

Illinois Fruit and Vegetable News

Vol. 10, No. 2, February 24, 2004

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 ...

Census of Specialty Crops Production (Please complete it and mail it in ... or request a copy.)

Crop and Regional Reports (January-February low temperatures in northern Illinois)

Notes from Chris Doll (Low temps, mud and orchard activities, critical low temps for fruit bud survival, spring fertilization, Small Fruit and Strawberry School March 2-3, Penn State HACCP workshop for cider producers)

Fruit Production and Pest Management (Pheromone traps for tree fruit insects)

Vegetable Production and Pest Management (Preseason overview of corn earworm and corn borer control in sweet corn)

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

Census of Illinois Specialty Crops Production

Quick notes: To all Illinois growers who received a survey questionnaire on Specialty Crop Production in Illinois, please complete it as soon as possible and return it. If you did not receive this questionnaire and you grow fruits, vegetables, herbs, or other specialty crops, please contact Mohammad Babadoost at 217-333-1523 or babadoos@uiuc.edu to request a copy of the survey form. The information gathered in this survey is needed in order for specialty crops production to be represented accurately in statistics that are used in determining funding for a variety of programs.

Cathy Eastman, Center for Economic Entomology, Illinois Natural History Survey (ceastman@staff.uiuc.edu)

Crop and Regional Reports

January - February low temperatures in northern Illinois. Winter low temperatures can be key to fruit bud and insect survival. Here are a few numbers from northern Illinois for the period January 1 - February 22:

Location	County	Lowest Temp. (°F)	Date	Days Temps Below 0 °F
Chicago - O'Hare	Cook	-6	1/31	4
Freeport	Stephenson	-12	1/31	7
Galena	Jo Daviess	-16	2/4	13
Grayslake	Lake	-11	1/30	5
Harvard	McHenry	-12	1/31	7
Kankakee	Kankakee	-9	1/31	5
Malta	DeKalb	-12	1/31	7
Moline	Rock Island	-12	1/31	6
Peoria	Peoria	-10	1/31	5
Rockford	Winnebago	-12	1/31	7
Savanna	Carroll	-11	1/31	6

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

Notes from Chris Doll

It has been a pretty good February for fruit plants in this area; no abnormal high or low temperatures were recorded. The coldest temp of the winter at my location was 1 degree on January 30. The lowest temp reported for western Illinois was -7 degrees, and in southeastern parts of the state the low was -9 degrees F. Reports from peach growers in the primary growing regions are that little or no thinning of fruit buds has happened. This is in contrast to the reported -14 degrees by David Byers at Bedford, Indiana, and some injury reports from Kentucky.

Recent pruning activities were slowed somewhat by ice and snow cover, and when that left, very soft, muddy conditions prevailed. One of the disadvantages of a good weed control program with sterilant materials is poor footing for the pruners in a year such as this. The soft, muddy soil can be a benefit to black raspberry and thornless blackberry growers who have allowed shoot tips to root, as they are easily pulled out under these conditions.

We are not out of the worrisome weather watch time, but each day takes us closer to spring. If an Alberta Clipper makes it down in the next few weeks, you can get some idea of the potential injury from low temperatures by checking pages 54 and 55 of the "Commercial Tree Fruit Spray Guide" for 2004. The flower bud development illustrations for each of the tree fruits make a good place to record the spring development dates.

Saturated soils are not in the most appropriate condition for applying fertilizer or herbicides due to potential run-off problems, but both tasks can be done as soon as favorable conditions prevail. It is the traditional time for suggesting that 50 percent of the nitrogen for peaches be applied, saving the remainder for bloom or petal fall when the crop forecast is more accurate. All other crops can be fertilized when feasible.

The Illinois Small Fruit and Strawberry Schools will be at the Mt. Vernon Holiday Inn on March 2 and 3. This is great opportunity to learn more about the culture and marketing of these crops. For program details, contact either Elizabeth Wahle or Bronwyn Aly in the staff listing at the end of the newsletter. If any "old timers" have any recollections of the Strawberry School prior to 1966, I would like to hear from you to help compile a complete record of the school. My telephone number is 618-656-1605.

For cider makers, there is a HACCP Workshop scheduled at the Penn State University Campus, University Park, PA, on March 12. For information and details, contact Dr. Luke F. LaBorde at 814-863-2298 or lfl5@psu.edu. Note that the registration deadline is March 4.

Chris Doll

Fruit Production and Pest Management

Pheromone Traps for Fruit Insects

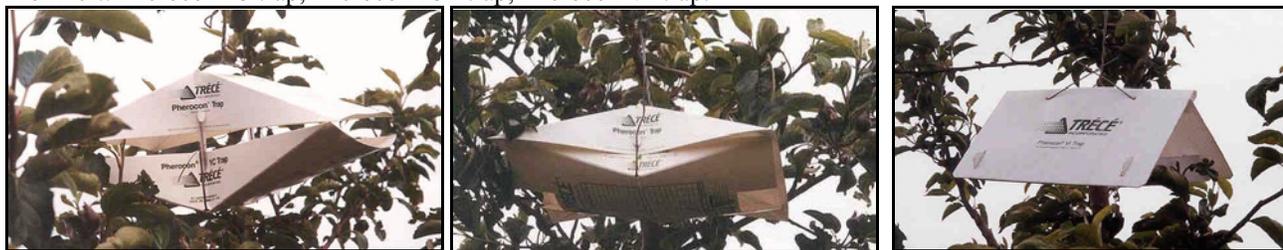
This note will look a lot like one from this newsletter in early March of 2003 ... it must be that time of year again ...

For apple, peach, and grape growers, NOW is the time to order pheromone traps for key insects if you've not already done so. Although traps are available and useful for monitoring many insects of fruit crops, the ones listed in the table that follows are probably the most important for most Illinois growers. Other pests that may be worth monitoring with traps include dogwood borer, spotted tentiform leafminer, redbanded leafroller, and obliquebanded leafroller in apples and peachtree borer in peaches. Contact me if you want more information on these insects.

What kind of traps should I use?

A few companies manufacture traps, and all have a similar range of designs. Trece is still the best known, so I'm using their models as examples, but there's no reason not to use other traps as long as they are pretty much identical in shape and size, and the lesser-known competitors may provide equal quality for a lower price. The standard sticky trap for most orchard insects has been the Pherocon IC. The inside surface of the bottom – the “floor” of the trap – is coated with stickum or tanglefoot, and the bottom hangs from the top by wires. Spacers on the wires hold the bottom slightly below the top or roof so that there is an opening all along the sides as well as the ends of the IC trap. Although this trap has been used for monitoring flights of most orchard insects, a slightly different trap, Trece's Pherocon ICP, has been recommended most often for codling moth trapping. Although the trap top is the same as the one used for the IC, the bottom of the ICP trap is slightly smaller than the IC bottom, and it is attached without spacers so that it slides under the sides of the trap top, leaving a closed trap except for the ends. The ICP trap (or an identical model from other suppliers) is the one I used for several years to monitor codling moth flights around Illinois. A few years ago, Trece began selling a new trap, the Pherocon VI, and it differs from the other two described above primarily in that it's quick to set up (the user doesn't have to assemble the top and bottom with wires), and it uses a separate sticky bottom or “liner” that slides in and out. Its main benefit is that it is MUCH faster to change sticky liners on this trap than it is to change the bottoms of the IC or ICP. I compared these three traps at the University of Illinois orchards in 2002 and found no difference in how many codling moths they captured over the season as a whole. The IC bottoms caught more extraneous things (insects and debris) than the other two, but otherwise there was no difference in their performance. I find the Pherocon VI to be so much easier and faster to handle than the others, so I recommend using it (or a similar trap from another manufacturer) for monitoring codling moth, Oriental fruit moth, grape berry moth, lesser peachtree borer, leafrollers, etc.

From left: Pherocon IC trap, Pherocon ICP trap, Pherocon VI trap.



What attracts moths to traps?

For all the moths typically monitored using sticky pheromone traps, the trap must be baited with a pheromone lure – usually a small piece of rubber or plastic containing a synthetic blend of chemicals that is very similar to compounds used by female moths to attract males. When traps capture male moths, that serves as an indication that females are also present, and mating and egg-laying are occurring. When you order pheromone traps, you also must order lures for the specific insect(s) you wish to monitor. (Sometimes you may order “kits” that come with a combination of traps and enough extra sticky liners and lures to last the season.) Remember that although you may use the same type of trap to monitor different pests, you must use only a single lure per trap ... it does not work to put lures for codling moth and tufted apple bud moth in the same trap. Depending on the pest species, lures usually last 2 to 8 weeks (suppliers can tell you the effective life of the lures they sell), so you have to order enough lures to last through the whole season.

What about apple maggot?

For apple growers in the northern half of Illinois, monitoring the flight of apple maggot flies also is necessary. Traps for

apple maggot flies rely on appearance (the color and shape of a bright red apple) and the use of a food odor (“apple volatiles”) instead of a pheromone, and they are designed to capture female apple maggot flies ready to lay eggs on fruit. All the major suppliers of insect traps carry these kinds of traps. Growers should order the red spheres, tubes or tubs of stickum or tanglefoot, and the food lures recommended by the supplier. Apple maggot traps may be used without any food lures; counts are interpreted accordingly.

An apple maggot trap.



How many traps should I use?

There are no precise answers, but in general, for the moths that are pests in Midwest fruit crops, use 2 to 3 pheromone traps per pest species per each block of trees or vineyard up to 15 to 20 acres in size. Guidelines often recommend at least 3 traps per pest species for any orchard up to 15 acres in size and 1 more trap for every 5 to 10 acres above 15. To monitor 50 acres of trees in 3 or 4 separate blocks, use at least 2 traps per block and at least 6 traps total. Always use at least 3 apple maggot traps (red spheres) per block of trees. See the table below regarding placement of traps.

If you have only one block of trees, you may want to order 3-trap "kits" that suppliers package for each of the major pests. Kits with "standard" lures will include 3 lures per trap, but because the lures for most will have to be replaced every 4 weeks, most Illinois growers will need yet another 2 extra lures per pest species per trap to get through the entire season. Suppliers also sell these extra lures and extra "liners" (the sticky trapping surface) for traps. If you operate an orchard larger than 20 to 30 acres, you'll need more traps; don't "mess with" 3-trap kits; contact the suppliers and make plans to order supplies in bulk. "Long-life" lures are available for the codling moth and the Oriental fruit moth (and some other species) ... these lures last 8 weeks between changes and are the best choice for almost all Illinois growers.

Apple growers in southern Illinois ... a few years ago we saw some problems with tufted apple bud moth in orchards treated pretty much exclusively with organophosphates. With greater reliance on alternative chemistries in recent years, this pest has not reached outbreak levels in any Illinois orchards in the last 2 to 3 years (to my knowledge), but I'm including it in the table on the next page because it still warrants attention in some orchards.

Pheromone trapping guidelines

Crop and Pest	When should you use traps?	Where do you hang the traps?
Apples -- all of Illinois Codling moth	Early bloom through harvest	At eye level or higher, spaced throughout the block, including one somewhere near the upwind edge and one near the downwind edge.
Apples -- south of I-70 Tufted apple bud moth	April 15 through harvest	Same as above for codling moth.
Apples -- north of Springfield Apple maggot	June 1 through harvest	In the outer portion of the canopy of trees on the edge of the block ... VERY visible to adults flying into the block (remove foliage around the sticky red spheres). Hang in border rows or end trees nearest any woods or brush outside the block
Peaches Lesser peachtree borer	Bloom or petal fall through harvest	Same as above for codling moth.
Peaches Oriental fruit moth	Pink through harvest	Same as above for codling moth.
Grapes Grape berry moth	Bloom through harvest	Hang traps on the top trellis wire. Place traps in the outside rows and near ends of rows; concentrate traps on edges near wooded areas.

Suppliers of pheromone traps include:

Supplier	Address	Phone & Fax
Great Lakes IPM	10220 Church Road Vestaburg, MI 48891 email: glipm@nethawk.com On the web at: http://www.greatlakesipm.com	Ph. 989-268-5593 Ph. 800-235-0285 Fax: 517-268-5311
Gempler's	P.O. Box 270 Mt. Horeb, WI 53572 On the web at: http://www.gemplers.com/	Ph. 800-272-7672 Fax: 800-551-1128
IPM Technologies, Inc.	4134 North Vancouver Ave., # 105 Portland, OR 97217 email: info@ipmtech.com On the web at: http://www.ipmtech.com	Ph. 503-288-2493 Ph. 888-IPM-TRAP Fax: 503-288-1887
Phero Tech Inc.	7572 Progress Way Delta, British Columbia, CANADA V4G 1E9 e-mail: info@pherotech.com On the web at: http://www.pherotech.com/	Ph. 604-940-9944 Ph. 800-665-0076 Fax: 604-940-9433
Suterra	213 Southwest Columbia Street Bend, OR 97702 email: agsales@suterra.com On the web at: http://www.suterra.com	Ph. 541-388-3688 Ph. 866-326-6737 Fax: 541-388-3705

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

Vegetable Production and Pest Management

Preseason Notes on Corn Earworm and Corn Borer Control in Sweet Corn

Usually I write a lengthy discourse on the corn earworm and the European corn borer when moth flights pick up in at least some portions of the state in June and July. By then, or course, everyone is too busy to read a lengthy discourse on anything. So, this year I'm going to drone on and on about these insects at a time when most vegetable growers have a little more time to read ... and to plan ahead.

First, for the corn earworm ... this is of course the big worm in the tips of sweet corn ears. Moths lay their eggs singly on silks, and larvae move down the silk channel immediately after they hatch from the eggs. On corn, larvae do not feed on any exposed parts of the plant (leaves, husks, etc.), so the only way to kill them (short of having planted BT sweet corn) is with a contact insecticide applied to the silks. Larvae crawl across the residues on the silks, and the insecticide is taken up through the cuticle.

Although this insect overwinters with at least some success in some areas of the state in some years, it also migrates in on weather fronts every year. Moths are almost always active in the Collinsville area by late May and early June, but in much of the state the period of first activity (and the first need to control them) can vary from June through August. Although control may be necessary in one portion of the state at a particular time, it may be unnecessary in many other locations. Consequently, it really is essential to operate an earworm trap and determine spray needs based on moth captures.

Use a wire Hartstack trap or a nylon version of the same general design (not a paper sticky trap). Bait the trap with Hercon "zealures," and replace the lure with a new one every 2 weeks. See the list below for suppliers. Earworm control is necessary when moth flight is ongoing and fresh silks are present. If traps are catching more than a few moths (3 to 5 per trap per night) when silking begins, sprays should be applied within 2 days after first silk -- insecticide residues must be on the silks to kill larvae immediately after they hatch from eggs and before they enter the silk channel.

Below: Hartstack earworm trap; adult earworm moths, eggs on silks, larva in ear tip.



For the last few years I have written that the pyrethroid insecticides Warrior, Capture, and Baythroid are most effective against earworms. These are restricted-use pesticides (users must be licensed). Pounce and Ambush also have been effective, but not as effective as Warrior, Capture, or Baythroid. Growers who are not licensed to apply restricted-use insecticides can reduce earworm damage by applying SpinTor or Sevin. None of the botanical insecticides is effective for earworm control,

nor are applications of BT products.

For 2004, I need to add a few caveats and commentaries on the standard insecticide recommendations in the preceding paragraph. First, organic growers now have an option for earworm control other than planting early so that at least a portion of the season's crop comes to harvest when earworm numbers are low. Entrust, an OMRI-listed insecticide containing spinosads (derived from soil microorganisms), is now labeled and sold as an 80-percent wettable powder, and although it is not as effective as the top pyrethroids have been in small-plot trials, it is better for corn earworm control than anything that organic growers have been able to use in the past. The more negative news that I have to pass along is that there has been some evidence of failures of Warrior and Capture used for earworm control in different Midwest locations in 2003. It is possible that these failures resulted from resistant populations transported here from cotton-producing areas to the south, where pyrethroid selection pressure is high and overwintering does occur every year. It is way too early to suggest that resistance will lead to failures if Capture or Warrior are used in 2004, but growers should be watchful for unexpected levels of infestation where seemingly adequate spray programs have been carried out. If failures do occur, two possible alternatives for earworm control include SpinTor and Mustang Max. SpinTor is a very different type of insecticide with a different mode of action than the pyrethroids; Mustang Max is a pyrethroid, but sketchy initial evidence suggests it might work where Capture and Warrior have failed.

Spray intervals: When moth flight is heavy (greater than 50-100 moths per trap per night) and temperatures are high (upper 60s at night, 90 and above during the day), the spray interval for Warrior, Capture, Baythroid, or Mustang Max should be no longer than 3 days (2 days for Pounce, Ambush, SpinTor, or Entrust). When moth counts are lower (5-25 per night) and the daily average temperatures (max + min divided by 2) are in the low 70s or lower, the interval for Warrior, Capture, Baythroid, or Mustang Max might be increased to 4 days, and for Pounce, Ambush, SpinTor, or Entrust to 3 days. The demands and expectations of your customers may influence these guidelines ... if you need 95 percent worm-free corn, keep the spray intervals on the short end of the ranges listed above. It is NOT useful to apply insecticides for earworm control until silking begins because significant egg-laying in corn begins only after silks are present.

Midwest sources of pheromone traps for earworms: Bob Poppe, Route 1, Box 33, Lexington, IL, 61753 (309-723-3201); Gempler's, P.O. Box 270, Belleville, WI 53508 (800-382-8473), and Great Lakes IPM, 10220 Church Rd NE, Vestaburg, MI 48891 (989-268-5693). **Sources for lures for earworms and corn borers and for light traps:** Gempler's and Great Lakes IPM at the addresses and phone numbers listed above.

European corn borer. To monitor corn borers and make control decisions in sweet corn, use the following guidelines: Treat late whorl-stage corn (at "row tassel") if 20 percent or more of the plants show larval feeding or if counts of corn borer moths in light trap counts are greater than 50 - 100 per night. Treat from tassel emergence until about a week before harvest at intervals of 5 to 7 days if light traps are capturing more than 10 to 25 moths per trap per night. You can use a corn borer pheromone lure and a cone-shaped trap (same type as for earworm moths) instead of a light trap to monitor corn borer, but the threshold number of corn borer moths captured per pheromone trap is still not too clear. All the insecticides listed for corn earworm control also are effective against corn borer.

Below: European corn borer moth and larva.



Ground versus aerial sprays? Usually ground for all but large fields

For small scale, fresh-market sweet corn growers, the first reason for ground sprays is simple ... in most cases relatively few rows of sweet corn that are in the stage that needs to be sprayed are surrounded by earlier corn and by a range of other vegetable crops. Drift or overspray onto these crops is very likely to be greater in aerial applications than in ground sprays, at least if all the rows at the edges of the target sweet corn are sprayed. If the insecticide used on corn results in any spray deposit on adjacent vegetable or fruit crops and it is not registered on those crops, it becomes an illegal residue. End of

discussion.

But not quite the end of the discussion ... what about larger acreages? After all, sweet corn processors routinely rely on aerial applications of insecticides for earworm control in their contracted acreage. Although they may “get by” with this because the a little bit of infestation and damage can be cleaned out in processing, there is another reason why aerial sprays have greater merit in these situations. The pyrethroids are generally thought to be much more effective at killing adult moths than were the older insecticides that preceded them (though PennCap-M also provides some adult control). In large fields, the influx of new earworm moths into the field after resident moths have been killed by an insecticide is relatively slow during at least some periods. Although aerial applications do not provide as thorough a coverage of silks as ground applications do, they do kill adult moths in the field at the time of spraying. Brian Flood of Del Monte has suggested that in fields of 30 acres or larger, adult control provided by aerial sprays persists for a few days because it takes a while for new female earworm moths to re-enter the field. (This is NOT true for corn borer moths, but aerial sprays are adequately effective at killing corn borer larvae anyway, as they feed on leaves and other exposed plant surfaces before tunneling into the plant.)

In smaller plantings, however, moths move back into the bulk of a field faster, simply because most of the field is close to an edge and to untreated surroundings. As a result, thorough coverage of silks and repeat applications of insecticides that put a residue on new silk growth are necessary. Where ground applications can be made in a timely manner, better coverage of silks is possible with ground sprayers equipped with drop nozzles. If heavy rains prevent the use of ground rigs for a few days, however, then a timely aerial application is FAR more effective than a ground spray applied 1 or 2 days late, after earworms have entered the ear.

So ... I’ll stand by my recommendation that for earworm control, ground applications are more effective for most fresh-market sweet corn growers. Aerial applications have their place – in larger acreages typical of contract fields grown for processors and when rains prevent timely sprays from ground equipment.

Enough on earworms and corn borers for February ... we’ll revisit the topic in June.

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

This issue's words of wisdom ...

Quotes from Albert Einstein ... really smart guys can be humble ... and funny ...

- “With fame I become more and more stupid, which of course is a very common phenomenon.”
- “Just as with the man in the fairy tale who turned everything he touched into gold, with me everything is turned into newspaper clamor.”
- "If we knew what it was we were doing, it would not be called research, would it?"
- “Gravitation can not be held responsible for people falling in love”
- “The wireless telegraph is not difficult to understand. The ordinary telegraph is like a very long cat. You pull the tail in New York, and it meows in Los Angeles. The wireless is the same, only without the cat.”
- "Put your hand on a hot stove for a minute, and it seems like an hour. Sit with a pretty girl for an hour, and it seems like a minute. THAT'S relativity."
- “Common sense is the collection of prejudices acquired by age 18.”
- “Two things are infinite: the universe and human stupidity; and I'm not sure about the universe.”
- "You do not really understand something unless you can explain it to your grandmother."

And finally ...

- “Science is a wonderful thing if one does not have to earn one's living at it.” (He could have said that about growing fruits and vegetables.)

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

Extension Educators in Food Crop Horticulture		
Bill Shoemaker, St. Charles Res. Center	630/584-7254	wshoemak@inil.com
Maurice Ogutu, Countryside Ext Center	708-352-0109	ogutu@uiuc.edu
Elizabeth Wahle, Edwardsville Center	618-692-9434	wahle@uiuc.edu
Extension Educators		
Mark Hoard, Mt. Vernon Center	618-242-9310	hoard@uiuc.edu
Suzanne Bissonnette, Champaign Center	217-333-4901	sbisson@uiuc.edu
George Czapar, Springfield Center	217-782-6515	gfc@uiuc.edu
Dave Feltes, Quad Cities Center	309-792-2500	dfeltes@uiuc.edu
Russel Higgins, Matteson Center	708-720-7520	rahiggin@uiuc.edu
Campus-based Specialists		
Mohammad Babadoost, Plant Pathology	217-333-1523	babadoos@uiuc.edu
Raymond Cloyd, Greenhouse insects	217-244-7218	rcloyd@uiuc.edu
Kelly Cook, Entomology	217-333-6651	kcook8@uiuc.edu
Mosbah Kushad, Fruit & Veg Production	217-244-5691	kushad@uiuc.edu
John Masiunas, Weed Science	217-244-4469	masiunas@uiuc.edu
Chuck Voigt, Veg Production (& herbs)	217-333-1969	c-voigt@uiuc.edu
Rick Weinzierl, Entomology	217-333-6651	weinzier@uiuc.edu

Return Address:

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

