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Wet Weather Problems in the State

[M. D. Orzolek](#), Department of Horticulture

The last couple of weeks in June unfortunately were rather wet in many parts of the state. Some counties picked up in excess of 10 inches of rain in about 5 days. Besides making the fields to wet to work for the week, what else has this rain brought us?

- 1) The potential for many foliar diseases in all vegetable crops especially tomato, eggplant, potato, cabbage, cucumbers, pumpkins, watermelons, cantaloupes, squash and leafy greens. Growers should be on a regular spray schedule for controlling and suppressing foliar disease in all vegetables.
- 2) Lack of pollination of fruit crops such as cucumbers, melons and squash. During cloudy weather (the last 7 out of 10 days were cloudy in the state) bees tend to stay in their hive and are not in the fields pollinating fruit crops. Growers may observe a lack of fruit production during the first week of July, but with sunny days, fruit production should eventually reach normal numbers.
- 3) Leaching! The excess rains of the last two weeks certainly had the potential to leach nitrogen, potassium and boron that had been applied to the field under dry conditions. Recommend adding additional N and K through the drip irrigation system or side dressing the nutrients at relatively low rates - 5 to 10 lbs/A actual N and K. Adding an additional 0.5 to 1.0 lb/A Boron is also recommended in those locations that received over 6.0 inches of rain during the last half of June.
- 4) Finally, many of us will see a new flush of weeds that have germinated and started growing rather vigorously. If your crop will be harvested in 2 weeks or less, then maybe just mowing the weeds prior to harvest will help reduce the weed seed population already in the soil. If you will still be growing the crop for more than 4 weeks then you may want to develop a strategy for weed management during those 4 weeks or more, when the soil dries somewhat, that may include; cultivation, hand hoeing, mowing weeds off to eliminate seed heads, pulling weeds by hand or post-emergence herbicide applications for specific crops and specific weed species.

Identifying Initial Downy Mildew Symptoms in Cucurbits is Critical for Successful Management

Margaret Tuttle McGrath, Department of Plant Pathology, Cornell University

Knowing how to identify the first symptoms of downy mildew in cucurbit crops is a critical component of an effective management program. Level of control achievable with fungicides can decline greatly when applications are delayed after downy mildew onset. Downy mildew can begin to develop at any time during crop development, including the cotyledon stage. In contrast, powdery mildew typically begins to develop in field-grown cucurbit crops over a narrow period in crop development around the time of initial fruit formation; earlier in severely stressed plants and later in early-spring summer squash crops. Applying fungicides preventively throughout crop development for a disease that could begin to develop at any time, including late in the season when yield will not be impacted, is undesirable and not economical. Fungicides for downy mildew that are mobile in the plant are most effective but unfortunately they have narrow-spectrum activity, in particular lacking efficacy for the most common cucurbit foliar disease, powdery mildew, thus these fungicides are only recommended when downy mildew is present. Downy mildew was an important disease problem in cucurbit crops in 2004 and 2005.

To help with identifying initial symptoms of downy mildew, several photographs have been posted at http://vegetablemdonline.ppath.cornell.edu/NewsArticles/Cuc_Downy_Mar06.html. These include small yellow spots and small irregular black spots with yellow-green border. First symptoms also can be a water-soaked spot. Infection does not expand beyond veins thus spots develop an angular appearance as the spots expand. Sometimes several spots occur together forming a yellow patch that can have an orange tint, especially in pumpkin. Additional images of downy mildew are at http://vegetablemdonline.ppath.cornell.edu/NewsArticles/Cuc_Downy.htm.

With a good hand lens it may be possible to observe pathogen spores on the underside of leaves opposite these early spots of downy mildew, thereby confirming the diagnosis, but spores are not always present in addition to being very small and thus hard to see. Spore production can be encouraged by putting leaves on damp paper towel in a plastic bag for about 24 hours. Spores are lemon-shaped, dark gray with a purplish tint, and form on short specialized hyphae (conidiophores). As spots develop, further spore production may occur resulting in the underside of spots becoming visibly fuzzy due to the dark spores without the need for magnification; however, spores do not always form, even when leaves are incubated in a moist environment.

Information on fungicides, resistant varieties, and the on-line downy mildew forecasting system is presented at http://vegetablemdonline.ppath.cornell.edu/NewsArticles/Cuc_Downy.htm.

Pumpkin Downy Mildew Controls for Pennsylvania

Alan MacNab, Department of Plant Pathology

Downy mildew generally does not occur until mid-August. However since it can occur earlier, scout fields for earlier appearance. Refer to the Cucurbit Downy Mildew Forecasting website (<http://www.ces.ncsu.edu/depts/pp/cucurbit/>) for current status of the disease. Begin sprays when vines run or if disease occurrence is predicted for the region. Preventive applications are much more effective than applications made after disease is detected. Resistance to the QoI/Class II fungicides has been reported in the eastern US. The following are the most effective materials. Tank mix one of the following products with a protectant such as chlorothalonil (Bravo, Echo, Equus) at the equivalent of 1.5 to 2 pint of 6F/A, or maneb at the equivalent rate of 2-3 pint of 4F/A.

Ranman: 2.1-2.75 fl.oz. 400SC/A, or

Previcur Flex: 1.2 pint 6F/A, or

Curzate: 3.2 oz 60DF/A, or

Pristine: 12.5-18.5 oz 38WG/A, or

Tanos: 8 oz 50WDG/A, or

Cabrio: 12 oz 20WG/A

Materials with different modes of action should be alternated.

Sprays should be applied on a 7-day schedule. Cabrio, Tanos, and Pristine should not be alternated with each other or used consecutively. Under severe disease conditions, spray interval may be reduced if the label allows.

Late Blight Confirmed on Tomato Field in Lancaster Co.

Alan MacNab, Department of Plant Pathology

Late blight has been confirmed to be present in a commercial field of tomatoes in western Lancaster Co. Since disease is at a very early stage of development, and two applications of fungicide were applied before symptoms appeared, an aggressive fungicide program (already initiated) probably will minimize loss in this field. However, at this time, we do not know if other fields are affected. Also we do not know if this isolate from tomatoes will affect potatoes. Late blight spores can remain viable in moist conditions during transport by air (wind). Such transport by air likely could occur over distances of 50 miles or more. Therefore, I strongly recommend fungicide application as soon as possible to all tomato fields within 50 miles of western Lancaster Co., and within 150 miles northeast of western Lancaster Co. Specific fungicide suggestions are outlined below. The next fungicide application applied could be the most important application for this season. If late blight becomes firmly established before an application is made, it may not be possible to save the planting. On the other hand, where fungicides have been applied as recommended, crops have been protected and good crops have been harvested.

Late Blight Control Program Considerations for Tomatoes

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- A. If no **Late Blight** is reported (at least within adjacent states)
 - B. If **Late Blight** is present within 50-150 miles
 - C. If **Late Blight** is present within a field
 - D. Fungicides for **Late Blight** control on tomatoes
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A. If no **Late Blight** is reported (at least within adjacent states):

1. Apply protectant fungicides on the basis of a proven forecast program (1-800-PENN-IPM), or at regular intervals.
2. When applying fungicide, it is important to obtain complete coverage of the plant.

B. If **Late Blight** is present within 50-150 miles:

1. Apply a fungicide with some systemic activity (e.g. Tanos, Previcur Flex, Ranman, Forum) + a protectant.
2. For the remainder of the season, apply fungicides at regular intervals, or adjust timing on the basis of a proven forecasting program such as BLITECAST.
3. Materials, rates, and intervals may be adjusted based on weather and the local disease situation.
4. When applying fungicide, it is important to obtain complete coverage of the plant.

C. If **Late Blight** is present within a field:

1. Decide whether to destroy part or all of a planting, or to continue an aggressive control program for the remainder of the season. Consider severity, value of the crop, cost to continue an aggressive control program and increased threat to surrounding fields. If a good

fungicide program was followed before appearance of **Late Blight**, it should be possible to save the crop. If the **Late Blight** fungus has already killed 10% of the foliage, and/or if 5-10% of green fruit are affected, it could be too late to salvage much of the crop. **If one has crop insurance, there should be agreement with an insurance adjustor before a planting is destroyed.**

2. If the planting is not destroyed, continue an aggressive fungicide program to control **Late Blight**:
 - a. Apply sprays for remainder of season.
 - b. Immediately apply a material with some systemic activity (e.g. Tanos, Previcur Flex, Ranman, Forum) + a protectant.
 - c. Do not exceed 5-day intervals between sprays as long as there is active sporulation and spread.
 - d. During hot dry periods, 7-10 day intervals may be possible.
 - e. When applying fungicide, it is important to obtain complete coverage of the plant.

D. Fungicides for **Late Blight** control on tomatoes:

1. Some fungicides with some systemic activity for **Late Blight** control:
 - Forum/BASF; 4-day PHI.
 - Tanos/DuPont; 3-day PHI.
 - Previcur Flex/Bayer; 5-day PHI.
 - Ranman; 0-day PHI.

Whenever any of the fungicides listed above are used for control of **Late Blight**, tank mix with chlorothalonil or mancozeb.

2. Some fungicides with protectant activity for **Late Blight** control:
 - chlorothalonil (Bravo, Echo, Equus): 0-day PHI; in recent tests, Bravo was a superior protectant fungicide for **Late Blight** control.
 - maneb and mancozeb; 5-day PHI.
 - Gavel/Dow; 5-day PHI.
 - Several fixed-copper materials; 0-day PHI.

Corn Worm Status

Shelby Fleischer, Department of Entomology

Corn earworm overwinters as a pupa in the soil. The literature reports poor to no overwintering survivorship in Pennsylvania. However, as of June 28, corn earworm is present. Thirteen of 16 sites are positive; three are above a spray threshold if you have tasseling or silking corn. These 3 are in southern Lancaster Co., and Lehigh Co. in the east, and Washington Co. near Pittsburg in the west. There have also been one or two surprisingly high counts in New Jersey in past weeks. We don't typically see major immigration until at least late July, but some isolated spots are occurring. It is unclear if this is due to some overwintering in warm or sheltered locations, or some immigration. Ideally, this is a good time to monitor traps on your farm. If you have valuable early-season corn that is tasseling/silking, a single spray should protect that crop.

European corn borer (ECB), which does overwinter well as late-instar larvae, showed very good population development this year, perhaps due high overwintering survivorship through the mild winter. Highest captures of adults occurred during mid-to-late June, and are now declining, but not over yet. Counts at these locations suggest 4 to 6 day spray schedules. As of June 28, I believe we are in the tail end of the 1st generation, mixed with the emergence of the univoltine generation – most of these are larvae. A 2nd generation flight of ECB is starting at northern VA/DC area, and projected to reach Hagerstown Maryland within a week. You should check your farm for ECB larvae now, and be prepared for a 2nd generation flight arriving in a couple of weeks. Look for shothole damage, tassel clipping, and larvae in the whorls. Sprays timed at early row tassel help clean up ECB populations.

Fall armyworm captures are low to absent except in isolated spots. Problems with nontarget captures are also re-occurring this year. Details about this problem are at <http://www.ento.psu.edu/extension/factsheets/armyworm/idfallarmyworm.htm>.

Corn rootworms are in the late larval or pupal stage. Late larval stages are the most active for root feeding. Adult emergence – which could feed on silks - is more than a week away.

In summary, corn borer is the most likely problem now, but corn earworm is present in some warmer areas. Sprays timed at early row tassel help clean up ECB populations; a cover spray on silks may be warranted on valuable early-season corn. If you did not rotate, then now is a good time to see if your rootworm management was effective.

The organization of monitoring data is a cooperative project with Penn State Extension and the Pennsylvania Vegetable Grower's Association; this year we also received support from ENRI (Environment and Natural Resources Institute) of the College of Agriculture. The trap catch information from Pennsylvania and neighboring state are best reviewed as maps at www.pestwatch.psu.edu or links from there. "PestWatch" visualizes changes over time as animations, while individual dates can be seen as still frames with linked time-series graphics. GIS functionality is through a small set of graphical function buttons. The "Interactive Maps" tab brings you to the PestWatch visualization of the spatial and temporal data, and scrolling to the times during July through August typically provide the most data with the greatest spatial variation.

During the past decade, major moth immigrations into the Northeast have varied by as much as a month.

Another important link you can reach from PestWatch is maps estimating insect and crop phenology. Phenology refers to the timing of biological events. These maps include estimate of phenology for European corn borer and corn rootworm. You can reach them by clicking on the “thermometer” button on the right hand side of the interactive maps. Or go there directly, at <http://psu.zedxinc.com/cgi-bin/site.cgi?location=2&user=psu>.

Greenhouse Design and Operation Course

October 26 & 27, 2006

New Brunswick, NJ – This popular two-day program will review greenhouse design parameters, including heating, ventilation & cooling, supplemental lighting & shading, glazing, environmental control, developing a master plan, open-roof greenhouses, crop production, greenhouse economics, and high tunnels. A tour of research and commercial greenhouse facilities is included.

Tuition for our two-day course is \$345 if you register before October 5, 2006. After this date, the tuition will be \$395. Your tuition includes daily continental breakfasts, lunches, coffee breaks, and light afternoon snacks, along with your course materials and field trip. Please contact Dominick Mondri at (732) 932-9271 x604 or mondri@aesop.rutgers.edu for further details. Online registration is available at www.cookce.rutgers.edu.

Upcoming Meetings

If you have a meeting you would like to announce, please send the meeting title, date, location and contact information to esanchez@psu.edu.

Local

August 8, 2006. Bramble Disease Management Field Day, Horticulture Farm, Rock Springs, PA. For more information contact the Pennsylvania Association for Sustainable Agriculture (PASA) at 814-349-9856 or at www.pasafarming.org.

August 26, 2006. Workshop for Training Master Gardener’s on High Tunnel Technology, the Penn State High Tunnel Research and Education Facility, Horticulture Farm, Rock Springs, PA. For more information contact Bill Lamont, wlamont@psu.edu or Becky Grube becky.grube@unh.edu, or George W. Hamilton george.hamilton@unh.edu.

September 7, 2006. Twilight Vegetable Pest Walk in Northampton County, starting at 4:30 pm. Pesticide update credits will be offered. Contact Emelie Swackhamer, Lehigh and Northampton County Cooperative Extension for more information at 610-391-9840 or 610-746-1970.

Regional

July 1, 2006. Workshop for Training Master Gardener's on High Tunnel Technology, Woodman Farm, University of New Hampshire, Durham, New Hampshire. For more information contact Bill Lamont, wlamont@psu.edu or Becky Grube becky.grube@unh.edu, or George W. Hamilton george.hamilton@unh.edu.

July 19, 2006. 2006 Vegetable and Small Fruit Field Day, Rock Springs, PA. For more information contact Mike Orzolek at 203 Tyson Bldg, The Pennsylvania State University, University Park, PA 16802 or by phone at (814) 863-2251 or e-mail at mdu1@psu.edu.

October 26 & 27, 2006. Greenhouse Design & Operation, Cook College Office of Continuing Professional Education, New Brunswick, NJ. For more information contact Karen Tizzano at ktizzano@rci.rutgers.edu.

National

International

To join our distribution list, send an e-mail to: Gazette-L-subscribe-request@lists.psu.edu. No subject or message text is required. The system picks up the name and address from the e-mail headers. To delete yourself from the list send an e-mail to: Gazette-L-unsubscribe-request@lists.psu.edu. Again, no subject or message text is required.

The newsletter is also posted within three days on the Department of Horticulture Vegetable program website at: <http://hortweb.cas.psu.edu/extension/veg crops/newsletterlist.html>.

Where trade names appear, no discrimination is intended, and no endorsement by Penn State Cooperative Extension is implied.

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