectors, and flags can make the ATV easier to see.

In Delaware registration is required of off-highway vehicles through the Division of Motor Vehicles. Applicants must be at least 18 years of age unless they are accompanied by one parent or legal guardian. The law also prohibits the operation of ATVs on public streets or highways and the rider must have the permission of the property owner before operation on private property. Delaware law also requires the proper use of a helmet, prescribes accident procedures, speed limits, and other information.

For more information, call your local police or visit the website [www.atvsafety.org](http://www.atvsafety.org).

### Hydrogen Sulfide and Manure Pits - Ron Jester; *Extension Safety Specialist (retired)*; [rcjester@udel.edu](mailto:rcjester@udel.edu)

No doubt you have heard by now about the tragic incident on a dairy farm in western Virginia where 5 died from deadly manure gas. According to the paper, when the farmer was overcome by the gas, an employee jumped in to help and was also overcome. Then the wife and two daughters tried to help and were overcome.

This represents a very common scenario that has occurred hundreds of times on farms. The culprit is hydrogen sulfide which is released when manure is being moved or stirred. The tragic commentary is that as little as one or two breaths, with as little as 600 parts per million (less than one-tenth of a percent) can cause a person to lose consciousness. Until farmers and their employees recognize this deadliest gas and the fact that rescue from pits must be conducted by trained rescue workers with protective gear, multiple deaths will continue to occur.

The hazard from exposure increases as follows:

- When gases build up in a confined space and then are suddenly released in the work environment
- Delays in emptying pits and tanks cause manure levels to rise, bringing trapped gases closer to workers examining a pit or tank
- Hot weather speeds up manure decay, thus increasing the amount of hydrogen sulfide produced
- Windless days increase the potential of pockets of hydrogen sulfide during agitation of manure

The keys to the prevention of such tragedies are educating family and workers concerning the danger of this poisonous gas, developing worker safety practices in manure pits and specified areas, properly designed ventilation systems, an action plan when entering confined spaces and rescue procedures.

For more information visit the National Ag Safety Database at [www.phppo.cdc.gov/nasd](http://www.phppo.cdc.gov/nasd).

# Weather Summary

Carvel Research and Education Center Georgetown, DE

Week of June 28 to July 4, 2007

Readings Taken from Midnight to Midnight

## Rainfall:

0.09 inch: June 29

0.02 inch: July 1

0.17 inch: July 4

## Air Temperature:

Highs Ranged from 91°F on June 28 to 77°F on June 30 and July 2.

Lows Ranged from 72°F on June 28 to 52°F on July 3.

## Soil Temperature:

79°F average.

(Soil temperature taken at a 2" depth, under sod)

Additional Delaware weather data is available at <http://www.rec.udel.edu/TopLevel/Weather.htm>

*Weekly Crop Update is compiled and edited by  
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