UNIVERSITY OF ILLINOIS EXTENSION
College of Agricultural, Consumer, and Environmental Sciences

Illinois Fruit and Vegetable News

Vol. 20, No. 19, April 15, 2015
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, weinzier@illinois.edu. The ***Illinois Fruit and Vegetable News*** is available on the web at: http://ipm.illinois.edu/ifvn/. 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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- **Upcoming programs** (listings for beginning and established growers)
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Upcoming Programs

Check the Illinois SARE calendar for a full list of programs and links for registration.
http://illinoissare.org/ and http://illinoissare.org/calendar.php
Also see the University of Illinois Extension Local Food Systems and Small Farms Team's web site at:
http://web.extension.illinois.edu/smallfarm/ and their calendar of events at
http://web.extension.illinois.edu/units/calendar.cfm?UnitID=629.

- **Farmers Market and Local Food Production Promotion Program Grant Writing Workshops, April 8, 15, and 23, 2015.** (1:00 – 5:00 p.m., April 8 in Springfield at the Sangamon County Extension Office; April 15 in Mt. Vernon at the Jefferson County Extension Office; April 23 in Grayslake at the Lake County Extension Office. For more information, contact Deborah Cavanaugh-Grant at cvnghgrn@illinois.edu or 217-782-4617. Register at https://web.extension.illinois.edu/registration/?RegistrationID=11736.
- **Online Good Agricultural Practices – Food Safety Webinar Series, April 9, 2015 to April 30, 2015.** (Thursdays - April 9, 16, 23 and 30, from 6:00 p.m. to 8:00 p.m.). Cost: $20. To register, see http://web.extension.illinois.edu/gkw
- **Southwestern Illinois Twilight Orchard Meetings, April 16 and May 21, 2015.** April 16 at Eckert's Orchard near Grafton; May 21 at Weigel Orchard near Golden Eagle. 5:30 – 7:30 p.m. at each location. For more information, contact Ken Johnson at 217-243-7424 or kjohnso@illinois.edu.
- **Tomato Grafting, April 22, 2015.** 1:00 to 3:00 p.m. at the Kankakee Extension Office (1650 Commerce Dr., Bourbonnais, IL). Graft your heirloom tomatoes onto hybrid rootstocks for better performance. Cost: $3 per person. Call 815-933-8337 to register.

- **Southern Illinois Bee Association Field Day, April 25, 2015.** 8:30 a.m. (registration) – 5:00 p.m., 402 Ava Road, Murphysboro, IL 62966. Registration fee is $35.00 for nonmembers and $20.00 for members; lunch will be provided. For information, call 618-571-2716.
- **Webinar, Resources for Organic Producers Selling Local Foods, Wednesday, April 29.** Begins at noon. Covers resources on organic certification, labeling, and online directories of local markets. Pre-registration is not required. Dial in at 866-740-1260; access code is 7206000. Access online at http://www.readytalk.com; participant access code is 7206000.
- **Hydroponics Workshop, May 13, 2015.** 9:00 a.m. to 2:45 p.m. at Kankakee Community College, 100 College Dr., Kankakee IL 60901. Jeff Kindhart and Sam Wortman will provide an introduction to hydroponic systems. Cost: $10 per person. Lunch on your own. Link to be provided; call 815-933-8337.
- **Southern Illinois Summer Twilight Series Meeting, May 18, 2015.** 6:00 p.m. at Miller Farms, 918 Calvary Cemetery Rd, Campbell Hill, IL 62916. Visit a diverse farm operation that includes plasticulture strawberries, low tunnel tomatoes, blueberries, cover crops, egg production, and more. Program is free but pre-registration is required by Friday, May 15 online at https://web.extension.illinois.edu/registration/?RegistrationID=12224 or by phone at 618-382-2662. For more information about the Twilight Meeting go online or contact: Bronwyn Aly at baly@illinois.edu; 618-382-2662 or Nathan Johanning at njohann@illinois.edu; 618-687-1727.
- **Midwest Compost School, June 2-4, 2015.** Wauconda Township Hall, Lake County, IL. For more information, contact Duane Friend at friend@illinois.edu or 217-243-7424. Register at http://extension.illinois.edu/go/midwestcompost.
- **Illinois Summer Horticulture Day, June 11, 2015.** 8:45 a.m. – 3:00 p.m. at Boggio's Orchard and Produce, 12087 IL Highway 71, Granville, IL 61326. Registration begins at 8:00 a.m. Advance registration is $25 and includes lunch. More information about Boggio's Orchard and Produce is available at www.boggiosorchardandproduce.com. Event information is available at http://www.specialtygrowers.org/illinois-state-horticultural-association.html. For questions and reservations, email Rachel at ilsthortsoc@gmail.com or call 217-853-6048.

Regional Reports

From southern Illinois ... We finally got a partial break from the rain last weekend, along with warmer temperatures (around 80˚ on Sunday, April 12). Temperatures are forecast to be in the 70s for highs and 50s for lows most of this week with scattered chances of rain throughout the week. While growers have had a few breaks in the weather, many would appreciate a few warm, sunny and windy days to help dry out the soil and allow some more field work.

Tree fruits are progressing well, with most peaches around petal fall and apples just entering full bloom. Early blueberry varieties are approaching full bloom as well, and some warm sunny days would benefit the work of pollinators. Plasticulture strawberries are starting to bloom, and some already have some small green fruit.

I noted the first emergence of asparagus on April 2 at Murphysboro, which was earlier than I expected. Our first harvest was about a week after that. Harvests have been fairly slow, with mostly cool, cloudy days.

Nathan Johanning (618-687-1727; njohann@illinois.edu)

From western Illinois … Our part of Illinois (Quincy area) has missed much of the rain that has fallen in other parts of the state. We had less than 1 inch in March, and so far in April, we've had 5 rain events, and I've emptied less than 0.6 inch from the gauge. Tile lines are barely running, but seeps seem to be running full tilt. For some, filed work has been ongoing since the first of the month, others have gotten a slow start, but everyone can find some soils that are dry enough to work in. We've still not had enough rainfall to incorporate dry fertilizer spread two weeks ago, and half-melted remnants of the granules are still visible on the soil surface.

One grower who decided to get his neighbors excited planted some sweet corn 3 weeks before Easter. It has now emerged. Now not everyone gets that crazy with planting, but sweet corn planted on April 6 has a radicle root extended 1inch deep.

Growers have been busy working fields, applying fertilizer, planting and transplanting. Some anxious growers planted tomatoes (outside) the week prior to Easter only to see them succumb to a low temperature in the 20's Easter morning. Early planted greens have emerged. Transplanting of onions and cole crops has been ongoing.

In the high tunnels, transplanting of most crops has been completed. Lack of sunshine has limited growth to some degree. Growers attempting to maximize growth in tunnels have been kept busy adjusting side walls with the cloudy and sunny weather changing almost hourly the past week. I will echo Kyle Cecil's warning on aphids in high tunnels. For growers transitioning from winter crops to summer crops, be cautious of aphids bridging the gap between these crops. It's almost impossible to prevent aphids from overwintering in a winter crop, thus the potential for early infestation in the "high dollar" summer crops can be high.

High-tunnel strawberries have been blooming for several weeks, and outdoor plasticulture berries have a few early blooms showing, but most are at bud stage. Some of these early flowers sport black frost killed centers. Asparagus harvest has begun, with several pickings being reported thus far. Rhubarb growth has also begun. Peach trees are at bloom and apples are at pink

Mike Roegge (217-223-8380; roeggem@illinois.edu)

Also from western Illinois … Recent cool and damp weather have not provided favorable conditions for crops in the field or in high tunnels. I was in several high tunnels a few days ago, and it seemed to be "raining" on us the whole time we were standing inside. There is not a great deal that a grower can do to remedy this right now other than provide ventilation to help move moisture out and off the plants. If the air you are bringing in is at 90% humidity, it can seem like a losing battle. Free moisture and relative humidity over 90% favor many disease pathogens, so managing the environment and managing diseases are important during cool, damp weather. With current conditions, diligence in scouting is essential. One resource to assist growers with disease management is the University of Illinois Plant Clinic. Contact the clinic at: S-417 Turner Hall, 1102 S. Goodwin Ave., Urbana, IL 61801. Phone: 217-333-0519; email: plantclinic@illinois.edu

Kyle Cecil (309-342-5108; cecil@illinois.edu)

Fruit Production and Pest Management

Updates on Fire Blight of Apple in Illinois

Fire blight is a bacterial disease caused by *Erwinia amylovora*. Fire blight occurs in Illinois every year and causes shoot blight, canker blight, and rootstock blight on apples and pears. I consider fire blight the most destructive disease of apples and pears in Illinois. Blossom blight symptoms of the fire blight are not common in Illinois, but shoot blight is widely observed during June and July.

In 2008 and 2009, we had widespread and severe fire blight in apple orchards in Illinois. This resulted in speculation that streptomycin-resistant strains of *E. amylovora* might be present. Resistance to streptomycin in *E. amylovora* has been reported from other states, such as California and Michigan.

We conducted statewide surveys in 2010, 2011, and 2012, and collected 117, 129, and 170 *E. amylovora* isolates, respectively, from 20 counties. None of the 416 *E. amylovora* isolates tested were resistant to streptomycin (Agri-Mycin 17WP) at 50 mg/liter (50 ppm). However, seven non-*E. amylovora* bacterial isolates were collected from *E. amylovora*-infected shoots that were streptomycin-resistant, which could be a potential source of streptomycin-resistance for *E. amylovora* in Illinois in the future. In 2011 and 2012, we conducted field trials to evaluate efficacy of oxytetracycline (Mycoshield 17WP), kasugamycin (Kasumin 2L and ARY-0416-06), copper hydroxide (Kocide-3000 41.6DF), *Bacillus subtilis* (Serenade Max, QST713), and *Pseudomonas fluorescens* (Blight Ban A506) for management of fire blight. Only kasugamycin (Kasumin 2L and ARY-4016-06) reduced blossom infection significantly.

Kasumin 2L is registered for control of fire blight of pome fruit (e.g., apple, crabapple, pear, Asian pear, quince) and should be used wherever resistance to *E. amylovora* has been confirmed. Otherwise, streptomycin is still the most effective chemical for control of *E. amylovora*. Based on the label for Kasumin 2L, spray volume must be sufficient to provide good coverage of treated foliage; begin applications at 20–30% bloom or when conditions favor disease development and repeat applications at 7-day intervals or when conditions favor disease development; do not make more than two consecutive applications of Kasumin 2L, if additional applications are needed, rotate with another product with a different mode of action that is registered for this use; and do not make more than 4 applications of Kasumin 2L per season. Follow all label directions (http://www.cdms.net/LDat/ldB4M000.pdf).

Spraying all of pome fruit trees in the orchard is essential. Spray the trees with a fixed copper compound at silver tip; use the MARYBLIT program for predicting infection and timing spray applications, and apply streptomycin during bloom, as predicted by MARYBLIT; apply streptomycin after a major hail or storm damage; do not make more than four applications of streptomycin per season. Refer to the ***2015 Midwest Tree Fruit Spray Guide*** for the updates on fire blight management.

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

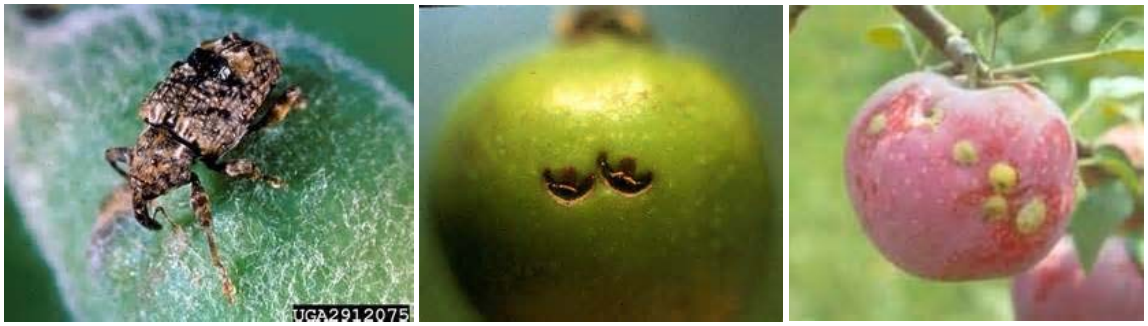
Plum Curculio Management

In orchards with a history of plum curculio infestations, the time to control this insect is at petal fall. Because the insecticides that are effective against this insect are toxic to bees, it's important that growers not apply petal fall sprays too early. Although removing honey bee hives when most flowers have dropped

may protect the colonies that were supplied to the orchard for pollination services, wild honey bees and other native bees such as the orchard mason bee will continue to forage on later flowers, so waiting until bloom is truly over before spraying for plum curculio is important for protecting pollinators.

Adult plum curculios move from overwintering sites to apples, pears, plums, and peaches (and some other tree fruits) beginning around the time of bloom. Females chew crescent-shaped slits into developing fruitlets and deposit an egg under the surface. Larvae that hatch from the eggs develop in the flesh of peaches, plums, and other stone fruits. In apples and pears, most larvae do not survive, but the feeding/egg-laying scars enlarge to become blemishes that cause downgrading of fruit at harvest.

Imidan, Avaunt, and Assail are among the most effective insecticides for curculio at petal fall. All are at least moderately toxic to bees. , so be sure to delay applications until bees are no longer in the orchard. See the ***2015 Midwest Tree Fruit Spray Guide*** for a listing of additional insecticides that can be used for curculio control. The ***Spray Guide*** also lists Belay and Actara for curculio control, but these two insecticides are MUCH more toxic to bees, and I discourage growers from using them at this time, especially if some late bloom is still attracting pollinators. For organic growers, repeated applications of Surround (OMRI-approved) provide some reduction in curculio damage. In peaches, the pyrethroids used for stink bug control (see page 36 of the ***Spray Guide***) also control plum curculio.



Left: plum curculio (Clemson University); center: crescent-shaped slits on a small apple (West Virginia University) … eggs are laid into these slits; right: egg-laying scars as they appear later on mature apples (University of Kentucky).

And … although most apple and peach growers are familiar with plum curculio; a related species in apples and pears (at least Asian pears) is the apple curculio, *Tachypterellus quadrigibbus*. It damages fruits at about the same time, and we usually see it persist a little longer into the late spring at the U of I research orchard at Urbana. Apple curculio is a little smaller than plum curculio and has a longer snout. Like plum curculio, it chews an opening through the skin of small apples (around dime-size and larger) and lays an egg into the opening. It may chew several holes close together on a single fruit. The scar it leaves is round, however, not crescent-shaped, and as the fruit grows, the damaged areas may appear as raised bumps. The same insecticides and application timing used for plum curculio control also reduce damage by apple curculio.


Apple curculio (photo by Aron Katz).

Rick Weinzierl (217-244-2126; weinzier@illinois.edu)

Vegetable Production and Pest Management

Scouting for and Managing Asparagus Beetles

With the emergence of asparagus comes the opportunity for asparagus beetles to lay eggs and feed on the spears. At Murphysboro asparagus beetles showed up almost as quickly as the first asparagus emerged. In this location asparagus beetles had be present last year as well. Asparagus beetle adults overwinter and move onto spears in the spring, where their feeding causes scars and deformed growth. They lay numerous eggs on spears, and although larvae move to ferns to feed, the eggs are viewed as contaminants by buyers, further reducing the marketability of the crop. Scouting is critical, and during harvest it is easy to spot asparagus beetles, damage, and eggs. The recommended threshold to make an insecticide spray is 5-10% of plants infested or 2% of spears with eggs. There are many labeled products that can provide good control with very short pre-harvest intervals (PHIs) such as Sevin XLR Plus, Pounce, and Malathion. See the ***2015 Midwest Vegetable Production Guide*** for a listing of registered insecticides, rates, and PHIs.

Nathan Johanning (618-687-1727; njohann@illinois.edu)

Asparagus beetle adult and eggs on asparagus spears.

Nathan Johanning (618-687-1727; njohann@illinois.edu)

High-Tunnel Tomato and Pepper Trials at the St. Charles Horticulture Research Center

In 2014, nineteen tomato and eleven bell pepper cultivars were evaluated for yield performance at the University of Illinois St. Charles Horticulture Research Center (SCHRC). Tomatoes were grown from seed that was started on March 18 and were potted into 4-inch peat pots filled with Pro Mix on March 29. Both tomato and bell pepper transplants were planted randomly into single-layer black plastic beds 5 feet on center in the high tunnel on May 22. Tomatoes were set at a spacing of 12 inches for indeterminate cultivars and 18 inches for determinate cultivars. Determinate cultivars were grown using a trellis weave system and pruned up to but not including the first sucker below the first cluster. No additional thinning or pruning was done on the determinate cultivars. Indeterminate cultivars were pruned to a single leader and clamped to a single polyethylene twine suspended from a permanent overhead trellis made from treated lumber and high tensile wire. Peppers were set in twin rows, 16 in. apart and in-row spacing of 12 inches.

The planting was monitored for pest problems and treated as required. Insects that presented significant problems were limited to tomato hornworm and aphids. Aphids were a consistent pest of peppers throughout the growing season. Yield data are given in Tables 1 and 2. The data represent the mean of five plants for both tomato and pepper. Unless noted, tomato varieties are determinate.

Shelby Henning (630-584-7254; shenning@illinois.edu)

Table 1. Total season (7/15-11/11) harvest results from SCHRC high-tunnel tomato cultivar evaluation, 2014.

	----------No. Fruit[†]----------				-------Marketability------		Average fruit weight[‡] (oz.)	----------Yield (oz.)[§]----------	
Variety	Total	Total #1	Total #2	Marketable	% Marketable	% Cull		Total	Marketable
Baltimore	163	107	39	146	90	10	10.3	104.5	93.6
Big Beef[¶]	242	111	66	177	73	27	7.8	118.2	86.4
Brickyard	135	83	40	123	91	9	8.1	68.7	62.6
Florida 47R	206	138	51	189	92	8	7.7	99.5	91.3
Lemon boy[¶]	220	88	70	158	72	28	8.0	110.0	79.0
Mountain Majesty	223	133	40	173	78	22	8.8	123.2	95.6
Phoenix	203	147	36	183	90	10	8.6	109.2	98.4
Picus[#]	327	275	40	315	96	4	3.8	78.2	75.3
Pink Girl[¶]	224	76	56	132	59	41	9.3	130.1	76.6
Primo Red	144	86	30	116	81	19	9.3	83.8	67.5
Red Bounty	195	137	29	166	85	15	7.9	96.3	82.0
Red Deuce	138	70	19	89	64	36	11.5	98.9	63.8
Red Morning	171	83	23	106	62	38	9.7	103.3	64.0
Richmond	187	114	54	168	90	10	7.1	82.5	74.2
Rocky Top	196	141	39	180	92	8	8.1	99.4	91.3
Summer Pick	164	81	49	130	79	21	9.6	98.9	78.4
SV47257td	120	67	22	89	74	26	9.6	71.7	53.2
SV7101td	180	126	34	160	89	11	8.8	99.5	88.5
SV7631td	173	107	41	148	86	14	8.9	96.0	82.1

†Data shown are a total seasonal harvest of five plants per variety

‡Data shown are an average of fruit production divided by harvest weight at each sampling date.

§Data shown are total or marketable no. fruit multiplied by average fruit weight.

¶Indeterminate variety.

#Paste-type variety.

Table 2. Total season (715-11/11) harvest results, high-tunnel bell pepper cultivars.

Variety	Total No. of Harvested Fruit†	Total Harvest Weight (Lbs.)	Average Fruit weight (oz.)
Archimedes	111	35.5	5.1
Aristotle X3R	100	32.6	5.2
Bastille	95	30.6	5.2
Bayonet	100	32.9	5.3
Chesapeake	142	44.3	5.0
Currier	96	32.8	5.5
Cutlass	91	29.0	5.1
Karisma	97	33.7	5.6
PS09941288	130	41.7	5.1
PS09954288	85	27.5	5.2
Rampart	90	31.1	5.5

†Data shown are a total seasonal harvest from of five plants per variety

Shelby Henning (630-584-7254; shenning@illinois.edu)

Local Foods Issues

Good News on One Food Safety Issue

FDA has released a proposed rule that makes it clear the agency does not intend to consider farmers markets, roadside stands, CSA distribution points, and other direct marketing venues as "food facilities" subject to certain food safety regulations. The National Sustainable Agriculture coalition explained: "There were two aims of this clarification – the first was to reinforce that CSAs, farmers markets, roadside stands, and other primarily direct-marketing operations are not facilities, do not have to register with FDA as facilities, and are not subject to the Preventive Controls Rule. The second aim was to clarify that the location of the direct sale could not trigger the facility definition – e.g., that delivering a CSA box to a location where customers could pick up their boxes would not make that operation a facility." Please note this proposed change does not pertain to the food safety regulations on farms. For more information, http://sustainableagriculture.net/blog/retail-food-establishment/

Deborah Cavanaugh-Grant (217-782-4617; cvnghgrn@illinois.edu) and James Theuri (815-933-8337; jtheu50@illinois.edu)

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

Extension Educators – Local Food Systems and Small Farms		
Bronwyn Aly, Gallatin, Hamilton, Hardin, Pope, Saline, Wayne, and White counties	618-382-2662	baly@illinois.edu
Stephen Ayers, Champaign, Ford, Iroquois, & Vermilion counties	217-333-7672	srayers@illinois.edu
Deborah Cavanaugh-Grant, Logan, Menard & Sangamon counties	217-782-4617	cvnghgrn@illinois.edu
Kyle Cecil, Henderson, Knox, McDonough, & Warren counties	309-342-5108	cecil@illinois.edu
Bill Davison, Livingston, McLean, and Woodford counties	309-663-8306	wdavison@illinois.edu
Connie Echaiz, Lake and McHenry counties	847-223-8627	cechaiz@illinois.edu
Laurie George, Bond, Clinton, Jefferson, Marion, & Washington counties	618-548-1446	ljgeorge@illinois.edu
Zachary Grant, Cook County	708-449-4320	zgrant2@illinois.edu
Doug Gucker, DeWitt, Macon, and Piatt counties	217-877-6042	dgucker@illinois.edu
Nathan Johanning, Franklin, Jackson, Perry, Randolph, & Williamson counties	618-687-1727	njohann@illinois.edu
Andy Larson, Boone, Dekalb, and Ogle counties	815-732-2191	andylars@illinois.edu
Grant McCarty, Jo Daviess, Stephenson, and Winnebago counties	815-235-4125	gmccarty@illinois.edu
Mike Roegge, Adams, Brown, Hancock, Pike & Schuyler counties	217-223-8380	roeggem@illinois.edu
David Shiley, Coles, Cumberland, Douglas, Moultrie & Shelby counties	217-543-3755	dshiley@illinois.edu
James Theuri, Grundy, Kankakee, & Will counties	815-933-8337	jtheu50@illinois.edu
Jamie Washburn, Effingham, Jasper, Clay, Fayette, Clark, Crawford and Edgar counties	217-374-7773	jlwshbrn@illinois.edu.
Extension Educators – Horticulture		
Richard Hentschel, DuPage, Kane, & Kendall counties	630-584-6166	hentschel@illinois.edu
Andrew Holsinger, Christian, Jersey, Macoupin, & Montgomery counties	217-532-3941	aholsing@illinois.edu
Sonja Lallemand, Franklin, Jackson, Perry, Randolph, & Williamson counties	618-687-1727	lalleman@illinois.edu
Elizabeth Wahle, Bond, Clinton, Jefferson, Marion, Madison, Monroe, St Clair, & Washington counties	618-344-4230	wahle@illinois.edu
Horticulture Research-Extension Specialists at our Research Stations		
Jeff Kindhart, Dixon Springs Agricultural Center	618-695-2770 618-638-7799	jkindhar@illinois.edu
Shelby Henning, St. Charles Horticulture Research Center	630-584-7254	shenning@illinois.edu
Campus-based Extension Specialists		
Mohammad Babadoost, Plant Pathology	217-333-1523	babadoos@illinois.edu
Mosbah Kushad, Fruit & Vegetable Production	217-244-5691	kushad@illinois.edu
John Masiunas, Weed Science	217-244-4469	masiunas@illinois.edu
Chuck Voigt, Vegetable Production (& herbs)	217-333-1969	cevoigt@illinois.edu
Rick Weinzierl, Entomology	217-244-2126	weinzier@illinois.edu

Return Address:

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