



# 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.

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### *Upcoming Programs*

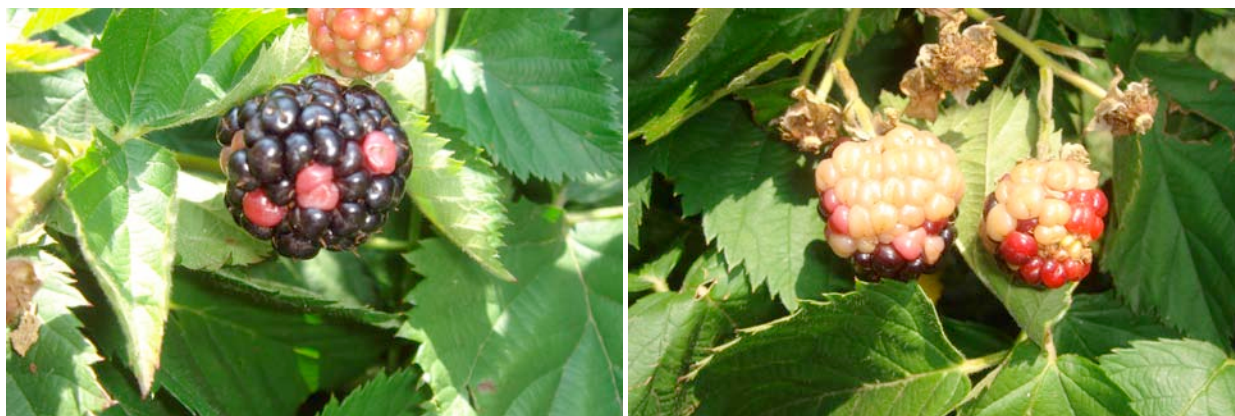
- **University of Illinois Dixon Springs Agricultural Center Field Day, August 4, 2011**, at the Dixon Springs Ag Center near Simpson, IL. Tours begin at 9:00 a.m. Speakers will discuss a variety of topics, including high tunnels for tomato and small production in southern Illinois. There is no cost to attend this event, and a free meal will be provided. The Dixon Springs Agricultural Center is located on Illinois Route 145 near Glendale. It is 25 miles south of Harrisburg and 25 miles north of Paducah, Ky. More to follow in the July 18 issue of this newsletter. Certified Crop Advisor credits will be provided. For more information, call the Dixon Springs Agricultural Center at 618-695-2441.
- **Evaluating Soil Quality, Saturday, August 6, 2011**, at Cow Creek Farm, 2112 East 100N, Paxton IL (Ford County). Jeff Glazik and Roger Windhorn of USDA Natural Resources Conservation Service will demonstrate how to collect soil samples for soil testing, and how to measure simple soil quality indicators such as soil structure, water infiltration, and soil penetration resistance. Participants will also have an opportunity to review soil test results, learn how to interpret findings, and discuss how to use county soils maps developed by the Natural Resources Conservation Service (NRCS), particularly when considering land for purchase or lease. 1:30pm-4:00pm (registration starting at 1:00 pm). For more information and to register, check <http://www.cisfn.org> or contact Deborah Cavanaugh-Grant at [cvnghgrm@illinois.edu](mailto:cvnghgrm@illinois.edu), 217-782-4617.
- "Is Entrepreneurial Farming for You?", August 25, 2011, and September 13, 2011. Workshops cover resource assessment, goal-setting, financial planning, and marketing options. These workshops will be held in University of Illinois Extension offices and will run from 5:30 p.m. to 9:00 p.m. at the Champaign County Office (801 North Country Fair Drive, Champaign) on August 25 and the Will County Office (100 Manhattan Road, Joliet) on September 13. Registration for each workshop is \$30 and includes a light supper. Payment can be processed online at <http://central.illinoisfarmbeginnings.org> or by contacting The Land Connection at 217-688-2570.

## ***Regional Updates***

**In southwestern Illinois** ... the weather has been fickle – good to some and rough on others. Like the entire Midwest, the southern region has been under a heat advisory for much of the last two weeks. Some areas have received a lot of rainfall and others none. The Centralia area received 4 inches and 75 mph winds on the 24<sup>th</sup>, while the St. Louis Metro east received nothing but hot. Areas to the north and south received more reasonable amounts of rain on the 24<sup>th</sup>.

Harvest is ongoing for both fruits and vegetables. Orchards throughout the region are picking peach cultivars such as PF-17, Glohaven, Coralstar and Bounty; white cultivars like White Lady, Blushingstar and Carolina Belle; and Sunglo nectarine. Quality is good from what I have sampled so far. Aside from localized areas that had damage from the March 23<sup>rd</sup> freeze or areas in the path of hail, the apple crop looks good at this stage. Grapes will come into full harvest within the next few weeks.

Blackberries are still in harvest and where rain has been a bit more abundant and the effects of heat and sun are less abundant on the fruit. I have received numerous blackberry calls regarding fruit not ripening properly, mostly in the southern half of the state where blackberries are more common. The fruit are often described as having spots (which are actually individual drupelets) that are white, yellow, or light in color. If individual drupelets are affected, somewhat randomly located on the fruit, it is most likely stink bug injury. Stink bug injury can happen anytime during fruit development. If several drupelets together are affected on the fruit, usually on the side facing the sun, then it is heat/sunburn (ultraviolet radiation) injury. A fruit can actually have injury from both at the same time as well. In both cases the fruit are safe to eat, just maybe not as palatable or saleable depending on the level of injury. Most of what I have seen so far appears to be heat related. Not only has much of the state experienced extremely high temperatures, we have also experienced extremely high humidity, which reduces a plants ability to cool itself, further enhancing the effect. See the pictures below for comparison.



Left: stink bug injury. Right: heat / sunburn injury.

Despite the delay in planting due to continuous spring rains, sweet corn still made the 4<sup>th</sup> of July target for many markets, though not as abundant as in past years. Sweet corn harvest now is in full swing as well as most other vegetables. Mites have been flaring in tomatoes and beans in the drier areas, but otherwise pests have been relatively low in those areas.

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**In northern Illinois**, day temperatures in the upper 80s to upper 90s and night temperatures in the upper 60s to 70s have been common. The region received 2-8 inches of rainfall during the July 18-31 period, with much of it recorded on July 27 and 28 particularly in the counties bordering Wisconsin. Soil moisture content is adequate to high, and some fields are still flooded. There were reports of hail damage in some farms in the region and sand blasting of vegetables due to strong winds.

Grapes are sizing well, as are apples and pears. Picking of summer-bearing raspberries is done on many farms. Summer spray programs continue in apples, but codling moth counts have been low in much of the region.

Sweet corn picking started two weeks ago, and harvest of muskmelons, cucumbers, peppers, and tomatoes is also underway. Pumpkins are starting to vine out, and some are blossoming. There reports of blossom end rot in tomatoes and peppers, bacterial spot and speck on tomato leaves and fruits, septoria leaf spot on tomatoes, powdery mildew on cucurbits, angular leaf spot and bacterial leaf spot on pumpkins, and bacterial wilt on cucurbits. Cucumber beetles, squash vine borer, squash bugs, and aphids are targets of control on many farms.

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

### ***Blueberry Maggot in Blueberries***

Blueberry picking this year at Kankakee County's Pembroke Township blueberry patch has not been fun. For every bunch of fruit picked, one has to spend a moment sorting the good from the ugly. The two-acre patch is nearly 50 years old, in a wooded area, and has been grown organically in isolation from other farming activities. This year, pickers noted the damaged fruit and were puzzled by a phenomenon that they had not witnessed for scores of years. About 30% of the fruit is infested by blueberry maggot, *Rhagoletis mendax*.

Although the blueberry maggot is commonly a serious pest of blueberries in northern states, it is a sporadic pest in Illinois and only very rarely reported in central and southern Illinois. Infested berries become soft, mushy, and unmarketable. Immersion of infested fruit in hot water or in salty water causes the maggots to exit fruit and allow identification.



Left to right: infested blueberries, a blueberry maggot larva, and adult (fly) stage. (Left and center photo by James Theuri; right photo from Michigan State University.)

The following notes on the life history of blueberry maggot are adapted from a summary provided by Michigan State University (<http://www.blueberries.msu.edu/bbmaggot.htm>).

Adults of the blueberry maggot (flies) are dark and about 5 mm in length. The most characteristic feature is the dark pattern on their wings, which can be used to distinguish this species from other fruit flies. They also have a white spot on the back of the thorax and three (male) or four (female) white bands across the top of the abdomen. Fly emergence typically starts as midseason varieties (e.g., Bluecrop) start turning blue. Flies feed and mate for 7 to 10 days before females are ready to lay eggs.

This insect can be monitored using yellow traps baited with ammonium acetate. Traps should be hung in the top third of bushes without foliage touching them. Traps placed at the field border and interior can identify immigrating and resident fly populations, respectively. Keep traps effective by changing bait regularly. It is critical to monitor traps to detect and accurately time controls. Fly species identification is important because other flies with similar wing patterns may be caught.

If flies are detected, management is typically required within 7 to 10 days to prevent egg laying in fruit. Eggs are 1 mm long, oval and white, and are laid singly in fruit. Maggots hatch in about 5 days and grow to about 7 mm long inside one berry. Infested berries soon become soft, and shriveled. Mature larvae drop to the ground, where they burrow into the soil to pupate. There is one generation per year

Insecticides labeled for blueberry maggot control include Asana, Assail, Danitol, Imidan, GF-120 (spinosad), Malathion, Provado, Rimon, and Sevin. See the 2011 [Midwest Small Fruit and Grape Spray Guide](#) for rates and restrictions. GF-120 is an OMRI-approved insecticide-bait product that can be used in certified organic production. (GF-120 is not listed in the Spray Guide ... see the product label for rates and instructions.)

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

### ***Twospotted Spider Mite in Tomatoes***

Mike Roegge recently reported twospotted spider mite infestations that required treatment in tomatoes near Quincy. Hot, dry weather may trigger similar problems in many other fields as well. Miticides that are registered and effective against twospotted spider mites in tomatoes include Acramite, Agri-mek, Epi-mek, and Oberon. For listings of miticides registered on additional vegetable crops, see the 2011 [Midwest Vegetable Production Guide](#).

### ***Aphids in Pumpkins***

Another pest problem that's starting to show up is aphids in pumpkins. Where aphids are numerous on leaves or fruit of cucurbits and the infestation includes winged adults and wingless forms as well, the culprit is almost always cotton-melon aphid, *Aphis gossypii*. Later in the summer as vines dry down and the only succulent plant parts in the field are the fruits, thousands of aphids can be found on a single pumpkin. Controlling aphids to prevent colony buildups that result in live insects on fruit at harvest (and a cosmetic or contaminant issue for shipping and sales) can be necessary when this occurs.



Cotton-melon aphid, *Aphis gossypii* (Univ. of Tennessee)

Under the “Aphids and Leafhoppers” heading of 2011 [Midwest Vegetable Production Guide](#), there are lots of insecticides listed, but several carry the note “leafhoppers only,” and others are labeled for one or two but not all of the vine crops covered in that chapter. For pumpkins ...

- Insecticides that are primarily aphicides and that have at least some locally systemic activity for greater control where complete coverage is difficult are Actara and Fulfill. Where aphids are THE target for sprays, choose one of these specific aphicides. Preharvest intervals (PHIs) are zero days for Actara and Fulfill on pumpkins.
- Older products that carry labels against aphids and are fairly effective IF thorough coverage is possible include Endosulfan (2-day PHI), Lannate (1- to 3-day PHI), and Malathion (3-day PHI).
- Organic growers may use M-Pede or other insecticidal soaps ... they are fairly effective against aphids that are contacted directly by sprays.
- Pyrethroids generally are not good aphicides, and this means that Baythroid, Capture, Danitol, and Pounce (and generic versions of all of these) usually do not provide adequate control of aphids in pumpkins. They do, however, kill common predators and parasites of aphids, and as a result, they may trigger greater outbreaks.

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### ***Blossom-End Rot of Tomatoes and Peppers***

With recent dry-wet-dry-wet fluctuations in soil moisture, many have noticed a higher than usual number of fruits damaged by blossom-end rot. In one of our trials at the University of Illinois nearly 100% of the fruits developed this disorder. Blossom-end rot is not caused by insects or pathogens but by a combination of physiological and environmental factors. The disorder is easy to control but hard to predict. In 1914 Brooks described blossom-end rot in tomato in the *Journal of Phytopathology* but did not explain its exact causes. The disorder appears as a water-soaked lesion, often chlorotic, on the blossom end of large fruited varieties of tomato, pepper, eggplant, watermelon, and zucchini grown either in the field or in greenhouses. Symptoms of blossom-end rot usually occur within two weeks after fruit set. Blossom-end rot symptoms usually occur on the earliest fruits but can also occur on later fruits if conditions are favorable. Long-fruited varieties (Roma type) are more vulnerable to blossom-end rot than round fruits, but it can also occur on round fruits as the picture shows. However, no blossom-end rot symptoms have been seen on wild tomatoes, and they rarely occur on small fruited varieties like cherry tomatoes. The disorder can also occur on the inside of the fruit in the tissue surrounding the seed where it is called “black seeds”. The incidence of blossom-end rot is infrequent in most properly managed fields, but it can be very serious under certain conditions.



Blossom-end rot of tomato and watermelon.

Since 1942, most experts have agreed that the disorder is likely caused by calcium deficiency in the distal end of the affected fruits. However, there are other factors that have also been linked to blossom end rot incidence, including low tissue phosphorous and manganese, high tissue nitrogen, magnesium, and potassium, high soil salinity, drought stress, too much water, high temperature, high light intensity, location of the fruit on the plant, root damage, and cultivar. Most of these factors, however, appear to affect plant growth and so their effect maybe indirectly related to the incidence of the disorder compared to calcium. Calcium controls the process of cell expansion and serves as a messenger for cell to cell communication. Calcium is delivered into the fruit via the xylem vessels. There are fewer and narrower xylem vessels at the blossom end of the fruit where the rot is likely to occur. Also the xylem-to-

phloem ratio is low and there are fewer vessels in the seed cavity in the blossom end of affected fruits. Combined, these factors are believed to be the reason why the rot develops on the blossom end of the fruit.

Before you jump on your tractor and start spraying, you need to be aware that blossom end rot is not a simple disorder that can be cured with calcium. Studies have shown that there is no critical level for calcium that can induce the rot, other elements beside calcium can also contribute to the rot development, and some hormones and high temperature have also been shown to induce the rot. Even when assuming that calcium is the main reason for the rot, some fruits like tomato are not likely to respond to calcium treatment. Tomato fruits do not have openings (stomates or lenticels) on their skin and so it is difficult for calcium to move through the skin and into the fruit, especially during the critical times at the early stages of development. Here are a few tips on how to prevent blossom end rot from developing in your tomatoes, peppers or other fruits. **Number 10 may occur later in the sequence of management steps in this list, but it is extremely important.**

1. Check soil pH the previous fall before planting and add non dolomitic lime to correct low pH.
2. Check the soil organic matter. Subtract the amount of nitrogen in the soil from the total amount of nitrogen that the plants need for optimum growth.
3. Avoid adding too much Mg, K, or other cation nutrients that compete with calcium, unless the plants show visible signs of deficiency.
4. Do not use ammonia type fertilizers, use nitrate forms instead. Ammonia fertilizers compete with calcium uptake.
5. Choose cultivars that grow slowly, produce less foliage, and produce medium size fruits. Cherry tomatoes and cayenne peppers rarely develop blossom end rot.
6. Avoid planting too early in the season.
7. Do not severely prune the plants.
8. Avoid damaging the root system by cultivating away from the plants.
9. Adding too much nitrogen, especially early in the season will likely lead to blossom end rot development.
- 10. Maintain adequate soil moisture. It is better to irrigate frequently at low rate than to irrigate a few times at high rate.**
11. Install drainage tiles or do not plant in areas where soil flooding is likely to happen.
12. Use of cover crops may reduce soil moisture fluctuation and blossom end rot.
13. No-till methods also may be beneficial.
14. Blossom end rot is irreversible and so remove damaged fruits as soon as you see the symptom.
15. Blossom end rot does not happen after harvest, although in apples bitter pit, which is similar to blossom end rot, occurs mostly in storage.

Spraying calcium, regardless of its form, will not eliminate blossom end rot on affected fruits. The three most important factors that will likely minimize blossom end rot development in your tomatoes, peppers or eggplants are monitoring the level of nitrogen carefully (divided the rate into smaller doses and use nitrate nitrogen), prevent fluctuation in soil moisture, and keep the soil pH at 6.5 to 6.8. If you can manage these three factors you can manage blossom end rot.



Sunburn of bell peppers.

Blossom-end rot sometimes is confused with sunburn. In almost all cases, sunburn occurs on the outside of the fruit surface facing the sun, while blossom-end is less likely to occur on the outside fruits facing the sun. Also, unlike

blossom-end rot, sunburn is not limited to the calyx end of the fruit but can extend to the petiole end, as the picture below shows.

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## ***Local Foods Issues***

### ***Grant Programs and Information Resources***

**USDA Farm Service Agency's (FSA) Tree Assistance Program (TAP)** provides financial assistance to qualifying orchardists and nursery tree growers to replant or rehabilitate eligible trees, bushes and vines damaged by natural disasters occurring on or after Jan. 1, 2008, and before Oct. 1, 2011. For those reporting loss from May 8, 2010 to Sept. 30, 2011, the final date to submit an application and supporting documentation is within 90 calendar days from the later of the disaster event or the date when the loss of trees, bushes or vines is apparent. For more details, visit your local FSA office or the program website at: <http://www.fsa.usda.gov/FSA/webapp?area=home&subject=diap&topic=tap>

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[The People's Garden Grant Program](#) pulls together funds from AMS, APHIS, FNS, FS, and NRCS to facilitate the creation of produce, recreation, and/or wildlife gardens in urban and rural areas, which will provide opportunities for science-based informal education. The eligibility is quite broad. **Deadline: August 26, 2011.** A teleconference for potential applicants will be held on **August 4**. To participate, call toll-free (888) 858-2144; the access code is 1059897. NIFA will post a summary of the questions and information on its [website <http://www.nifa.usda.gov/>](http://www.nifa.usda.gov/). More information: [Tom Bewick \[http://www.nifa.usda.gov/about/AllUnits/staff\\\_view.cfm?record\\\_id=171\]\(http://www.nifa.usda.gov/about/AllUnits/staff\_view.cfm?record\_id=171\)](#).

[Small Business Innovation Research Program](#) makes competitively awarded grants that are to qualified small businesses to support high quality, advanced concepts research related to important scientific problems and opportunities in agriculture that could lead to significant public benefit. For more information contact [Charles Cleland](#). Closing date: September 1, 2011.

[Small, Socially Disadvantaged Producer Grants](#) program: More information: [USDA Rural Development State Office](#), and the [Federal Register](#). Deadline: August 15, 2011.

[Value-Added Producer Grants](#) may be used for feasibility studies or business plans, working capital for marketing value-added agricultural products. Deadline: August 29, 2011. Further details are available at <http://www.gpo.gov/fdsys/pkg/FR-2011-06-28/html/2011-16121.htm>.

The most recent issue of *CHOICES*, a principal outreach vehicle of the American Agricultural Economics Association, focuses on [Innovations to Support Beginning Farmers and Ranchers](#). Note in particular the overview article and another on "U.S. Farm Bill Resources and Programs for Beginning Farmers."

[Field Guide to the New American Foodshed](#). The New American Foodshed is a large and relatively unexplored territory of local and regional markets now opening up for farm, ranch, and related entrepreneurs. It encompasses a growing number of food marketing channels that are developing within regions, for regions, and among regions as consumers and communities put new values into their purchases and investments. This website is designed to help those entrepreneurs and their advisors find and use relevant business development information from this new territory of local and regional food markets.

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*Less seriously ...* photographic examples of the word “irony” ...





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