



UNIVERSITY OF ILLINOIS EXTENSION

College of Agricultural, Consumer, and Environmental Sciences

Illinois Fruit and Vegetable News

Vol. 18, No. 1, March 30, 2012

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, 217-244-2126, weinzierl@illinois.edu. The *Illinois Fruit and Vegetable News* is available on the web at: <http://ipm.illinois.edu/ivfn/>. 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

Notes from Chris Doll (fruit phenology; planting new trees; comments on thinning)

Fruit Production and Pest Management (critical low temperatures; oriental fruit moth and codling moth; physiology of fruit thinning)

Vegetable Production and Pest Management (another note on seedcorn maggot)

Local Foods Issues (Plant a Row for the Hungry)

University of Illinois Extension educators and specialists in fruit and vegetable production and pest management

Upcoming Programs

- **Meet the Buyers Event for Fruit and Vegetable Farmers, April 4, 2012**, at John A. Logan Community College, 700 Logan College Drive, Carterville, IL. Programming from 8:30 a.m. to 5:00 p.m. will include presentations on MarketReady, GAPs, and food hubs, and produce buyers who will be present to meet directly with growers include a health food co-op and health food store, a restaurant, a foodservice distributor, university food services, food banks, and a grocery chain capable of taking direct store deliveries). There is no charge for growers to attend but pre-registration is requested – call the Williamson County Farm Bureau at 618-993-2609.
- **SW Illinois Orchard Twilight Meeting, April 12, 2012**. Joe Ringhausen Orchards, located 24748 Reddish Rd., Fieldon, IL. Program begins at 6:00 p.m. and will include discussions led by UI Extension on early season insect and disease management in fruit crops. For more information contact Andrew Holsinger at 217-532-3941 or aholsing@illinois.edu.
- **SW Illinois Orchard Twilight Meeting, May 24, 2012**. Eckert's Grafton Farm, 20995 Eckert Orchard Lane, Grafton, IL. Program begins at 6:00 p.m. For more information contact Andrew Holsinger at 217-532-3941 or aholsing@illinois.edu.
- **Illinois Summer Horticulture Day, June 14, 2012**, at Kuipers Family Farm near Maple Park, Illinois. More details in upcoming issues of this newsletter.

Notes from Chris Doll

What a year already! Weather, primarily warm weather, has been a hot topic, especially for the past month. I have not averaged the daily temperatures, but the media report that March has been the warmest on record, with only three days to go (and all above 70 degrees). There have been only two freezing temps (27 and 29 degrees F) on March 3 and 4. As a result, all phenology developments are the earliest on record. Apricots began blooming on March 7, peaches were in full bloom on March 12, and first bloom of apple was on March 20. The differences in days for these crops from 2007 (our most recent early spring that saw an Easter weekend freeze and widespread crop loss) are 17 days earlier for apricots, 14 days for peaches, and 11 days for apples, which makes them at least 3 to 4 weeks ahead of "normal." Two big questions are being asked: Will there be any killing freezes? When will harvests begin? As per a press release

from Smalls Orchard in Mondamin, Iowa, if the crop survives the killing freezes, will Jonathan harvest begin in the heat of early August?

More comparisons with the 2007 year with the Easter Sunday freeze that was devastating in this area: Our March 2012 above-average warm spell began on March 13, and since that time the daily high temps were above 74 degrees 14 of 16 days. In 2007, the warm spell began on March 21 and continued for 14 consecutive days before five days of freezing temps beginning on April 4. Many fruit areas in the Midwest and eastern parts of the country had freeze warnings this week, but in the St. Louis area, 50 degrees was the minimum for the week. It remains to be seen whether summer will bring predicted heat and low rainfall.

Currently, the Back-40 apricots have a full crop, with fruit size from 1/2 to 3/4 inch diameter fruits. Peaches are beginning shuck split, and apples are at late petal fall to calyx. Plum fruit set looks good, and the same is true in pears. Bee activity was fairly light during all the blossom times, but optimism prevails that they were sufficient. The codling moth and oriental fruit moth trap line remains empty, but that might be due to mating disruption, even though the dispensers went on a little late. Some windy, rainy days occurred during full bloom of both peach and apple, so time will tell if the fungicide spray program was successful. Development of apple bloom was so rapid that it was difficult to get the Apogee application on by the book.

There have been times when soil conditions were favorable for tree planting, and it still remains fairly early by the calendar, so the prime time for planting continues. A recent release talked about "hydrating" trees before planting. It is fairly common to put the nursery stock in a water tank before planting, and hydrating means that they are in the water for more than a day to allow water uptake. A flowing stream was suggested as the ideal water source. Pond water might suffice if no chemicals for weed control have been added. Hydrated trees still need protection from drying out during the planting operation.

As with the rapid growth creating application problems with Apogee, so it might be with chemical thinning. For some readers, it is now too late for the petal fall applications, but it might serve as a reminder for other areas. With the heavy bloom being seen this spring, the thinning program is critical for producing a good crop and avoiding the problem of biennial or alternate bearing that results from under-thinning. So, as a reminder, some thoughts on thinning conditions:

- Cloudy skies before and after thinning sprays tend to increase chemical activity.
- Temperatures below 60 degrees at application time greatly reduce activity of NAA.
- Temperatures below 70 degrees at application time can reduce activity of Sevin.
- Temperatures above 90 degrees may result in over-thinning by both NAA and Sevin.
- Apply two-thirds of the spray volume to the upper half of the trees.










































Chris Doll

Fruit Production and Pest Management

Notes on Critical Freezing Temperatures for Tree Fruits

Let's hope that we don't need to consult it, but the chart below presents estimates of the effects of cold temperatures on tree fruit blossoms and young fruits. It's taken directly from page 65 of the 2012 Midwest Tree fruit Spray Guide (distributed at several of our winter programs). Mark Longstroth of Michigan State University has posted a little more info at http://news.msue.msu.edu/news/article/freeze_damage_depends_on_tree_fruit_stage_of_development. Mark's article includes links to two tables – [Tree Fruit Critical Temperatures](#) is a table very similar to the one below. He also has posted a [Picture Table of Fruit Freeze Damage Thresholds](#) that includes the same information with color pictures.

Rick Weinzierl (217-333-6651; weinzier@uiuc.edu) and Deborah Cavanaugh-Grant (217-782-4617; cvnghgrn@illinois.edu)

Stage	Apple		Pear		Peach		Tart Cherry		Plum & Prune	
	°F 10% Kill	°F 90% Kill	°F 10% Kill	°F 90% Kill	°F 10% Kill	°F 90% Kill	°F 10% Kill	°F 90% Kill	°F 10% Kill	°F 90% Kill
1	 Dormant		 Dormant		 Dormant	-18°	 Dormant		 Dormant	
2	15°  Silver tip	2°	15°  Swollen bud	1°	18°  Swollen bud	2°	17°  Bud burst	5°	14°  Swollen bud	1°
3	18°  Green tip	10°	20°  Bud burst	7°	23°  Half-inch green	5°	25°  Green tip	14°	18°  Bud burst	3°
4	23°  Half-inch green	15°	26°  Green cluster	15°	25°  Pink	18°	26°  Tight cluster	17°	26°  Green cluster	16°
5	27°  Tight cluster	21°	26°  White bud	22°	27°  Bloom	24°	27°  Swollen bud	24°	26°  White bud	21°
6	28°  Pink	25°	28°  Bloom	23°	28°  Petal fall	25°	28°  Bloom	25°	27°  Bloom	23°
7	28°  Bloom	25°	28°  Petal fall	24°	28°  Fruit set-shucks on	25°	28°  Petal fall	25°	28°  Petal fall	23°
8	28°  Petal fall	25°	28°  Fruit set	24°	28°  Fruit set-shucks off		28°  Fruit set	25°	28°  Fruit set	
9	28°  Fruit set	25°								

Oriental Fruit Moth and Codling Moth

The Illinois Degree-Day Calculator site is not available this spring pending updates to revise it. If you are trapping for codling moth and oriental fruit moth, please email me or call me with reports of biofix dates (first sustained captures of moths in traps) for your location ... I'll use your information and the Midwestern Climate Center database to provide updates on degree-day accumulations for these insects throughout the state in upcoming issues of this newsletter.

Like the development of perennial fruit crops, insect development is way ahead of normal. The insects that commonly occur on apples and peaches at petal fall and shuck split in late April and May of “normal” years are present this year at petal fall and shuck split in late March and April. I do not yet have reports of codling moth flight in apples, but oriental fruit moth flight began by March 18 (if not earlier) in southern Illinois and on March 24 at Urbana.

Oriental fruit moth management in peaches (and to a lesser extent at this time of the season in apples) will be a key concern in the coming weeks. This is especially true for growers in western Illinois (Calhoun and Jersey counties) where pyrethroid-resistant populations are not controlled by the pyrethroids (Warrior, Asana, Mustang Max, permethrin, and others) commonly used for stink bug control.

First generation oriental fruit moth larvae (and larvae of subsequent generations) infest new shoot growth and cause flagging of terminals in peaches and other stone fruits. Second and third generation larvae tunnel into fruits of peaches and related crops, and fourth and fifth generation larvae tunnel into apples (the fruit). Key points to consider in preventing infestations in peaches are that (1) second generation moth flight begins about 950 DD (base 45F) after the beginning of first generation flight (biofix), and (2) peak egg-laying by second-generation moths occurs around 1500 DD after biofix. For growers who are using mating disruption for oriental fruit moth control, dispensers may have already been applied to disrupt first generation flight, but it is essential that dispensers be in place before second generation flight begins at 950 DD. Because the Illinois Degree-Day Calculator site is not available this spring pending updates to revise it, I am as yet unable to provide the usual information on when the 950 degree-day total will likely be reached, but a seat-of-the pants prediction would say that dispensers need to be applied by May 7-10 ... a little earlier might be better. For those who plan to limit oriental fruit moth damage to new shoots and reduce the successful development of first-generation larvae, insecticide applications are justified now in the southern half of the state. To control pyrethroid-resistant populations, Altacor, Assail, Delegate, or Rimon are effective insecticides.

Codling moth flight generally begins in apples during bloom or shortly after, so traps should be in place now throughout the state, and if mating disruption is used for codling moth management, dispensers should be in place now or very soon. Codling moth phenology can be difficult to understand when traps catch a few moths, then cold weather arrives and traps remain empty for a while, then counts go back up with warmer conditions. Do the early counts justify setting a biofix and starting phenology models to estimate the best timing for insecticide applications? There is no single correct answer to this, but if traps captured more than a few moths (3 to 5 per trap in any block), mating and egg-laying likely occurred at levels that will generate at least some early infestations of fruit when larvae hatch from eggs beginning about 240 DD (base 50 F) after the initial captures. Preventing those infestations still requires that an insecticide residue be on fruit when larvae chew through the “skin” of small fruits before they begin tunneling toward the center. Several good insecticides can be used to protect fruit; they include older compounds where there are no resistance problems (Imidan, Guthion, Intrepid, and others) and a number of new alternatives such as Altacor, Assail, Calypso, Delegate, and Rimon. Only one application of Guthion is allowed on apples this year, and all use of Guthion on tree fruits will be prohibited after this season.

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

Understanding the Physiology of Fruit Thinning.

Apple and peach development is advancing rapidly due to the warm weather that we have been experiencing in the last three weeks. Bee activity is also greater than normal in many orchards, except on very windy days, which means that we will have plenty of fruit set. If you haven't been aggressive in your thinning program in the past, this may be the year to think about it.

As most of you know thinning is not an exact science. There are many factors that can make a thinning chemical work effectively and others that make it less effective. Dr. Alan Lakso at Cornell University has developed a carbohydrate balance model for apples. The model is based on supply and demand for energy-rich carbohydrates by the tree. During times of high supply and low demand (sunny and cool), the balance is positive and it is difficult to thin chemically. When the balance is slightly negative, chemical thinning becomes easier. When the balance drops to a critical limit, the trees are under significant carbohydrate stress, and chemical thinning will be strong. Below a critical limit, the natural stress may be so severe that some fruits will be shed even when thinners aren't used, because the response to chemical thinners is predicted to be very strong.

In general tree physiology and environmental conditions are the two major factors affecting the response of most chemical thinners. The physiological factors in the tree that affect thinning response include variety, tree age, tree health, crop load, and severity of pruning. A weak and a very old tree is relatively easier to thin than a healthy and young tree. Similarly, a heavily cropped tree is relatively easier to thin than a lightly cropped tree. However, you should know that even though the chemical may have knocked a large number of fruit off the tree, you may still have more fruit left due to poor chemical coverage. So monitor the number of the fruits that are left on the tree, not those on the ground.

Another factor that contributes greatly to the effectiveness of a thinner is the variety. For example, 'Fuji' fruits are harder to thin than 'Gala' fruits. The type of tree is also important; for example 'Spur' varieties are harder to thin than non-spur varieties. Some studies also suggest that pruning may have an influence on the effectiveness of thinning. Application timing is also important. Some thinners work best when applied at bloom time. Benzyl adenine is much more effective when applied at bloom than after fruit set while NAA works best when fruit diameter is between 8 and 9 mm than on larger fruits. Penetration of the chemical thinner is greater through the lower side of the leaf than the upper side, and these difference increases as the leaves age because older leaves have more wax deposited on the upper surface than the lower surface. Interestingly, very little NAA enters the plant leaf through the stomates and instead most enters through active transport channels across the plasmalemma. In other words, the leaves spend energy to get NAA inside so it can cause the fruit to abscise. A tree that has heavy bloom will require a significant amount of energy to take up the thinner, and so it is advisable to supplement the tree with some nitrogen at bloom to offset the amount of the energy spent on producing the flower and getting rid of the fruit during thinning.

Environmental factors also have a strong influence on the effectiveness of thinning chemicals. Ed Stover and Duane Green published a very nice review in HortTechnology (2005, volume 15, pages 214-221) on the effect of environment on the performance of thinners. In this article they pointed out several pre-, during, and post-application factors that impact the effectiveness of growth regulators on fruit thinning. During the early stages of growth, leaves deposit waxes on the surface. The amount, structure, and composition of these waxes influence leaf wetness and penetration of thinning chemicals. Deposition of these waxes is affected by the environment. Low light, high humidity, frost damage, and low temperatures were listed as factors that can increase the response of thinning chemicals, while high temperature and dry conditions reduce the effectiveness of the thinning chemicals. Many of these factors work synergistically, so if the weather is warm and humid the thinning chemical will work more effectively than if the weather is cold and dry. The greatest uptake occurs right before the chemical has completely dried (because of the increase in the concentration of the chemical). However, uptake decreases drastically when the chemical has completely dried. Therefore, conditions that allow for longer drying periods will increase the effectiveness of thinning. Field studies have also shown that if the chemical droplet dries before it is washed by rain, its activity is not lost. However, if the droplet is still wet and a rain occurs, then the chemical will be less effective because it washes off before it gets into the leaf. These are only a few of the factors that impact the effectiveness of the thinning chemicals, and that is why it is difficult to predict if a thinner will work or not.

The number of chemical thinners on the market has not changed in a long time. NAA and Sevin are the most popular thinners, followed by several formulations of NAD (Amid-Thin and Accel). Consider spraying NAA if fruit size is 12 mm or less, preferably 9 to 10 mm. If fruit size is larger than 12 mm, then consider a mixture of a full rate of Sevin and a half rate of NAA or Accel. Do not apply NAA when fruit size is larger than 15 mm, and never combine NAA with Accel so you don't get pigmy fruits, especially on spur varieties such as 'Spur Delicious'. Consider using Ethrel if fruit size is larger than 20 mm. To see if the thinner worked, I suggest that you cut a few fruits in half, soon after you apply the thinner, leaving the bottom 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 you can use a single application of either Sevin or NAA at full rate. Most thinners work best in the first application.



Determination of fruit size for thinning decisions is based on the average diameter of about 50 fruits, including the king fruit (usually the largest fruit in the center of the cluster), along with the next largest two to three fruits in the same cluster. Collect 10 to 12 fruit clusters from five to six trees from the same block and variety and measure fruit diameter.

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

Vegetable Production and Pest Management

Another Note on Seedcorn Maggot

The March 8, 2012 issue of this newsletter (<http://ipm.illinois.edu/ifvn/volume17/frveg1720.html>) included a brief review of seed and root maggots, along with some images. Since then, I've received a few reports of seedcorn maggot damage in newly seeded vegetables and in some cases early transplants in southern Illinois. The paragraph below is repeated from the March 8 issue. Where stand reductions are significant, growers can replant a few days later and expect little or no damage because the first generation larvae will have completed development and not be present to damage the new seedlings. Here's the text on seedcorn maggot again ...

Seedcorn maggots most commonly feed on the seeds and seedlings of corn, beans, peas, and cucurbits; they also may be found along with onion maggot or cabbage maggot infesting onions and plants in the cabbage family (Brassicaceae). Flies typically emerge in April in southern IL and May in northern IL [but this year the emergence was much earlier], and females prefer to lay eggs in fields with abundant decaying organic matter (where manure or a cover crop was recently incorporated). Peak emergence of flies occurs at 200 degree-days above a base of 39F (with accumulations beginning when ground has thawed); damage to seeds or seedlings is greatest over the 10 days after this peak. Larvae feed on decaying plant material in soils but also tunnel into seeds (and sometimes transplants) and reduce successful germination and stand establishment. Losses to seedcorn maggot can be reduced by incorporating manure or cover crops at least 3 weeks before planting or transplanting, preparing a well-tilled seedbed, and waiting until soil temperatures have warmed so that germination and early plant growth are rapid. Seeds of sweet corn, snap beans, and peas can be treated with a diazinon or diazinon+lindane seed treatment to prevent seedcorn maggot damage; soil insecticides used for corn rootworm control in sweet corn also kill seedcorn maggots. Neonicotinoids used in seed treatments on cucurbits or in-furrow applications to soil when cucurbits are planted or transplanted are not effective for seedcorn maggot control. Where damage results in reduced stands, replanting or resetting transplants can be done 4-5 days later without likelihood of damage to the new seeds or transplants.

(Rick Weinzierl; 217-244-2126; weinzier@uiuc.edu)

Local Foods Issues

The “Plant a Row for the Hungry” initiative invites local gardeners and farmers grow and donate excess produce for food banks and food pantries. For more information on the program, see

<http://blogs.extension.org/mastergardener/2010/05/10/plant-a-row-for-the-hungry/>

Kaleigh Friend, (Central Illinois Foodbank; 217-522-4022; kfriend@centralilfoodbank.org)

Less seriously ...from Jerry Mills (and others)

Mike feared his wife Barb wasn't hearing as well as she used to and he thought she might need a hearing aid. Not quite sure how to approach her, he called the family doctor to discuss the problem. The doctor told him there is a simple informal test that Mike could perform to get a better idea about her hearing loss.

'Here's what you do,' said the doctor, 'stand about 40 feet away from her, and in a normal conversational speaking tone see if she hears you. If not, go to 30 feet, then 20 feet, and so on until you get a response.'

That evening, Barb was in the kitchen cooking dinner, and Mike was in the den. He said to himself, 'I'm about 40 feet away, let's see what happens.' Then in a normal tone he asked, 'Honey, what's for dinner?'

No response. So Mike moved closer to the kitchen, about 30 feet from his wife and repeated, 'Barb, what's for dinner?' Still no response. He moved into dining room where he was about 20 feet from his wife and asked, 'Honey, what's for dinner?'

Again he got no response. So he walked up to the kitchen door, about 10 feet away, repeated the question and yet again heard no reply.

So Mike walked right up behind her and asked, 'Barb, what's for dinner?'

Barb replied, 'Mike! ... for the FIFTH time, CHICKEN!'

University of Illinois Extension Educators and Specialists in Fruit and Vegetable Production and Pest Management

Extension Educators – Local Food Systems and Small Farms		
STEPHEN AYERS , Champaign, Ford, Iroquois, & Vermilion counties	217-333-7672	srayers@illinois.edu
DEBORAH CAVANAUGH-GRANT , Logan, Menard & Sangamon counties	217-782-4617	cvnghgrn@illinois.edu
KYLE CECIL , Henderson, Knox, McDonough, & Warren counties	309-342-5108	cecil@illinois.edu
LAURIE GEORGE , Bond, Clinton, Jefferson, Marion, & Washington counties	618-548-1446	ljgeorge@illinois.edu
CHRISTOPHER KONIECZKA , Livingston, McLean, & Woodford counties	815-842-1776	cmkonie@illinois.edu
PAUL MARIMAN , DeWitt, Macon, & Piatt counties	217-877-6042	pmariman@illinois.edu
MATT MONTGOMERY , Fulton, Mason, Peoria, & Tazewell counties	309-547-3711	mpmontgo@illinois.edu
ELLEN PHILLIPS , Boone, DeKalb, & Ogle counties	815-732-2191	ephillps@illinois.edu
JOHN PIKE , Franklin, Jackson, Perry, Randolph, & Williamson counties	618-993-3304	jpik@illinois.edu
MIKE ROEGGE , Adams, Brown, Hancock, Pike & Schuyler counties	217-223-8380	roeggem@illinois.edu
DAVID SHILEY , Coles, Cumberland, Douglas, Moultrie & Shelby counties	217-543-3755	dshiley@illinois.edu
JAMES THEURI , Grundy, Kankakee, & Will counties	815-933-8337	jtheu50@illinois.edu
Extension Educators – Horticulture		
RICHARD HENTSCHEL , DuPage, Kane, & Kendall counties	630-584-6166	hentschel@illinois.edu
ANDREW HOLSINGER , Christian, Jersey, Macoupin, & Montgomery counties	217-532-3941	aholsing@illinois.edu
SONJA LALLEMAND , Franklin, Jackson, Perry, Randolph, & Williamson counties	618-687-1727	lalleman@illinois.edu
ELIZABETH WAHLE , Bond, Clinton, Jefferson, Marion, Madison, Monroe, St Clair, & Washington counties	618-650-7050	wahle@illinois.edu
Extension Programs for Farm to School		
JULIA GOVIS , Statewide Extension Program Coordinator, Farm to School	630-955-1150	jgovis@illinois.edu
Horticulture Research-Extension Specialists at our Research Stations		
JEFF KINDHART , Dixon Springs Agricultural Center	618-695-2770 618-638-7799 (cell)	jkindhar@illinois.edu
BILL SHOEMAKER , St. Charles Research Center	630-584-7254	wshoemak@illinois.edu
Campus-based Extension Specialists		
MOHAMMAD BABADOOST , Plant Pathology	217-333-1523	babadoos@illinois.edu
MOSBAH KUSHAD , Fruit & Vegetable Production	217-244-5691	kushad@illinois.edu
JOHN MASIUNAS , Weed Science	217-244-4469	masiunas@illinois.edu
CHUCK VOIGT , Vegetable Production (& herbs)	217-333-1969	cevoigt@illinois.edu
RICK WEINZIERL , Entomology	217-244-2126	weinzier@illinois.edu

Return Address:

Rick Weinzierl
Department of Crop Sciences
University of Illinois
1102 South Goodwin Ave.
Urbana, IL 61801

