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College of Agricultural, Consumer, and Environmental Sciences

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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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Upcoming Programs

- **Managing Grape Vines After Freeze Damage, May 12, 10:00 a.m.**, Vahling Vineyard near Stewardson, IL (just north of Effingham). Dr. Paul Read, University of Nebraska, will be the featured speaker. Note the directions and details in Elizabeth Wahle's notes below.
- **Calhoun County Orchard Twilight Meeting, May 22, 6:00 p.m.**, Murray's Orchard, just north of Mosier, IL. From Hardin, go north to Kampsville, and turn left (west) on State Route 96. Follow the right hand turn to stay on State Route 96, and then turn right onto Crooked Creek Road (at the white church on corner). Go about a _ mile, and Murray's Orchard is the first driveway on the right. Ongoing management needs for freeze-damaged orchards will be among the topics to be discussed.

Regional Updates

In southern and southwestern Illinois, it is important for fruit growers to file a notice of loss **now** with their local FSA office if they have not done so already (regardless if you have NAP coverage). The FSA is assembling the official loss information which will be used by state and federal agencies to approve any crop disaster assistance on a county by county basis.

It looks as if a few growers in Calhoun County have a small peach crop. I toured an orchard last week that had a full crop of Cresthaven and Contender. They also had a Redhaven crop, but not enough to justify the spray bill. Other orchards stretching from Calhoun to St. Clair County are reporting small peach crops as well – all later varieties. Not everyone with Cresthaven, Glohaven, Contender, and Jim Dandy have a crop though, as survival seems to be very site specific. Thinning started last week on many of the apple varieties that made it through the freeze.

The next twilight meeting for tree fruit growers has been scheduled in Calhoun County for May 22, at 6:00 pm, at Murray's Orchard just north of Mosier, IL. From Hardin, go north to Kampsville, and turn left (west) on State Route 96. Follow the right hand turn to stay on State Route 96, and then turn right on to Crooked Creek Road (white Church on corner). Go about a _ mile, and Murray's Orchard is the first driveway on the right.

I initially was concerned about bramble yields following the freeze, but plants are recovering and setting bloom, though the resulting flowers and fruit are fairly small in size and quantity compared to previous years. The upshot is there will be a bramble crop for many growers. Primocanes are coming up strong, and it won't be long before it is time to tip back black and purple raspberries and blackberries to maximize next year's yield. Plasticulture strawberry picking started last week, with some pretty nice looking berries. The matted-row berries should be coming on soon. Keep scouting for thrips. The plants look rougher than normal, and there are a fair amount of odd-shaped berries as a result of freeze injury to the bloom. U-pick operations should run a contest on who finds the most unique strawberry. I picked one that looked like a X-mas stocking ... see the picture below. Blueberries are similar to apples in terms of crop potential; some varieties were hit harder than others, as well as some locations. Bloom is almost completed and the earliest setting fruit is pea-sized. Grapes are recovering well with secondary growth, and flower clusters are already visible on many of the varieties. Many growers have started the process of thinning excess shoots and clusters that resulted from the freeze damage.



Strawberries: Some odd shapes have resulted from freeze injury to blossoms.

Early-planted sweet corn was stalled enough by the cold weather that the later plantings have caught up. I have seen some beautiful vegetable fields – greens, tomatoes, asparagus, and peppers. Rain has been fairly significant, so everything planted is off to a good start.

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In northern Illinois, from April 26 to May 9, day-time highs fluctuated between the low 50s and the low 80s, and night-time lows have ranged from the low 40s to low 50s. Soil moisture is very low, with less than $\frac{1}{2}$ inch of rainfall in the northern region during the April 26-30 period and less than 0.1 inch so far in May. Drip irrigation is already on in some strawberry patches and in fields where cool season vegetables were transplanted recently.

There is a lot of variation in bloom in apples, where some trees in the same row are loaded with blossoms and others have very few or none. Early-maturing apple varieties are at petal fall, and late varieties are in full bloom. Orchardists are applying bactericides and fungicides to control apple scab, fire blight, and insect pests. Remember to save bees by not spraying apples during bloom. Codling moth pheromone traps and/or mating disruption dispensers are up in most orchards. Cold injury to newly planted peach trees, shoots of mature peach trees, and canes of some varieties of raspberries and blackberries has been reported, but losses here are much less than in the southern portion of the state because crops were less advanced when the freeze occurred. There were very few blooms in Asian pears compared to European types. Strawberries are in full bloom, and raspberries in pre-bloom stage. Grapes are in the 10-inch shoot stage, and peaches are at petal fall. Ground has been worked for vegetable planting, and black plastic mulch has been laid in some fields. Tomatoes, cucumbers, peppers, melons, and other warm-season vegetables for transplanting are still inside greenhouses.

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Degree-day Accumulations

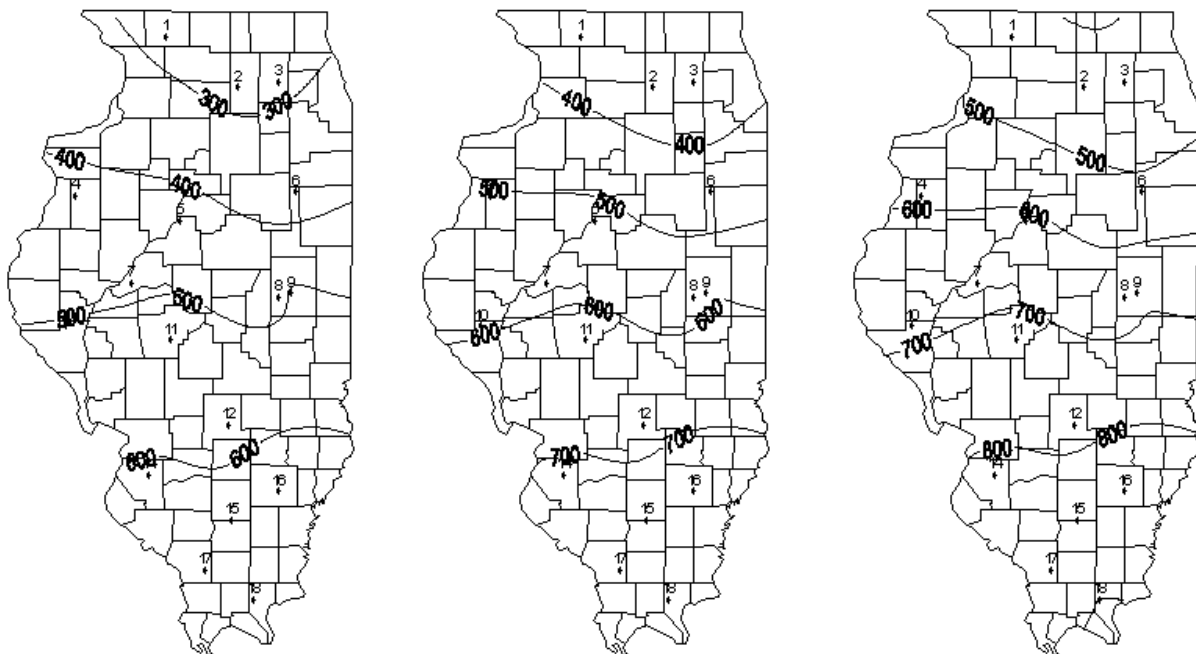
Degree-day accumulations listed below for weather stations in the Illinois State Water Survey WARM data base have been summarized using the Degree-Day Calculator on the University of Illinois IPM site (<http://www.ipm.uiuc.edu/degreedays/index.html>). The list below includes only degree-day accumulations 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-day accumulations, base 50 degrees F, starting January 1.

Station	County	Base 50F DD Jan 1 – May 8, Historic Average	Base 50F DD Jan 1 – May 8, 2007	Base 50F DD Jan 1 – May 15 (Projected)	Base 50F DD Jan 1 – May 22 (Projected)
1. Freeport	Stephenson	279	277	345	416
2. Dekalb	Dekalb	315	273	347	423
3. St. Charles	Kane	287	287	351	417
4. Monmouth	Warren	358	424	505	589
5. Peoria	Peoria	395	448	533	619
6. Stelle	Ford	351	354	434	518
7. Kilbourne	Mason	480	481	572	663
8. Bondville	Champaign	409	462	548	638
9. Champaign	Champaign	413	516	603	692
10. Perry	Pike	454	504	591	681
11. Springfield	Sangamon	450	542	638	738
12. Brownstown	Fayette	519	567	667	769
14. Belleville	St. Claire	578	612	715	821
15. Rend Lake	Jefferson	613	621	732	843
16. Fairfield	Wayne	572	650	768	879
17. Carbondale	Jackson	611	666	767	871
18. Dixon Springs	Pope	647	682	790	900



Degree-day accumulations, base 50 F, from January 1 – May 8, 2007 (left), and projected through May 15 (center) and May 22 (right).

Notes from Chris Doll

A year ago, things were growing slowly and concern was about rainfall. At this time, the area has received about the normal amount of rain and with the warm temperatures, vegetative growth is excellent. Trees and other perennials are making new growth, and without a fruit crop, the growth might be too much. Fortunately, some reports of sightings of apple and peach fruits have been received, but the area from here south is extremely light. In the Back 40, American grapes surprised me with some live fruiting shoots that might make a five percent crop. There was a secondary bloom on several apple varieties on April 24 (following full bloom on April 2) that set a few apples and also was severely infected with fireblight. Peaches are very scarce, some strawberry bloom finally showed, and brambles have been severely damaged. Some commercial fields of matted row strawberries lost the early flowers but have a fair to good bloom coming on.

Early in the days of the freeze, I commented that there were two benefits. The first is that the flowers of the sweet gum trees froze to eliminate the gum balls, and the second was that the stress of apple thinning spray time would be delayed until next year. However, growers in the no- to low-damage areas have the thinning time rapidly approaching. The suggestions in the Spray Guide remain about the same as they were last year.

Without a fruit crop, my phenology notes for comparing with other years do not mean much. So, the degree-days that Dr. Weinzierl has summarized will give some indication of crop phenology with last year and normal. A warm week is upon us and the degree-day accumulations are climbing rapidly. My biofix for codling moth was set on April 29, and the degree-days through May 8 total 210.

Other than the fireblight in the Back-40 and some rosy apple aphids in a commercial orchard, pest problems have been either light or controlled.

The January-March 2007 (Vol. 17, no. 1) issue of HortTechnology had a report on treatments to induce return bloom on biennial-bearing varieties. The study was done by North Carolina State University researchers on several varieties with NAA and ethephon at different rates, times and combinations. The conclusions were that "an effective thinning program and either early summer NAA or ethephon sprays both appear to be prerequisites for achieving more consistent cropping on strongly biennial apple cultivars." In the Midwest, sprays of NAA at 5 ppm at 5, 7, and 9 weeks after petal fall will help. Ethephon at 200 ppm can also be used.

Chris Doll

Neonicotinoids and Honey Bee Colony Collapse Disorder

The following text is reprinted from the April 24 issue of the Northwest Michigan Horticultural Research Station's *Weekly Update*, available on the web at <http://www.maes.msu.edu/nwmihort/fruitnet424.html>.

"As we mentioned last week, we have reported cases of colony collapse disorder (CCD) in our honey bee hives in the region. We also reported that neonicotinoid insecticides have been found in nectar and pollen in hives where bees have disappeared. The following recommendation has been issued from Dr. Zachary Huang, the MSU honeybee expert: Avoid using neonicotinoid insecticides near honeybees, if possible. If growers must rely on these chemistries, avoid using them during bloom or before bloom, as the pesticides are systemic and can be transported into nectar and pollen. As we do not use these insecticides around bloom time in cherry, this recommendation can be easily followed. In the case of apples, we recommend other chemistries that are more effective for first generation codling moth and obliquebanded leaf roller control when we would have potential contact with honeybees. Recent evidence suggests neonicotinoids can impair honey bee learning and disrupt their homing abilities."

It remains unclear what role neonicotinoid insecticides are playing in colony collapse disorder. To my knowledge, the possible roles of these insecticides as well as several pathogens are being investigated, and no single "suspect" is consistently associated with the decline of colonies. Regardless, all the precautions recommended in the paragraph above are relevant and wise even if neonicotinoids are not determined to have a major role in colony collapse disorder. We know that this group of insecticides is toxic to bees, with specific compounds each somewhat different in the risks they pose. NOT applying them during bloom or a short time before bloom clearly is a wise precaution, as is NOT applying them in fields or orchards where blooming weeds are attracting honey bees even if the crop is not. Neonicotinoid insecticides include imidacloprid (Admire, Provado, Advantage, Gaucho, Marathon, Merit, Imicide, and more), thiacloprid (Calypso), thiamethoxam (Cruiser, Flagship), and acetamiprid (Assail, TriStar).

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Fruit Production and Pest Management

Apple Thinning

It is likely that seed set may not be great in apple fruits that made it through the spring freeze and the cold weather that was common during pollination. A study on apricots showed that late spring frost caused injury to floral organs, reduced fruit set, and reduced seed number. The study established a clear relationship between the early external symptoms observed in the flower organs and damage in the developing seed, the arrest of fruit growth, and subsequent fruit drop. Studies on apples have also reported that fruits that remained attached to the tree after thinning with growth regulators have more seeds than fruits that drop. In other words, fruits that have less than a full complement of seeds are likely to abort easier than fruits that have full set of seeds; the more seeds the fruit has the more likely that it will be harder to thin.

Based on these observations, we can guess that apples will be easier to thin this year where crop loads are sufficient to require thinning, so I think it will be better to start with a milder thinner such as Sevin or NAD (or accel) at 7 to 8 mm fruit diameter. Try not to use NAA, as it is a more aggressive thinner than Sevin, especially on easier-to-thin varieties. To see if the thinner worked, I suggest that you cut a few fruits in half soon after you apply the thinner, leaving the stem half attached to the tree. Mark the place where these fruits are and check on them after about 10 days. If they dropped, select a branch with a heavy fruit set then shake it vigorously. Count the number of fruits that are left attached to that branch. If there are more fruits left than necessary, then consider spraying NAA if the fruit size is 12 mm or less. If fruit size is larger than 12 mm, then consider a mixture of Sevin and a low rate of NAA. Do not apply NAA alone when fruit size is larger than 12 to 13 mm so that you don't get pigmy fruits, especially on spur varieties such as 'Spur Delicious.'

Mosbah Kushad (217-244-5691; kushad@uiuc.edu)

Codling Moth Phenology

Based on observations from Echo Valley Orchard near Murphysboro, Eckert's at Belleville, Chris Doll's backyard orchard at Edwardsville, Hagen's Orchard near Brussels (southern Calhoun County), and the University of Illinois orchard at Urbana, here are biofix dates and degree-day accumulations and projections for codling moth for southern and central Illinois. If growers to the north have begun to catch moths and can send biofix dates, I'll include those in the next issue. Chris Doll reported 210 DD since biofix for Edwardsville, 34 more than estimated using the nearest WARM weather station at Brownstown; we'll see how the numbers compare as the season continues. Using on-site temperatures clearly is the most accurate actual accumulations, and interpolating between Belleville and Brownstown data may give the most useful projections for Edwardsville.

Orchard Location	Weather Station	CM Biofix Date	DD ₅₀ through May 8, 2007	DD ₅₀ projected through May 15, 2007	DD ₅₀ projected through May 22, 2007
Murphysboro	Carbondale	18 April	339	441	545
Belleville	Belleville	23 April	285	389	496
Edwardsville	Brownstown	29 April	176	277	379
Brussels	Brownstown	27 April	196	296	399
Urbana	Champaign	30 April	161	249	338

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**. An isolated catch of 1 moth in one of several traps followed by a few days of no captures does not constitute a biofix. On the other hand, traps do **not** have to catch lots of moths to mark a biofix. If traps were checked every 2 days, and the average on May 1 was 1 moth per trap, then on May 3 the average was 1.5 moths per trap, then on May 5, 2 moths per trap, consider the biofix date to be May 1 (or April 30).

Codling moth development:

First egg hatch (for first generation larvae)	~220 DD ₅₀ after biofix
50 percent of first generation moths emerged	~240 DD ₅₀ after biofix
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

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

Oriental Fruit Moth Phenology

In the previous issue of this newsletter I noted that oriental fruit moth flights had begun in late March or by the first of April in orchards at Dixon Springs, Belleville, and Brussels. In orchards near Brussels, extensive searches on May 2 for surviving larvae from these early flights yielded nothing (no infested shoots, and many shoots that had died back from freeze damage). I have to conclude that very few of the moths or larvae present before the Easter freeze survived to give a start to first generation at these locations.

Moths that emerged after the freeze seem to provide the best indication of biofix dates for starting phenology models that will predict the timing of events for the remainder of the year, so for now, the biofix dates listed in the table below are the first sustained captures AFTER the freeze. Start times for phenology models therefore are very similar for southern through central Illinois.

Orchard Location	Weather Station	OFM Biofix Date	DD ₄₅ through May 8, 2007	DD ₄₅ projected through May 15, 2007	DD ₄₅ projected through May 22, 2007
Dixon Springs	Carbondale	17 April	413	555	698
Belleville	Belleville	13 April	431	569	708
Brussels	Brownstown	16 April	412	545	680
Urbana	Champaign	20 April	371	491	612

Generation time for oriental fruit moth development is approximately 950 degree-days (base 45 F). Eggs hatch in approximately 90-100 DD after they are deposited.

Oriental fruit moth, first generation development:

First eggs laid	~75 DD ₄₅ after biofix
Peak first generation flight	~150 DD ₄₅ after biofix
Peak egg laying	~350 DD ₄₅ after biofix

(Table based on *Common Tree Fruit Pests* by Howitt., published as NCR 63 by Michigan State University, East Lansing, MI, 1993.)

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Lesser peachtree borer

Lesser peachtree borer flights have been underway for at least a few days from southern through central Illinois. In orchards where this insect has been a moderate to severe problem, now is the time to apply the first of two trunk and scaffold-branch sprays to reduce injury from the larvae of this insect. A second application can be made in August after a summer flight peak; that application usually provides (greater) peachtree borer control as well. Lorsban 4EC is effective against lesser peachtree borer, providing 4 to 6 weeks of control. Other insecticides labeled for use trunk and scaffold-branch sprays include Endosulfan and a few pyrethroids (Pounce, Asana, Warrior, and Baythroid); see pages 33-34 of the [2007 Midwest Commercial Tree Fruit Spray Guide](#). Mating disruption is an effective alternative to trunk sprays for lesser peachtree borer and (greater) peachtree borer control and may be used in organic production. Contact me if you want more information on this approach.



Left: Lesser peachtree borer adults (Cornell University). Right: Lesser peachtree borer larvae (West Virginia University).

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Fireblight

After freeze-injury in early April in apple orchards and very conducive weather conditions (frequent rain falls and temperatures of 60-80 °F) in May, it is now obvious that 2007 is going to be a fireblight year in Illinois. Widespread fruit blight and shoot blight have already been observed in apple orchards in the southern portion of the state. Application of antibiotics (i.e., Streptomycin 17WP) during bloom is essential to control fire blight in Illinois. Since apple trees are still in bloom in northern Illinois, growers should not hesitate to apply Streptomycin (i.e., Agromycin 17WP) as predicted by the MARYBLYT program (or COUGARBLIGHT program) or at 5-day intervals, but not exceeding a total of four applications. Do not apply antibiotics after bloom, unless there is a trauma event (i.e., hail or heavy storm). Follow the practices recommended in the [2007 Midwest Commercial Tree Fruit Spray Guide](#).



Summer Diseases of Apples

Major summer diseases of apples in Illinois are sooty blotch, flyspeck, and fruit rots (bitter rot, black rot, and white rot). Other diseases that usually develop in spring may continue spreading in summer are scab and powdery mildew. Sooty blotch/flyspeck and fruit rots can cause yield losses of up to 100% if effective control measures are not applied.



An on-site wetness-based disease-warning system was evaluated during 2001-2006 for management of summer diseases of apple in 17 commercial apple orchards throughout Illinois. Canopy wetness was measured by using the Spectrum Technologies Wetness/Temperature Watchdog sensor, which was placed on the northern side of the canopy of a tree in the orchard 5 ft above the ground facing north at an angle of 45° to horizontal. Trees were sprayed through the first cover spray (10 to 14 days after petal fall). The second cover spray was applied after accumulation of 175 hours of wetness. There was no significant difference in incidence or severity of sooty blotch, flyspeck, fruit rots, or other diseases between experimental trees and the trees received the standard spray schedule. The disease prediction system saved growers 1 to 7 (mean 3.25) sprays in comparison with a 2-week spray schedule. This on-site wetness-based disease-warning system is now practiced by several growers in Illinois. Growers interested in using this disease-warning system should contact me for help to establish the program.

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

Vegetable Production and Pest Management

Striped cucumber beetle

Mike Roegge of Adams County reported that striped cucumber beetles were active there by earlier this week, and their feeding on cucurbits began before that in more southern counties. Just a reminder ... this is the insect that carries the pathogen that causes bacterial wilt of cucurbits, a disease that's particularly devastating to cucumbers and muskmelons. Controlling beetles to prevent wilt is warranted when numbers exceed 0.1 to 1 per plant. (This range results from the variation in prevalence of the disease last summer and fall and the portion of overwintering beetles that carry the bacteria ... these levels vary from season to season and from place to place.) Insecticides that are effective against striped cucumber beetles include in-furrow systemics applied at planting or transplanting (Furadan or Admire) and a number of foliar sprays. See page 82 of the [2007 Midwest Vegetable Production Guide](#) for a listing of insecticides and rates. In organic production systems, floating row covers can be used to prevent cucumber beetles from reaching plants and transmitting bacterial wilt. Row covers must be removed at bloom to allow pollination, but early-season protection delays and reduces losses to bacterial wilt.



Striped cucumber beetle on a pumpkin seedling.

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Words of Wisdom ... what you wish you might hear in a political debate ...

The debate had been underway for well over an hour, and [the candidate] had grown weary of his opponent's constantly shallow, hollow answers – always another trite sound bite with little or no relevance to the question. As his opponent finally ended yet another disconnected and baseless rant, the moderator asked, “Do you have anything you would like to say in brief response?”

[The candidate] answered, “I find it almost immoral to engage in a battle of wits with such an obviously unarmed opponent.”

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