

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, weinzierl@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 address above.

This issue's words of wisdom ... which usually means the jokes ... are at the end of newsletter ... check the last page.

In this issue ...

Crop and Regional Reports (from Elizabeth Wahle, Bronwyn Aly, and Maurice Ogutu)

Notes from Chris Doll (rapid fruit crop development, initial codling moth flight, thinning, Apple Basket orchard auction)

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Degree-day Accumulations (and links to the new Degree-Day Calculator on the University of Illinois IPM site)

Fruit Production and Pest Management (Apple thinning, eastern flower thrips, and codling moth)

Vegetable Production and Pest Management ("Leps" in cabbage and related crucifers)

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

Crop and Regional Reports

In the south and southwest, things are picking up speed. As of this writing, the southern region missed most of the rain and damaging storms experienced further north. We have been having a fairly dry spring both in rainfall and humidity, making rain a hoped-for event. Planting continues with the favorable working conditions. Sweet corn is reported to be on at least the 3rd succession planting, and several early-season tomato transplants are in the ground with covers. Horseradish planting is well underway if not completed by many growers. Several varieties of matted row strawberries are in full bloom, and this is a good time to remember to watch out for thrips. Examine closely with a hand lens several flowers throughout the patch. If you don't have a hand lens, shake several flowers in Dixie Cup or other white-colored container covered with plastic wrap. You are looking for a very small (splinter-size), tan-colored, cigar-shaped insect. Maintain scouting throughout the cropping season and keep in mind PHI's as you approach harvest. Plasticulture strawberries are sizing and should be in harvest within the next 10 days depending on location. Bloom-thinning peaches continues, and some varieties are already at shuck split. The first round of chemical bloom thinning of apples is just underway.



Strawberry blossom in a white bowl (left); eastern flower thrips on a strawberry petal (right).

Eckert's Grafton Farm is hosting the first twilight meeting in the southern region for tree fruit growers on May 5th, starting at 6:00 pm. Heading north on Rt. 3 out of Grafton, Eckert's is located just west of Rt. 3 on Otterville Road. The program will include a tour of the orchard and the operation as a whole, and state specialists will be present to give current updates and recommendations. Contact: Elizabeth Wahle (618) 692-9434 for more information.

And a reminder reprinted from issue 5:

Looking to the future, a day of peach orchard tours has been scheduled in Southern Illinois on May 14th. This is a joint meeting for Illinois and Missouri growers and is sponsored by University of Illinois Extension, University of Missouri Extension, and Southwest Missouri State University. Growers from Illinois, Missouri, and surrounding states are invited to meet in Illinois to tour Grammer's Orchard, Rendleman Orchards, and Flamm Orchards. The registration fee for the tour is \$5.00, and pre-registration by May 7th is requested to provide an accurate lunch count. (A registration form is provided with this issue for those who receive the newsletter by US Mail; for those who read it on the web, click on the link at end of this paragraph.) The tour will begin at Grammer's Orchard at 9:00am. Grammer's is located approximately 5 miles south of Murphysboro on IL-127. Turn east on Grammer Road and go approximately 2 miles, then turn right onto Dutch Ridge Road. Grammer's is located just left of Dutch Ridge Road on Peach Road (144 Peach Road, Carbondale). The group will spend approximately 1 hour at Grammer's before traveling to Rendleman Orchards. Rendleman's is approximately 11 miles south of Murphysboro on IL-127 (9680 State Route 127 N, Alto Pass). The tour at Rendleman's will begin at 10:30 a.m. and move to Flamm's where lunch will be provided at noon. Flamm's is north of Cobden on Old Highway 51 (8760 Old Highway 51 N, Cobden). The group will finish the day by touring Flamm Orchards, beginning at 1:00. Elizabeth Wahle (618-692-9434) is the contact for the tour schedule. The event is posted at <http://web.extension.uiuc.edu/regions/hort> and <http://mtngrv.smsu.edu/calendar.htm>

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

At the Dixon Springs Ag Center, it seems this spring is turning out to be quite different from the last two seasons – the ground is very dry. We haven't seen rain in almost 3 weeks, and when it did rain the total accumulation was no more than 0.2 inch. We are hopeful that this week will bring some much needed moisture. Plasticulture strawberries are looking good this season. and it has been a benefit for them that the season has been dry. Sweet Charlie's are starting to turn pink, and we expect to start harvesting next week. Blueberries have also set a heavy crop, and the bumble bees have been working overtime to get everything pollinated. Apples were at full bloom the end of last week. Even with dry conditions, we have been applying streptomycin for fire blight control because of the amount of inoculum present at our location. With 26 different varieties of grapes, we are seeing vines stages anywhere from bud break to 5-inch shoots. Tomatoes and peppers are in the greenhouse, and we expect to transplant into the field the first week of May.

Bronwyn Aly (618-395-2444; baly@uiuc.edu)

In northern Illinois, day temperatures have ranged from the upper 40s to upper 80s, with mostly sunny days, and night temperatures varied from the low 30s to the 60s between April 8 and April 20. Tillage operations have been going on in most farms, as it has been very dry since the beginning of the month, with rainfall of less than ½-inch recorded on April 20 in many counties.

Most apple trees are half-inch green to tight cluster stage; pears are in the green cluster to white bud stages, and peaches are in full bloom. Apple scab and powdery mildew control spray programs are going on in many orchards. Spotted tentiform leafminer traps are up in most orchards, and orchardists have embarked on European red mite, San Jose scale, and adult spotted tentiform leafminer control spray programs. Grapes are at bud swell, and spray programs for anthracnose, European red mites, and scales are going on. Currently we have not received any report on flea beetles or climbing cutworms in vineyards. Raspberry canes have green tips, and asparagus harvesting is underway on most farms. Most growers in the Kankakee area planted cool season vegetables such as potatoes, cabbage, broccoli, and onions last week. Tomatoes, peppers, and other warm season vegetable seedlings have been started indoors.

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

Notes from Chris Doll

A fast week in the orchard! Apples went from early pink on the 9th to full bloom on the 15th to petal fall on the 20th. Growth was so fast (coupled with lots of wind) that some growers got caught with no Apogee applications for fire blight. New shoot growth is now at 3 to 4 inches. Peach and other fruit trees were a few days ahead of the apples in development and the peach are now showing shuck split and even shuck off. The high temperature was 90 degrees on the 17th and was coupled with very low relative humidity of 19 percent. According to a recording weather station at Marthasville, Mo., there were 4 days with relative humidity of 21 percent recorded last week. Some of this is the lack of rainfall, which has totaled only 0.3 inch for the month.

Apple bloom was very good in the area, and peach growers reported the heaviest bloom ever, prompting questions about chemical thinners for peach. At this time, nothing is reliable for the area. The blooming season has been enjoyable from the first apricot into the dogwood time now. Even the dandelions seem to be outdoing their usual bloom this year. Is there any economic value to that crop?

Other than the apple scab wetting rain in late March, there were no concerns about that disease, and fire blight predictions were quiet until the end of last week. On the 20th following 0.17 inch of rain, cedar apple galls were in bloom and I had to admire the rapidity and beauty of their development. The negative side is that morel mushrooms have been nil in my travels. Hunting for European Red Mite has been almost as bad as morels, as only a few were found in 6 orchard blocks.

An IPM company catalog has a phenology chart based on New York data based on DD base 50. It listed full bloom for McIntosh as 188 DD and mine were there at 190 DD. First adult catch of codling moth is listed at 256 DD, and my first catch was the night after hitting 250 DD and a Missouri orchard's first catch was at 255 DD. The latter site then had enough moths of the 21st to set the biofix for the pest.

Some petal fall apple thinning applications have begun the most stressful time of apple production. Underthinning can be as bad as overthinning, so that leaves one chance in three for success. However, experience is the best teacher and so a growers records and following some of the written guidelines can improve the odds. The Illinois Spray Guide has a fairly simple and effective chart on thinner use on page 44. The "Apple Thinning Guide" written by Phil Schwallier of Michigan State University and published by the Great Lakes Publishing Company (Fruit News) is a good publication as are some of the Spray Books from states like Virginia, Pennsylvania, New Jersey and New York. Since weather can have a great effect on the action of the chemicals, try to make applications at temperatures above 70 degrees and remember that cloudy conditions(including several days) ahead of spraying can make the trees more susceptible to chemical reaction.

In this area, it is time to give peach trees the remainder of the nitrogen fertilizer, apply herbicides to reduce weed competition to the trees, give the newly planted trees a drink of water, and perform ringing and scoring treatments to apple trees that need the treatment.

And finally, this Saturday, April 23, will see the end of Franked Orchards or more recently The Apple Basket at Barry, IL when Jack and Karen Cruttendon auction the farm and facilities. It most likely means the loss of more apple acreage and another apple knocker. Jack was a plus to the industry and we wish him well in his new endeavors.

Chris Doll

Upcoming Programs, Opportunities

Illinois-Missouri Peach Orchard Tour, May 14

See Elizabeth Wahle's notes above about updates for southern and southwestern Illinois.

Southwestern Illinois Tree Fruit Twilight Meeting, Eckert's at Grafton, May 5

Again, see Elizabeth Wahle's notes above about updates for southern and southwestern Illinois.

Illinois Summer Horticulture Day, June 17

The Illinois State Horticulture Society Summer Orchard Day (now more broadly the Illinois Summer Horticulture Day) will be held at Eckert's Country Store and Farms in Belleville on June 17. More details will follow in subsequent issues of this newsletter.

International Dwarf Fruit Tree Association Summer Tour, June 20-22

The IDFTA summer orchard tour will take place in Wisconsin and Minnesota this year; the dates are June 20-22. The tour will be headquartered in LaCrosse, WI – not all that far from Illinois. More details will be provided in this newsletter as the dates approach. If you need more information right away, contact Teryl Roper at the University of Wisconsin (trroper@wisc.edu).

Degree-Day Accumulations and Projections

	DD, Base 50°F through April 20	11 YR AVE, Base 50°F through April 20	Projected DD, Base 50°F through April 27	Projected DD, Base 50°F through May 4
Carbondale	374□	311□	437□	517□
Belleville	318□	288□	379□	458□
Brownstown	276□	260□	335□	411□
Springfield	160□	158□	210□	263□
Champaign	234□	181□	281□	346□
Peoria	241□	178□	289□	354□
Stelle	263□	153□	305□	367□
St. Charles	163□	110□	195□	243□

To view an up-to-date contour map of accumulated degree-days in Illinois, go to <http://www.sws.uiuc.edu/warm/pestdata/choosemap.asp?plc=#>, and select a base temperature of 50° F.

As noted last week, the University of Illinois IPM web site and the Illinois State Water Survey web site offer a degree-day calculator that uses weather station data from 18 Illinois sites to compute degree days for specific pests and thresholds. Depending on the pest, you can enter the biofix or use a January 1 starting date and the program will use weather data from the station you select to compute degree-day accumulations to date and to forecast accumulations 1 and 2 weeks ahead based on historical averages. The data used in this program (and the data summarized in the table we will present in this newsletter this year) are from Illinois Climate Network stations; these are not necessarily the same stations used in our newsletter updates of recent years. Check out the degree-day calculator at:

<http://www.ipm.uiuc.edu/degreedays> or <http://www.sws.uiuc.edu/warm/agdata.asp> .

Kelly Cook (217-333-6652; kcook8@uiuc.edu) and Rick Weinzierl (217-333-6651; weinzierl@uiuc.edu)

Fruit Production and Pest Management

Fruit Thinning for Apples

Flower and fruit development are progressing much faster after the warm weather we have been experiencing. However, in central Illinois we are about at the same stage of bloom development as last year. Growers who have yet to begin thinning are probably wondering what chemicals to use this year. The type and amount of chemicals to use will depend on many factors, some that are under your control and others that are not. These factors include (a) cultivar to be thinned, (b) age of the tree, (c) crop load or how heavy the fruit set is, and (d) weather conditions at time of thinning. I will address each of these points individually and give you a summary of how you can combine all these factors to help you make a decision. As most veterans of thinning know, apple cultivars vary considerably in their response to thinning agents. Fuji and Golden Delicious are much harder to thin than Spur Red Delicious, and so for Fuji and Golden Delicious you have to be much more aggressive in your thinning than Spur Delicious. Thinners knock more fruits off a tree when the tree is too young or too old. Thinners are more active when the tree has a heavy crop load than when the crop load is light. Thinners are more active when applied before or after overcast weather. Other factors that have some effect on the activity of chemical thinners are temperature and drying period (wind). Here are three scenarios for you to consider in your thinning.

- **Conservative mild thinning.** Apply 2.5 to 10 ppm NAA at 9 to 10 mm fruit size. Another option is to apply a 1.0 pint of Sevin XLR at the same fruit size. This program can be applied on easy to thin cultivars or when the weather is cloudy.
- **Moderate thinning.** Apply 5 ppm NAA plus 1 pint of Regulaid. Or apply 1.5 Sevin XLR or 1.5 lb Sevin 50W plus 24 oz of Accel. at 8 to 9 mm fruit size.
- **Aggressive thinning.** Apply 1.0 lb 50W Sevin or 1 pint XLR Sevin, plus 1 pint of oil, plus 48 oz of Accel.
- **Very aggressive thinning.** Use 2 lb Sevin 50W or 2 pints Sevin XLR, plus 2 quarts of oil, plus 48 oz of Accel. Apply when fruit diameter is 10 to 15 mm. The aggressiveness of this program will be lessened as the fruit increases in size. This program will cause severe drop in easy to thin cultivars even as a drift.

All of the above thinning programs must be applied as dilute sprays of no less than 200 gallons per acre. Concentrated sprays are ineffective for thinning. Use tree-row volume calculations when possible.

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

Fruit Insects

Eastern flower thrips in strawberries

Elizabeth Wahle noted the need to sample for eastern flower thrips as strawberries begin to blossom. I've received no reports yet of high numbers of this insect, but strong southerly winds often bring it to us from the south at about this time of year. The key step in thrips management is scouting, beginning as the first blossoms open. Controlling populations that exceed the threshold may be warranted until all berries that will be harvested have reached the approximate diameter of a dime. The process is fairly simple: Sample 5 to 10 areas within a planting. In each area, pick 5 to 10 blossoms directly into a white bowl or zip-lock bag, cover or close it, and shake it. Look for thrips that are dislodged from the blossoms. The threshold for control is not defined very precisely – the estimate ranges from 2 to 10 per blossom. Although that's a broad range, counts in many plantings will be less than 1 per blossom, and control will not be needed. Registered insecticides that should control thrips in strawberries include Lorsban applied very early (21-day preharvest restriction), Brigade (bifenthrin), and Danitol (fenpropathrin). Organic growers might use Entrust (spinosyns) or neem (Neemix and others).

Codling moth in apples

Chris Doll reported early captures of codling moth in southwestern Illinois and Missouri, and I have traps in a far-southern Illinois orchard that started catching moths in the last few days as well. It's a bit early to say if these early captures will continue and therefore represent the beginning of a "sustained flight," but if they do (as I suspect they will), a general biofix date for far southern Illinois (Murphysboro to Cobden area) might be estimated as April 20 for orchardists who do not use their own traps. I'll probably use an April 20 biofix for describing codling moth development for that area as the season progresses. The first application of the insecticides that most Illinois growers will use this season for codling moth control should be made by 240 Fahrenheit degree-days (base 50) after biofix. Effective insecticides for codling moth control include Guthion, Imidan, Assail, and Calypso, as well as the pyrethroids Pounce, Asana, Danitol, and Warrior. Where resistance to Guthion or Imidan has been a problem, Illinois data suggest that the pyrethroids above will NOT provide control. In addition,

pyrethroids destroy populations of predator mites and may trigger outbreaks of European red mite. Assail and Calypso are recommended as alternatives to Guthion and Imidan, growers are warned not to use them over and over again because resistance may evolve rapidly. Assail should provide effective control for 14 days if applied at 2.3 ounces per acre.

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

Vegetable Production and Pest Management

Vegetable Insects

"Worms" in cabbage, broccoli, and other crucifers

It's only April, but it's a good time to think ahead about some things, including all the worms that feed on cabbage and related crops. Technically speaking, "worms" is not a very accurate term, but many of us use it to refer to the collection of larvae of the Lepidoptera (butterflies and moths) that attack the foliage and heads of cole crops (cabbage, broccoli, Brussels sprouts, and cauliflower) and crucifer greens (mustard greens, turnip greens, collards, kale, and others). In most instances, the three culprits are the imported cabbage worm, the diamondback moth, and the cabbage looper.

The imported cabbage worm overwinters as a pupa within a chrysalis in crop debris, and adults – the common white cabbage butterflies – begin flying in early spring. They lay bullet-shaped, ridged yellow eggs (individually, not in masses) on foliage. Larvae are velvet-green, and just over 1 inch long when fully grown; they tend to feed from the edges of the leaf, and large veins are left intact. The chrysalis that encloses the pupa is grayish green to bright green and suspended by threads from the underside of outer leaves. It usually takes 4 to 5 weeks for larvae to mature from the egg to the adult stage.

The diamondback moth is the smallest of these three species. It winters in Illinois as a moth, though its survival can be low in severe winters. Eggs, larvae, and pupae may be introduced on transplants shipped in from southern regions, and northward migration of moths during the season also can extend its range. Flat, yellowish eggs are laid singly or in small groups, often near leaf veins or on stems, but they usually go unnoticed. Larvae initially mine between leaf surfaces, then they feed externally, often consuming all but the upper or lower epidermis, leaving a "window pane" effect. Fully grown, they are about 3/8 inch long. They pupate within a light silken cocoon on a leaf, and a small moth (1/2-inch wing span) emerges a week or so later. Each generation takes 3 to 4 weeks for growth and development, and there can be as many as 6 generations per year in Illinois.

The cabbage looper is the largest and most destructive of the three common Leps (Lepidopteran larvae) that attack cole crops here. This insect does not overwinter (at least not in significant numbers) in most of the Midwest; instead it migrates into the region on weather fronts, usually from June through September. Moths lay dome-shaped, ridged white eggs singly or in small masses on the underside of leaves. Larvae have only 3 pairs of abdominal prolegs (rear fleshy legs without joints) instead of the "normal" 5 pairs of many common Lepidopteran larvae. They grow to a length of 1 1/4 inch or more, and their feeding on leaves and heads can be very heavy. In addition, their frass (insect poop) is a less-than-sought-after contaminant. Each season, 2 to 3 generations of cabbage loopers develop in most of Illinois.

The simplest thresholds (and therefore the ones most often used by growers who scout their own fields) for these insects lump all species together, at least for determining the need for control. Growers should examine 10 plants per site in each of 10 sites in a field (more samples = more dependable conclusions), record each as infested (by any of the species) or uninfested, and use the following thresholds:

Thresholds for imported cabbage worm, diamondback moth, and cabbage looper: treat if infestations of any/all of the 3 species are found on more than the percentage of plants listed below.

Crop and Stage	Percent Infested Plants
Broccoli and cauliflower	
Seedbed	10
Transplant to first flower or first curd	50
First flower or curd to harvest	10
Cabbage	
Seedbed	10
Transplant to cupping	30
Cupping to early head	20
Mature head	10
Collards, Kale, Mustard Greens, and Turnip Greens	
Whenever leaves to be harvested are present	5



Larvae of imported cabbageworm (left) and cabbage looper (right)



Larva and adult (left and center) of diamondback moth, and damage to cabbage (right)

Early in the season, whenever flea beetle or aphid control or thrips control is NOT needed, use Bt (*Bacillus thuringiensis*) applications to control the Lepidopteran "worms" on crucifers. Bt products include Agree, Biobit, Cutlass, Dipel, Javelin, Ketch, MVP, XenTari, and others. These Bt preparations must be eaten to be effective, and they are toxic only to larvae of butterflies and moths. They work well against imported cabbage worm and diamondback moth larvae and are effective enough against young cabbage looper larvae to keep most infestations below economic thresholds at least until heads are present. Relying as much as possible on Bt products early in the season avoids killing natural enemies that help to keep these pests (especially diamondback moth) under control; it also reduces selection for resistance, especially in the diamondback moth, to pyrethroids and a few other insecticides that are valuable for use as cleanup sprays near harvest. Several insecticides are labeled for use against these pests in cole crops (cabbage, broccoli, etc.), but the list of included versus excluded crops gets pretty complex for leafy greens. Check the 2004 Illinois Agricultural Pest management Handbook or the 2004 Midwest Vegetable Production Guide and product labels for specific listings.

Also remember ... **onion thrips** often move into cabbage as surrounding small grain fields dry down. Thrips are difficult to control in cabbage after they move between wrapper leaves. The time to treat is often at cupping or as heads begin to form. Capture, Ammo, and Mustang are among the insecticides that are very effective against thrips in cabbage.

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

This issue's words of wisdom ...

“You can’t fix stupid.”

It’s a bad sign when the lead scientist in the gene cloning laboratory finds making coffee to be too complicated.

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