



# UNIVERSITY OF ILLINOIS EXTENSION

College of Agricultural, Consumer, and Environmental Sciences

## *Illinois Fruit and Vegetable News*

Vol. 13, No. 1, March 8, 2007

*a newsletter for commercial growers of fruit and vegetable crops*

*"We are what we repeatedly do. Excellence, then, is not an act, but a habit." Aristotle*

Address any questions or comments regarding this newsletter to the individual authors listed after each article or to its editor, Rick Weinzierl, 217-333-6651, [weinzier@uiuc.edu](mailto:weinzier@uiuc.edu). The *Illinois Fruit and Vegetable News* is available on the web at: <http://www.ipm.uiuc.edu/ifvn/index.html>. To receive email notification of new postings of this newsletter, call or write Rick Weinzierl at the number or email address above.

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

### *Upcoming Programs ...*

- **Tri-State Organic IP Video Series: Organic Weed control**, March 15, 2007, 5:00 – 7:30 p.m.; this is the second of five sessions to be held from February through November). Contact Deborah Cavanaugh-Grant at 217-968-5512 or [cvnghgrn@uiuc.edu](mailto:cvnghgrn@uiuc.edu), or check the web site at <https://webs.extension.uiuc.edu/registration/default.cfm?RegistrationID=510>
- **Dormant Grape Pruning Workshop**, March 17, Fox Creek Winery, Olney, IL. See details in Elizabeth Wahle's southern region updates below.
- **Commercial General Standards Pesticide Training in English and Spanish**, March 22-23, 2007, St. Claire County Extension Office. For details, contact the St. Claire UI Extension Office at 618-236-4172 or by email at [stclair\\_co@extension.uiuc.edu](mailto:stclair_co@extension.uiuc.edu). See details in Elizabeth Wahle's southern region updates below.

### *Regional Updates*

**In southern and southwestern Illinois**, there are no signs of field prep yet, but pruning of apples, peaches, and grapes is ongoing. Most of the region is still wet after receiving significant rainfall the last week of February.

I just received notice that Ultra Blazer (sodium salt of acifluorfen) has a strawberry label as of July, 2006. See the full label at [www.cdms.net](http://www.cdms.net). Availability in the supply chain has yet to be determined. The key thing to know is that Ultra Blazer, if available, should not make contact with an actively growing strawberry crop. It can be used at renovation and when plants are dormant. Like Sinbar and 2,4-D, Ultra Blazer can cause crop injury – read the label thoroughly. Application to matted row strawberries requires a 120-day PHI.

A dormant grape pruning workshop at Fox Creek Winery is scheduled for Saturday, March 17, 2007 at 9:30 am. This workshop, sponsored by the Illinois Grape Growers and Vintners Association, University of Illinois Extension, and Illinois Department of Agriculture is designed to instruct and demonstrate pruning principles and techniques for dormant grape vines. Conducting this pruning demonstration will be Bruce Bordelon, Viticulture Specialist from Purdue University, and Elizabeth Wahle, University of Illinois Extension Specialist. Workshop participants will meet at Fox Creek Winery, located at 5502 North Fox Road, in Olney, Illinois, starting at 9:30 a.m. At 10:00 am, Dr. Bordelon will begin the pruning demonstration and instruction. 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 hand pruners. For those just beginning, extra pruners will be available. There is no charge to

attend this workshop. Grape publications will be available for sale at the workshop, including the 2007 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](mailto:wahle@uiuc.edu).

You and your staff are invited to attend a special pesticide safety education program offered in southern Illinois. On March 22 and 23, University of Illinois Extension staff will be teaching the Commercial General Standards subject matter in English with immediate translation to Spanish by bilingual staff members. This unique class can benefit your staff in two ways. First, for those employees that have a good command of English but can't quite pass the test for licensing, this class may provide the thorough understanding of the subjects necessary, as they will be presented in Spanish as well as English. Secondly, for those employees who are weaker in English, the class offers an outstanding opportunity to gain an understanding of the safety issues surrounding pesticides and their application. Either way, your employees win when they are better informed and protected. If you have additional questions, please call the St. Clair UI Extension Office at 618-236-4172 or e-mail at [stclair\\_co@extension.uiuc.edu](mailto:stclair_co@extension.uiuc.edu).

*Elizabeth Wahle (618-692-9434; [wahle@uiuc.edu](mailto:wahle@uiuc.edu))*

**In northern Illinois**, it has been cold, cloudy and windy during the last half of February and early March – so perfectly normal. Day temperatures have been in the upper teens to upper 40s, and night temperatures ranged from below zero to the low 30s. The region received 1 to 2 inches of rainfall and 2 to 6 inches of snow during the same period, and up to 3 inches of snow is still on the ground, with more in northern counties bordering Wisconsin and some counties closer to the Mississippi river. Pruning of mature fruit trees has been slowed down by colder temperatures that limit outdoor activities. Pruning of younger fruit trees and small fruits will commence as soon as it warms up.

*Maurice Ogutu (708-352-0109; [ogutu@uiuc.edu](mailto:ogutu@uiuc.edu))*

### ***Notes from Chris Doll***

It looks like spring is ready to be sprung after what seemed like a cold February. St. Louis weather said that it was the fifth coldest on record. Luckily, it appears that the minimum of 2.3 F for the month did not kill many peach flower buds, and grapes and blackberries look ok too. There had been some green tip on blackberries and tea rose buds that burned, but more are present lower on the shoots.

Inspection of some apple and peach blocks show a good bud set on both. In our local drought-stressed area (Madison County had the lowest corn yield for the state in 2006), some peach shoot growth is weak, but there are plenty of buds for a crop.

According to the Illinois Fruit Calendar, those of us in Area B (South Central), can prune all trees with little danger of cold injury. Fertilizers can be applied to both sod covers and to trees, although runoff from bare soil is likely with heavy rain. Planting of trees can be done any time, but preferably when it dries out a little more. There is still time to collect scion wood for grafting of nuts and fruit trees. It might also be a good time to find a source of honeybees for pollination. It is also the time to finish pruning and tying grapes and thornless blackberries so that the tasks are done before bud swell, at which time many buds could be knocked off in the process.

As the pruning season winds down, there is still time to consider some pruning concepts for improving fruit quality. First, don't forget the tops, because the high growth potential of shoots in that area creates shade that prevents light penetration. Pruning also tends to balance the leaf-fruit ratio so that sufficient leaves are present to nourish the fruit and there are not too many fruits. Elimination of the older shoots and spurs (>4 - 5 years) will leave viable and productive younger ones. And finally, think of the tractor driver and the tree, so that enough space is available to drive through without damaging fruit on the tree or in the bins.

Some apple growers have seen Jerry Mills' description of his balanced, no-stress power pruning set up on the Brownie unit. I had the pleasure of trying it this week, and the counter-balance that holds a 6-foot lopper is easy to use. He offered to bring the machine to the Back-40 to finish my trees, but I had to say "no thanks" because of space limitations.

During the long, cold February, I decided to go back 100 years to the 1907 Illinois State Horticulture Transactions (Volume 41) to learn what the good old days were like. Well, count your blessings, as 100 years ago you would be making your lime and sulfur wash. On page 31, the lengthy recipe is given, as well as one for making your own lead arsenate. The President's address on page 31 mentioned the "freaks of April frosts" that year that destroyed much of the Illinois fruit crops, and yet described the optimism of fruit growers as follows: "Although they may be dissatisfied with the present – they are never without hope – next time or next year, sometime in the future, this hope they feel sure will become a reality and reward will be certain."

*Chris Doll*

## ***Marketing Locally Grown Produce***

Growing and marketing go hand in hand for any successful specialty crop operation. One of the neatest things about these operations is that the recipes for marketing successes are numerous and as diverse as the crops and people that grow them. Increasingly there is a movement on many operations to more direct marketing. Although always a mainstay of smaller scale growers, this movement is ever-increasing among medium and larger operations in Illinois. The reasons for this trend are numerous and range from obvious advantages such as higher prices afforded by direct marketing to more complex issues such as maintaining a viable enterprise with smaller acreage and less labor input. The labor issue is substantial and likely to become more of a factor in the near future.

The good news is that there seem to be increasing opportunities for direct marketing. New farmers markets are being developed every year, and there are more people, businesses, and institutions becoming interested in purchasing local food. Although there are numerous arguments that surround the local food movement (including its definition), there is a growing demand for local food. Since consumers vote with currency, their vote should not be ignored.

A number of studies designed to understand consumer desires and values associated with direct marketing of local food have been undertaken. These include studies by the University of Illinois, such as one by graduate student Sarah Hultine. An overview of this study can be found in the article [Illinois Farmers Making More with Less by Selling Direct](#). Other interesting studies include one by Tim Woods and others at the University of Kentucky. This work is summarized in the [2006 Kentucky Restaurant Produce Buyers Survey](#), and it provides some insight into the types of produce that chefs would like to be able to purchase from local sources. Other work in this area has been undertaken by the Ohio State University Department of Human and Community Resource Development. Their web site contains the results of a number of very interesting studies that they have conducted. It is interesting to note some of the shifts that occurred between the [2004 Survey Summary](#) and the [2002 Survey Summary](#). An example of these shifts that should arouse interest in direct marketers of produce is the fact that in 2002, 39% of the survey respondents agreed or strongly agreed with the statement, "Food is not as safe as it was 10 years ago." In the 2004 survey the number of respondents that agreed or strongly agreed with that same statement was 47%. I think that as producers and marketers we need to leave behind our own personal, political and other baggage and simply look at these surveys to point to what our customers want. These studies do a great job of providing us with insight into a rather large group of Ohio consumers. It is not lost on me that Ohio is not Illinois, but it should also not be lost that these surveys may be useful to you in helping to better understand Midwestern consumers. I encourage you to take a few minutes to look at the studies and see how many people are willing to pay a premium for local, high-quality produce. For those who receive this newsletter only as a printed copy without electronic links to the articles listed above, feel free to contact me for printed copies of those reports.

*Jeff Kindhart (618-695-2444; [jkindhar@uiuc.edu](mailto:jkindhar@uiuc.edu))*

## ***Fruit Production and Pest Management***

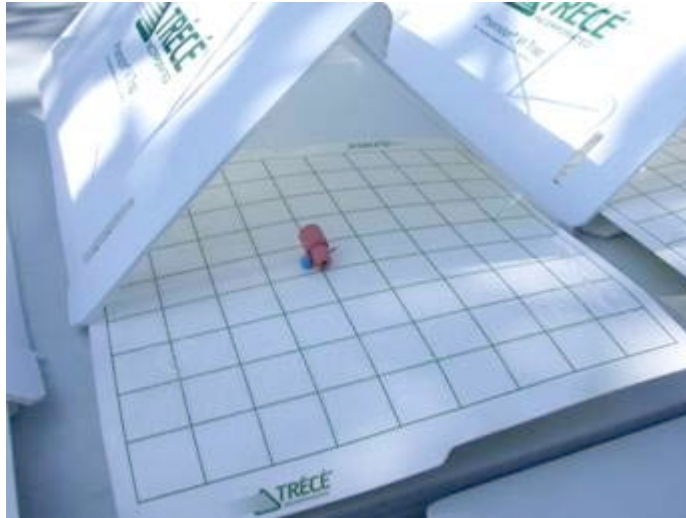
### ***Pheromone Traps for Fruit Insects***

It's that time of year again ... time for my annual (or nearly so) reminders about pheromone traps for fruit insects. With a few updates for 2007, here we go ...

For apple, peach, and grape growers, NOW is the time to order pheromone traps for key insects if you've not already done so. (Yes, sooner would have been better, and I always push this message at our winter meetings.) 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 fruit 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, but Scentry, Suterra, and others are also reliable providers. Over the last few years, the trap design that has become most widely used for fruit insects in general is the large plastic delta trap; Trece sells it as the Pherocon VI trap, and Suterra and Scentry simply call it a large plastic delta trap (LPD). This trap is quick to set up and easy to maintain, because unlike earlier "wing traps," the sticky trapping surface is provided by an exchangeable card that slides in and out quickly and easily. It is MUCH faster to change sticky liners on this trap than it is to change the bottoms of the wing traps we previously used, and when I compared the delta trap with two different wing traps in University of Illinois orchards in 2002 I found no difference in how many codling moths they captured. Since then I've found them to be effective at monitoring all the moth pests listed below. If you bring the trap "shell" indoors at the end of the season, you can expect to get 2 to 3 years use from each trap (while replacing lures and liners as needed).



A Pherocon VI trap (an example of a large plastic delta trap), with the sticky liner partially removed, showing a pheromone lure.

*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 (especially 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 stick-um 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, I consider it adequate to use 2 to 3 pheromone traps per pest species per each block of trees or vineyard up to 15 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 3 to 5 acres above 15. To monitor 50 acres of trees in 3 or 4 separate blocks, use at least 3 traps per block and at least 9-12 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 relatively small 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, so 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 ... it has been a few years since 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 3-4 years (to my knowledge), but I'm including it in the following table because it still warrants attention in some orchards.

***Pheromone trapping guidelines***

<b>Crop and pest</b>	<b>When should you use traps?</b>	<b>Where do you hang the traps?</b>
Apples -- all of Illinois Codling moth	Early bloom through harvest	At eye level or higher (upper third of canopy is best), 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	Similar to codling moth, but trap height should not exceed 5 to 6 feet.
Peaches -- Oriental fruit moth	Green tip to pink through harvest	Similar to codling moth, but trap height need not exceed 6 feet.
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: <a href="mailto:glipm@nethawk.com">glipm@nethawk.com</a> On the web at: <a href="http://www.greatlakesipm.com">http://www.greatlakesipm.com</a>	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: <a href="http://www.gemplers.com/">http://www.gemplers.com/</a>	Ph. 800-272-7672 Fax: 800-551-1128
Phero Tech Inc.	7572 Progress Way Delta, British Columbia, CANADA V4G 1E9 e-mail: <a href="mailto:info@pherotech.com">info@pherotech.com</a> On the web at: <a href="http://www.pherotech.com/">http://www.pherotech.com/</a>	Ph. 604-940-9944 Ph. 800-665-0076 Fax: 604-940-9433
Suterra	213 Southwest Columbia Street Bend, OR 97702 email: <a href="mailto:agsales@suterra.com">agsales@suterra.com</a> On the web at: <a href="http://www.suterra.com">http://www.suterra.com</a>	Ph. 541-388-3688 Ph. 866-326-6737 Fax: 541-388-3705

Rick Weinzierl (217-333-6651; [weinzierl@uiuc.edu](mailto:weinzierl@uiuc.edu))

***Vegetable Production and Pest Management***

***Planning ahead for corn earworm management***

Again this year I'm writing a couple of lengthy discussions well in advance of the time of year when the target pests occur. This one is an update on the corn earworm. It will be a long time before traps begin to capture moths of this species in June and later, but it's not too soon to plan for their monitoring and control. (And yes, there are some updates in this summary in comparison with those from previous years.)

**Corn earworm ...** 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.



Left: Corn earworm larva. Right: Hartstack trap.

Previously we have recommended using either a wire Hartstack trap or a nylon version of the same general design marketed by Scentry and several regional distributors. We've long known that paper sticky traps are ineffective at monitoring corn earworm moths, and there's growing evidence that the Scentry nylon cone traps may not work well enough. Several years ago the Scentry traps were shown to catch fewer moths than the Hartstack traps in trials completed in the northeastern U.S., and results from monitoring work done in 2006 show that the nylon traps also may fail to detect light but still significant flights when the wire Hartstack traps do catch moths. Consequently, I'm inclined to recommend that all sweet corn and seed corn producers use the wire Hartstack trap. (Data to support this recommendation came from a regional monitoring effort coordinated by Bill Hutchison of the University of Minnesota and conducted by several entomologists and horticulturists who participate in the Great Lakes Vegetable Workers Group.) 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.

For a decade or so I have written that the pyrethroid insecticides – especially Warrior, Capture, Baythroid, and Mustang Max – 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 the four products listed above. Growers who are not licensed to apply restricted-use insecticides can reduce earworm damage by applying SpinTor, Entrust (same active ingredient as SpinTor, but formulated to allow use in certified organic production), or Sevin. None of the botanical insecticides is effective for earworm control, nor are spray or dust applications of BT products.

Now, a few caveats and commentaries on insecticides for corn earworm control ...

- First, organic growers do 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.
- During the last few years, entomologists throughout the Midwest who have conducted small-plot trials to evaluate the effectiveness of new and existing insecticides for control of corn earworm have recorded less effective control by one or more pyrethroids in comparison with prior years' trials. For the last 3 to 4 years, entomologists in Midwestern states collected corn earworm larvae from corn ears in September and sent the living larvae to Roger Leonard, an insecticide toxicologist at Louisiana State University, so that he could conduct bioassays to detect resistance in the populations represented by these samples. His research, as well as bioassays of moths from Midwest pheromone traps, indicates that populations from various locations in the Midwest show pyrethroid resistance levels similar to those found in corn earworms in southern cotton-producing areas ... realize that the same species is known there as the cotton bollworm, and that populations there are under strong selection for pyrethroid resistance because of sprays applied to cotton, corn, sorghum, and soybeans. Also realize that for most of the Midwest, infestations of corn earworm result from immigration of earworm moths from the south on storm fronts in the summer ... so whatever shifts toward resistance occur in the south are carried here by each season's migrants. Consequently, while pyrethroids applied to sweet corn in Illinois have little or no impact on resistance in the next year's population here (because in general Illinois infestations all die off at the end of the season and are replaced by moths from the south the next year), we can be the recipients of a resistant population as a result of perennial selection in the south.
- Now that I've repeated the near-equivalent of shouting "Fire" in a crowded building (but really only repeating the same message that I've conveyed the last couple of years), it's worth keeping this in perspective ... we still have not yet seen any widespread control failures in the field, and pyrethroids may continue to work very well in earworm control this year and into the future. Laboratory evidence of some level of resistance in field-collected samples of larvae or adults does not mean that the resistance level is great enough to allow survival in the field. That said, it would be wise for sweet corn growers in Illinois and throughout the Midwest to (1) monitor earworm flights with pheromone traps and keep daily records of the number of moths captured; (2) keep very accurate records of insecticide application dates, rates, and weather; and (3) understand that if a pyrethroid fails to give control because of resistance, other pyrethroids are very likely to fail as well. Ambush, Pounce, Warrior, Capture, Baythroid, Mustang-Max, Decis, Proaxis, and Discipline are all pyrethroids. Insecticides with alternative modes of action and some effectiveness against corn earworm include Larvin, Lannate, SpinTor, and Sevin. Entrust is an organically-certified formulation of the same active ingredient that's in SpinTor. Tank mixes of a pyrethroid plus Larvin or Sevin were among the most effective treatments used in small plot trials in Illinois in 2006.

**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 high levels of control in fresh-market sweet corn for Warrior, Capture, Baythroid, or Mustang Max should be no longer than 3 days and as short as 2 days (with a max of 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 source of the Hartstack trap for earworms:** Bob Poppe, Route 1, Box 33, Lexington, IL, 61753 (309-723-3201). **Sources for lures for earworms:** Gempler's and Great Lakes IPM at the addresses and phone numbers listed above under the Fruit heading.

The wire Hartstack trap is not cheap ... think in the \$200 range for the trap plus shipping, and think higher numbers if the traps must be shipped a long way. But before you let the price tag make you balk, consider ...

- These traps will last for many years (I have a couple that are over 20 years old) ... as long as you don't run over them with tractors or other vehicles.
- Along with a few dollars for lures every year and daily monitoring of moth counts, they provide you with guidance that can keep you from spending thousands of dollars unnecessarily or losing thousands of dollars worth of sweet corn sales. If you spray 10 acres of sweet corn even twice a week for 3 weeks before earworms are present and require control, that's 6 applications at (conservatively) \$12.00 per acre for each application ... multiplied by 10 acres, that's \$720 (plus the loss of time not spent doing something more necessary). Multiply that by a 20-year life span for the trap, and the total exceeds \$14,000. I think that pays for the trap and the lures. Viewed in a different way, if high trap counts lead you to spray more often in order to get the control you really need, you market more corn. For a fresh-market producer who sells sweet corn at \$4.00 per dozen, a yield of 1,000 dozen per acre is worth \$4,000. Preventing a 5 percent loss by spraying extra when needed saves \$200 per acre in sales. Multiply that by 10 acres and 20 years, and the total reaches \$40,000 ... that, plus keeping your customers from complaining about wormy corn, certainly pays for the cost of a trap and a package of lures every year. I rest my case ... buy a Hartstack trap and use it.

#### **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 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 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 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 for March ... we'll revisit the topic in June.

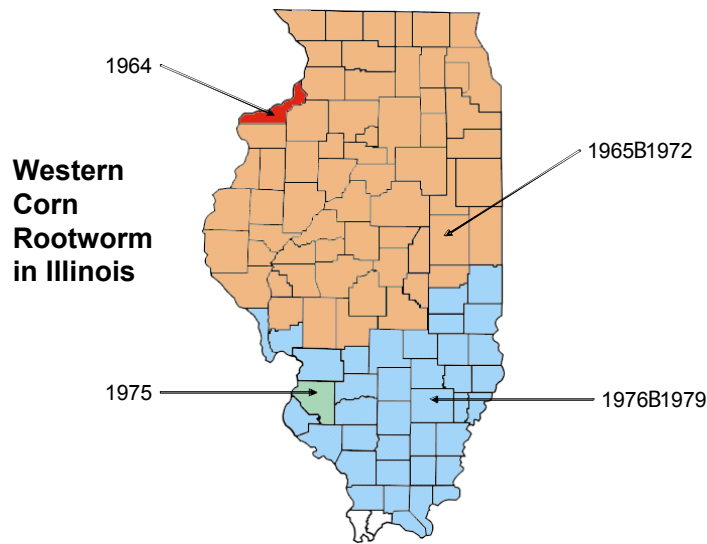
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#### ***The Variant Strain of the Western Corn Rootworm***

The western corn rootworm has been a serious pest of corn – sweet corn, field corn, or seed corn – where it is grown without rotation after a previous year's corn crop for over 40 years in Illinois. Until recently, rotating crops provided effective control because adult females laid eggs almost exclusively in the soil of corn fields in later summer, and larvae that hatched from overwintered eggs could



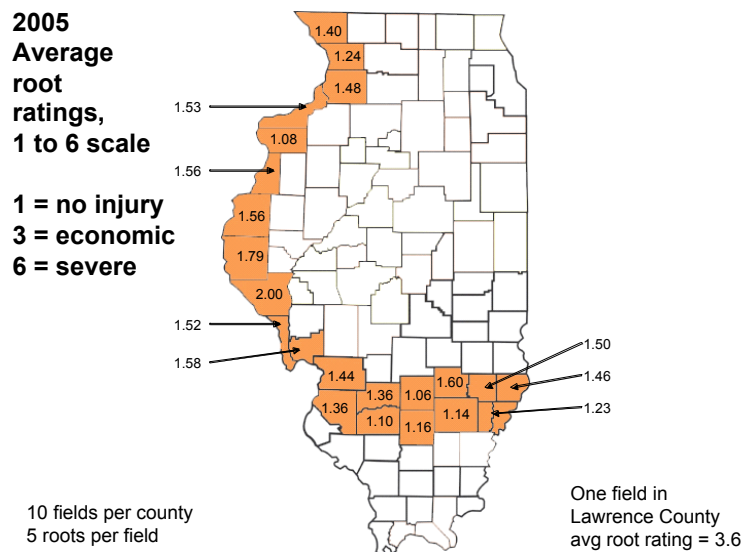
survive only by feeding on the roots of corn. In a corn-soybean rotation, larvae that hatched in this year's soybean field – last year's corn field when eggs were laid there – starved to death. And this year's corn field was last year's soybean field, so no eggs were laid there last summer.



Dates of initial establishment of the western corn rootworm in Illinois.

Beginning in the 1990s, a variant strain or biotype of western corn rootworm developed, and females of this variant strain laid eggs in crops other than corn. Where they laid eggs in soybeans, the larvae that hatched the following year found themselves in corn fields, and they fed, survived, and damaged the crop. This variant strain developed first in east-central Illinois, and the extent of its spread has been monitored in Illinois and states to the east. Kevin Steffey and Mike Gray, extension entomologists in the Department of Crop Sciences, have coordinated much of the survey work done in Illinois, and they provided the information summarized below.

The latest survey of root injury in corn after soybeans was done in 2005, and it focused on the counties indicated in the map below. In general, it was assumed that the variant strain was present in areas significantly north or east of these counties, and the goal was to see if serious damage to first-year corn was occurring yet in the counties surveyed. Significant injury to first-year corn is considered to be an indicator of the presence of the variant strain. Results of the 2005 survey are presented in the map below.



Kevin Steffey noted in his correspondence to me that “the distribution of the variant western corn rootworm has expanded west to the Mississippi River and south to the I-70 corridor. There was verification of rootworm larval injury in corn planted after soybeans in southeastern Iowa in 2006. We suspect that the frequency of occurrence of significant rootworm larval injury in corn after soybeans is less in the counties along the Mississippi River than their eastern neighboring counties, with the frequency declining south of Hancock County. We received reliable reports of severe rootworm larval damage to first-year corn in 2006 in Effingham and Bond counties. On the eastern side of the state, one first-year field in Lawrence County had severe rootworm larval damage in 2005.” Further information on the variant strain of western corn rootworm is available at <http://www.ipm.uiuc.edu/bulletin/article.php?id=569> and at <http://www.ipm.uiuc.edu/bulletin/article.php?id=576>.

So ... where the variant strain exists, be aware that planting sweet corn in last year’s soybean fields may not avoid crop injury as it has in the past. Corn following corn and corn following soybeans (as well as some other crops) may be injured by western corn rootworm larvae. See the 2007 Midwest Vegetable Production Guide for details on insecticides for corn rootworm control.

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### ***Words of Wisdom ...*** “that would be me” ...

A man owned a small orchard in the central Midwest. The state Wage & Hour Department claimed he was not paying proper wages to his help and sent an agent out to interview him.

"I need a list of your employees and how much you pay them," demanded the agent.

"Well," replied the grower, "there's my orchard helper who's been with me for 3 years. I pay him \$600 a week plus free room and board. The cook has been here for 18 months, and I pay her \$500 per week plus free room and board. Then there's the half-wit who works here about 18 hours every day and does about 90% of all the work around here. He makes \$10 per week, and I buy him a bottle of bourbon every Saturday night."

"That's the guy I want to talk to -- the half-wit," says the agent.

"That would be me," replied the orchard owner.

*(from Pat Curran, northern Illinois)*

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