UNIVERSITY OF ILLINOIS EXTENSION
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, 217-333-6651, weinzier@uiuc.edu. The ***Illinois Fruit and Vegetable News*** is available on the web at: http://www.ipm.uiuc.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.

In this issue ...

Upcoming Programs

- **Small Farms / Sustainable Ag Tour, July 30, 2007, Living Earth Farm, Farmington, IL.** 9:00 a.m. to 1:00 p.m., including a lunch featuring local and organic food. Ponte Vecchio restaurant in Peoria, which buys produce from Living Earth Farm will send their Chef Josh Uteck; Chef Charles Robertson, instructor in the culinary arts program at Illinois Central College will be available for questions; and Erin Meyer, owner and entrepreneur of Basil's Harvest will prepare specialty items. All three guests will be preparing lunch using locally grown produce. More information and registration is available at http://web.extension.uiuc.edu/smallfarm/ag_tours.cfm. For additional information, contact Deborah Cavanaugh-Grant (217-968-5512; cvnghgrn@uiuc.edu).
- **Details to follow in subsequent issues of this newsletter …**
  - Southern Illinois University Grape Program Open House, August 11, 2007.
  - University of Illinois St. Charles Horticulture Research Center Grape Open House, August 25, 2007.
  - Illinois Pumpkin Field Day at the University of Illinois St. Charles Horticulture Research Center, September 11, 2007.

Regional Updates

In northern Illinois, the last ten days have been characterized by day temperatures in the 70s to 80s and night temperatures in the 50s to 60s. Soil moisture is adequate or greater in most parts of the region, as rainfall was widespread and heavy from July 16 to 20. Some areas, including location in Dekalb County, received more than 5 inches of rainfall, and nearly all areas received at least 1 inch. Apples are sizing well, and growers are continuing with cover spray programs that now include calcium. Scattered infestations of Japanese beetles have been reported. Grapes also are sizing well … and grape foliage is another favorite of Japanese beetles where they occur. Sweet corn, summer squash, cucumber, and pepper harvesting is going full speed, and tomatoes will be ready soon for most growers. Muskmelon harvesting will start very soon in Kankakee area. European corn borer and corn earworm moth counts at the St. Charles Horticulture Research Center have been very low. Foliar and fruit diseases are now showing up in vegetable fields; root rot and fruit rots are problems in pumpkins. Insect pest pressure has been low with a few imported cabbage worms & cabbage loopers observed on cole crops, cucumber beetles & western corn root worm beetles on vine crops, squash bugs laying eggs on vegetable leaves, and flea beetles on eggplant leaves.

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Degree-day Accumulations

Degree-day accumulations listed below for weather stations in the Illinois State Water Survey WARM data base have been summarized using the Degree-Day Calculator on the University of Illinois IPM site (http://www.ipm.uiuc.edu/degreedays/index.html). The list below includes only 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 Cook) 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).

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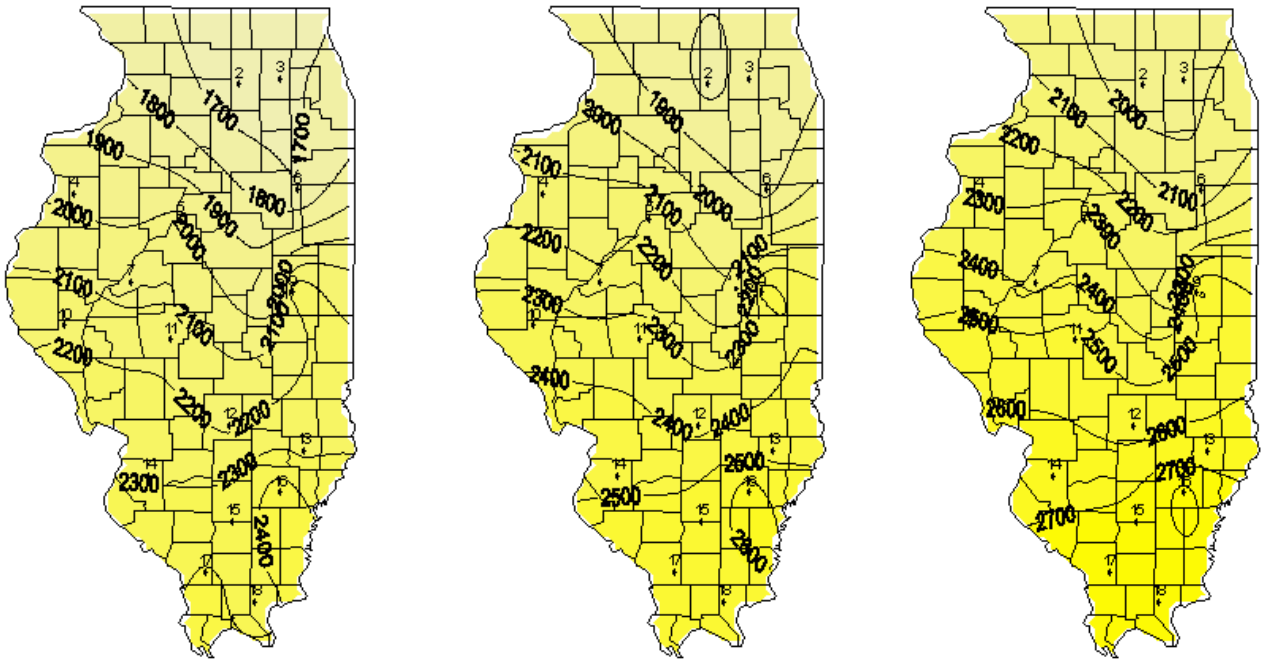

Degree-days, base 50 F, January 1 through July 23, 2007 (left), and projected accumulations through July 30 (center) and August 6 (right).

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

Station	County	Base 50F DD Jan 1 – July 23, Historic Average	Base 50F DD Jan 1 – July 23, 2007	Base 50F DD Jan 1 – July 30 (Projected)	Base 50F DD Jan 1 – Aug 6 (Projected)
1. Freeport	Stephenson	1623	Missing	Missing	Missing
2. Dekalb	Dekalb	1681	1618	1771	1918
3. St. Charles	Kane	1577	1692	1842	1987
4. Monmouth	Warren	1788	1969	2131	2285
5. Peoria	Peoria	1874	2022	2195	2361
6. Stelle	Ford	1765	1702	1867	2025
7. Kilbourne	Mason	1984	2039	2209	2373
8. Bondville	Champaign	1896	1921	2087	2245
9. Champaign	Champaign	1934	2279	2456	2627
10. Perry	Pike	1922	2187	2362	2529
11. Springfield	Sangamon	2050	2174	2359	2537
12. Brownstown	Fayette	2153	2180	2369	2551
14. Belleville	St. Claire	2222	2293	2480	2660
15. Rend Lake	Jefferson	2313	2345	2541	2729
16. Fairfield	Wayne	2254	2453	2646	2832
17. Carbondale	Jackson	2237	2407	2596	2777
18. Dixon Springs	Pope	2291	2384	2575	2758

Notes from Chris Doll

SW Illinois is experiencing some great weather for July – almost apple coloring weather, with temperatures ranging from the 50's to the low 80's. However, experience tells us that many of the apples that develop red color this early in the season are prone to sunburn later in the summer. The season continues to be early, up to seven days ahead of 2006 on a couple of tree fruits that ripened this weekend. The light crop of Gala is turning color. Rainfall on the Back-40 remained scarce, as the total for July is now 0.4 inches. Others have received more.

My degree-days for the codling moth are now up to 2094 since first-generation biofix, which is 280 ahead of July 23, 2006. Some second generation larvae ranging from second to fourth instar were found in orchards last week. Trap numbers have slowed down on both CM and OFM. Other pest problems included a couple of mite flare ups, a small amount of San Jose Scale crawlers, some late-flying Japanese beetles, bitter rot on apples, powdery mildew on apples and tart cherry, and a few late strikes of fireblight.

There has been some yellowing of both peach and apples leaves, accompanied by leaf drop. Some of these leaves show crimping and spotting caused by the spring freeze, and I believe the overall problem was caused by the freeze. Other examples of the freeze are cracked and deformed fruits, and many small apples with a small number of seeds.

Without a fruit crop, many of the peach trees in the area are making lots of vegetative growth. Four to five feet of shoot growth out of the top of a tree is not unusual. Some of the vigorous shoots can be removed or cut back to improve light penetration to the center of the tree and better cropping in the lower and center of the tree next year.

The Volume 42, Number 4, July 2007 issue of ***HortScience*** (American Society for Horticultural Science) had a couple of abstracts that might be of interest to peach and apple growers. *The Impact of Orchard Systems on Yield and Yield Efficiency of Redglobe Peach in the First Six Fruiting Seasons* by D. R. Layne of Clemson University "found that the total cumulative yield and the average yield efficiency was the greatest for the open center, followed by the quad V, and the lowest for the perpendicular V training systems. No significant difference in cumulative yields was observed between Lovell and Guardian rootstocks; trees on Lovell had a significantly higher yield efficiency on Lovell than the more vigorous Guardian."

Early Fuji Cultivar Performance in New Jersey, by Win Cowgill and Martha Maletta of Rutgers University and Wesley Autio of the University of Massachusetts, studied four cultivars of early Fujis through the first three harvests. They found that "Rising Sun, Beni Shogun, Early Auvil and September Wonder (all trademarked or patented cultivars) on B9 rootstock began fruiting in the third leaf. All were large-fruited and had commercially acceptable red color. In 2005, Beni Shogun had significantly better red color than other cultivars, and in 2006, Beni Shogun and September Wonder had significantly better red color. There were no significant differences between cultivars in flesh firmness, soluble solids, starch index rating, length-to-diameter ratio or taste test rating."

Chris Doll

Fruit Production and Pest Management

Codling Moth Phenology

Developmental events for the codling moth based on degree-day accumulations are presented below. Remember that **"biofix" refers to the date of the first sustained capture of first-generation moths in traps**.

Codling moth development:

First moths of second generation emerge	~900 DD_{50} after biofix
First hatch of second generation larvae	~1100 DD_{50} after biofix
50 percent of second generation moths emerged	~1340 DD_{50} after biofix
50 percent of second generation eggs hatched	~1580 DD_{50} after biofix
First moths of third generation emerge	~1920 DD_{50} after biofix
99 percent of second generation eggs hatched	~2100 DD_{50} after biofix
Beginning of third generation egg hatch	~2160 DD_{50} after biofix
*First moths of fourth generation emerge	~2900-3000 DD_{50} after biofix
*Beginning of fourth generation egg hatch	~3200 DD_{50} after biofix

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

- Extrapolated from the model presented by Beers et al.

Degree-day updates and codling moth comments from south to north, for select locations in Illinois:

See previous issues of this newsletter for the names of specific orchards where biofix dates were observed and reported. All degree-day accumulations and predictions are based on nearest weather station data; temperatures recorded within your orchard provide more accurate data; use the numbers from the table below as approximations only.

For codling moth:

Orchard Location	Weather Station	CM Biofix Date	DD_{50} July 23, 2007	DD_{50} projected July 30, 2007	DD_{50} projected Aug 6, 2007
Murphysboro	Carbondale	18 April	2080	2267	2447
Belleville	Belleville	23 April	1966	2152	2331
Edwardsville	Belleville	29 April	1876	2061	2240
Brussels	Brownstown	27 April	1809	1997	2177
Urbana	Champaign	30 April	1924	2101	2270
Speer	Peoria	07 May	1612	1784	1950
Harvard	Freeport	10 May	Missing data		

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Preharvest Intervals for Pesticides used on Fruit Crops

Just a reminder … with peach and bramble harvests ongoing and apple and grape harvests looming – at least where there are crops to harvest – it's wise to keep an eye on the preharvest intervals for fungicides and insecticides used in fruit crops at this time of year. PHIs for fungicides used on tree fruits are listed on page 35, and PHIs for insecticides and miticides are listed on pages 37-38 of the ***2007 Midwest Commercial Tree Fruit Spray Guide***, and similar tables are presented on pages 47 and 49 of the ***2007 Midwest Commercial Small Fruit and Grape Spray Guide***.

A few noteworthy numbers from these lists:

- For apples, PHIs for some insecticides that are used widely in Illinois for codling moth control include: Calypso – 30 days; Rimon – 14 days; Danitol – 14 days; Assail – 7 days; Imidan – 7 days; Sevin – 3 days.
- For a few common miticides used in apples, PHIs include: Apollo – 45 days; Agri-Mek – 28 days (Agri-Mek is not recommended for use at this time of year anyway); Savey – 28 days; Nexter – 25 days; Zeal – 14 days; Kanemite – 14 days; Fujimite – 14 days; Envidor – 7 days; Acramite – 7 days. Using products with shorter PHIs may be necessary where mite control is still needed in late varieties that are planted in the same blocks as early varieties nearing harvest.
- In brambles, where Japanese beetle control is needed when harvest is near or ongoing, note the following PHIs: Sevin – 7 days; Capture (or Brigade or Discipline) – 3 days; Malathion – 1 day; pyrethrins – 0 days.
- In grapes, where multicolored Asian lady beetle control may be necessary to prevent contamination of clusters and fouling of juice for wine, PHIs include: Capture – 30 days; Danitol – 21 days; Baythroid – 3 days; malathion – 3 days; pyrethrins – 0 days. Note the relatively new product in this list, at least in terms of registrations on grapes – Baythroid. Its 3-day PHI and its effectiveness make it good choice where late sprays are needed.

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Vegetable Production and Pest Management

Reporting Downy Mildew on Pumpkins in Illinois

On July 21, 2007, downy mildew of cucurbits, caused by *Pseudoperonospora cubensis*, was diagnosed in a processing pumpkin field in Mason County in central Illinois. The disease was wide-spread in the field, and the infection likely started several days earlier. This could indicate that the disease could be found in other cucurbit fields in Illinois as well.

Downy mildew only affects leaves. Symptoms of downy mildew vary with the host and 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. The symptoms in the pumpkin field were very obvious (see the pictures), and heavy sporulation of the pathogen was observed by microscopic examination.

At this time, all cucurbit fields need to be scouted carefully and sprayed before or at the first sign of the disease. Fungicide sprays should be applied at 7-day intervals. The following fungicides are recommended for control of downy mildew of cucurbits in Illinois: Previcur Flex 6SC, Tanus 50WG, and Ranman 3.6SC. These fungicides should be mixed with Bravo (chlorothalonil) and alternated. Gavel can be used to control downy mildew of cucurbits other than pumpkins.

For more information on downy mildew of cucurbits, consult the ***2007 Midwest Vegetable Production Guide for Commercial Growers*****.**

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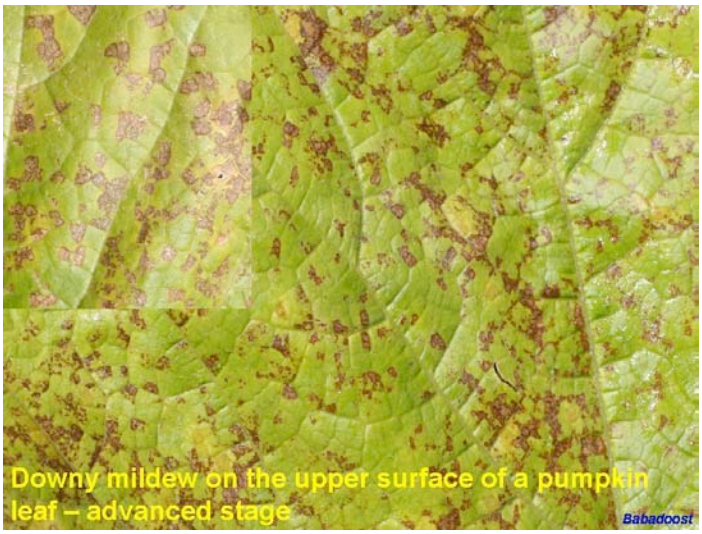

Causes and Remedies for Blossom End Rot in Peppers, Tomatoes, and other Solanaceous Vegetables

Blossom end rot is a physiological disorder caused by factors other than pathogens or insects. In 1914 Brooks described blossom end rot in tomato in the journal ***Phytopathology*** but did not explain its exact causes. The disorder appears as a water-soaked region, often chlorotic, on the blossom end of large fruited varieties of tomato, pepper, eggplant, watermelon and zucchini grown either in the field or in greenhouses. Symptoms of blossom end rot usually occur within two weeks after fruit set. Blossom end rot symptoms usually occur on the earliest fruits but it can also occur on later fruits if conditions are favorable. Long fruited varieties are more vulnerable to blossom end rot than round fruits, but it can also occur on round fruits as the following photo illustrates. However, no blossom end rot symptoms have been seen on wild tomatoes and they rarely occur on small fruited varieties like cherry tomatoes. The disorder can

also occur on the inside of the fruit in the tissue surrounding the seed where it is called “black seeds.” The incidence of blossom end rot is infrequent in most properly managed fields, but it can be very serious under certain conditions.

Tomatoes showing blossom-end-rot.

Since 1942, most experts have agreed that the disorder is likely caused by calcium deficiency in the distal end of the affected fruits. However, there are other factors that have also been linked to blossom end rot incidence, including low tissue phosphorous and manganese, high tissue nitrogen, magnesium, and potassium, high soil salinity, drought stress, too much water, high temperature, high light intensity, location of the fruit on the plant, root damage, and cultivar. Most of these factors, however, appear to affect plant growth and so their effect may be indirectly related to the incidence of the disorder compared to calcium. Calcium controls the process of cell expansion and serves as a messenger for cell to cell communication. Calcium is delivered into the fruit via the xylem vessels. There are fewer and narrower xylem vessels at the blossom end of the fruit where the rot is likely to occur. Also the xylem to phloem ratio is low and there are fewer vessels in the seed cavity in the blossom end of affected fruits. Combined, these factors are believed to be the reason why the rot develops on the blossom end of the fruit.

Before you jump on your tractor and start spraying the plants you need to be aware that blossom end rot is not a simple disorder that can be cured with calcium for many reasons. Studies have shown that there is no critical level for calcium that can induce the rot, other elements beside calcium can also contribute to the rot development, and some hormones and high temperature have also been shown to induce the rot. Even when assuming that calcium is the main reason for the rot, some fruits like tomato are not likely to respond to calcium treatment. Tomato fruits do not have openings (stomates or lenticels) on their skin and so it is difficult for calcium to move through the skin and into the fruit, especially during the critical times at the early stages of development. Here are a few tips on how to prevent blossom end rot from developing in your tomatoes, peppers or other fruits.

1. Check soil pH the previous fall before planting and add non dolomitic lime to correct low pH.
2. Check the soil organic matter. Subtract the amount of nitrogen in the soil from the total amount of nitrogen that the plants need for optimum growth.
3. Avoid adding too much Mg, K, or other cations that compete with calcium unless the plants show visible signs of deficiency.
4. Do not use ammonia type fertilizers, use nitrate forms instead. Ammonia fertilizers compete with calcium uptake.
5. Choose cultivars that grow slowly, produce less foliage, and produce medium size fruits. Cherry tomatoes do not develop blossom end rot.
6. Avoid planting too early in the season.
7. Do not severely prune the plants.
8. Avoid damaging the root system by cultivating away from the plants.
9. Adding too much nitrogen, especially early in the season will likely lead to blossom end rot development.
10. Maintain adequate soil moisture. It is better to irrigate frequently at low rate than to irrigate once at high rate.

Spraying calcium, regardless of its form, will not eliminate blossom end rot on affected fruits. The three most important factors that will likely minimize blossom development in your tomatoes, peppers or eggplants are to monitor the level of nitrogen carefully (divided the rate into smaller doses and use nitrate nitrogen), prevent fluctuation in soil moisture, and keep the soil pH at 6.5 to 6.8. If you can manage these three factors, you can manage blossom end rot.

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Brief Notes on Vegetable Insects

- Corn earworm counts and corn borer counts have remained low in most portions of Illinois; counts of earworm moths near Collinsville have been the exception – over 200 per night at the end of last week.

- Where cole crops are close to harvest and "clean-up sprays" are needed to prevent late cosmetic injury or contamination of heads at harvest by imported cabbageworm, diamondback moth, or cabbage looper, pyrethroids often are the best choices. Registered pyrethroids likely to work the best include Baythroid, Capture, and Warrior; Pounce and Asana also are available. While Lep control in plantings that are nearing harvest may be accomplished best with pyrethroids, remember that later plantings still in earlier growth stages can be protected adequately by use of *Bacillus thuringiensis* (Bt) products (including Agree, Biobit, Dipel, Javelin, Lepinox, Xentari), Proclaim, SpinTor/Entrust, or a high rate of Avaunt. Using these alternatives aids in resistance management and in allowing the survival of natural enemies that provide some control of these pests.

- If/when/where corn earworm control in tomatoes is necessary (remember that corn earworm also is known as tomato fruitworm) *Bacillus thuringiensis* (Bt) products are fairly effective. They work against this insect in tomatoes but not against it in sweet corn because in tomatoes the larvae feed on some on foliage and the surface of fruit, where they ingest Bt spores and toxins that poison them. In sweet corn they do not feed until they have entered the silk channel, never consuming any plant tissue that has been treated with Bt sprays. Bt products and Entrust are effective alternatives for organic growers.

- Maintaining control of striped and spotted cucumber beetles, especially in muskmelons and cucumbers, is necessary if bacterial wilt (transmitted by these beetles) is to be prevented.

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Words of Wisdom …

The Difference Between Dogs and Cats

A dog thinks: Hey, these people I live with feed me, love me, provide me with a nice warm, dry house, pet me, and take good care of me ... They must be gods!

A cat thinks: Hey, these people I live with feed me, love me, provide me with a nice warm, dry house, pet me, and take good care of me ... I must be a god!

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