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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, 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.

Final issue of the 2006 newsletter year …

This is the final issue of the *Illinois Fruit and Vegetable News* for the 2006 subscription year. For those who subscribe for US Mail delivery of printed copies, a subscription form for 2007 is included with this issue. For those who receive email notifications that include a link to the newsletter's web site, your email subscription automatically renews unless you request that I remove your name from the subscription list.

In this issue …

Upcoming Programs … please note the expanded discussions of these programs following the bulleted listing below.

- **Illinois Grape Growers and Vintners Association Annual Meeting**, February 22-25, Hilton Hotel, downtown Springfield. Each day will focus on a particular aspect of the grape and wine industry: Thursday will be marketing; Friday, enology; Saturday, viticulture; and Sunday will be reserved for the IGGVA business meeting. Check the program at http://www.illinoiswine.com/pdf_forms/2007reg-agenda.pdf.
- **Illinois Small Fruit & Strawberry Schools**, February 27-28, 2007, at the Holiday Inn, Mt. Vernon, IL. Contact Jeff Kindhart (jkindhar@uiuc.edu) or Bronwyn Aly (baly@uiuc.edu), 618-695-2444.
- **Tri-State Organic IP Video Series,** 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, or check the web site at https://webs.extension.uiuc.edu/registration/default.cfm?RegistrationID=510
- **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.

Illinois Small Fruit and Strawberry Schools

The 2007 Illinois Small Fruit and Strawberry Schools will be held February 27 and 28 at the Holiday Inn in Mt. Vernon. The schools are designed to provide information to those interested in growing and marketing small fruit crops in the Midwest. Presentations will be provided by university specialists, industry professionals and growers.

The Illinois Small Fruit School will be on February 27, and the first educational session will begin at 9:30 a.m. and include presentations on the possibilities of elderberry production in the Midwest, table grape production for direct marketing, weed control and the role of micronutrients in small fruits, blueberry diseases, insect pests at harvest, marketing tips for small fruit, and growing blueberries in the Missouri area. Featured speakers throughout the day include Patrick Byers, fruit grower advisor of Missouri State

University, plant pathology professor Mark Gleason of Iowa State University, agricultural economist Tim Woods of the University of Kentucky, and various members of the University of Illinois research and extension staff. Educational sessions will end at 5:00 p.m.

The Illinois Strawberry School will be held February 28 with the first session kicking off at 8:30 a.m. Presentations will include information on insect and disease management and weed control. A number of strawberry marketing strategies will be addressed, and Lakeview Farms owner Carl Lask will present a session on utilizing the technological wonders of the internet and e-newsletters to communicate with berry customers. Leslie Cooperband will inform growers about using organic nitrogen sources during production, while Mosbah Kushad will discuss the post-harvest handling of strawberries. Missouri State University's research professor of fruit Martin Kaps will present variety trial information and University of Kentucky fruit and vegetable specialist Joe Masabni will evaluate herbicides in strawberry plasticulture production. Educational sessions will end at 3:30 p.m. In addition to the educational sessions, there will be a trade show both days featuring vendors offering products, supplies and services to small fruit and strawberry growers.

The registration fee is $30 per farm family and includes admission to the educational sessions and trade show along with one copy of the *2007 Proceedings* (available on CD-ROM or printed version) and the *2007 Midwest Commercial Small Fruit and Grape Spray Guide*. For more information contact Jeff Kindhart (jkindhar@uiuc.edu) or Bronwyn Aly (baly@uiuc.edu) (618-695-2444).

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Tri-State Organic IP Video Series

In order to provide regional- and national-caliber speakers on topics relating to organic farming, the University of Illinois Extension is co-hosting a series of video presentations at offices throughout Illinois. The series began on Tuesday, February 13, and continues on the dates listed below. Each evening session runs from 5:00 to 7:30 p.m. and will be transmitted to selected U of I Extension offices so more people can take advantage of this educational opportunity without having to travel far.

Future dates and topics are as follows:
March 15 -- Organic Weed Control
April 19 -- Insect and Disease Control in Organic Vegetables
September 20 -- Organic Poultry Production
November 15 -- Beginning Organic Farming/Certification and Marketing

All presentations will begin at 5:00 p.m. and end at 7:30 p.m. Pre-registration is required by three days before each workshop, along with a fee of $10. To register, visit https://webs.extension.uiuc.edu/registration/default.cfm?RegistrationID=510 or contact Donna Cray (217-241-4644; dcray@uiuc.edu.). For additional information, contact Deborah Cavanaugh-Grant (217-968-5512; cvnghgrn@uiuc.edu). The Tri-State Organic Video Series is sponsored by University of Illinois Extension, the North Central Region Sustainable Agriculture Research and Education (NCR-SARE), The Ohio State University Extension, and Purdue University Extension.

Deborah Cavanaugh-Grant (217-968-5512; cvnghgrn@uiuc.edu) and Elizabeth Wahle (618-692-9434; wahle@uiuc.edu)

Commercial General Standards Pesticide Training in English and Spanish

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 that is necessary. Secondly, for those employees that 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 don't hesitate to call the St. Claire UI Extension Office at 618-236-4172 or by e-mail at stclair_co@extension.uiuc.edu.

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

Notes from Chris Doll

A warm winter has changed into cold. Since January 26 when it warmed up to 61 degrees, we have had only 4 days when the high was above freezing. So far, the winter minimum here was 2.3 degrees, and grower reports at last week's fruit schools were in the -2 to +6 degree range. Some peach bud kill of 50-60 percent on the likes of Cresthaven were reported. In the Back 40, the severity ranges from 10 to 30 percent dead. So, maybe we have had some thinning that some growers were wishing for. As we progress toward spring, and the usual vagaries in weather, you can check on flower and fruit survival to minimum temperatures by studying pages 54

and 55 of 2007 the Midwest Commercial Tree Fruit Guide. I use the sketching of flower bud development as a site for recording the dates, which works better than my memory, this year and in past years.

It has not been pleasant weather for pruning, but some growers have managed to continue the process. It is a good time to work on fire blight-susceptible apple and pear varieties so that spreading the disease is not a concern. The gamble on pruning peaches early diminishes with each day, and only the worry about future loss to freezes should keep one out of the orchard.

It is time to consider fertilizing the orchards as well. At the present time, the old caution statement about not applying to frozen soil is relevant as rains could wash it away before it has a chance to move into the soil. The same precaution is on the labels of many soil sterilant types of herbicides. For both fertilizers and herbicides, the chances of loss are diminished if there is a good sod ground cover.

A few years ago, Dr. Rich Marini, now with Penn State University, told us how to grow big peaches. One of the suggestions was to apply the first half of the nitrogen to peach trees about a month before bloom. That time is rapidly approaching. Some of the other suggestions given were to make sure that adequate supplies of other nutrients were also available. At bloom, physically remove about 50% of the blossoms (assuming that a 100% bloom is present). Then complete the thinning job before pit hardening. Some removal of vigorous upright shoots from the interior of the tree about 40-50 days after bloom will improve light penetration and better fruit development. Maintain a good pest control program to have functional foliage, and delay harvest as long as possible based on ground color and flesh firmness to gain the benefits of growth in the final stage. Irrigation during the final swell is great if available when needed.

The January 2007 issue of **California Agriculture** contained an article titled "High Spring Temperatures Decrease Peach Fruit Size." In the summary, it was concluded that high early spring temperatures, especially those in the first 30 days after bloom, tend to decrease the average size of fruit packed. If such an event happens, increased thinning is needed to offset the effect of the high temperatures.

An article in the Journal of the American Pomological Society, Volume 60, Number 1, in January 2006 by Drs. C. R. Hampson and D. L. McKensie at Summerland, BC, Canada, gave the details of "Sensory Characteristics of 21 New Apple Cultivars After Short-Term Cold Storage." The sensory characters studied and measured were skin toughness, crispness, hardness, juiciness, sweetness, sourness and flavor intensity. The cultivars that rated highest (in alphabetical order) were Ambrosia, Chinook, Scarlet O'Hara, Sundance, Crimson Crisp, Cripp's Pink, Delblush, Pinova and September Wonder, plus 2 numbered selections. Gala, Golden Delicious and Liberty were cultivars that did not make the highest list, and Honeycrisp was not included. Delblush, Cripp's Pink and Pinova had both the highest soluble solids and titratable acidity. The conclusion appeared to be that there are other factors necessary for commercial acceptance, such as fruit size, appearance, and productivity.

Chris Doll

Fruit Production and Pest Management

Caring for Newly Arrived Trees Before Planting

Some of you will be receiving new trees very soon, so it's a good time to share a few points on how to care for these trees. First and foremost, find out from the nursery the exact date the trees will be shipped and a tracking number if available. Call the shipping company to find out the exact date of delivery and give them your cell phone number, in case the truck driver can't find you when he/she arrives at your farm. Quickly inspect the trees or at least the box for signs of damage as soon as it arrives, preferably before you sign the shipping slip. If a box is damaged on the outside, open it and make sure the film liner is not damaged. Reject the shipment if the box liner is damaged and the trees look dry. Open the box immediately, even if it is undamaged. Check the trees to make sure that the variety, rootstock, and caliber are correct. Each tree should have a label for the rootstock, and each variety should be labeled as well. Trees of the same variety may be bundled together, but there should at least be one label listing the variety name. Also check to see if the graft union is at least two inch above the root system (apples). If you noticed that the trees arrived dry, if the buds have started to grow, or if the trees are not labeled correctly, call the nursery immediately and explain the problem. Don't accept the trees, ask for replacement. If the trees look healthy, but they are shipped bare root, then put moist sawdust or wet rags around the roots. The sawdust should feel moist not soggy. Fruit trees are very sensitive to low oxygen, so don't put the roots directly in water for more than a few seconds. If the trees are shipped with sawdust, make sure it is moist. Reseal the boxes and place them in a cold room. Do not trim any broken branches or roots on these trees before planting. Any damage to the trees will enhance bud break, so wait until the time of planting to make any cuts.

Trees should be stored in a cold environment to prevent the buds from breaking. The cooler should be set at about 50 to 55 degrees F. A cold room is preferred, but a cellar or any non heated room will do for a short storage time. If you plan to store the trees in a fruit storage room, make sure it has been properly aerated to get rid of any residual ethylene. Ethylene is a hormone produced by most

fruits. It stimulates bud break at very low concentrations. Ethylene has no smell and it mixes very easily with air so the room should be aerated for at least a week before you store any trees in it. To speed up the process of aeration, you can use an exhaust fan to remove any residual ethylene. Make sure you bring in fresh air free of ethylene. Ethylene is autocatalytically produced in the plant, so any small amount left in the room can cause buds to start breaking dormancy. Smoking, propane powered forklifts, car exhaust, and some types of rubber will generate ethylene. Do not cover the tree tops with plastic bags, especially if you are going to store them in a cellar or non refrigerated rooms. High humidity and some ethylene will be generated by the trees stored in plastic bags, especially in late winter or early spring. So only the roots should be covered in plastic bags. Humidity is another important factor that can affect stored trees. Make sure to place a humidifier or at least an open pan of water in the room to increase the humidity. Lay the trees flat on the ground or raise the bottom of the tree a little higher than the top so their buds will not germinate quickly.
If you plan to store trees that you dug out of your own nursery, it is best to store them in pots of soil or peat moss. Water will evaporate from the pots and some of it will be taken up by the trees, so make sure to add water to the pots even in cold storage. Check your cooler temperature frequently and make sure the temperature in the room is set correctly. A thermometer is the only way to determine the exact temperature in the room.

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

Notes on Peach Leaf Curl and Apple Fire Blight

Peach leaf curl. Peach leaf curl occurs in Illinois every year. If not controlled effectively, this disease causes yield losses and tree losses. Peach trees need to be sprayed for control of peach leaf curl before bud swell. A single application of a copper compound (i.e., Kocide, Cuprofix, copper oxychloride, Bordeaux mixture), Ziram, Carbamate, or Bravo can effectively control peach leaf curl. Trees can be sprayed any time after leaf drop in the fall until before bud swell in the spring. For additional information, consult the "Commercial Tree Fruit Spray Guide 2007" for listings of effective fungicides (http://www.extension.iastate.edu/Publications/PM1282.pdf/).

Fire blight of apple. Fire blight is the most important disease of apples in Illinois. A combination of practices is needed for effectively controlling this disease. Any spray during winter to control fire blight of apple is NOT effective. The recommended practices for controlling this disease are as follows: (1) start your orchard with fire blight-resistant nursery stock; (2) prune the infected shoots and remove the cankers in winter and destroy them (do not leave them in the orchard); (3) apply antibiotic (i.e., Streptomycin 17WP) during bloom (apply Streptomycin as predicted by MARYBLYT program); (4) apply Apogee during full bloom to before petal fall (this may reduce shoot blight); (5) remove infected shoots during summer (remove the shoots in a dry, sunny day

and cut them off approximately 8 inches below the sign of infection); and (6) apply Streptomycin after trauma events (i.e., hail or heavy storms). For additional information, consult the "Commercial Tree Fruit Spray Guide 2007" (http://www.extension.iastate.edu/Publications/PM1282.pdf/).

Mohammad Babadoost (217-333-1523; babadoos@uiuc.edu)

Vegetable Production and Pest Management

Notes on Soybean Aphid

The soybean aphid does not colonize any vegetable crops, but it is known or suspected to transmit several common viruses of vegetables, including cucumber mosaic virus and zucchini yellows mosaic virus. In recent years, when over-wintering populations in northern IL have been high and spring migrations from buckthorn (winter host) to soybean have been heavy, virus problems have developed earlier and been more severe in cucurbits and snap beans than they have been in years with lower over-wintering populations. I asked Dr. David Voegtlin, and aphid specialist with the Illinois Natural History Survey, to provide a brief summary of his observations on soybean aphid populations, and here's what he provided. (RW)

By mid-July in the summer of 2006 the soybean aphid was distributed throughout Illinois at low levels and reached economic levels in only a limited number of areas in the northern part of the state. Numbers of soybean aphids caught in the suction trap network reflected the low field populations. Only 152 soybean aphids were caught in all IL traps in July and August, with 97 of them caught in the DeKalb trap. The number of soybean aphids caught in September and October was considerably higher at 1,762. This fall flight is composed of aphids that are migrating from soybeans to buckthorn where the over-wintering eggs are deposited.

The large fall flight suggested the possibility of a sizeable over-wintering population (as eggs) and a subsequent large spring population. Several sites were visited in the northern third of the state in October, November, and January, and eggs have been found at most of the locations. Particularly high numbers of eggs were found in the Quad Cities area, where at some locations random sampling of buckthorns has shown 100% of them have over-wintering eggs. There seems little doubt that there will be a large number of soybean aphids produced on buckthorn in northern Illinois this spring. Whether this will translate into a major outbreak in the summer of 2007 remains to be seen. From observations in previous years, we do know that fall flights of several hundred or more (suction trap counts) have resulted in outbreaks in soybeans the following growing season.

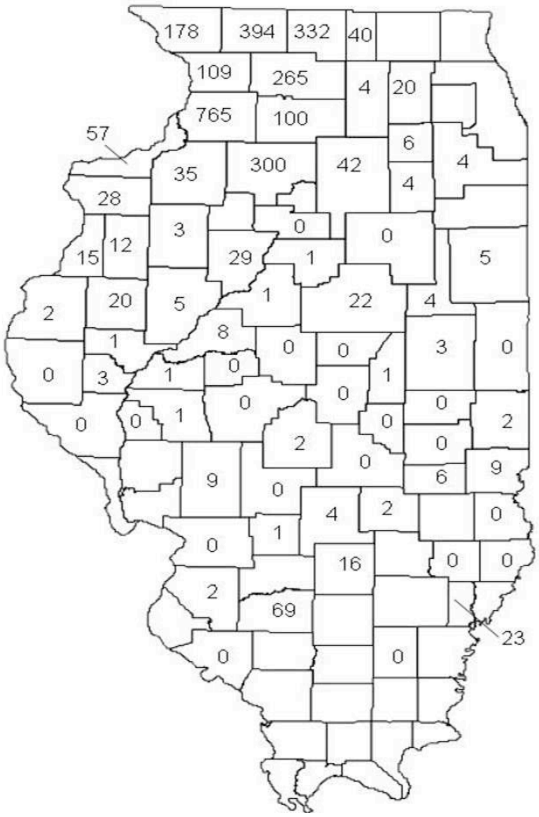
David Voegtlin, Center for Ecological Entomology, Illinois Natural History Survey (dvoegtli@uiuc.edu)

Western Bean Cutworm: Summary from 2006

The western bean cutworm was first detected in Illinois in 2004. Historically a pest of corn in Colorado and Nebraska, we have seen the western bean cutworm gradually spread eastward through Iowa and Illinois. In 2006 it was found as far east as Ohio. Most attention to this insect has centered on its status as a pest of field corn, but it also infests and damages sweet corn.

After finding this pest in Illinois in 2004, a trapping network was put into place in 2005 to monitor its distribution in the state. Traps were placed in 56 Illinois counties throughout northern and much of central Illinois, as well as a few selected counties in southern Illinois. Operation of traps began on July 1 and continued through August 15, with traps checked two to three times each week. At least one moth was caught in 33 of the 56 counties. Trap catches were higher in counties in northwestern Illinois, especially those along the Iowa border.

In 2006, trapping efforts were expanded in Illinois to include nearly every county, and traps also were placed in Indiana and Ohio. Once again, trap captures in Illinois were highest in northwestern Illinois in the counties of Bureau, Ogle, Stephenson, Whiteside, and Winnebago. Though more widespread in 2006, numbers of western bean cutworms caught in traps in Illinois pale in comparison to those caught in Iowa (http://www.ent.iastate.edu/trap/westernbeancutworm/node/11006).



Captures of western bean cutworm moths in pheromone traps, 2006.

A quick review of this insect's life cycle may help in understanding its potential role as a pest of sweet corn. Generally, only one generation of western bean cutworm occurs each year, with moth emergence beginning in late June/early July. Moth flight peaks in mid-July and ends in mid-August. In corn, female western bean cutworm adults lay eggs primarily on the upper surfaces of the leaves. Fields attractive to western bean cutworms for oviposition are those in which corn is tasseling or near tasseling and fields that have hybrids with upright leaf characteristics. Larvae hatch within 5 to 7 days after the eggs are laid.

The larvae pass through five instars and feed on corn for approximately one month. First instars are very mobile and may infest several host plants. As larvae develop, their color changes from dark brown (first instar) to light tan, with brown hatch markings on their backs becoming more distinct with age. When larvae develop to the third instar, they have three dark stripes just behind the head. This characteristic helps differentiate the western bean cutworm from other caterpillars feeding in corn. After a larva finishes feeding and completes development, it drops to the ground and burrows beneath the soil, where it constructs an overwintering cell. Western bean cutworms spend the winter in the prepupal stage. They pupate in May, then emerge as adults in mid-summer.
So unlike other cutworms, the western bean cutworm is a mid- to late-season pest of corn, with larvae damaging the crop from mid-July through early- to mid-August. Newly hatched larvae may feed in corn whorls on the flag leaf, tassel, and other yellow tissue, and

as pollination begins, they may move to and begin feeding on developing silks. However, the western bean cutworm is a pest in sweet corn because it feeds primarily on corn ears. Larvae chew through ear husks to developing kernels, and their feeding presents the same cosmetic and contaminant problems caused by earworm, armyworms, and corn borers. Because larvae disperse from egg masses, larvae from a single egg mass may infest other corn plants in the same and adjacent rows in an area 6 to 10 feet in diameter.

Where spray programs are in place for corn earworm or European corn borer, western bean cutworm is likely to be controlled at the same time. If, however, egg-laying and larval development occur at a time between corn borer generations and before corn earworm flights reach northern Illinois (and therefore spray programs are minimal or not in place at all), damage can be severe. We'll keep you posted on sampling and control of this insect as its time of occurrence approaches … it's simply one more potential pest that warrants attention for a few weeks in July and August.

Kelly Cook, Center for Ecological Entomology, Illinois Natural History Survey (kcook8@uiuc.edu) and Rick Weinzierl(217-333-6651; weinzier@uiuc.edu)

Corn earworm: 2006 insecticide trial summary

The corn earworm (CEW), *Helicoverpa zea*, and the European corn borer (ECB), *Ostrinia nubilalis*, are perennial pests of sweet corn in Illinois. If traps indicate that significant populations are present, commercial growers control these insects and other more sporadic pests with repeated applications of insecticides beginning either at row-tassel stage (for ECB) or within 2 days after silks first appear (for CEW). Pyrethroids have been used most commonly for CEW and ECB control for over two decades; they are also used widely in cotton, corn, soybeans, and sorghum in Louisiana and Texas – the area from which CEW migrates to the Midwest each season. There is growing concern that low to moderate levels of pyrethroid-resistance in at least some populations of the corn earworm may limit the effectiveness of this class of insecticides. To evaluate the current performance of registered pyrethroids and alternative insecticides, we conducted two small-plot insecticide trials in sweet corn in 2006, one at the University of Illinois Agricultural Engineering Farm near Urbana, IL, and one at the University of Illinois Horticulture Research Center near St Charles, IL. Treatments at one or both sites included three pyrethroids (Capture, Warrior, and Mustang Max), three carbamates (Larvin, Lannate, and Sevin), three compounds with unique modes of action (Entrust, Rimon, and DPX E2Y45), and a Bt sweet corn hybrid ('BC0805'). Multiple rates and combinations of these treatments were used (See Tables 1-2).

Experimental Design and Methods

The experimental design for each plot was a randomized complete block with four replications. Plot size for each treatment was 4 rows x 30 feet; only the center two rows of each plot were treated. To assess insect infestation and injury, 25 randomly selected ears were picked from the center two rows of each four-row plot in harvest samples. The number and size (small, medium, and large) of CEW, ECB, and fall armyworm larvae were recorded for each ear, as were the number of sap beetle adults and larvae. We also recorded the number of damaged kernels per ear and the number of ears with damage that exceeded 3 kernels per ear.

Plot details and methods for each trial were as follows:

St. Charles:

- Planting date: May 25, 2006; harvest date: August 18, 2006.
- Hybrid: 'Providence' for treatments 1-5; 'BC0805' for treatments 6-7 (Table 1). 'BC0805' is a Bt hybrid that is the near-isoline of 'Providence.'
- In addition to the treatments listed in Table 1, plots 1 and 6 were treated with 1 quart Sevin XLR per acre on July 28 for western corn rootworm beetle control and pollination protection.
- Insecticide application dates: July 28 and 31; August 4 and 7.
- Insecticide application methods: Applications were made from a CO_2-powered backpack sprayer that delivered approximately 25 gallons of water per acre using a 2-row hand boom, with 2 drop nozzles per row.

Urbana:

- Planting date: June 19, 2006; harvest date: August 25, 2006
- Hybrid: 'Jubilee Xtra' for treatments 1-17 and 20; 'BC0805' for treatments 18-19 (Tables 2-3). 'BC0805' is a Bt hybrid with a maturity rating nearly identical to 'Jubilee Xtra.'
- In addition to the treatments listed in Tables 2-3, the entire plot was treated on August 1 (first silk) with Pounce 3.2 EC at 4 ounces (0.1 lb. a.i.) per acre for western corn rootworm beetle control and pollination protection.
- Insecticide application dates: August 3, 5, 7, 10 (treatments 1-12), 11 (treatments 13-19), 13, 15, 17, 20. Threat of rain resulted in suspension of sprays on August 10 and completion on August 11.
- Insecticide application methods: Applications were made using a John Deere Hi-Cycle sprayer that delivered approximately 30 gallons of water per acre through one overhead nozzle and 2 drop nozzles per row (TXVS6 Conejet nozzles).

Data Analysis

Data were analyzed in 2-way ANOVAs with $P = 0.05$, using Microsoft Excel. To normalize variance, all insect counts were transformed using a square-root (x+1) transformation prior to analysis; all observations of percentage injury per plot were transformed using an arcsine transformation. Protected LSDs ($P = 0.05$) were used to with the transformed data sets to separate treatment means; however, means presented in Tables 1-3 are of raw data, not transformed values.

Results and Discussion

St. Charles:

Moderate population pressure resulted in 41 medium-to-large CEW larvae per 100 ears and 64 total CEW larvae per 100 ears in the untreated check (Table 1). Other potential pests such as ECB, fall armyworm, and western bean cutworm were not present. Based on total numbers of corn earworms present in ears at harvest, all of the treatments used here provided 91 to 98 percent control in comparison with the untreated check. Differences among treatments in numbers of medium-to-large larvae, small larvae, and total larvae were not significant. All treatments also reduced the number of damaged kernels per ear and the percentage of damaged ears.

Urbana:

Population pressure was heavy for CEW and light to moderate for ECB. In the untreated check, there were 126 medium-to-large CEW larvae per 100 ears and 184 total CEW larvae per 100 ears (Table 2). Harvest samples from the untreated check contained 34 ECB larvae per 100 ears.

The presence of medium-to-large CEW larvae in sweet corn ear tips is especially damaging both from the standpoint of kernel loss and market rejection because of contamination. The most effective treatments for reducing the number of medium-to-large larvae in ears at harvest were DPX E2Y45 and Bt corn (treatments 16-19, Table 2); these provided 92 to 99 percent control in comparisons with the untreated check. Pyrethroids alone (treatments 1-5, Table 2) gave 67 to 77 percent control of medium-to-large CEW larvae. Tank-mixing Larvin, Lannate, Sevin, or Exponent (a synergist) with Warrior did not significantly ($P = 0.05$) improve control of medium-to-large CEW larvae over Warrior alone at the 0.03 lb. a.i./acre rate. (Although counts of medium-to-large larvae were slightly lower in plots treated with these tank mixes than in plots treated with Warrior alone, the differences were not great enough to rule out that they occurred by chance.) Larvin applied at 0.75 lb. a.i./acre and Entrust applied at 0.1 lb. a.i./acre were at least as effective as the pyrethroids. Rimon was least effective in reducing the numbers of medium-to-large CEW larvae in ears at harvest.

The presence of small CEW larvae in ears at harvest results from larvae entering ears only a short time before harvest and from the failure of larvae to develop normally on the kernels of Bt hybrids even if they entered the ear several days before harvest. DPX E2Y45, Warrior plus Larvin, and Warrior plus Sevin were among the most effective treatments for reducing the number of small CEW larvae in ear tips at harvest, however they were not significantly better than Warrior alone at the 0.025 lb. a.i./acre rate. The most notable differences in control of medium-to-large CEW larvae versus the control of small CEW larvae were observed in the Bt hybrid treatments (treatments 18-19, Table 2). Although CEW larvae were unable to grow normally on kernels of 'BC0805' (hence, very few medium-to-large larvae[RE1]), small larvae (first and second instars) occurred at a frequency of 26 to 28 per 100 ears.

In comparisons of total numbers of CEW larvae among treatments, the DPX E2Y45 treatments, the 'BC0805' treatments, Warrior plus Larvin, and Warrior plus Sevin were significantly more effective than any of the pyrethroids alone. The percentage of damaged ears and the number of damaged kernels per ear in the DPX E2Y45 0.088 lb. a.i./acre treatment and the 'BC0805' treatments were significantly lower than in any of the treatments using pyrethroids alone.

Overall, in terms of CEW control, all the treatments tested significantly reduced numbers of larvae and the extent of their damage at harvest. However, the pyrethroids did not provide the level of control commonly observed in small plot trials in the late 1980s and early 1990s (usually well over 90 percent control even with heavy pest pressure). Even when applied in this trial at 2- to 3-day intervals, none of the pyrethroids alone resulted in even 80 percent control of CEW. DPX E2Y45 performed very well against CEW. All treatments significantly reduced ECB infestations in comparison with the untreated check at harvest. Only Larvin and Sevin XLR failed to provide greater than 90 percent control. Although Rimon was not very effective against CEW, it appears to be active against ECB. All treatments also significantly reduced infestations of sap beetle adults and larvae in comparison with the untreated check at harvest, but infestations were too light and too variable to allow differentiation among treatments.

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

Table 1. Corn earworm (CEW) larvae and ear damage, means of 4 replications, St. Charles, IL, August 18, 2006.

	Med-Large CEW larvae/100 ears	% control	Small CEW larvae/100 ears	% control	Total CEW larvae/100 ears	% control	% damaged ears (> 3 kernels/ear)	Damaged kernels/ear
1. Untreated	41 a		23 a		64 a		49 a	5.00 a
2. Capture 0.04 lb a.i.	1 b	98	3 b	87	4 b	94	7 b	0.72 b
3. Larvin 0.75 lb a.i.	3 b	93	2 b	91	5 b	92	3 bc	0.27 bc
4. Entrust 80W 0.1 lb a.i.	4 b	90	2 b	91	6 b	91	5 b	0.37 bc
5. DPX E2Y45 0.077 lb a.i.	1 b	98	0 b	100	1 b	98	2 bc	0.13 c
6. BC 0805, untreated	0 b	100	3 b	87	3 b	95	0 c	0.06 c
7. BC 0805 + Capture 0.04 lb a.i. on 28 July and 7 Aug only	1 b	98	1 b	96	2 b	97	2 bc	0.12 c

Table 2. Corn earworm (CEW) larvae and ear damage, means of 4 replications, Urbana, IL, August 25, 2006.

	Med-Large CEW larvae/100 ears	% control	Small CEW larvae/100 ears	% control	Total CEW larvae/100 ears	% control	% damaged ears (> 3 kernels/ear)	Damaged kernels/ear
1. Capture 0.04 lb a.i.	39 cde	69	13 bcde	78	52 defg	72	59 efg	8.8 de
2. Capture 0.1 lb a.i.[1] Warrior 0.03 lb. a.i.	29 cde	77	28 efg	52	57 efg	69	50 cdef	6.2 bcde
3. Warrior 0.025 lb a.i.	41 def	67	11 abcde	81	52 defg	72	64 fg	9.3 de
4. Warrior 0.03 lb a.i.	36 cdef	71	18 cdef	69	54 defg	71	56 defg	6.6 cde
5. Mustang Max 0.025 lb a.i.	39 cdef	69	21 cdef	64	60 fg	67	66 fg	8.6 de
6. Larvin 0.5 lb a.i.	43 ef	66	22 cdef	62	65 g	65	62 fg	7.0 cde
7. Larvin 0.75 lb a.i.	20 bcde	84	20 cdef	66	40 cdefg	78	57 efg	8.1 de
8. Entrust 80W 0.1 lb. a.i.	28 cde	78	25 ef	57	53 defg	71	42 cdef	6.5 bcde
9. Warrior 0.03 lb a.i. + Larvin 0.75 lb a.i.	17 bc	87	4 ab	93	21 bc	89	30 bcd	3.3 abcd
10. Warrior 0.03 lb a.i. + Lannate 0.225 lb a.i.	31 cde	75	22 cdef	62	53 defg	71	44 cdef	4.7 abcd
11. Warrior 0.03 lb a.i. + Sevin XLR 2 lb a.i.	22 bcd	83	8 abcd	86	30 bcd	84	34 bcde	3.5 abcd
12. Warrior 0.03 lb a.i. + Exponent 0.15 lb a.i.	21 bcd	83	20 cdef	66	41 defg	78	43 cdef	4.6 abcd
13. Lannate 0.45 lb a.i.	47 fg	63	13 bcde	78	60 efg	67	50 cdefg	6.7 cde
14. Sevin XLR 2 lb a.i.	35 cdef	72	35 fgh	40	70 fg	62	45 cdef	6.2 bcde
15. Rimon 0.08 lb a.i.	75 g	40	48 gh	17	123 h	33	77 g	14.8 ef
16. DPX E2Y45 0.066 lb a.i.	10 ab	92	8 abc	86	18 b	90	28 bc	3.6 abcd
17. DPX E2Y45 0.088 lb a.i.	1 a	99	0 a	100	1 a	99	19 ab	1.8 abc
18. BC 0805 untreated	8 ab	94	28 def	52	36 bcde	80	13 ab	1.0 ab
19. BC 0805 + Warrior 0.03 lb a.i., 3 and 11 Aug only	10 ab	92	26 defg	55	36 bcde	80	4 a	0.5 a
20. Untreated Jubilee Xtra	126 h		58 gh		184 i		98 h	27.0 f

[1] Capture (0.1 lb. a.i.) was tank mixed with Warrior (0.03 lb. a.i.) on the August 3 and August 5 application dates. On all subsequent application dates, only Warrior (0.03 lb. a.i.) was applied.

Words of Wisdom … to all the kids who survived the 1930's 40's, 50's, 60's and 70's …

We drank water from the garden hose and not from a bottle. We shared one soft drink with four friends, from one bottle, and no one actually died from this. We ate cupcakes, white bread, and real butter, and we drank Kool-Aid made with sugar, but we weren't overweight because we were always outside playing! We would leave home in the morning and play all day, as long as we were back when the lights came on. No one was able to reach us all day. And we were OK.

We would spend hours building go-carts out of scraps and then ride down the hill, only to find out we forgot the brakes. After running into the bushes a few times, we learned to solve the problem. We did not have Playstations, Nintendo's, X-boxes, or any video games at all, no 150 channels on cable, no video movies or DVD's, no surround-sound or CD's, no cell phones, no personal computers, no internet or chat rooms … we had friends and we went outside and found them.

We fell out of trees, got cut, broke bones and teeth and there were no lawsuits from these accidents. We ate worms and mud pies made from dirt, and the worms did not live in us forever. We were given BB guns for our 10th birthdays, made up games with sticks and tennis balls and, although we were told it would happen, we did not put out very many eyes. We rode bikes or walked to a friend's house and knocked on the door or rang the bell … or just walked in and talked to them.

The idea of a parent bailing us out if we broke the law was unheard of. They actually sided with the law!

These generations have produced some of the best risk-takers, problem solvers, and inventors ever! The past 50 years have seen an explosion of innovation and new ideas. We had freedom, failure, success, and responsibility, and we learned how to deal with it all.

Kind of makes you want to run through the house with scissors, doesn't it?

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