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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, 217-333-6651, 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.

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

Upcoming Programs

- **University of Illinois St. Charles Horticulture Research Center Twilight Meeting and Open House, July, 26, 2007.** For more information, contact Bill Shoemaker at 630-584-7254 or wshoemak@inil.com.
- **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 ...**
 - University of Illinois St. Charles Horticulture Research Center Twilight Meeting and Open House, July, 26, 2007. For more information, contact Bill Shoemaker at 630-584-7254 or wshoemak@inil.com.
 - 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.

EZregs

A new web site constructed by University of Illinois Extension offers detailed information on how State of Illinois regulations apply to livestock, food crop, and ornamental horticulture production operations. Included are answers to questions about regulations on certification of pesticide applicators, recording keeping, the federal Worker Protection Standard, the Illinois Pesticide Act, and more. Check it out at www.ezregs.uiuc.edu.

Regional Updates

From the Dixon Springs Ag Center ...

This past week some areas in southernmost Illinois received over 5 inches of rain. This has spurred some foliar fungal diseases on tomatoes, and there is some bacterial leaf spot on bell peppers where growers are using susceptible varieties. Corn earworm counts remain very low at DSAC. The area tomato and pepper crops continue to be good, and sweet corn harvest also continues. The blueberry crop is very small, but a few varieties have a near full crop while most at the station had little or no fruit. Corn and tomato insecticide trials are in progress, and we are harvesting tomatoes from our organic-versus-conventional plots.

The tobacco crop at DSAC is looking good at this time. Yes, tobacco ... this is a nitrogen fertility study being conducted in conjunction with the Crop Science Department here. Last week the crop received side-dress nitrogen treatments, and it has since been cultivated and is growing well.



Tobacco plots at the Dixon Springs Agricultural Center.

In northern Illinois, late June through early July brought day temperatures in the 70s to low 90s and night temperatures in the mid 50s to 70s. The region received 1 to 2 inches of rainfall during the period between June 26 and July 4. There has been a lot of variation in rainfall, with some areas receiving too much and others much less.

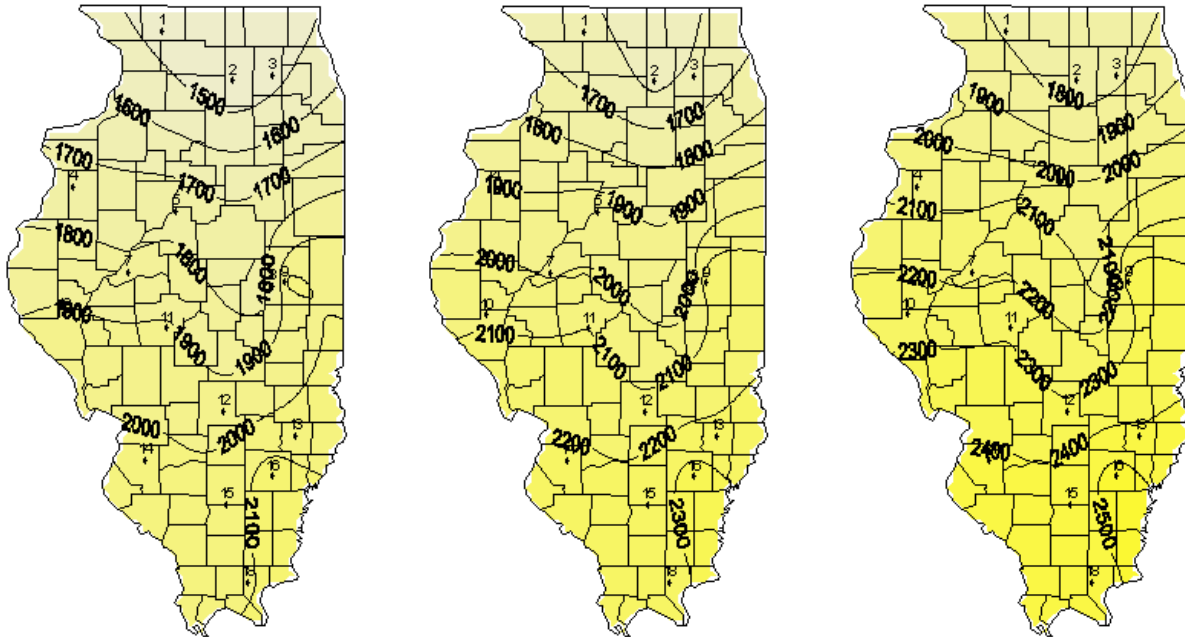
Apples and grapes are sizing well, and sour cherry picking is almost done. I have received reports of spur blight on raspberries. Insect pests such as cucumber beetles and aphids have been observed on cucurbits, and Colorado potato beetle and flea beetles are feeding on eggplants. Imported cabbage worm, cabbage looper and diamondback moth are all present in cole crops. I have received some reports of herbicide drift on vegetables, particularly tomatoes, and some cucurbit plants dying particularly on low-lying spots. In Kankakee County, harvest of cabbage, summer squash, beets, green onions, and greens such as mustard greens and collards is ongoing. Sweet corn will be ready for picking in there early next week. Green bean harvest is underway on a few farms. The potato crop looks great in the area.

Maurice Ogotu (708-352-0109; ogutu@uiuc.edu)

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).

Rick Weinzierl (217-333-6651; weinzier@uiuc.edu)



Degree-days, base 50 F, January 1 through July 11, 2007 (left), and projected accumulations through July 18 (center) and 25 (right).

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

Station	County	Base 50F DD Jan 1 – July 11, Historic Average	Base 50F DD Jan 1 – July 11, 2007	Base 50F DD Jan 1 – July 18 (Projected)	Base 50F DD Jan 1 – July 25 (Projected)
1. Freeport	Stephenson	1354	1469	1628	1790
2. Dekalb	Dekalb	1420	1418	1573	1730
3. St. Charles	Kane	1318	1467	1619	1773
4. Monmouth	Warren	1513	1738	1900	2066
5. Peoria	Peoria	1581	1782	1956	2133
6. Stelle	Ford	1492	Missing	Missing	Missing
7. Kilbourne	Mason	1697	1816	1988	2164
8. Bondville	Champaign	1613	1718	1886	2057
9. Champaign	Champaign	1642	2023	2201	2382
10. Perry	Pike	1637	1914	2088	2268
11. Springfield	Sangamon	1741	1913	2101	2290
12. Brownstown	Fayette	1842	1931	2119	2312
14. Belleville	St. Claire	1913	2039	2227	2419
15. Rend Lake	Jefferson	1993	2046	2241	2441
16. Fairfield	Wayne	1932	2157	2350	2548
17. Carbondale	Jackson	1926	Missing	Missing	Missing
18. Dixon Springs	Pope	1982	2093	2282	2477

Notes from Chris Doll

It's summer time! Luckily we are not as hot as some of the western states, but the areas that have missed the heavy showers are dry and show heat stress on crops on the hot days. Locally, there have been five grass-wetting showers in the past 14 days, with a total amount of 0.1 inch. These have been enough, along with some heavy dews, to raise the wetting hours for sooty blotch to 255 on my data logger.

It is difficult to determine phenology dates without a crop of fruit to harvest. The thornless blackberry and Pristine apple first harvest date was about the same as 2006, which was an early year. Some grower reports indicate that the season is ahead of last year. Tree and vine vegetative growth has been good to excellent, but many of the apple fruits that survived the freeze are below normal in size because of a reduced seed count. There may be other physiological effects of the freeze, as a few of my early apples, including Prima, already show severe cork pitting. Growers with a crop might make sure that calcium is included in the cover sprays.

My degree-days from codling moth biofix now total 1801. Luckily, the trap count is down to 3 for the past week, but OFM totaled 33. A small outbreak of red mites showed up a week ago. A new planting of apples that did not get sprayed in the spring had a light infection of cedar apple rust (the most I've seen in 40 years), and the lesions are now ready to sporulate. Fireblight infections have abated, but the unpredictability of the disease is evidenced in some orchards by great differences in the amount of infection within a variety and between varieties. One orchard with only commercial varieties has the greatest incidence on Jonathans in one block and Golden Delicious in another. Fuji and Suncrisp were not hit as bad. Some trees of Jons/M9 have died because of rootstock infection. Bud 9 trees appear to have fared better.

Now that we are past July 1, the standard precautions of avoiding use of glyphosate materials on trees is in effect unless extreme caution is taken to keep off leaves and sprouts. I was in an orchard earlier this spring that showed effects of careless application in 2005 – some two-inch scaffolds had died and willow-leaves were present on many of the live branches two years later. Paraquat is a "safer" material since it only burns what it hits and is not translocated, but careful application is also a best management practice.

And mid-July is the time to collect leaves for analysis. The collection period usually can extend until August 15. A leaf analysis program can give a better understanding of the nutritional standing of trees because they give the actual uptake of nutrients from a much greater soil area and depth than what is sampled via a soil sample.

Chris Doll

Fruit Production and Pest Management

Bird Management in Small Fruits

Chris Doll directed me to a great article on bird management by Cathy Heidenreich in the June 22 issue of Cornell University's New York Berry News. It's titled "Bye Bye Birdie – Bird Management Strategies for Small Fruit," and it's online at <http://www.nysaes.cornell.edu/pp/extension/tfabp/newslett/nybn66a.pdf>. It includes information on bird identification, cultural practices to deter birds, chemical repellents, scare devices, predators, and visual deterrents. If you are unable to access it online, let me know, and I'll send you a printed copy.

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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 12, 2007	DD ₅₀ projected July 19, 2007	DD ₅₀ projected July 9, 2007
Murphysboro	Carbondale	18 April	1702	1887	2078
Belleville	Belleville	23 April	1735	1925	2115
Edwardsville	Belleville	29 April	1644	1834	2025
Brussels	Brownstown	27 April	1581	1771	1963
Urbana	Champaign	30 April	1692	1872	2052
Speer	Peoria	07 May	1394	1570	1746
Harvard	Freeport	10 May	1188	1349	1510

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Vegetable Production and Pest Management

Cucurbit Downy Mildew

Downy mildew, caused by *Pseudoperonospora cubensis*, is a destructive disease of cucurbits. There was no cucurbit downy mildew in Illinois in 2006 and no incidence of this disease has been observed in the state in 2007 yet. But, there are reports of downy mildew on cucumbers in Michigan, Ohio, and Ontario (<http://www.ipm.msu.edu/cat07veg/v06-27-07.htm#4>).

Downy mildew affects only 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 progresses, 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 downy mildew pathogen survives only on cucurbit hosts. The pathogen overwinters in the southern United States where cucurbits are grown during winter months, and it progresses northward with cucurbit production each spring. Another source of primary inoculum of downy mildew pathogen is cucurbit crops in greenhouses. Cucumber infections in Michigan, Ohio, and Ontario are suspected to be caused by inoculum originated from the greenhouse.

Control of downy mildew on cucurbits is achieved by planting resistant cultivars, early planting of crops, and/or fungicide sprays. Cucumber cultivars resistant to downy mildew are available. Because of the potential for rapid plant infection, sprays should be initiated on a preventive basis for vulnerable plantings. Fields should be scouted regularly for disease development. Several fungicides effective against downy mildew of cucurbits are available; consult the *Midwest Vegetable Production Guide for Commercial Growers* (www.entm.purdue.edu/entomology/ext/targets/ID/index.htm).

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

Corn earworm and European corn borer control in Bt sweet corn

Corn earworm moth captures in pheromone traps have been fairly light for all Illinois reporting locations for the last several days, with only the Collinsville area showing captures greater than a few per night. Again I urge commercial sweet corn growers to purchase a cone-shaped wire pheromone trap (Poppe Service, Lexington, IL, 309-723-3201) and lures (Zealures from Great Lakes IPM, Vestaburg, MI, 989-268-5693) to use in monitoring corn earworm moth flights at their own farms. European corn borer flights also have been very low in most areas.

A few growers have asked what spray program is needed in Bt sweet corn hybrids (the "Attribute" hybrids that produce a *Bacillus thuringiensis* toxin that kills caterpillars such as European corn borer, corn earworm, and fall armyworm). We continue to evaluate Bt hybrids along with insecticides on non-Bt hybrids in small-plot trials. In general, in terms of plant and ear protection, Bt sweet corn hybrids give total control of European corn borer, very good control of corn earworm (though a few small larvae may survive in ear tips), and usually very good control of fall armyworm. Where corn borers or fall armyworm (or other armyworms) feed and develop on weed hosts before moving to sweet corn, larger larvae may not be killed rapidly when they feed on Bt corn. Available Bt sweet corn hybrids do not, however, produce toxins that kill beetles that feed on silks or in ear tips – corn rootworm beetles, Japanese beetles, and sap beetles. Limited use of foliar insecticides is necessary where these insects occur at damaging levels. Typically an insecticide application is required at row tassel or first silk if prevention of silk-clipping by corn rootworm beetles or Japanese beetles is necessary. One or two additional applications at about 7-day intervals will provide adequate continued control of these insects and of sap beetles that enter ear tips and feed on kernels. Pyrethroids such as Warrior, Capture, Baythroid, or Mustang Max would be the typical choices for most commercial growers because these products are used for earworm control in non-Bt hybrids. Sevin XLR-Plus will also give adequate control of the beetles listed above, and it is not a Restricted-Use pesticide. If extremely heavy earworm moth counts occur, treating with one of the pyrethroids listed above can reduce occurrence of small earworm larvae in ear tips. The necessary treatment interval to supplement control provided by the Bt toxins in the Bt hybrids is not yet well defined, but for fresh-market growers who might otherwise spray every 2 to 3 days to provide a 95-percent worm-free harvest, increasing the spray interval to 4 or 5 days should still give the desired result.

In last year's small-plot trial at Urbana, there were 126 medium-to-large earworm larvae per 100 ears in the untreated, non-Bt plots at harvest. (Yes, this is extremely high pressure.) In BC 0805 (a Bt hybrid) with no foliar applications of insecticides, there were 8 medium-to-large larvae per 100 ears. Very small larvae were present in approximately of the ears. Why are some larvae found in ears if the Bt toxin is supposed to kill them? Small larvae are present because they are not poisoned by the Bt toxins until after they crawl down the silk channel and begin to feed (sometimes not until they reach the kernels); after ingesting the Bt toxin, small larvae survive for a few days (but not grow normally), so they can still be present at harvest if they entered the ear only a few days earlier. Additionally, roughly of the kernels in BC-0805 do not produce the Bt toxin, so if a larva is lucky, it may feed on one, two, or even more kernels before the odds take over and it hits a kernel that contains toxins. As a result, a few half-grown larvae may be found in BC-0805. When moth counts are low, this is rare. When harvests follow a period when moth counts are consistently in the hundreds per night, a lot more larvae had started the journey into ears, and even a very small percentage of survivors means more infested ears.

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Words of Wisdom ...

While driving down a steep and curvy logging road, a group of biologists loose control of their SUV and careen down the hill. The truck piles up at the bottom of the canyon, and everyone aboard perishes. Surprisingly, they all go to heaven. At an orientation they are asked, "When you are in your casket and your friends and family are mourning about your death, what would you like to hear them say about you?"

The first guy, a well known botanist says, "I would like to hear them say that I was one of the greatest botanists of my time, and left an eternal contribution to the botanical world."

The second guy, an ornithologist, says, "I would like to hear that I was a wonderful birder and made a huge difference in the recovery of our bird populations."

The last guy, a scruffy entomologist, replies, "I would like to hear them say... 'LOOK, HE'S MOVING!!!!' "

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