



# UNIVERSITY OF ILLINOIS EXTENSION

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, 217-244-2126, [weinzierl@illinois.edu](mailto:weinzierl@illinois.edu). The *Illinois Fruit and Vegetable News* is available on the web at: <http://www.ipm.illinois.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.

### *In this issue ...*

**Upcoming Programs** (see the list below)

**Regional Updates** (from Elizabeth Wahle and Maurice Ogutu)

**Notes from Chris Doll** (weather impacts; seasonal reminders; summary of "Top Ten's")

**Vegetable Production and Pest Management** (summary of 2008 sweet corn insecticide evaluations)

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

### *Upcoming Programs*

- **MOSES Organic Farming Conference, February 26-28, 2009** ... LaCrosse, WI. For information, see <http://www.mosesorganic.org/conference.html>.
- **Illinois Small Fruit and Strawberry Schools, March 3-4, 2009** ... Holiday Inn, Mt. Vernon. Contact Bronwyn Aly at 618-695-2444 or [baly@uiuc.edu](mailto:baly@uiuc.edu).
- **Southern FS Grape Production Information Meeting**, March 5, Von Jacob Vineyard, Alto Pass. Registration begins at 8 a.m. This program is provided free of charge to established grape growers and those thinking about starting a new vineyard. Advance registration by February 27 is needed. To register, contact Jim Shannon at [jshannon@southernfs.com](mailto:jshannon@southernfs.com), (618)-893-4852 (local), or 1-800-468-0649 (toll free).

### **More on the Illinois Small Fruit and Strawberry Schools**

The 2009 Illinois Small Fruit and Strawberry Schools will be held March 3 and 4 at the Holiday Inn in Mt. Vernon. These schools provide two full days of educational sessions on growing and marketing small fruit crops in the Midwest. Sessions will be presented by specialists from University of Illinois, the Ohio State University and private industry, as well as Midwestern growers. A trade show both days features vendors offering products, supplies and services to small fruit and strawberry growers. Advance registration is \$30 per farm family and includes admission to the educational sessions and trade show along with one copy of the *2009 Midwest Commercial Small Fruit and Grape Spray Guide*. Registration must be postmarked by February 25 to receive the early bird rate. Late and at-door registration is \$35 per farm family. For more details, contact Bronwyn Aly or Jeff Kindhart at 618/695-2441, or email [baly@illinois.edu](mailto:baly@illinois.edu) or [jkindhar@illinois.edu](mailto:jkindhar@illinois.edu). You can also visit the Southern Illinois Gardening website, <http://web.extension.uiuc.edu/regions/hort> to download the program agenda.

## ***Regional Updates***

**From southwestern Illinois ...** Weather conditions have been extremely variable the last few weeks in southern Illinois. In mid January, temperatures dropped below zero, with some areas reporting as low as -5 degrees F. Apples should be fine, but some peach thinning is evident after cutting buds, though nothing reported so far here warrants concern. Later in January, a widespread ice storm caused significant damage in the more southern reaches of the state, with the hardest hit areas being eastern Oklahoma, northern Arkansas, southern Missouri, and western Kentucky. Hundreds of thousands of people were without power due to snapped power lines, and some still are. The more northern portions of the region missed the ice, but instead picked up about eight inches of snow. Temperatures came up enough the second week of February to melt the snow and accumulate just shy of 20 GDD, and that short bit of warmth was appreciated by pruning crews. The warm-up ended with heavy showers and now the southern region is back to normal February weather – highs in the mid thirties and lows in the twenties. Ground conditions have for the most part stayed frozen, offering few opportunities for horseradish growers to dig roots.

The southern region recently hosted two commercial tree fruit schools and one commercial vegetable school. Attendance was up for all schools, but for those of you unable to attend, I have posted the presentations on my website at the following location: <http://web.extension.uiuc.edu/edwardsvillecenter/>, click on “Food Crop Horticulture” and scroll down to see the various resources.

Grape growers from Illinois and surrounding states are invited to the fifth annual **Production Information Meeting** sponsored by Southern FS on March 5 at Von Jacob Vineyard, at their Alto Pass, Illinois location. Registration starts at 8 a.m. The program is provided free of charge to established grape growers and those thinking about starting a new vineyard. Advance registration by February 27 is needed. To register, contact Jim Shannon at [jshannon@southernfs.com](mailto:jshannon@southernfs.com), (618)-893-4852 (local), or 1-800-468-0649 (toll free).

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

**In northern Illinois**, there has been a wide variation in temperatures, with -7 to mid the 40s F daytime highs and night temperatures of 27 below zero to the upper teens during the last two weeks of January. The coldest night temperatures of 18 to 27 below zero were recorded between January 16 and 17, with the lowest temperatures recorded in the Rockford area and in northwest counties close to Mississippi river. The region recorded the highest snowfall during the last ten years, and the ground was covered with snow during the last two weeks of January and the first week of February. This was followed by warmer weather during the first two weeks of February, with day temperatures in the upper teens to low 60s and night temperatures slightly below zero to upper 40s. During the month of January and February, northwestern and northern counties experienced at least seven days when the night temperatures were below zero. The area recorded less than 2 inches of rainfall between January 15 and February 16, which is below the expected average. The area recorded more than 30 inches of snow by February 16. Due to the extreme variation in temperature, many orchardists have not started pruning tree fruits but will do so as soon as it warms up.

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

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

Concerns with national and international political and economic conditions almost make fruit growing a fun occupation. Growers only have problems with weather, like cold, wind, ice, rain and heat, labor, multiple insect and disease pests, thinning, marketing, and costs of all the inputs needed to produce and sell the crop. This winter’s weather has caused a few concerns because of very cold temperatures up north that could affect survival of some apple varieties such as Jonagold and many of the grape varieties and some of the peach trees that have been planted during the warming years. The sub-zero temperatures should have killed peach flower buds in central Illinois, while the single digit sub-zero temperatures thinned some of the peaches in this area. Minus 5 degrees in the Back-40 killed about 50 percent of the Cresthaven buds and lesser percentages on most other varieties.

Following a record of over 57 inches of rain in 2008, a recent rain in excess of three inches has raised the local water table to near saturation. At least it did not come as ice that has stressed the trees and electric lines in many areas of the country. There have been plenty of windy days to cause problems to floating row covers on plasticulture strawberries. Otherwise, it seems that everyone is waiting for spring (only 30 calendar days away). Pruning can be done on all crops, but peaches are best delayed some more to better evaluate the bud survival and pruning intensity. It is a good time to prune thornless blackberries and black raspberries so that tip-layered plants can be pulled out of the soil rather than just being cut off so that the survivors become "weed plants." And for some of us that did not get fire blight and leaf curl sprays on last fall, it might help to ready the equipment now.

The recent Illinois Specialty Growers Association and Illinois State Horticulture Society annual meeting was one of the better events of the winter. It was my privilege to MC a panel of outstanding Illinois growers on the topic of "A Top Ten Do's and Don'ts for Orchard Establishment and Maintenance." The following are some of my notes from that panel:

*Wayne Sirles, Rendleman Orchards from Alto Pass, who grows apples and peaches:* Prepare the area for planting, including improving the site for good air drainage for temperature and humidity control; prep the soil for pH and nutritional needs, with GPS units used for better evaluation; good planning for crop rotation, especially for peaches; plant trees at proper depths; prevent deer damage during establishment; and stay abreast of promising new varieties.

*Jim Eckert, Eckert Orchards, from Belleville, who grows apples and peaches:* Try to plan for prevention rather than fixing all aspects of the operation; good preparation including nursery stock availability; don't let codling moth problems get out of hand – use all aspects of control including mating disruption, virus sprays, and new chemistry; shoot for annual cropping via correct pruning and heavy thinning; consider drainage, soil type, water availability, and replant situations; have crop insurance; select rootstocks for production, durability, and size control for marketing methods; select varieties for full-season marketing in PYO operation; be aware of the WOO factor, which means WAY OUT OF THE ORDINARY, and be informed via memberships like the ISHS, IFTA, New York Fruit Grower Quarterly, and trade publications.

*Craig Tanner, Tanners Apple Orchard near Speer:* reiterated what the previous growers said. Many of us saw his excellent management at last summer's Field Day and we were able to read about him in the January GoodFruit Grower.

*Ken Hall, Edwards Apple Orchard, Poplar Grove:* Ken mentioned a top eleven, beginning with avoiding being in a tornado alley. His Top Ten in descending order were: Study and plant the best adapted rootstock/scion combination; plant with 3-4 inches of rootstock out of the ground; plant feathered trees; develop a good support system, with adequate posts at a 60-foot spacing, a single wire at seven feet, and a conduit stake at each tree; select a proven training system and minimize pruning; adapt a tree density and pruning system that maximizes sunlight interception; do economic studies (might show that money is best spent on more trees than more acres; be patient; plan for product scarcity as a good thing (avoiding surpluses); and develop a good attitude.

The Illinois Small Fruit and Strawberry School will be held at the Mt. Vernon Holiday Inn on March 2 and 3. An outstanding list of speakers and topics are scheduled for these sessions. Details can be obtained from Bronwyn Aly or Jeff Kindhart listed in the directory at the end of the newsletter.

Chris Doll

## ***Vegetable Production and Pest Management***

### ***Evaluations of Conventional and OMRI-approved Insecticides for Control of Corn Earworm in Sweet Corn, 2008***

Pyrethroid insecticides have been the most effective compounds for corn earworm (CEW) control in sweet corn since the introduction of permethrin in the 1980s. Among the most effective pyrethroids currently labeled on sweet corn for earworm control are bifenthrin (Capture and generic products), lambda-cyhalothrin (Warrior and generic products), and zeta cypermethrin (Mustang Max). Other pyrethroids include permethrin, cyfluthrin (Baythroid), and a mixture of bifenthrin and zeta cypermethrin sold under the trade name Hero. Corn earworm resistance to pyrethroid insecticides has limited their effectiveness in some locations in recent years, and continued assessments of insecticides with different chemical structures and modes of action are needed to provide alternatives for resistance management. Additionally, the use of pyrethroid insecticides is not allowed in certified organic production, and assessments of products approved for use by OMRI (the Organic Materials Review Institute) is needed to supply information to organic growers. To address these needs we completed evaluations of organic and conventional insecticides at two locations in Illinois in 2008.

At the University of Illinois Dixon Springs Agricultural Center near Simpson in southern Illinois we assessed the effectiveness of the OMRI-approved products Entrust (spinosad), EcoTec AG (an insecticidal oil that contains rosemary oil and mint oil), CedarCide (a cedar oil), and a combination of Pyganic (natural pyrethrins) plus Dipel (*Bacillus thuringiensis*). For comparison, treatments at this site also included a transgenic Bt sweet corn hybrid, BC0805. The BC0805 plots (two separate treatments) were either left unsprayed or treated with Warrior on a 6-day interval. The experimental design and description of these plots is provided below.

At the University of Illinois Integrated Pest Management Research Farm near Urbana we evaluated several conventional and experimental insecticides, including pyrethroid products currently considered to be standards for corn earworm control. Individual products are listed in Table 2. Pyrethroids used in this plot included Warrior, Bifenture (a generic bifenthrin), Mustang Max, Baythroid, and Hero. Coragen (chlorantraniliprole) and Belt (flubendiamide) represent a different group of chemical structures and modes of action (in Group 28 in the Insecticide Resistance Action Committee mode of action classification). Voliam Express is a pre-mix of Coragen and Warrior. Radiant is a synthetic spinosyn somewhat similar to Entrust and SpinTor. Lannate is carbamate.

#### **Experimental Design and Methods**

The experimental design for each plot was a randomized complete block with four replications. Harvest data were taken from only three replications at the Dixon Springs site. 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, 15 randomly selected ears were picked from the center two rows of each 4-row plot in harvest samples at Dixon Springs; 25 ears were harvested from each plot at Urbana. The number and size (small, medium, and large) of CEW, European corn borer (ECB) and fall armyworm (FAW) 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 (tip and side). Data were analyzed in 2-way ANOVAs with  $P = 0.05$ , using Microsoft Excel.

Plot details and methods for each trial were as follows:

#### **Dixon Springs:**

- Planting date: 13 June, 2008; harvest date: 13 August, 2008.
- Hybrid: 'BC0805' for treatments 7 and 8; 'Providence' for all other treatments (see Table 1). BC 0805 is a Bt hybrid; Providence is its near-isoline.
- Insecticide application dates: 28 and 31 July and 03, 06, and 09 August. In treatment 8, Warrior was applied only on 28 July and 03 August.
- Insecticide application methods: Applications were made from a CO<sub>2</sub>-powered backpack sprayer that delivered approximately 60 gallons of water per acre using 4 drop nozzles per row (XRTES Jet 11004 VS)

### Urbana:

- Planting date: 19 June, 2008; harvest date: 29 August, 2008.
- Hybrid: BC 0805 for treatments 19 and 20; Providence for all other treatments (see Table 2). BC 0805 is a Bt hybrid; Providence is its near-isoline.
- Insecticide application dates: 11, 14, 17, 20, 22, and 25 August. In treatments 5, 12, 13, and 20, sprays differed according to date or spray intervals differed from the standard schedule (see details in Table 2).
- 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).

## **Results and Discussion**

### Dixon Springs:

Moderate population pressure resulted in 0.68 medium to large CEW larvae per ear in the untreated check (Table 1). Entrust, Entrust plus EcoTec AG, Cedarcide, BC0805, and BC 0805 plus Warrior significantly reduced infestations of medium-to-large larvae at harvest, although Cedarcide was not as effective as the treatments that included Entrust. EcoTec AG alone did not significantly reduce numbers of medium to large larvae in harvest samples, and the combination of Entrust plus EcoTec AG was not significantly more effective than Entrust alone. As expected, the number of small CEW in the BC0805 treatment was higher than in other treatments – small larvae survive for a few days even after they feed on Bt kernels, and there were no large larvae these in these ears to cannibalize them. Overall, it is significant that Entrust, an OMRI-approved product, performed very well under moderate pressure. There were too few ECB, FAW, and sap beetles to allow evaluation of their control in this trial.

### Urbana:

Population pressures at Urbana were light to moderate for CEW and too low to allow evaluation of ECB, FAW, or sap beetle control. In the untreated check, there were 0.33 medium to large CEW larvae per ear (Table 2) at harvest. All treatments significantly reduced the number of damaged kernels on ear tips and the number of medium to large CEW larvae in ears at harvest. Under light pressure, the pyrethroids performed better than they have in any recent trials at this location.

This work was supported in part by Bayer, Dow Agrosiences, DuPont, Syngenta, FMC, UPI, and Brandt Consolidated. Funding also was provided by the Midwest Food Processors Association and the USDA North Central Region Integrated Pest Management Center.

*Richard Weinzierl, Jeff Kindhart, and Ronald Estes (217-244-2126; [weinzier@illinois.edu](mailto:weinzier@illinois.edu))*

Table 1. Corn earworm (CEW) larvae and ear damage, means of 3 replications, Dixon Springs, IL, 13 August, 2008.

	Damaged kernels per ear tip	% control, tip damage	Damaged kernels per ear, side entry	Small CEW larvae per ear	Medium CEW larvae per ear	Large CEW larvae per ear	Percent control of M-L larvae
1. Untreated Check	15.2a	--	2.7a	0.1a	0.44a	0.24ab	--
2. Entrust 80W; 2 oz/A	1.9 d	88	0 c	0 a	0.04 b	0.02 c	91
3. EcoTec AG; 3 pints/A	10.4 c	32	1.5 b	0 a	0.24ab	0.24ab	29
4. Entrust 80W; 2 oz/A + EcoTec AG; 3 pints/A	1.9 d	88	0 c	0 a	0.02 b	0 c	97
5. CedarCide; 3 pints/A	11.0 bc	28	0 c	0.1a	0.18 b	0.13 bc	54
6. Pyganic 1.5EC; 18 fl oz/A + Dipel DF; 2 lbs/A	14.9ab	--	0.4 c	0 a	0.47a	0.29a	--
7. BC 0805, no insecticides	2.6 d	83	0 c	0.3 b	0.11 b	0 c	84
8. BC 0805 + Warrior 1ME; 3.8 fl oz/A in sprays 1, 3, and 5	1.0 d	93	0 c	0.1a	0.04 b	0 c	94

Within columns, means followed by the same letter do not differ significantly from each other at  $P = 0.05$ .

Table 2. Corn earworm (CEW) larvae and ear damage, means of 4 replications, Urbana, IL, 29 August, 2008.

Treatment	Damaged kernels per ear tip	Small CEW larvae per ear	Medium CEW larvae per ear	Large CEW larvae per ear	% Control of M-L CEW larvae
1. Untreated check	6.4a	0.20a	0.24a	0.09a	--
2. Bifenture 2EC; 2.5 fl oz/A	0.6 bc	0.02 b	0.03 bc	0.00 b	91
3. Warrior 1ME; 3.84 fl oz/A	0.2 c	0.00 b	0.01 bc	0.02 b	91
4. Warrior 1ME; 3.84 fl oz/A (sprays 1-4)	0.3 c	0.01 b	0.01 bc	0.00 b	97
5. Bifenture 2EC; 6.4 fl oz/A (sprays 1-2); Warrior 1ME 3.8 fl oz/A (sprays 3-4)	0.1 c	0.00 b	0.01 bc	0.00 b	97
6. Mustang Max 0.8EC; 3.0 fl oz/A	0.6 bc	0.04 b	0.03 bc	0.01 b	88
7. Baythroid XL 1EC; 2.2 fl oz/A	1.8 b	0.03 b	0.07 b	0.00 b	79
8. Hero 1.24EC; 8 fl oz/A	0.7 bc	0.01 b	0.02 bc	0.00 b	94
9. Voliam Express 1.25ZC; 7 fl oz/A	0.3 c	0.01 b	0.03 bc	0.00 b	91
10. Coragen 1.67SC; 5 fl oz/A + 0.5% MSO (v/v)	0.5 bc	0.00 b	0.06 bc	0.00 b	82
11. Coragen 1.67SC; 5 fl oz/A	1.1 bc	0.01 b	0.03 bc	0.00 b	91
12. Coragen 1.67SC; 5 fl oz/A + 0.5% MSO (v/v) (sprays 1, 3 and 5)	0.6 c	0.02 b	0.06 bc	0.00 b	82
13. Coragen 1.67SC; 5 fl oz/A + 0.5% MSO (v/v) (sprays 1-3); Warrior 1ME; 3.84 fl oz/A (sprays 4-7)	0.3 c	0.03 b	0.01 bc	0.00 b	97
14. Coragen 1.67SC; 3.5 fl oz/A + 0.5% MSO (v/v)	0.4 c	0.00 b	0.02 bc	0.01 b	91
15. Belt 4SC; 3.0 fl oz/A	1.3 bc	0.02 b	0.03 bc	0.01 b	88
16. Lannate 2.4SL; 1.5 pint/A	0.5 bc	0.04 b	0.02 bc	0.00 b	94
17. Radiant 1SC; 3 fl oz/A	0.7 bc	0.02 b	0.02 bc	0.00 b	94
18. Radiant 1SC; 6 fl oz/A	0.8 bc	0.04 b	0.05 bc	0.02 b	79
19. BC 0805; no insecticides	1.0 bc	0.18a	0.05 bc	0.00 b	85
20. BC 0805 + Coragen 1.67SC; 5 fl oz/A + 0.5% MSO (v/v) (sprays 1, 3 and 5)	0.4 c	0.06 b	0.00 c	0.00 b	100

Within columns, means followed by the same letter do not differ significantly from each other at  $P = 0.05$ .

***University of Illinois Extension Specialists in Fruit Production and Pest Management***

<b>Extension Educators in Food Crop Horticulture</b>		
Bill Shoemaker, St. Charles Res. Center	630/584-7254	<a href="mailto:wshoemak@inil.com">wshoemak@inil.com</a>
Maurice Ogutu, Countryside Extension Center	708-352-0109	<a href="mailto:ogutu@illinois.edu">ogutu@illinois.edu</a>
Elizabeth Wahle, Edwardsville Extension Center	618-692-9434	<a href="mailto:wahle@illinois.edu">wahle@illinois.edu</a>
Bronwyn Aly, Dixon Springs Agricultural Center	618-695-2444	<a href="mailto:baly@illinois.edu">baly@illinois.edu</a>
Jeff Kindhart, Dixon Springs Agricultural Center	618-695-2444	<a href="mailto:jkindhar@illinois.edu">jkindhar@illinois.edu</a>
Peter Chege, Quad Cities Extension Center	309-792-2500	<a href="mailto:pchege@illinois.edu">pchege@illinois.edu</a>
<b>Extension Educators in IPM</b>		
Suzanne Bissonnette, Champaign Extension Center	217-333-4901	<a href="mailto:sbisson@illinois.edu">sbisson@illinois.edu</a>
George Czapar, Springfield Extension Center	217-782-6515	<a href="mailto:gfc@illinois.edu">gfc@illinois.edu</a>
Doug Jones, Mt. Vernon Extension Center	618-242-9310	<a href="mailto:jonesd@illinois.edu">jonesd@illinois.edu</a>
Dave Feltes, Quad Cities Extension Center	309-792-2500	<a href="mailto:dfeltes@illinois.edu">dfeltes@illinois.edu</a>
Russell Higgins, Matteson Extension Center	708-720-7520	<a href="mailto:rahiggin@illinois.edu">rahiggin@illinois.edu</a>
<b>Campus-based Specialists</b>		
Mohammad Babadoost, Plant Pathology	217-333-1523	<a href="mailto:babadoos@illinois.edu">babadoos@illinois.edu</a>
Mosbah Kushad, Fruit & Vegetable Production	217-244-5691	<a href="mailto:kushad@illinois.edu">kushad@illinois.edu</a>
John Masiunas, Weed Science	217-244-4469	<a href="mailto:masiunas@illinois.edu">masiunas@illinois.edu</a>
Chuck Voigt, Vegetable Production (& herbs)	217-333-1969	<a href="mailto:cevoigt@illinois.edu">cevoigt@illinois.edu</a>
Rick Weinzierl, Entomology	217-244-2126	<a href="mailto:weinzier@illinois.edu">weinzier@illinois.edu</a>

Return Address:

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

