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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, 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 email address above.

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

Regional Updates

In the Southern Region ... Spring arrived on a cold note, with temperatures dropping below 20 degrees F on the 23rd of March. For the surrounding St. Louis area, early evaluations are that any peach flower buds well advanced into pink are gone, but anything considerably behind appears to be okay. Growing areas to the east and south seemed to have fared much better, with one grower in Marion County reporting little to no damage. Damage from Sunday's thunderstorms has yet to be reported.

A grape planting workshop will be held at Rolling Hills Vineyard, Saturday, April 15, 2006, at 9:00 am. This workshop, sponsored by the Illinois Department of Agriculture, the Illinois Grape Growers and Vintners Association, and University of Illinois Extension, is designed to give participants hands-on experience with various planting techniques for installation of a new vineyard. Workshop participants will meet at Rolling Hills Vineyard, located at the corner of Douglas Street and Bennett Street, in New Salem, Illinois, starting at 9:00 a.m. New Salem is located approximately 3 miles north of I-72 on CR-3. Don't forget to dress for the weather, since most of the workshop time will be spent in the vineyard. This is a hands-on workshop, and participants are encouraged to bring their personal gear, including gloves and work boots. Refreshments will be made available, but lunch will be on your own, so a sack lunch is suggested. Grape publications will also be available for sale at the workshop, including the 2006 Small Fruit & Grape Spray Guide for \$9.00 and The Midwest Grape Production Guide for \$15.00.

For further information and in order to plan space for the meeting, please contact Elizabeth Wahle at (618) 692-9434 or by email at wahle@uiuc.edu.

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

At the Dixon Springs Ag Center ... About 35 tomato varieties and 18 bell pepper varieties have been seeded and will be potted this week. These plants will be used for observation and replicated trials located at DSAC, Larry Trover's farm, and Bob Fournie's farm. Some of these varieties will also be used in a comparative study of their performance in organic versus traditional production schemes.

Tomato transplants grown at DSAC were field set last week in a high tunnel at Bill Bass's farm in Union County and in a low tunnel at Bernie's Berries in Chester, IL. DSAC will be conducting high-tunnel research in cooperation with Bill, including a plant-spacing study and cultivar evaluation. Research using the low-tunnel system in cooperation with Bernie Colvis will involve cultivar evaluation.



Left: Setting tomatoes in a high tunnel. Right: Setting plants in a low tunnel.

The cold weather experienced the past few weeks has had only moderate to slight impact in most cases on southern Illinois plasticulture strawberries. Growers who used two layers of row cover or one layer of row cover with overhead irrigation tended to have only slight flower damage. Growers relying on only a single layer of row cover saw moderate losses on all varieties except Sweet Charlie, which likely incurred significant loss.



Plasticulture strawberries (with most blossoms still healthy).

Most peach varieties in Johnson County are in full bloom to petal fall. Blueberries in Pope County are close to blooming. New blackberry cultivars from the University of Arkansas are slated to arrive in early April and will be used in a replicated cultivar evaluation trial at DSAC.

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In northern Illinois, while the weather is truly turning, it has a ways to go before the season gets off to a good start. No signs of bud swell in fruit trees or grapes yet. Ground covers are greening up though. We've had some pretty good rainfall during March and early April. Everyone needs to be acutely aware of their soil moisture status due to last year's severe drought. It looks like significant soil moisture recharge has taken place in most areas, but many fields may be less than fully restored to full soil moisture capacity. The next 6 weeks will be critical to the risk of recurring drought in northern Illinois. With the weather forecasts indicating temperatures jumping in and out of the 50's and 60's over the next 10 days, plants should become active and begin consuming soil moisture, though at low rates. How does the pump on that irrigation well look?

Very little fieldwork has taken place yet. With rain recurring in the forecast it's not likely many will get a quick opportunity to do so. This is a good time to review plans for field planting because once the fieldwork starts, there probably won't be another chance. Pruning needs to wrap up in orchards and vineyards. After last year's drought and the stress put on trees and vines, growers need to be careful to tend to needs of the plants without pushing production too hard. Yield goals should be medium and efforts should be made to build up the plant material by adequately addressing fertility and moisture needs during the growing season.

As plants begin to wake up from winter dormancy, so do other creatures. Insect pests which might begin to show up in coming weeks include flea beetles in vegetables and grapes. Mites could become active in fruit trees. Fungal pathogens will begin their growth cycles, releasing spores to initiate infection in some crops. Grape growers need to get lime-sulfur sprays on for anthracnose before buds begin to swell. This holds for brambles as well. Dormant oil sprays can be applied to fruit trees now. Prevention may be key to controlling some of these pest problems.

The greenhouse there should be an active pace right now. At this time many growers have ornamentals getting close to market stage, and at the same time they are seeding trays for field vegetables. Take time to review the performance of your management strategies. These operations are huge juggling acts and strategies for efficiency can make the difference in the bottom line. Have employees lived up to their responsibilities? Have supervisors properly supported employees? Are products staged well for the upcoming market or field planting plans? Too much to think about sometimes, but decisions made now are critical.

Do you have a weather station? Do you put out traps for monitoring insect pests? Do you have stations for monitoring conditions for disease, such as leaf-wetness monitors? These tools can do more than just give you reports. They can educate you on the activity of key elements to your farming enterprise. Farmers, or growers, are the original environmentalists. But it has become increasingly important, and profitable, to understand how your enterprise operates within the web of life. Technology can document what's happening and growers can integrate that information to their advantage on their farm. As you learn more about these integrated activities you can do a better job of anticipating issues before they arise.

Bill Shoemaker (630-584-7254; wshoemak@inil.com)

Notes from Chris Doll

After a warm, windy weekend with a couple of April showers that totaled 0.5 inch, things are green and growing if they have not blown away. In the Back-40, peaches are in full bloom, apples are in cluster bud, with some varieties in pre-pink, pears are in white bud to full bud, brambles in 3/4 inch leaf, and grapes show a little swelling. The above stages are 1-3 days earlier than 2005. March rainfall was about normal, but the year's total is only 4.3 inches, somewhat below normal. Bees have been more active in the peach bloom than ever before. However, I could not tell about activity on the plums and apricots, since those blooms all froze.

Luckily, the peach trees could not read the book to know that temperatures below 18 degrees are supposed to kill 90 percent of the flower buds in pink. Here at home on March 22, the data logger recorded two hours of temperatures of 14.3 degrees. Death of petals and pistils occurred only to a few young trees of newer varieties of peaches and nectarines. Loring, Red Haven, Cresthaven, etc. all have the full crop potential left. There was a heavy ice and snow cover on all the trees at the time, with four inches of snow on the ground. The data logger had over an inch of ice and snow covering it, and in that situation, the wetting sensor recorded very little wetting from midnight to morning. As for the peach trees in the area, reports are that most survived 18 degrees.

The heavy peach bloom opens the possibility of blossom thinning with mechanical means like brushes and rope thinners for those willing to gamble against the weather. It would be nice if a post-bloom chemical thinner was available, but right now only the caustic materials like lime sulfur or ATS are the major research materials.

The return apple bloom on standard and semi-dwarf trees is light on trees that had moderate to heavy crops last year. Trees on M9 and Bud 9 have a good potential. Fuji is noted for problems with return bloom, and a recent write-up on Cameo and Honeycrisp reports that they too have return bloom problems. I have all three varieties on multi-variety topworked trees and yesterday's inspection revealed that they are very light on flower clusters, whereas Gala, Goldrush and Jonathan had plenty of clusters.

The old Illinois Fruit Calendar of the University of Illinois, C1122, had the following forthcoming happenings for my area for the phenology season of pink of apple: "European red mites are beginning to hatch, red-banded leafroller should be laying eggs, as are leaf miners, and curculio are coming out and Oriental Fruit Moths are emerging. Tarnished plant bugs could be present in peach orchards. Tree training should be ongoing, and limb spreaders should be in place. Bees for pollination should be arranged for. Red raspberry growers that need Ridomil for Phytophthora control should make applications now". To this, I would add that straw should be removed from strawberries.

Chris Doll

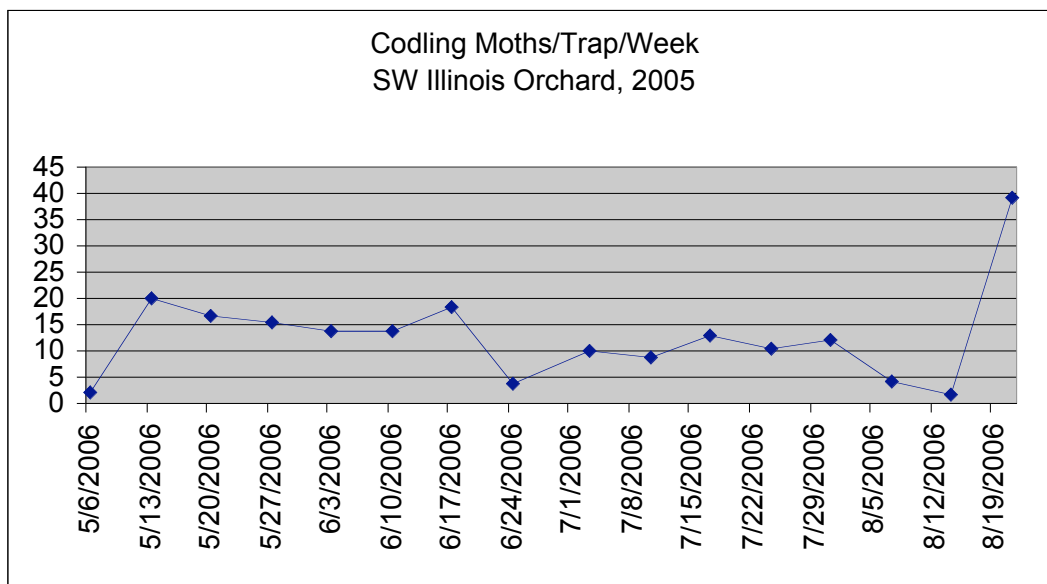
Fruit Production and Pest Management

Managing Organophosphate-Resistant Codling Moth

For growers who experienced serious codling moth control failures in 2005 despite what they are convinced was a timely spray schedule, the reason certainly could have been the presence of an organophosphate-resistant population. If that's the case, the choice of insecticides for controlling the first generation in 2006 has to be altered if the season's overall management program is to be successful. If poor timing, low rates, or failure to reapply an insecticide after rains caused last year's failures, then overcoming those problems obviously is the key, not the guidelines below. To control resistant populations in Illinois – where as yet we do not have a state or federal label allowing the use of Rimon – I recommend the following:

- First, understand that the labeled organophosphates that do not work against OP-resistant populations include Guthion, Imidan, and Diazinon. Raising rates does not make them work; spraying more often does not make them work, and adding buffers or other adjuvants does not make them work.
- Second, the following insecticides have NOT been effective against OP-resistant populations in Illinois, so do NOT use them in the early season for codling moth control: Esteem, Intrepid, Avaunt, and the pyrethroids (including but not limited to Danitol, Asana, and Warrior). SpinTor (or Entrust) might be effective against OP-resistant populations, but it needs to be applied at no greater than 7- to 10-day intervals. And although the 2006 Spray Guide includes listings for codling moth granulosis virus (Cyd-x, Carpovirusine, and Virosoft CP4), these products are unproven ... so do not count on them to solve a raging problem that has developed because of resistance to the insecticides you've used in previous years.
- Third, do not attempt to use mating disruption if codling moth infestations were heavy in well-sprayed orchards last year. Although mating disruption is a good alternative to conventional insecticides where populations are low to moderate in density, it is not well-suited to bringing down very high populations of codling moth.
- Finally the good news part ... The neonicotinoid insecticides Assail, Calypso, and Clutch are very effective against OP-resistant codling moths, and field observations from throughout the region as well as laboratory bioassays from Michigan (Larry Gut et al. Michigan State University) indicate that OP-resistant moths are actually more susceptible

to neonicotinoids than OP-susceptible populations are. This should mean that the Assail, Calypso, and Clutch might be used in rotations with Guthion/Imidan and the other insecticides listed above (particularly Danitol) in the long run. In fact, in southern Illinois orchards where Guthion failed to provide control in 2001-2003, Guthion was used successfully in rotations with Assail in 2005. The key was to use a neonicotinoid for a few consecutive sprays to kill the vast majority of the OP-resistant population. So how many times should a grower apply a neonicotinoid in the early season to “knock out” (as much as possible) last year’s resistant population in orchards where problems were severe? My answer ... for the entire duration of the first generation hatch. If one assumes that almost all the larvae that infested fruit at harvest in well-sprayed orchards last year were resistant, then almost all of this year’s first generation moths will be resistant (they’re the adults of those larvae). So during first generation, any use of one of the insecticides listed above as ineffective against resistant populations creates a time frame where resistant individuals will survive. For this reason, throughout the winter meeting season I’ve recommended that using Assail, Calypso, or Clutch for the entire first generation larval hatch is the best approach to getting adequate control and managing resistance. How long is this? The graph below shows moth flight at a southwestern IL orchard in 2005. All the moths trapped through June 24 (and probably a few days longer) had overwintered as larvae that infested last year’s crop. So I would have recommended that all the sprays applied from around May 18-20 (around 240 DD after biofix) through around July 1 (to kill larvae hatching from eggs laid by moths through June 24 or after) be one of the neonicotinoids. At 2-week intervals, that would have meant 3 or 4 sprays on roughly May 20, June 4, June 18, and (maybe) July 2.



With the beginning of second generation larval hatch (in 2005 at the site above, around July 10-15), I would recommend a rotation of insecticides including Guthion/Imidan, Danitol, Intrepid (for Lepidopteran larvae only), and one of the neonicotinoids for the remainder of the season. Rimon (yet a different chemical class and mode of action) will be useful either early in the season or in this late season rotation once it is registered.

What if you don't have a resistance problem? Plan to rotate insecticides anyway. Using Guthion or Imidan until it fails means that you'll lose a lot of fruit to codling moths by the time you discover the failure.

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

Fruit-thinning Challenges

Apple fruit buds at the U of I Fruit Farm are advancing very fast due to the warm weather that we had last week. So before too long it is going to be time to put on a thinning spray. 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. Tree physiology and environmental conditions are the two major factors affecting the response to most thinners. The physiological factors in the

tree that affect the thinning response include variety, tree age, tree health, crop load, and severity of pruning. A weak or 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 size fruits. Penetration of the chemical thinner is greater through the lower side of the leaf than the upper side, and this 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 significant amount of energy to take up the thinner, 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 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 witness, 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 to 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 biggest uptake of the chemicals occurs right before the chemical is completely dry due to the increase in the concentration of the chemicals. However the 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, then 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.

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Vegetable Production and Pest Management

Cooperators Needed to Report Corn Borer and Corn Earworm Trap Counts

If you are an Illinois grower, processor, or extension educator who operates a light trap to monitor European corn borer moths or a pheromone trap for either European corn borer or corn earworm ... and if you would consider reporting those counts to me on a twice-weekly basis by email or phone, please contact me. This year I plan to present up-to-date summaries of flight information on these two insects (and perhaps western bean cutworm as well) for several locations around the state in each issue of this newsletter. Please contact me at the phone number or email address below.

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Brief Notes on Early Season Vegetable Insects

- **Flea beetles** are a group of beetles in the family Chrysomelidae, the leaf beetles, and they’re called “flea” beetles because they have enlarged hind legs that allow them jump (though not quite as well as fleas do). A number of different species occur in the Midwest, with different species adapted to different groups of plants – the flea beetles on sweet corn are not the same as the ones on tomatoes and other nightshades or the ones on cabbage and other crucifers or the ones on grapes ... and so on. All of the species that are important as pests on Illinois crops

overwinter as adults in areas with a little vegetative cover, and they fly to host crops as soon as they are transplanted or emerge as seedlings. Most species simply eat tiny holes in the leaves of their host plants, but the corn flea beetle transmits the bacterium that causes Stewart's wilt ([see issue 2](#), March 3, 2006 for more information on this insect). With the exception of corn flea beetles on wilt-susceptible sweet corn hybrids, the general idea is that control is warranted if (1) heavy infestations and cool, wet weather combine to slow the growth of seedlings, or (2) they are feeding on leaves of greens and causing cosmetic injury that will make the crop less marketable. Check the [2006 Midwest Vegetable Production Guide](#) for insecticides and treatment guidelines for individual crops, but remember the key is to scout fields weekly (or even twice weekly) and treat as needed.

- **Asparagus beetles** also overwinter as adults and move to asparagus spears and then ferns to feed and lay eggs. Control beetles on spears if infestations exceed 5 to 10 percent of crowns infested with beetles or eggs are present on more than 2 percent of the spears. Insecticides registered for asparagus beetle control include Sevin, Lorsban, malathion, permethrin, SpinTor, and Entrust. See the [2006 Midwest Vegetable Production Guide](#) for rates and restrictions.
- Cutworms – several species – attack a variety of vegetable crops in the spring. Black cutworm moths migrate into the Midwest each year from the south in March and April and lay eggs, especially in fields with abundant winter annual weeds. Early stages of larvae of this species feed on decaying plant material and the winter annual weeds, then move to crop seedlings, especially corn. Other species overwinter as larvae, especially in lighter soils that allow them to move deep enough into the soil to avoid too-cold temperatures. Early season cutworms may be problems in asparagus, peas, cole crops, radishes, carrots, cucurbits, sweet corn, and tomatoes. Again, see the [2006 Midwest Vegetable Production Guide](#) for specifics for control in each of these crops.

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

Words of Wisdom

On Spring ...

- The best thing about spring is that it always comes when it is most needed.
- April showers bring May flowers – with the help of spading, fertilizing, planting, watering, and weeding.
- Spring comes unusually late or unusually early every year – as usual.
- When spring comes, many a man who is retired wishes he were still working so that he could take the day off.
- The only difference between April and March is that you expect it in March.
- Spring is the glorious season when the grass grows up along the roadside and hides all the discarded beer cans.
- In the spring many a husband is transferred from the doghouse to the garden.
- April is the month when green returns to the lawn, the trees, and the Internal Revenue Service.
- Spring is the silly season when men plant grass in order to slave in the summer keeping it cut.

(from 20,000 Quips and Quotes, Evan Esar, Barnes and Noble Books, New York, 1995)

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