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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.

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 …**
  - University of Illinois St. Charles Horticulture Research Center Twilight Meeting and Open House, July, 26, 2007.
  - 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 southern and southwestern Illinois, yellow sweet corn harvest started this week, and the rains couldn't have come at a better time. Crops were really looking pretty rough throughout much of the southern half of the state. Looking at the Doppler, one would think everyone in the southern region received rain, but I already know of several growers who were passed by. Fortunately, rain is in the forecast all week, and those who missed out over the weekend still have a chance for rain over the next few days.

Arkansas tomatoes are on the market, as well as small-fruited locally grown tomatoes. Our field grown tomatoes should be just around the corner. The tomato and pepper crops are looking strong this season. Green beans have been in harvest the last few weeks, and continue to pick strong. Pumpkin planting continues, and with recent rainfall, concerns about herbicide activation have been reduced.

It might not have started with a bang, but the peach harvest season started last week with 'Garnet Beauty.' For the most part, there is not a commercial crop of the early season peaches, but some of the later varieties will be a bit more abundant – mostly from the northwestern portion of the region. Blueberry harvest is still ongoing. If it's necessary to bring bush height down following final harvest, do so before mid August so that next year's crop is not reduced. Blueberries set next year's fruit buds in late summer, so if you hedge too late into the year, yield will be reduced. I've seen some fairly nice apple crops in a limited number of varieties, particularly Blushing Gold, Golden Delicious, Firm Gold, and Jonathans in the southern region despite the Easter freeze. I'll keep my fingers crossed that none of our growers get hail damage like what has been recently discussed on Apple-Crop. For those of you not familiar with Apple-Crop, I highly recommend your join this free electronic discussion forum. Subscription information is available at http://www.virtualorchard.net/applecrop.html. Not only is Apple-Crop an avenue to get opinions from University researchers, Extension agents and specialists, students, commercial apple growers, wholesalers/brokers, retailers and direct marketers of apples all at once, but it is also a wonderful avenue to keep up to date on current activities in the apple industry.

Japanese beetles have made their presence known just about everywhere in Southern Illinois. They are really working over the grapes, cherries, and brambles. The robins sure do like them – too bad they like my raspberries and grapes too.

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

From the Dixon Springs Agricultural Center: The rains this past weekend were welcomed, although we hope it doesn't really rain all week this week as some forecasts suggest. Parts of southern Illinois, especially northern Union County, were in need of this past rain. Harvest of high tunnel tomatoes continues, and harvest of field grown tomatoes began last week for some area producers. Sweet corn harvest also has or will soon begin for several growers. The local pepper crop still looks good, with harvest likely to begin next week if not sooner. Tobacco plants being grown at the Ag Center benefited from recent rains as well, and they now appear to be off and growing. We have about 6,000 plants as part of a nitrogen study being conducted by Crop Sciences and NRES staff.

Again, as always, growers are urged to maintain their fertigation schedules and provide supplemental water in a timely fashion. It makes no sense (or cents) to invest in trickle irrigation and then not utilize or underutilize that investment.

Abby Benard and Bronwyn Aly examine peppers in a variety trial at Flamm Orchard in Union County.

Bronwyn Aly and Bill Bass with tomatoes harvested from a high tunnel in Union County.

Jeff Kindhart (618-695-2444; jkindhar@uiuc.edu)

In northern Illinois, the last 2 weeks have seen highs from the upper 70s to the lower 90s and lows from upper 40s to the low 70s, with precipitation quite variable – from as little as 1 inch to more than 4 inches. Soil moisture is adequate for most crops at this time. Grapes are sizing well, and some bunches will soon need to be thinned. Apple and peach fruits are about 2 inches in diameter, and thinning is continuing in many orchards. The peach crop in northern Illinois – for the small number of commercial growers who have some peach trees – is very light because of several days in February when the temperatures were -10 degrees F, low enough to kill most peach flower buds. Tart cherries are ripe, and picking is underway in some orchards; harvest of June-bearing strawberries has pretty much ended. Due to the wet weather of recent days, apple scab control will be important, especially where primary scab infections occurred.

In the Kankakee area, pollination is complete in early sweet corn, and cabbage harvest is underway. Herbicide injury has been observed on cucurbits and other vegetables planted in plastic mulch where the herbicide was incorporated before laying the mulch. In other parts of northern Illinois, some earlier planted sweet corn is tasselling; tomatoes and peppers are flowering; pumpkin, squash, and melon seedlings are vining well (and cucumber beetles continue to require control); diamondback moth, cabbage looper, and imported cabbage worm adults were observed flying in cabbage and broccoli fields; and flea beetles (as always) were observed feeding on eggplant leaves.

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

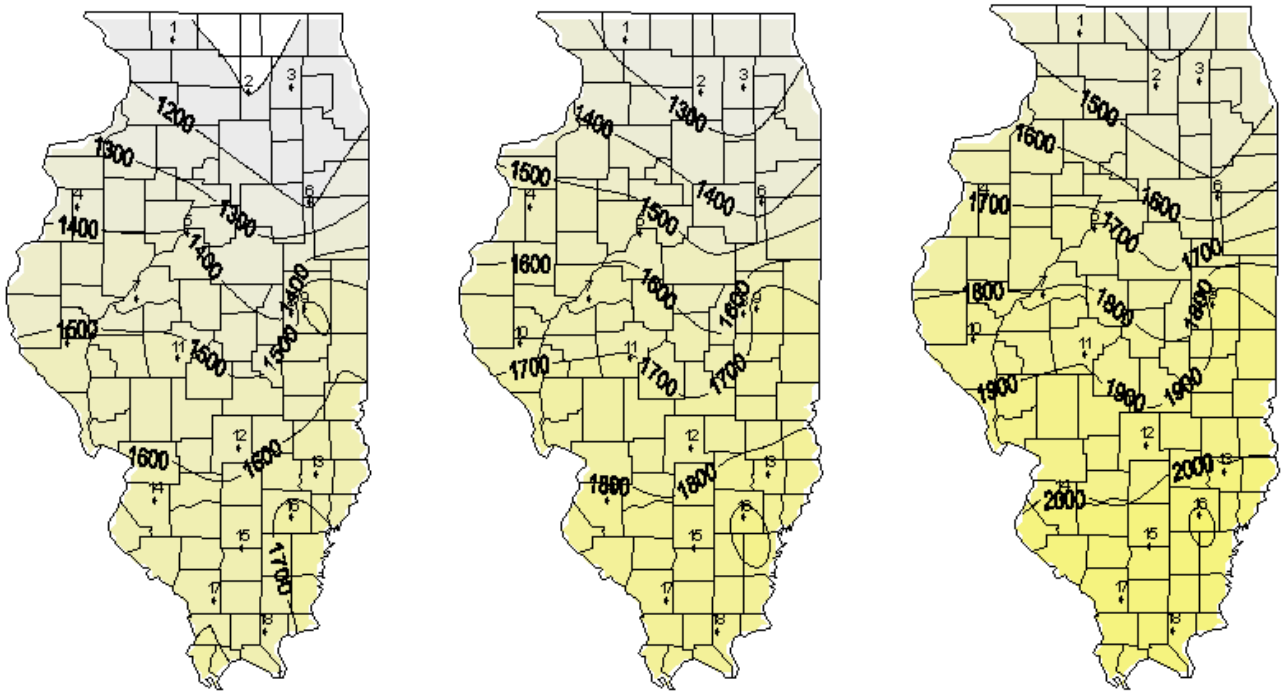
Degree-day Accumulations

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

Station	County	Base 50F DD Jan 1 – June 25, Historic Average	Base 50F DD Jan 1 – June 25, 2007	Base 50F DD Jan 1 – July 2 (Projected)	Base 50F DD Jan 1 – July 9 (Projected)
1. Freeport	Stephenson	1013	1116	1272	1426
2. Dekalb	Dekalb	1076	1097	1256	1411
3. St. Charles	Kane	988	1120	1269	1418
4. Monmouth	Warren	1157	1378	1537	1697
5. Peoria	Peoria	1206	1406	1574	1745
6. Stelle	Ford	1137	1182	1350	1517
7. Kilbourne	Mason	1324	1464	1632	1803
8. Bondville	Champaign	1250	1386	1554	1723
9. Champaign	Champaign	1260	1642	1815	1990
10. Perry	Pike	1268	1514	1680	1851
11. Springfield	Sangamon	1341	1527	1707	1893
12. Brownstown	Fayette	1434	1557	1740	1930
14. Belleville	St. Claire	1505	1638	1819	2007
15. Rend Lake	Jefferson	1575	1639	1829	2025
16. Fairfield	Wayne	1519	1742	1930	2122
17. Carbondale	Jackson	1522	1699	1875	2060
18. Dixon Springs	Pope	1580	1684	1864	2051



Degree-day accumulations, base 50 F, January 1 – June 25, 2007 (left), and projected through July 2 (center) and July 9 (right).

Notes from Chris Doll

A temporary relief from the drought – an inch of rain over three days here. Generally, the rains have been spotty, and recipients all feel lucky. Warm weather continues, and my codling moth degree days now total 1388, or well into the second brood. However, there's not much activity in my codling moth trap, but a heavy flight of OFM (40 in 3 nights) is ongoing, and peach tree borers continue to fly. Mites have been reported and seen in apples, and available miticides seem especially expensive when the crop is so minute. Japanese beetles are not bad in the Back-40, but they have skeletonized some Honeycrisp apples and Reliance grapes.

Until the last couple of days, the wetting hours on the data logger have been very few. The total for the year is now at 125. The dry month (1.1 inch of rain) has made the fire blight situation more tolerable, but some new infections continue to show. A severe

bacterial spot outbreak on leaves of many of my new peach and nectarine varieties has also slowed – maybe because of the weather and some sprays of dodine. Some of Jerry Frecon's bacterial spot ratings are true, even without any fruit, and I expect control problems in the future.

Back-40 harvest is complete for the following crops and the figures are the percent of the 2006 crop: strawberries – 33%; black raspberries – 5 %; red raspberries – 3 %; gooseberries – 0 %. Some of the crop loss, including gooseberries, was from raccoons and birds. It was the first time I've seen birds eating gooseberries. Blackberries, both thornless and thorny are beginning to ripen, and they look much better.

The National Peach Council report on the 2007 crop listed the following numbers (millions of pounds) for 2006 and 2007:

Georgia	82 and 41
Michigan	38 and 40
New Jersey	68 and 68
South Carolina	120 and 12
All others	199 and 133
Total	507 and 294

CONDOLENCES: Condolences are in order for Betty and the rest of the family of Clyde Arnold of Carbondale. Clyde passed away on June 6 at his home. He was 93 years old, and many of those years included orcharding and selling fruit – both retail and wholesale. As a marketer, he began apple sales in plastic bags and then designed equipment to facilitate filling and handling them. Clyde was a member of the Fruit Growers Exchange, the Illinois State Horticulture Society, and the Illinois Nut Tree Association, as well as many other public and service organizations.

Chris Doll

Fruit Production and Pest Management

Disaster Assistance for Freeze-Damaged Crops

On June 7, 2007, the Illinois Department of Agriculture issued a news release announcing that federal disaster assistance will be available to help growers recover from the April freeze that damaged several crops, especially in southern Illinois. The United States Department of Agriculture granted the governor's request to designate 55 Illinois counties as natural disaster areas. The designation qualifies farmers in those counties and 26 contiguous counties who sustained production losses between April 3 and April 11 for USDA assistance, including low-interest emergency loans.

The 55 counties declared as primary disaster areas are:

Adams	Fayette	Johnson	Monroe	Schuyler
Alexander	Franklin	Kankakee	Montgomery	Scott
Bond	Fulton	Knox	Morgan	Shelby
Calhoun	Gallatin	Lawrence	Perry	St. Clair
Champaign	Greene	Macon	Pike	Union
Christian	Hamilton	Macoupin	Pope	Vermilion
Clay	Hancock	Madison	Pulaski	Wabash
Clinton	Hardin	Marion	Randolph	Washington
Crawford	Jackson	Massac	Richland	Wayne
Cumberland	Jefferson	McDonough	Saline	White
Edwards	Jersey	Menard	Sangamon	Williamson

The 26 contiguous counties approved for disaster assistance include:

Brown	Edgar	Henry	Mason	Piatt
Cass	Effingham	Iroquois	McLean	Stark
Clark	Ford	Jasper	Mercer	Tazewell
Coles	Grundy	Livingston	Moultrie	Warren
De Witt	Henderson	Logan	Peoria	Will
Douglas				

Fruit growers who believe they may qualify for disaster assistance should contact their county Farm Service Agency office. Staff in county Farm Service Agency offices can verify whether producers have crops that are eligible for emergency funds. Applications will considered on a case-by-case basis, taking into account the extent of losses, security available, and applicant's repayment ability. Rules for administering disaster relief legislation were not yet completed when information was provided for this newsletter, so some delays may be encountered as growers reach local FSA offices … patience and diligence are advised.

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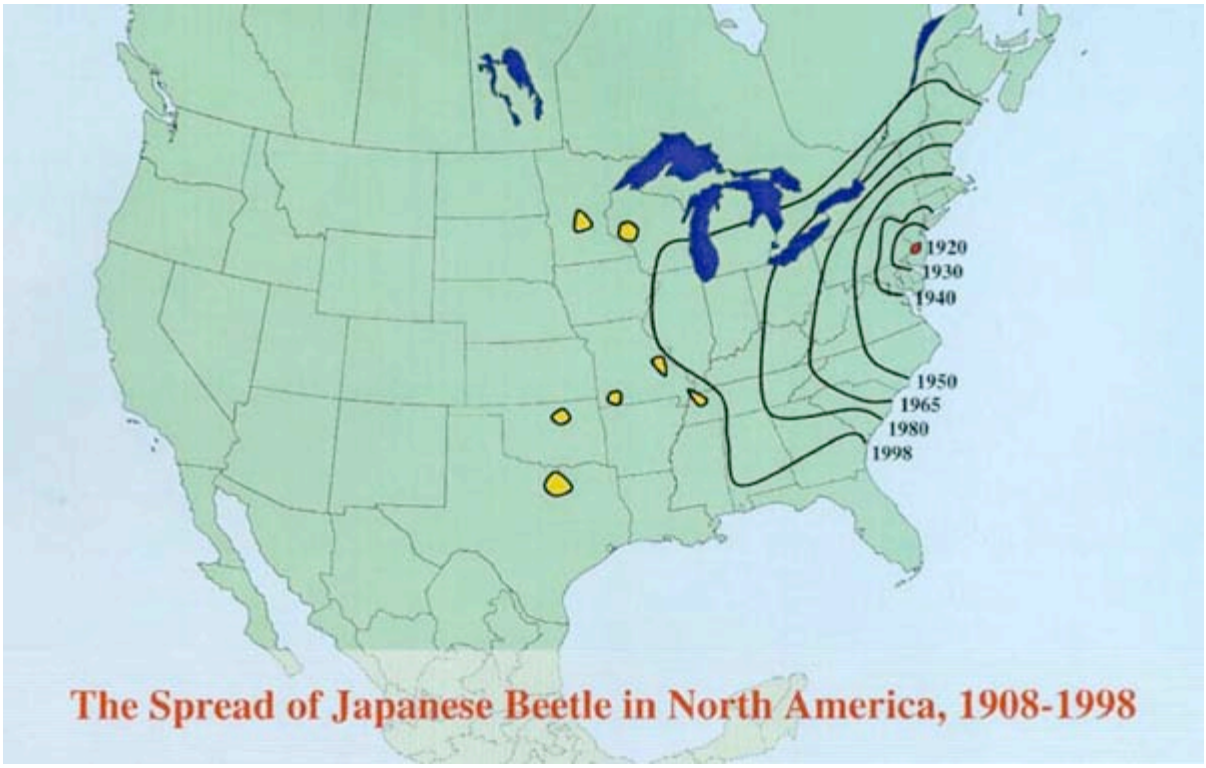
Japanese Beetle

Elizabeth Wahle and Chris Doll commented above on Japanese beetle, the hordes have descended on the apple orchard at Dixon springs, and numbers are increasing steadily at Champaign-Urbana. It must be time for the annual review of this insect's history in North America, its life cycle and what to do to control it. So, adapted and revised from previous years' articles, here's more than you really wanted to know about Japanese beetles …

The Japanese beetle is an "introduced" pest in North America. It was brought to the United States accidentally in the early 1900s with plant materials from Japan. It has since spread across much of the eastern United States to – and now across – the Mississippi River, and local populations are established in Texas, Oklahoma, Missouri, and Minnesota. The map below illustrates its spread through 1998 – when it had reached most areas in Illinois. Calhoun County, just north of St. Louis, saw the arrival of this insect in 2006.

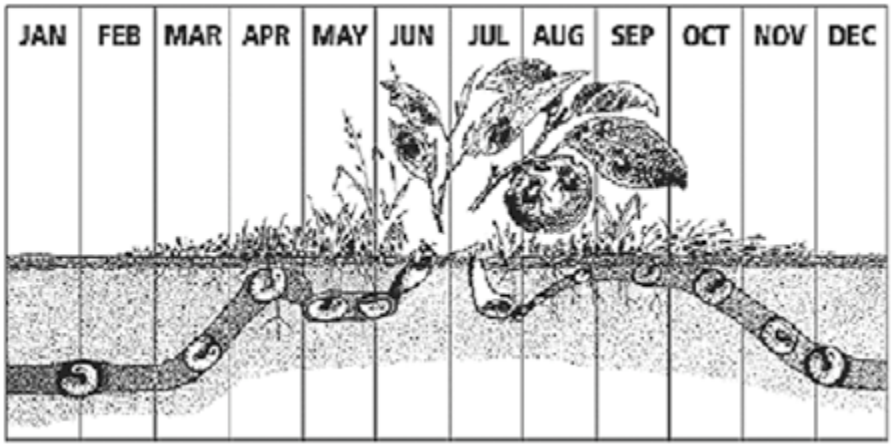


The spread of the Japanese beetle in North America. (Ohio State University, http://www.oardc.ohio-state.edu/biocontrol/images/jb_map.jpg)

Japanese beetle larvae - grubs - feed on the roots of a wide range of grasses and can be serious pests of turf. In most of Illinois, the common grub that damaged lawns and golf courses had been the annual white grub or masked chafer, *Cyclocephala* spp., but larvae of the Japanese beetle appear to be contributing to lawn and turf damage now as well. Adult Japanese beetles feed on the fruits and foliage of over 275 different plant species. Among the host plants that they prefer the most are roses, grapes, American linden, cherry, plum, peach, apple, flowering crab apples, Norway maple, and Japanese maple. In small fruit production in Illinois, adult Japanese beetles feed on the foliage of grapes and the foliage and fruits of blueberries and brambles. They also aggregate in mass to feed on fruits of peaches. Their tastes in apples include a distinct preference for Honeycrisp and a clear nonpreference for Goldrush. Adult Japanese beetles are about 3/8-inch long, with metallic green bodies and coppery-brown front wings ("wing covers"). Five tufts of white hairs (white spots) are visible along each side of the abdomen, and a sixth pair of white tufts are visible at the tip of the abdomen. Larvae are typical C-shaped grubs, with three pairs of legs on the thorax and no legs or prolegs on the abdomen. Newly hatched larvae are about 1/16 inch long; mature larvae are about 1 1/4 inch long. Larvae of the Japanese beetle can be distinguished from larvae of other grub species by the V-shaped pattern of spines (the raster) at the tip of the abdomen. (When students in my introductory entomology course have to identify grub larvae based on raster patterns, they refer to the process as “looking at the hairs on a grub’s butt.”)

Adult Japanese beetle (University of Minnesota)

Mature larvae of the Japanese beetle pupate in the soil in late spring, and adults emerge from June through August; adult emergence begins earlier in the southern portion of the region. Ron Hines first reported catching adults in traps in Massac County during the week ending June 5, 2007, and for the week ending June 19, 2007, he reported catching 309,352 beetles in one trap (and there are still plenty remaining at large in the county). Females emit a sex pheromone to attract males, and mating occurs in the turf or other grasses where the female emerges; additional matings occur later on the plants on which adults feed. Adults find a suitable host plant, begin feeding, and both sexes emit an aggregation pheromone to attract other beetles to the same plant. Females feed, lay eggs in grassy areas, and return to host plants to mate and feed again, completing several cycles of this behavior. Each female lays 40 to 60 eggs. Because adult beetles can live for several weeks and emergence from pupae spans a period of several weeks as well, Japanese beetle adults may be present from June through October in at least some areas. Larvae hatch from eggs in July, August, and September, and they feed on the roots of grasses until cold temperatures trigger their movement downward in the soil to depths of 4 to 8 inches; they survive prolonged exposure to temperatures of 25 degrees F at that depth with little or no mortality. In the spring, partially grown larvae move upwards in the soil and resume feeding on roots. They pupate in May and June.



Japanese beetle life cycle. (Ohio State University)

Management: Biological control agents are available for reducing numbers of Japanese beetle larvae in soil. They include the "milky disease" bacteria *Bacillus lentimorbis* and *Bacillus popilliae* and the insect-parasitic nematodes *Steinernema carpocapsae* and *Heterorhabditis* spp. However, if the goal is to reduce adult damage to fruit or vegetable crops or ornamental plants, the great mobility of adult beetles limits or negates the value of larval control unless it is practiced on an area-wide basis. Most fruit and vegetable growers must focus on adult control to limit crop losses. Although traps that attract and kill great numbers of Japanese beetles are marketed widely, studies have shown repeatedly that these traps do not reduce beetle populations enough to protect nearby plants, and in some instances damage is greater on plants near traps than on those in areas where traps are not used at all. Exclusion (by use of plant covers) and the use of insecticides are the only effective options for protecting small fruit crops from Japanese beetle adults. Plant covers (with textures similar to floating row covers) can be practical for protecting small numbers of blueberry plants or a very few small peach or apple trees when fruit is ripening, but covers rarely are feasible for protecting grapes (because sprays for fungal diseases are needed at the same time as protection from Japanese beetles) or brambles (bees are still visiting and pollinating some flowers while ripening fruit is vulnerable to Japanese beetles).

Insecticides labeled for use on blueberries, grapes, and brambles for Japanese beetle control are listed in the *2007 Midwest Small Fruit and Grape Spray Guide*. Baythroid, Danitol and Sevin are among the most effective choices for use on grapes; preharvest intervals (PHIs) are 3 days, 21 days, and 7 days for Baythroid, Danitol and Sevin, respectively. Malathion is moderately effective and also has a 3-day PHI. Pyrethrins that do not contain piperonyl butoxide may be used in organic production, and they provide some control when used at high rates and short intervals (every 1 to 3 days depending on reinfestation). In blueberries, if control is needed it is usually during harvest or very shortly before harvest. Although Asana is effective and labeled for application to blueberries, its 14-day preharvest interval prevents its use when infestations usually occur. Danitol has a supplemental label for use on blueberries with a 3-day PHI and may be among the most effective choices as when harvest approaches or is underway. Sevin (7-day PHI), Malathion (1-day PHI), and pyrethrins (0- or 1-day PHI) are moderately effective. In brambles, Capture (3-day PHI), malathion (1-day PHI), and pyrethrins (0- or 1-day PHI) provide adequate control. Several insecticides are labeled for application to apples and peaches for Japanese beetle control. In general, the organophosphates (Imidan and Guthion), carbamates (primarily Sevin), and pyrethroids (several) used in cover sprays aimed at codling moth and other fruit-damaging pests are effective against Japanese beetles as well. See the *2007 Midwest Commercial Tree Fruit Spray Guide* and specific insecticide labels for rates and restrictions; also keep in mind the comments below on European red mite management in apples. In peaches, pre-harvest intervals for effective insecticides are: Asana - 14 days, Imidan - 14 days, malathion - 7 days, Pounce (permethrin) - 14 days, Sevin - 3 days, and Warrior - 14 days. Sevin is often the best alternative for peach growers as the crop nears harvest. For all these insecticides, the key to adequate control is to scout regularly (once or twice weekly) and treat when damaging numbers of beetles occur on foliage or fruit. Just as important is to scout again beginning a couple of days after treatment to detect reinfestation - something that usually happens with Japanese beetles - and treat again if necessary.

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:

50 percent of first generation eggs hatched	~500 DD_{50} after biofix
99 percent of first generation eggs hatched	~920 DD_{50} after biofix
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

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

*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. The comments column below presents the estimates and expectations of codling moth phenology based on the table on page 260 in ***Orchard Pest Management*** by Beers et al., published by Good Fruit Grower, Yakima, WA; you may want to compare these expectations with observations from your orchard. (For example, Brownstown DD accumulations seem too low to match the moth flight pattern observed near Brussels in Calhoun County, and the difference may result from differences in temperatures at the orchard site versus those from this weather station some distance away. Similarly, DD accumulations for Belleville since April 29 lag behind those that Chris Doll reports from his Edwardsville orchard.)

For codling moth:

Orchard Location	Weather Station	CM Biofix Date	DD_{50} June 25, 2007	DD_{50} projected July 2, 2007	DD_{50} Projected July 9, 2007	Comments (based on DD accumulations and predictions and the model cited above for codling moth development):
Murphysboro	Carbondale	18 April	1371	1549	1734	Currently: Second-generation moth flight 50-60 percent complete; second-generation egg hatch ~20 percent complete. By July 9, second-generation moth flight will be winding down, and second-generation hatch will be ~70 percent complete.
Belleville	Belleville	23 April	1311	1493	1682	Currently: Second-generation moth flight ~45 percent complete; second-generation egg hatch ~10 percent complete. By July 9, second-generation moth flight ~90 percent complete, and second-generation hatch ~65 percent complete.
Edwardsville	Belleville	29 April	1220	1402	1591	Currently: Second-generation moth flight ~30 percent complete; second-generation egg hatch just underway. By July 9, second-generation moth flight ~85 percent complete, and second-generation hatch ~50 percent complete.
Brussels	Brownstown	27 April	1186	1370	1560	Currently: Second-generation moth flight 20-25 percent complete; second-generation egg hatch just underway. By July 9, second-generation moth flight ~80 percent complete, and second-generation hatch ~45 percent complete.
Urbana	Champaign	30 April	1287	1460	1636	Currently: Second-generation moth flight ~40 percent complete; second-generation egg hatch approaching 10 percent complete. By July 9, second-generation moth flight 80-90 percent complete, and second-generation hatch >50 percent complete.
Speer	Peoria	07 May	996	1165	1336	Currently: Second-generation moth flight ~5 percent complete; second-generation egg hatch yet to begin. By July 9, second-generation moth flight ~50 percent complete, and second-generation hatch 10-15 percent complete.
Harvard	Freeport	10 May	820	975	1129	Currently: First-generation flight should be finished, and first-generation egg hatch >95 percent complete. By July 9, second-generation moth flight ~15 percent complete, and second-generation hatch is just beginning.

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European Red Mite in Apples and Peaches

Rains that have fallen in many portions of the state may have aided in suppressing European red mite infestations in apples and peaches, but as recently as a few days ago mite buildups were becoming fairly common. Remember that several insecticides used in apples and peaches kill predaceous mites that otherwise can keep red mite populations in check. Insecticides that are especially harsh on predator mites include all the pyrethroids (Asana, Baythroid, Danitol, Decis, Pounce (permethrin), Proaxis, and Warrior) and all the carbamates (Carzol, Lannate, Sevin, and Vydate). The neonicotinoids (including Actara, Assail, Calypso, and Clutch) also tend to kill enough predators to allow red mite infestations to build. Guthion and Imidan are less toxic to predators, as are Rimon, Intrepid, and Esteem. Growers are advised to scout weekly for European red mites and treat if populations exceed 5 per leaf through early to mid July (or as many as 7.5 per leaf by late July and early August). Effective summer miticides for apples include Acramite, Envidor, Fujimite, Kanemite, Nexter, and Zeal. Apollo and Savey may also be used effectively in mid-summer, but Agri-Mek is less effective after leaves harden off. Very few peach growers will have mite problems this year, but if needed, Acramite, Apollo, Envidor, Nexter, and Savey are labeled for use on peaches.

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Apple Maggot in Apples

The following article by Harvey Reissig and Art Agnello appears in the June 25, 2007, issue of Cornell University's *Scaffolds* newsletter. It provides a great summary on this insect, so there's little reason to write a separate version just for Illinois. For Illinois

readers, remember that apple maggot occurs here in central and northern portions of the state but not in the south. Here's the article, again with credit to the authors.

Once again, it is time to expect the first appearance of apple maggot (AM) flies in volunteer apple stands and abandoned orchards, particularly in eastern N.Y.; western N.Y. could be about a week later, or not, depending on what kind of temperatures we get over the next week or so. [It's already time for this in the northern half of Illinois – R.W.] Crop scouts and consultants have been using traps to monitor AM populations for a long time, but this tactic, useful as it is, nevertheless is not recommended in all cases. Some orchards have such high or such low AM populations that monitoring for them is not time-efficient. That is, sprays are needed predictably every season in some blocks, and on a calendar basis; conversely, they are rarely needed at all in other blocks. However, most commercial N.Y. orchards [and northern Illinois orchards] have moderate or variable pressure from this pest, so monitoring to determine when damaging numbers of them are present can reduce the number of sprays used in the summer with no decrease in fruit quality. Sticky yellow panels have been in use for over 40 years, and can be very helpful in determining when AM flies are present. These insects emerge from their hibernation sites in the soil from mid-June to early July in New York [generally early to mid-June in IL], and spend the first 7–10 days of their adult life feeding on substances such as aphid honeydew until they are sexually mature. Because honeydew is most likely to be found on foliage, and because the flies see the yellow panel as a "super leaf", they are naturally attracted to it during this early adult stage. A few of these panels hung in an orchard can serve as an early warning device for growers if there is a likely AM emergence site nearby. Many flies pass this period outside of the orchard, however, and then begin searching for fruit only when they are ready to mate and lay eggs. That means that this advance warning doesn't always have a chance to take place – the catch of a single (sexually mature) fl y then indicates a spray is necessary immediately to adequately protect the fruit. This can translate into an undesirable risk if the traps are not being checked daily, something that is not always possible during a busy summer.

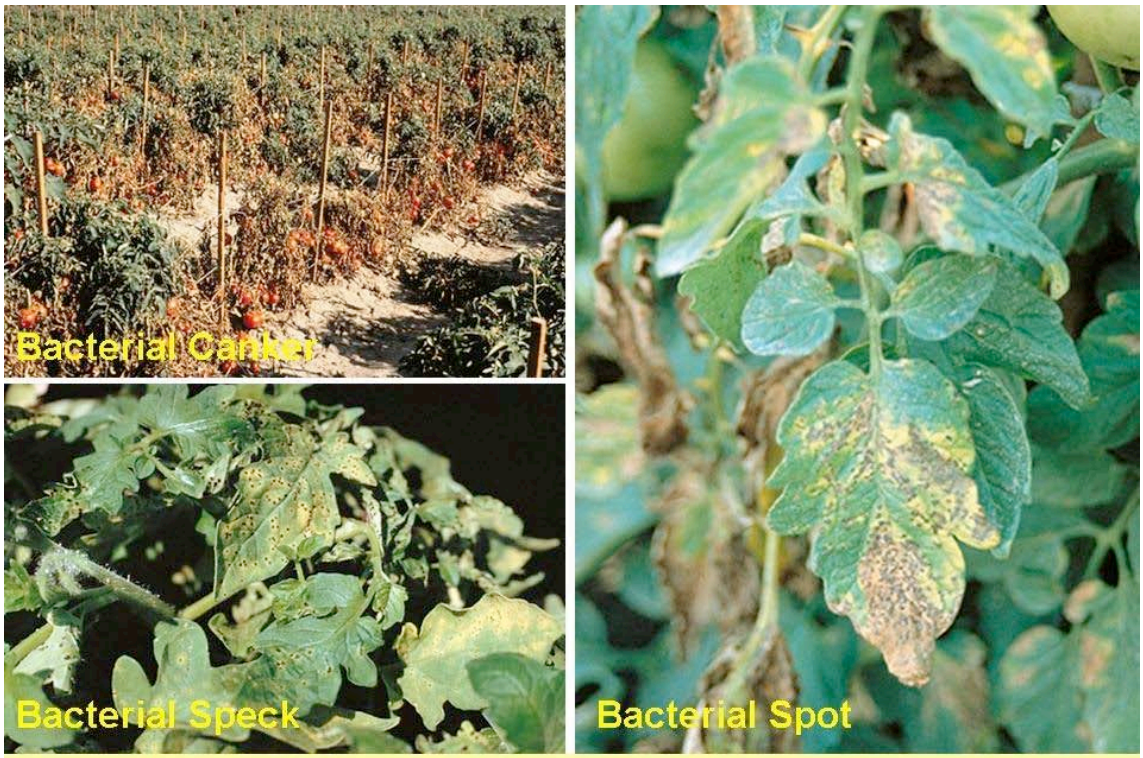
To regain this time advantage, researchers developed newer traps that have the form of a "super apple" – large, round, deep red, and often accompanied by the smell of a ripe apple – in an attempt to catch that first AM fl y in the orchard. Because this kind of trap is so much more efficient at detecting AM flies when they are still at relatively low levels in the orchard, the traps can usually be checked twice a week to allow a one- or two-day response period (before spraying) after a catch is recorded, without incurring any risk to the fruit. In fact, research done in Geneva over a number of years indicates that some of these traps work so well, it is possible to use a higher threshold than the old "one fly and spray" guidelines recommended for the panel traps. Specifically, it has been found that sphere-type traps baited with a lure that emits apple volatiles attract AM flies so efficiently that an insecticide cover spray is not required until a threshold of 5 flies per trap is reached. The recommended practice is to hang three volatile-baited sphere traps in a 10- to 15-acre orchard, on the outside row facing the most probable direction of AM migration (towards woods or abandoned apple trees, or else towards the south). Then, periodically check the traps to get a total number of flies caught; divide this by 3 to get the average catch per trap, and spray when the result is 5 or more. Be sure you know how to distinguish AM flies from others that will be collected by the inviting-looking sphere. There are good photos for identifying the adults on the Apple Maggot IPM Fact Sheet (No. 102GFSTF-I8); check the web version at: http://www.nysipm.cornell.edu/factsheets/treefruit/pests/am/am.asp. In home apple plantings, these traps can be used to "trap out" local populations of AM flies by attracting any adult female in the tree's vicinity to the sticky surface of the red sphere before it can lay eggs in the fruit. Research done in Massachusetts suggests that this strategy will protect the fruit if one trap is used for every 100–150 apples normally produced by the tree (i.e., a maximum of three to four traps per tree in most cases), a density that makes this strategy fairly impractical on the commercial level. A variety of traps and lures are currently available from commercial suppliers; among them: permanent sphere traps made of wood or stiff plastic, disposable sphere traps made of flexible plastic, and sphere-plus-panel ("Ladd") traps. The disposable traps are cheaper than the others, of course, but only last one season. Ladd traps are very effective at catching flies, but are harder to keep clean, and performed no better than any other sphere trap in our field tests. Brush-on stickum is available to facilitate trap setup in the orchard. Apple volatile lures are available for use in combination with any of these traps. These tools are available from a number of orchard pest monitoring suppliers, among them:

- Gempler's Inc., 100 Countryside Dr., PO Box 328, Belleville, WI 53508; 608-424-1544, Fax 608-424-1555.
- Great Lakes IPM, 10220 Church Rd. NE, Vestaburg, MI 48891; 800-235-0285, Fax 989-268-5311.
- Harmony Farm Supply, 3244 Gravenstein Hwy, No. B, Sebastopol, CA 95472; 707-823-9125, Fax 707-823-1734.
- Ladd Research Industries Inc., 83 Holly Court, Williston, VT 05495; 800-451-3406, Fax 802-660-8859.
- Olson Products Inc., PO Box 1043, Medina, OH 44258; 330-723-3210, Fax 330-723-9977.
- Scenturion Inc., P.O. Box 585, Clinton, WA 98236; 360-341-3989, Fax 360-341-3242.

(Article by Harvey Reissig and Art Agnello, Cornell University's Geneva Experiment Station. Illinois growers should address questions to Rick Weinzierl, 217-244-2126; weinzier@uiuc.edu)

Important Bacterial Diseases of Tomatoes in Illinois

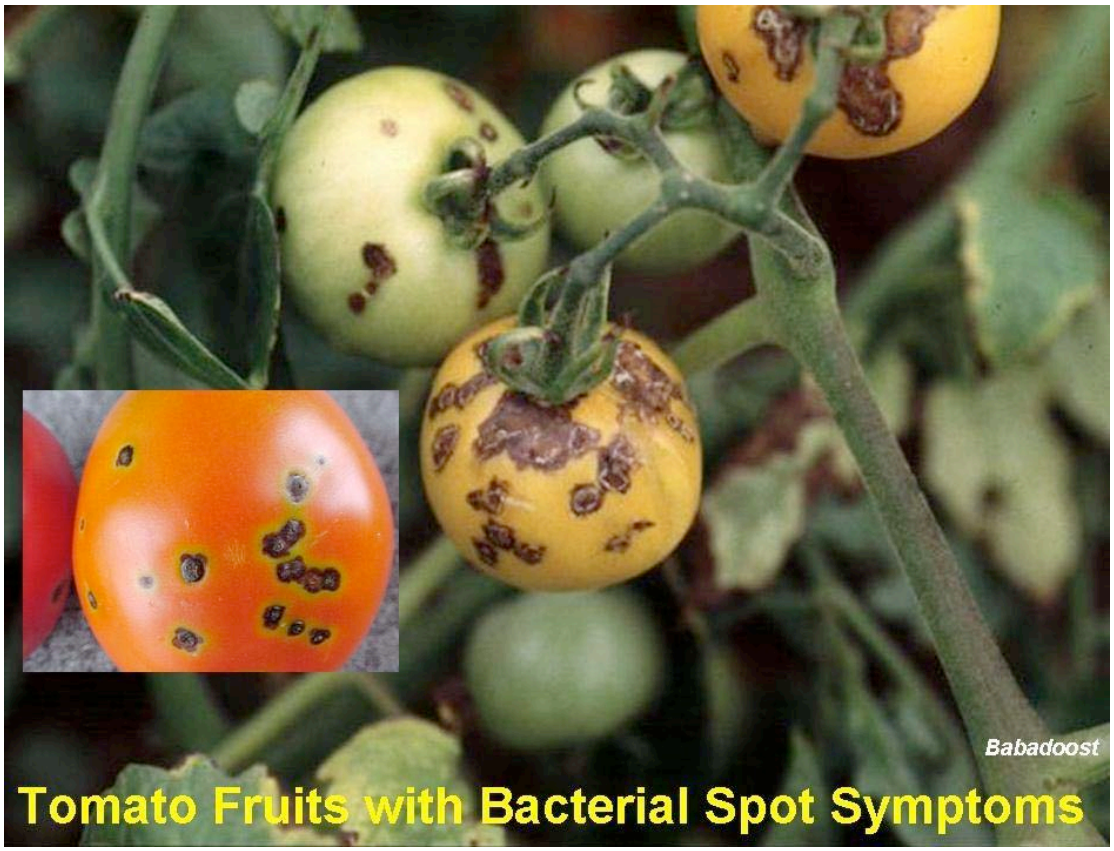
Bacterial diseases of tomatoes occur in commercial fields and home gardens in Illinois every year, causing up to 100% crop losses. Major bacterial diseases of tomatoes in Illinois are bacterial canker, caused by *Corynebacterium michiganense* pv. *Michiganense*, bacterial spot, caused by *Xanthomonas campesiris* pv, *vesicatoria*, and bacterial speck, caused by *Pseudomonas syringae* pv. *tomato*. These bacterial diseases can be distinguished from each other on the basis of fruit symptoms. Management of all three bacterial diseases is similar and requires cultural practices and preventive chemical applications, mainly copper compounds. Bacterial canker is more destructive than other two diseases.



Bacterial canker: Infected seedlings may be killed quickly. Early symptoms of the disease on the foliage are wilting, curling of leaflets, and browning of leaves. As the leaves die, the petioles remain green and firmly attached to the stem. A cut through the stem shows yellowish brown discoloration of the vascular element. Fruit symptoms may be observed at any age, but are usually seen first on green fruit _ to 2 inches in diameter. White spots 1/8 inch in diameter develop on the fruit. The spots have a dark brown center, which becomes raised, and are surrounded by a distinct white halo; they have been termed "bird's-eye spots."

Tomato Fruits with Bacterial Canker Symptoms

Bacterial spot: Leaves, stem, and fruit may be infected. Infected leaves show small, irregular, dark lesions, which can coalesce and cause the leaves to develop a general yellowing. Symptoms on fruit appear as black spots. The spots on green fruit are as small water-soaked, slightly raised lesions, measuring 1/8 to 1/4 inch in diameter. Gradually, the spots become brown, slightly sunken, with rough and scabby surface.



Bacterial speck: Infected leaves develop small, black lesions, often with a discrete yellow halo. Infected fruit develop lesions, which are small, sunken, black spots surrounded by darker green haloes. On ripe fruit, spots are dark brown to black, superficial flecks. The symptoms of bacterial spot and bacterial speck are similar. These two diseases are more readily distinguished on the basis of fruit symptoms.

Tomato Fruits with Bacterial Speck Symptoms

To manage bacterial diseases of tomatoes, the following practices are recommended: (1) use only certified, pathogen-free seed; (2) plant only certified, disease-free transplants; (3) sterilize greenhouse and seedbed soils; (4) practice 2- to 3-year crop rotation with non-solanaceous crops; (5) follow good sanitation programs; (6) in the field, control irrigation to minimize plant wetness; (7) control weeds; and (8) use bactericides to reduce severity of these diseases. Sprays of fixed copper (e.g., Kocide-3000, Cuprofix Disperss) help in protecting healthy plants against these bacterial diseases. Application of Tanos (famoxadone + cymoxanil) can suppress development of all three bacterial diseases of tomato. Also, application of Actigard (acibenzolar-s-methyl) can result in effective control of bacterial spot and bacterial speck. For more information on chemical control of tomato bacterial diseases in commercial fields, consult the *2007 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)

Squash Bug and Squash Vine Borer

Squash bug and squash vine borer have been reported from squash and pumpkin plantings from much of the state. For a refresher on these insects, see issue number 9 from the 2006 volume of this newsletter (http://www.ipm.uiuc.edu/ifvn/volume12/frveg1209.html) (pages 80-81 from the printed copies). Several insecticides, including Capture, Sevin, Endosulfan, Asana, and Pounce (permethrin), effectively control squash vine borer in squash and pumpkins. The product that is most effective against squash bug in these crops is Capture (the same active ingredient is also sold under the trade name Discipline). Asana (esfenvalerate) or Pounce (permethrin) can give some control IF applied when nymphs are young. When adults move into fields and feed on young plants, watch for wilting of seedlings and apply an insecticide if wilting is observed. Scout for eggs of the squash bug on upper and lower surfaces of leaves. If densities exceed one egg mass per plant, use insecticides for control as nymphs begin to hatch. Organic growers may choose to use floating row covers to exclude squash bugs from young plants, but when row covers have to come off to allow pollination, none of the insecticides approved for use in Certified Organic production systems are truly effective against squash bugs.

Squash vine borer adult (left) and larva (right)

Squash bug adult (above), eggs (lower left), and nymphs (lower right.

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

Corn earworm

Corn earworm moth counts in traps have begun a slow increase in some areas. Ron Hines' nylon cone traps in far southern Illinois caught less than 2 moths per trap for the 7 days ending June 19, but his trap in St. Claire County east of Belleville captured 6 moths per trap per night for the same period. Mike Roegge's nylon trap near Quincy captured 6-7 moths per night for the period ending June 25. Keep in mind that counts from nylon traps are typically only 15 to 40 percent of the numbers that would show up in wire traps. Dan Fournie of Collinsville reported 118 moths trapped overnight on June 24-25. Our trap near Urbana has been catching a few moths, as has Matt Klein's trap near Burlington in far northern Illinois. Check the article in issue number 1 of this year's newsletter

(March 8, 2007, http://www.ipm.uiuc.edu/ifvn/volume13/frveg1301.html#veg) for more information on corn earworm and corn borer control.

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Words of Wisdom …

Air Force One arrives at Heathrow and President Bush strides to warm and dignified reception from the Queen. They are driven in a 1934 Bentley to the edge of central London where they change to a magnificent 17th century carriage hitched to six white horses. They continue on towards Buckingham Palace, waving to the thousands of cheering Britons; all is going well. Suddenly the right rear horse lets fly with the most horrendous earth shattering breaking of the wind ever heard in the British Empire, and the smell is atrocious. Both passengers in the carriage must use handkerchiefs over their noses. The incident shakes the coach, but the two dignitaries of State do their best to ignore the incident. Feeling embarrassed, the Queen turns to President Bush, "Mr. President please accept my regrets ... I am sure you understand there are some things that even a Queen cannot control." Always Presidential, Mr. Bush replied: "Your Majesty, do not give the matter another thought. Until you mentioned it, I thought it was one of the horses."

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