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College of Agricultural, Consumer, and Environmental Sciences

Illinois Fruit and Vegetable News

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A newsletter for commercial growers of fruit and vegetable crops

"We are what we repeatedly do. Excellence, then, is not an act, but a habit." Aristotle

Address any questions or comments regarding this newsletter to the individual authors listed after each article or to its editor, Rick Weinzierl, 217-244-2126, weinzier@illinois.edu. The *Illinois Fruit and Vegetable News* is available on the web at: <http://www.ipm.illinois.edu/ifvn/index.html>. To receive email notification of new postings of this newsletter, call or write Rick Weinzierl at the number or email address above.

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University of Illinois Extension Specialists in Fruit & Vegetable Production & Pest Management

Upcoming Programs

- **Grape Grower Workshops, July 31 and August 1, 2009**, near Carbondale and Quincy; see Elizabeth Wahle's notes below.
- **University of Illinois Dixon Springs Ag Center Field Day, August 6, 2009**, at the Dixon Springs Ag Center. For information, contact Jeff Kindhart at 618-695-2444 or jkindhar@illinois.edu.
- **Twilight meeting for sweet corn and tomato growers, August 6, 2009**, at Fournie Farms in Collinsville; sign-in will start at 5:30 p.m., with the program beginning at 6:00 p.m. Discussion will focus on yield and evaluation data from on-site trials. For more information, contact Elizabeth Wahle at 618-692-9434 or wahle@illinois.edu.
- **2009 Illinois Pumpkin Field Day, September 10, 2009**, at the University of Illinois Vegetable Crops Research Farm at Champaign, IL. More information will be included in upcoming issues of this newsletter. For now, for program and registration details, check: <http://web.extension.uiuc.edu/edwardsvillicenter/foodcrophort.html>.
- **2009 Sustainable Agriculture Tours that involve fruits and vegetables:**
 - **August 13, Creative Community Co-op Farming.** Basu Natural Farms, Pembroke
 - **September 22, Fresh Fruits and Vegetables.** River Front Berry Farm, Martinton (<http://www.riverfrontberryfarm.com>)

A fee of \$20 per person will be charged for each tour, which includes lunch. Registration at least one week in advance is required. For more information on these and other tours, see <https://webs.extension.uiuc.edu/registration/default.cfm?RegistrationID=2845>. To register by phone, contact Donna Cray at 217-241-4644. For more information, contact Deborah Cavanaugh-Grant (217-968-5512; cvnghgrn@illinois.edu).

Regional Updates

At the Dixon Springs Ag Center ... Tomato harvest is picking up at DSAC. The cooler and wetter than average season has resulted in slower crop development, but fruit quality and plant health have been very good. We are one of multiple sites throughout the Midwest conducting a coordinated evaluation of several heirloom tomato varieties. The heirlooms have in general exceeded my expectations for both fruit quality (especially flavor) and consumer appeal. Traditional commercial determinate tomatoes are also performing well so far.



Tomato trials at the Dixon Springs Ag Center.

Our pepper cultivar evaluation has suffered some phytophthora problems, as have many commercial fields, with first harvest expected next week. Quality looks like it will be good, although there were fruit set problems on some cultivars. The sweet corn trial at DSAC is silking now, and corn earworm moth counts have been low.

On the fruit side of things, Japanese beetles present an ongoing battle in blueberries, blackberries, and apples although the population seems lighter than in recent years. Blueberry harvest is winding down at DSAC with 'Lateblue' beginning to pick this week. Matted-row strawberries are making growth, and plasticulture growers are ordering supplies for rooting tips in a couple of weeks. We have established buckwheat and mustard cover crops as part of our research on strawberry plasticulture during the coming year. Blackberry harvest continues on the florican crop and the primocane crop is still forming but will begin picking with a week or two. Pumpkin plots have also been established at DSAC as part of Dr. Masiunas' USDA RAMP project.

There will be a field day at DSAC on August 6 and a twilight meeting that evening in Collinsville. Hope to see you there.

Jeff Kindhart (618-695-2444 or 618-638-7799; jkindhar@illinois.edu)

In southern and southwestern IL ... Harvest is ongoing for many crops including tomatoes, sweet corn, everbearing raspberries, thornless and thorny blackberries, nectarines, and peaches. Quality is excellent. The earlier ripening grapes are at veraison and apples are sizing. Blueberry harvest is falling off. Blueberry growers are reminded that pruning for height control needs to be done by early August in order to avoid pruning off next year's fruit buds which usually start developing sometime after that period. Matted row strawberries following renovation are putting on good growth towards next year's crop. There was a bit of a shutdown in flower development and fruit set in solanaceous and cucurbit crops during the hot spell in late June, but production seems to be resuming now that temperatures have returned to more optimal levels.

With such a wet year, disease and loss of weed control are a common theme throughout the region. Several diseases seem to be making themselves known, including black rot and anthracnose in grape, scab and bacterial spot in peach, fire blight in apple, and bacterial diseases in tomato.

A twilight meeting is scheduled for sweet corn and tomato growers for August 6 at Fournie Farms in Collinsville; sign-in starting at 5:30 p.m. with the meeting beginning at 6:00 p.m. Discussion will focus on yield and evaluation data from on-site variety trials. The sweet corn trial contains 50 cultivars and the tomato trial contains 22 cultivars for comparison, giving growers an opportunity to look at newer or soon-to-be released material. For more details or if disability accommodations are required, please contact Elizabeth Wahle at (618) 692-9434 or by email at wahle@uiuc.edu.

The next grape grower workshop, sponsored by IGGVA, UI Extension, VESTA, and IDoA, is scheduled for July 31 at Blue Sky Vineyard and Winery, and another is scheduled at the Village Vineyard and Winery the following day on August 1. These workshops provide hands on experience working with special equipment used in measuring and determining grape ripeness. In addition to vineyard sampling of differing grape varieties and other fruits, winemakers are also invited to bring wine samples for analysis as well. Workshop participants on July 31 will meet at Blue Sky Vineyard and Winery, which is located in northeast Union County on CR-15/Rocky Comfort Road. Registration fees will be taken at the door starting at 5:30 p.m. and will be \$25.00 per person. The program is scheduled to run from 6:00 to 9:00 p.m. and will include refreshments. From Carbondale, go east on old US-13 HWY/ E Walnut Street. Turn right onto CR-12/ S Giant City Road and travel just over 6 miles. Turn left onto CR-24/ Grassy Road and travel another 3 miles. Turn right onto Rocky Comfort Road and travel just over 4.5 miles. The winery entrance will be on the left.

This same workshop will be repeated the following day on August 1 at the Village Vineyard and Winery in Camp Point. Workshop participants will meet at Village Vineyard and Winery, which is located northeast of Quincy in Adams County. Registration fees will be taken at the door starting at 9:30 a.m. and will be \$25.00 per person. The program is scheduled to run from 10:00 p.m. to 1:00 p.m., followed by lunch. From Jacksonville, take US-67 N/ IL-104 west toward Beardstown/ Macomb. Travel just over 13.5 miles and turn left to stay on IL-104. Travel 4.0 miles before turning right onto IL-99. Travel just over 15.0 miles, then turn left onto US-24/ 800 E/ IL-99. Continue to follow US-24 for just over 17.0 miles before turning right onto South Ohio Street. Turn right onto East State Street. East State Street becomes North Vermont Street. The winery entrance will be on the left (west).

Don't forget to dress for the weather, since some of the workshop time will be spent in the vineyard. This is a hands-on workshop, and participants are encouraged to bring their personal gear, including pruners, gloves and work boots. All testing equipment will be supplied, but participants are encouraged to bring their personal refractometer and or portable pH meter. For more details or if disability accommodations are required, please contact Elizabeth Wahle at (618) 692-9434 or by email at wahle@uiuc.edu.

The 2009 Pumpkin Day will be held September 10th at the Vegetable Crops Research Farm at Champaign, IL. For program and registration details go to: <http://web.extension.uiuc.edu/edwardsvillecenter/foodcrophort.html>

Elizabeth Wahle (618-692-9434; wahle@illinois.edu)

In northern Illinois, the last two weeks have seen mostly sunny days with highs in the 70s to mid 80s, and lows in the 50s to 60s. Soil moisture content is low in many parts of the region, as the area received about 1 inch of rain recently. In general, growers have turned on irrigation equipment in their farms.

Apples are sizing well, and orchardists are including calcium in their summer spray programs. Apple scab is a problem in some orchards after all the rains earlier in the year. Even so, some tree fruit crops need to be irrigated during this time, particularly varieties grafted on dwarfing rootstocks. The Japanese beetle population is very high in the region.

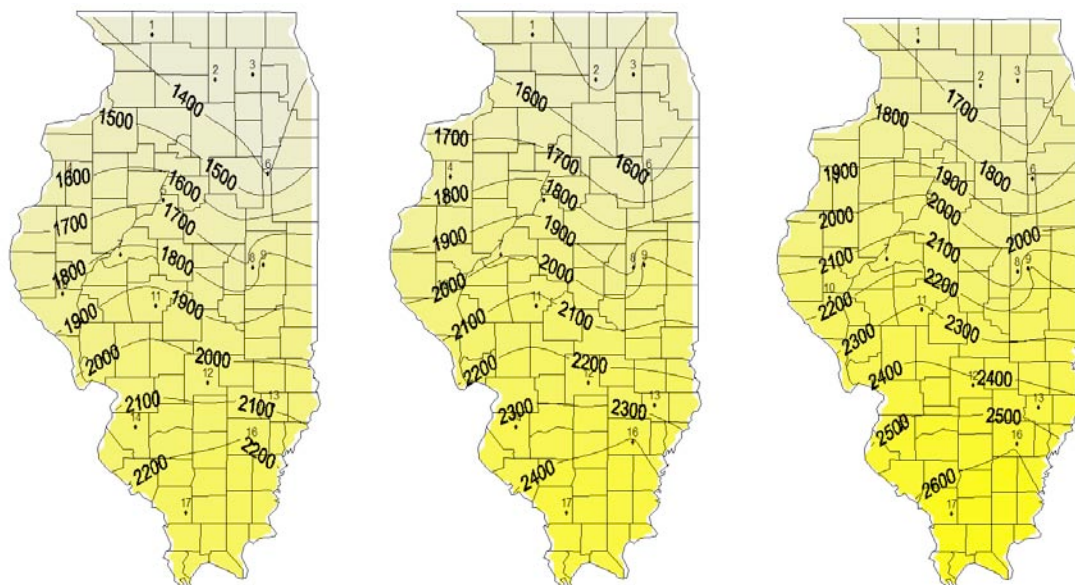
European corn borer and corn earworm moth counts were very low last week in grower fields and at the St. Charles Horticulture Research Center. Harvest of sweet corn and early-maturing varieties of bell pepper is underway in Kankakee County and will soon commence in other counties in the region. Harvesting of summer squash, cucumbers, greens, cabbage, and tomatoes and other vegetables in high tunnels is also underway. Muskmelon and watermelon fruits are sizing well in the Kankakee area; bacterial wilt and fusarium wilt reported in some cucurbit fields. Bacterial spot and speck of tomatoes is starting to show up in some farms. Foliar diseases such as anthracnose and angular leaf spot were observed in some pumpkin fields. Squash vine borer, squash bugs, cucumber beetles, and western corn rootworm beetles are common. Now is the time to side-dress pumpkins with nitrogen as the vines begin to run.

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Degree-day Accumulations

Degree-day accumulations, base 50 degrees F, starting January 1, 2009.

Station	County	Base 50F DD Jan 1 – July 22, Historic Average	Base 50F DD Jan 1–July 29, 2009	Base 50F DD Jan 1–July 19, 2009 (Projected)	Base 50F DD Jan 1–Aug 5, 2009 (Projected)
1. Freeport	Stephenson	1603	1366	1525	1682
2. Dekalb	Dekalb	1661	1327	1480	1628
3. St. Charles	Kane	1558	1375	1525	1671
4. Monmouth	Warren	1766	1581	1744	1899
5. Peoria	Peoria	1851	1690	1863	2031
6. Stelle	Ford	1744	1394	1560	1719
7. Kilbourne	Mason	1961	1823	1994	2158
8. Bondville	Champaign	1874	1698	1866	2025
9. Champaign	Champaign	1911	1866	2044	2216
10. Perry	Pike	1899	1822	1998	2168
11. Springfield	Sangamon	2025	1950	2136	2316
12. Brownstown	Fayette	2128	2044	2234	2417
13. Olney	Richland	2109	2084	2268	2445
14. Belleville	St. Claire	2196	2149	2337	2518
15. Rend Lake	Jefferson	2287	Missing	Missing	Missing
16. Fairfield	Wayne	2228	2215	2409	2596
17. Carbondale	Jackson	2211	2279	2459	2642
18. Dixon Springs	Pope	2265	Missing	Missing	Missing



Degree-day accumulations, base 50 F, January 1- July 22, 2009 (left), and projected through July 29 (center) and August 5 (right).

Degree-day accumulations presented in the maps above based on weather stations in the Illinois State Water Survey WARM data base have been taken from the Degree-Day Calculator on the University of Illinois IPM site (<http://www.ipm.uiuc.edu/degreedays/index.html>). The maps present degree-day accumulations and projections based on a 50-degree F developmental threshold and a January 1 starting date, but other options that use different thresholds and specific biofix dates are available on the Degree-Day Calculator. The degree-day calculator is available as a result of a joint effort of current and former extension entomologists (primarily Kelly Estes) and Bob Scott of the Illinois State Water Survey. If you have questions about how to use the site, contact me or Bob Scott (rwscott1@uiuc.edu).

Rick Weinzierl (217-244-2126; weinzier@uiuc.edu)

Notes from Chris Doll

Unusual weather in SW Illinois for mid-late July ... Jim Eckert said on the phone this morning that St. Louis has recorded 90 degrees only once so far this month. My records say two days, but only 90 for the high. Sunshine has been lacking on many days, so that sugars in peaches seem to be lacking, but the red color in the skin is great, as it is on the early apples. The cool weather the past two weeks has tallied only 322 degree-days (base 50), which should extend the current codling moth generation much longer than usual.

The back operation continues to limit my orchard travels much beyond the Back-40. And there, the harvesting is being done by a good worker. At this time, the Saturn and Red Haven peaches are ripe and Earligold apple is ready to pick. Thornless blackberries are in good shape, and the first picking of fall-bearing red raspberries was made today. Luckily, the Japanese beetle population is down, and no other insect pests have found the apples and peaches. However, a rainy season and sporadic spray schedule has allowed significant infections of peach scab, bacterial spot and brown rot in the stone fruits. Some brown rot infections have been seen both here and in an orchard that missed the pre-harvest fungicides, both on the fruit and shoots.

It's the time of the season that some peach trees are showing nitrogen deficiency in the leaves. This is indicated by a general pale color of the tree and reduced growth of the shoots. Leaves that are pale yellow can develop red spots that result in a shot-hole appearance similar to bacterial spot. The question of adding more nitrogen at this time of the year came up quite frequently when I was working. Usually, the answer was that it was OK on the first of July, maybe OK on July 15, and no after August 1. There are exceptions to these dates that depend on future weather (whether rains will come to move it into the soil) and how much tender growth it will stimulate that is subject to freeze injury.

In most hot and dry July's I comment on getting enough calcium on the apple trees to avoid corking of the fruit. A cool July with lots of wet soils can also cause the same lack of calcium uptake and resultant cork spot. Another aspect for this year is a lighter crop set on apples that can be more susceptible to the problem also.

The season for applying Retain for delaying apple maturity, with the resultant effects of some drop control and increased red color by extending the harvest season, is rapidly approaching, or may be past for Gala from here south. Win Cowgill of Rutgers likes 1/2 rate of Retain on Gala and other early varieties. I have seen it work better on Gala than Jonathan in this section of the state.

Chris Doll

Fruit Production and Pest Management

Codling moth and oriental fruit moth updates

Codling moth biofix dates and degree-day (base 50F) accumulations:

	Biofix Date	DD Base 50 F, through July 22	DD Base 50 F, projected through July 29	DD Base 50 F, projected through August 5
Murphysboro (Carbondale weather data)	April 24	1908	2096	2277
Centralia (Fairfield weather data)	April 28	1809	2002	2188
Hardin (Brownstown weather data)	April 30	1656	1845	2027
Urbana (Champaign weather data)	May 10	1462	1640	1810
Rockford (Dekalb weather data)	May 19	1059	1212	1309

Developmental events for the codling moth based on degree-day accumulations are presented below. Second-generation moth flight should be well underway in northern Illinois and nearly complete in the south. Within a couple of weeks, third generation flight will begin in the south.

Codling moth development:

First moths of second generation emerge	~860-900 DD ₅₀ after biofix
First eggs hatch for second generation larvae	~1100-1120 DD ₅₀ after biofix
50 percent of second generation moths emerged	~ 1340 DD ₅₀ after biofix
50 percent of eggs have hatched for second generation larvae	~ 1580 DD ₅₀ after biofix
90 percent of second generation moths emerged	~ 1660 DD ₅₀ after biofix
10 percent of third generation moths emerged	~ 2100 DD ₅₀ after biofix
First egg hatch for third generation larvae	~ 2160 DD ₅₀ after biofix
30 percent of third generation moths emerged	~ 2300 DD ₅₀ after biofix
10 percent of eggs have hatched for third generation larvae	~ 2340 DD ₅₀ after biofix

(Table based on *Orchard Pest Management* by Beers et al., published by Good Fruit Grower, Yakima, WA.)

Oriental fruit moth phenology becomes pretty “blurry” by this time of year in the southern half of the state. For Hardin, for example, since an April 15 biofix, base 45F degree-day accumulations are now around 2300 and are projected reach 2750 in 2 weeks. Those totals suggest that third generation flight is at a peak now and that in slightly more than 2 weeks the fourth generation flight will begin. However, several factors in addition to degree-days influence the relationship between population dynamics and time. Larvae that feed on different hosts or tissues (apples versus peaches for example, or peach shoots versus fruits) develop at slightly different rates. Temperatures vary in different portions of orchards or canopies. Individuals differ slightly in their development rates. Over the course of three and more generations of development, peaks and low points in population densities become less and less clear. Add to these the factors the impacts of control practices – remember, only the **surviving** individuals in a given generation (within an orchard, the ones that escape or are resistant to insecticide applications) reproduce and contribute to the next generation – and predicting peak flights based on degree-days in a specific orchard gets really muddled. To determine control needs for OFM in late peaches and in apples from now through the end of the season, the text below (repeated from an earlier newsletter) provides some guidelines.

To determine the need for and timing of insecticide applications for summer generations of oriental fruit moth, remember that if populations are heavy enough to warrant control, then effective spray residues must be present on fruit surfaces when eggs are hatching so that first stage larvae are killed before they enter the fruit. (For some insecticides, spray residues may be most effective if they are already on the fruit when the egg is laid; labels for these products specify timing applications accordingly.) The often-used threshold to reach a decision to spray is 5 moths per trap per week (some references recommend a threshold of 6-8 moths per trap per week). Catching this number of male moths is interpreted as evidence that female moths are also present, that mating and egg-laying is occurring, and that enough larvae will be produced to cause an economically significant amount of damage to fruit. Eggs hatch in approximately 175 degree-days, so whenever trap catches exceed 5 per trap per week, an effective residue needs to be on the fruit by 175 degree-days later. In the heat of summer, if daily highs and lows are 95 and 65, respectively, 175 degree-days (base 45) accumulate in 5 days. Insecticide applications should, for the most part, be assumed to last effectively for about 14 days, depending on wash-off by rainfall, so as the interval since the previous spray approaches 14 days, the need for reapplication today can be based on moth catches (and therefore presumed egg-laying) 5 to 10 days ago.

For growers who use mating disruption but want to know when flights are peaking and supplemental control (in addition to mating disruption) might be needed, placing traps in areas not treated with pheromone dispensers will be necessary. These might include nearby blocks of apples or peaches not under mating disruption, adjacent wooded areas, and the border rows of pheromone-treated blocks.

Rick Weinzierl (217-244-2126; weinzier@uiuc.edu)

Vegetable Production and Pest Management

Downy mildew of cucurbits



Downy mildew of cucurbits, caused by *Pseudoperonospora cubensis*, is a very destructive disease of cucurbits. On July 22, 2009, I identified downy mildew on cucumber leaves sent to me from Hamilton, Illinois (Hancock county). This is an unexpected incidence of downy mildew in Illinois. In 2008, no downy mildew of cucurbits was observed in Illinois. This year, downy mildew has been reported from the East Cost and Southern states, but it has not been observed in the neighboring states yet. Weather conditions in Illinois are very conducive for development of downy mildew and all cucurbit growers in the state should be prepared for its control. Downy mildew of cucumber may spread onto melons, but the pathogen on cucumber may not infect pumpkins and squashes.

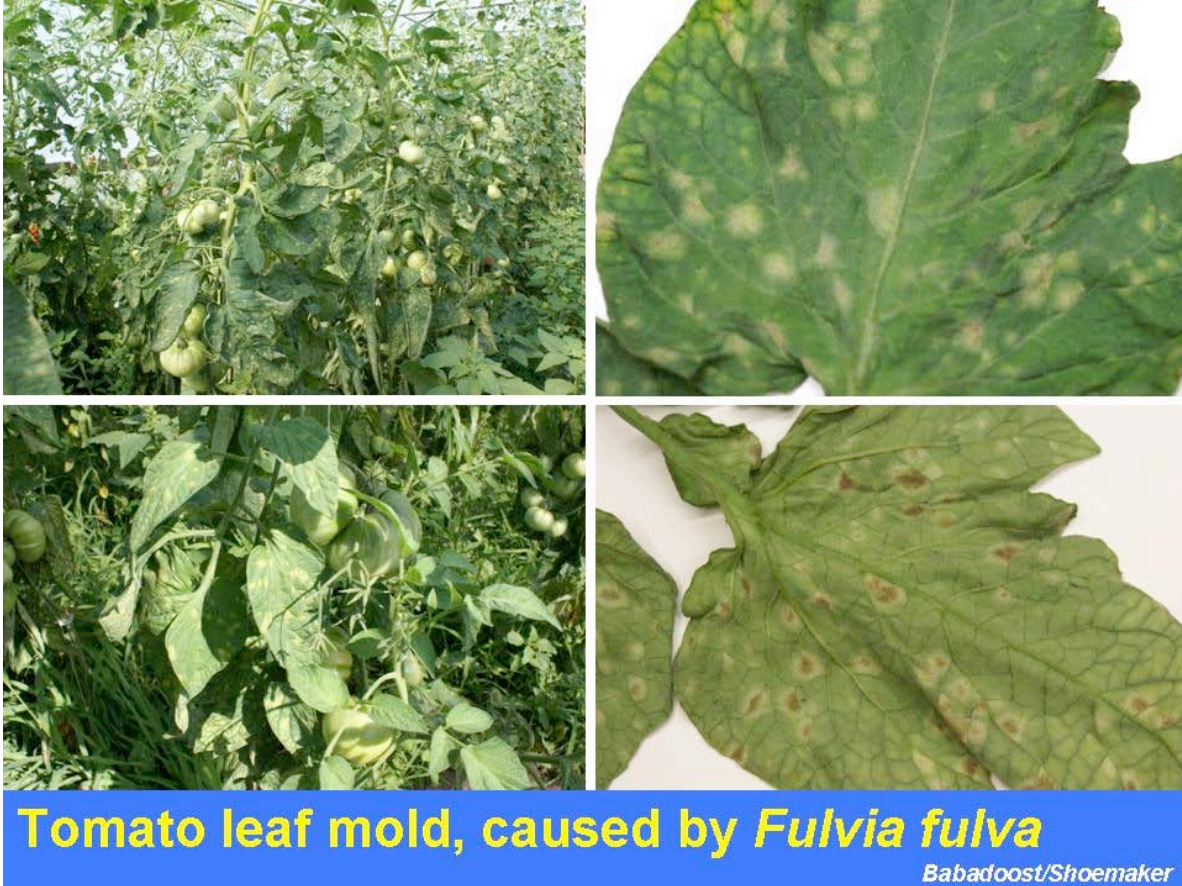
Downy mildew affects leaves only. Symptoms of downy mildew vary with the host and the environmental conditions. The first symptom is usually the appearance of indistinct, pale green areas on the upper leaf surface. The pale green areas soon become yellow in color and angular to irregular in shape, bounded by the leaf veins. As the disease progress the lesions may remain yellow or become brown and necrotic. During moist weather the corresponding lower leaf surface is covered with a downy, pale gray to purple mildew. Often an upward leaf curling will occur. Cucurbit fields should be scouted frequently (at least one per week) for occurrence of downy mildew. The field with infected plants should be sprayed at the first sign of the disease. Fungicide sprays should be applied at 7-day intervals. Previcur Flex 6SC, Tanus 50WG, Ranman 3.6SC, Revus 2.09SC, and Presidio 4SC are effective against downy mildew of cucurbits in Illinois. These fungicides should be mixed with Bravo (chlorothalonil) and alternated. Gavel also can be used to control downy mildew of cucurbits, except on pumpkins. Our studies in the past have showed that including chlorothalonil (e.g., Bravo) in the regular sprays is effective on delaying development of downy mildew in pumpkin fields.

For more information on downy mildew of cucurbits, consult the **2009 Midwest Vegetable Production Guide for Commercial Growers** (http://www.btny.purdue.edu/pubs/ID/ID-56/ID-56_Production_Guide.pdf) and refer to the following website: <http://veg-fruit.crops.cuiuc.edu/new/Cucurbits.asp>.

Mohammad Babadoost (217-333-1523; babadoos@illinois.edu)

Leaf mold of greenhouse tomatoes

Leaf mold, caused by the fungus *Fulvia fulva* (synonym *Cladosporium fulvum*), is a common and destructive disease on tomatoes grown under humid conditions. Leaf mold is primarily a problem on greenhouse tomatoes, but occasionally develops on field and garden-grown tomatoes if conditions are favorable. When humidity is high, the fungus develops rapidly on the foliage, usually starting on the lower leaves and progressing upward. If the disease is not controlled, large portions of the foliage can be killed, resulting in significant yield reductions. Severely infected tomato plants grown in high tunnel was observed in northern Illinois about one week ago.



Leaf mold of tomato can easily be diagnosed based on the syndrome of the diseases. Symptoms usually develop on foliage. The first leaf symptom is the appearance of small, white, pale green, or yellowish spots with indefinite margins on the upper leaf surface. On the corresponding areas of the lower leaf surface the fungus begins to sporulate. The fungus appears as an olive green to grayish purple velvety growth, composed mostly of spores (conidia). Infected leaf tissue becomes yellowish brown, and the leaf curls, withers, and drops prematurely. The withering and defoliation progress up the plant until the entire plant may appear dry and dead. Symptoms can also develop on blossoms and fruit. Blossoms can be killed before fruit set. Fruit infections appear as a black, leathery, stem-end rot, which can develop on both green and ripe tomato fruit.

The disease can be controlled by planting resistant cultivars and cultural practices. Cultivars reported resistant to some strains of the fungus are 'Santa Fe', 'Globelle' (pink fruit), 'Bay State' (red fruit), and 'Vetomold' (red fruit). Effective cultural practices are: (1) keeping the relative humidity in the greenhouse below 85 percent and keeping free moisture from forming or persisting on leaves; (2) providing good ventilation and as much light as possible; (3) maintaining temperature at 60 to 65°F, at least, heating the greenhouse at night when outside air drops below 60°F to control humidity increases that come with lower outside air temperatures; (4) avoiding leaf wetting and allowing leaves to dry before night; (5) using adequate plant spacing and fans to ensure good air circulation and leaf drying; (6) removing and destroying all plant debris after harvest. Spraying to control leaf mold in greenhouses has not been very successful. For additional information on tomato leaf mold, refer to http://web.aces.uiuc.edu/vista/pdf_pubs/941.PDF.

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Quick notes on vegetable insects:

- Corn earworm and European corn borer moth counts are low in most areas of the state now, though traps at Collinsville continue to catch significant numbers of corn earworm moths.

- Twospotted spider mites have shown up on tomatoes in several locations. Acramite, Agri-Mek (and generics), and Oberon are effective miticides for use against twospotted spider mite. (For tomato russet mite in tomatoes and peppers, use wettable sulfur for control.)
- In Brassica crops (broccoli and relatives, as well as greens such as collards, kale, and mustards), hot, dry weather in late summer (if it returns) often spurs problems with diamondback moth and cabbage looper. Diamondback moth populations vary, but many are resistant to several insecticides, including the pyrethroids and some organophosphates and carbamates. To maintain effective control of diamondback moth, growers are reminded to use insecticides with alternative modes of action; these include *Bacillus thuringiensis* products, Coragen, Entrust or SpinTor, Proclaim, and Rimon.

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