



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

Upcoming Programs

- **North American Fruit Explorers. August 19-21, 2010.** Best Western Motel/Conference Center, Lafayette, IN. To view the program and registration form, check: <http://web.extension.illinois.edu/edwardsvillecenter/foodcrophort3031.html>. For additional details or questions: contact Ed Fackler at cefackler@gmail.com or 812-366-3181.
- **2010 Sustainable Agriculture Tours**
 - **July 26, Illinois Berries**, J & J Berry Farm, Jersey County
 - **August 13, Romance Tour – Flowers and Wine**, Bright Flower Nursery and Famous Fossil Vineyard & Winery, Jo Daviess County and Stephenson County
 - **September 15, Agritourism – Farm Fresh Fun**, Country Corner, Henry County.A fee of \$20 per person will be charged for each tour, which includes lunch. This year two adults pay \$30 when registered together and children under the age of 10 attend free. Registration at least one week in advance is required. Visit http://web.extension.illinois.edu/smallfarm/ag_tours.cfm to register and for more details about each of the tours including a map and agenda. To register by phone, contact Donna Cray at 217-241-4644. For more information, contact Deborah Cavanaugh-Grant (217-968-5512; cvnghgrn@illinois.edu).
- **2011 Illinois Specialty Crops Conference. January 5-7, 2011.** Springfield, IL. We are in the planning stage for this program ... **mark your calendars, and if you have any suggestions for the program, please contact Rick Weinzierl at weinzierl@illinois.edu or 217-244-2126.**

Additional Resource: Illinois Small Farms Newsletter.

In addition to the listing on the home page for the *Illinois Fruit and Vegetable News* of newsletters specific to fruit and vegetable production and pest management, another resource that may be useful to some readers is the *Illinois Small Farms Newsletter*. It's available at: <http://web.extension.illinois.edu/smallfarm/newsletter/>. The current issue includes an article on efforts to breed disease-resistant apple varieties and an interview with Jim Eckert.

Regional Updates

In southern and southwestern Illinois, the harvest of summer-bearing and everbearing (floricane) raspberries is complete. Purple and black raspberry primocanes should be tipped back 3-4 inches once they have reached 24-30 inches (without support), or if you have support, let them grow another 10 inches before tipping. This will promote lateral shoots (equals increased fruit production) that will be stubbed back (shortened) next spring. Summer-bearing red and yellow raspberries need not be tipped, though if time permits, removal of fruited floricanes can be done anytime. Currently, blackberries are in harvest and the primocane crop of everbearing raspberries is developing. Brambles really benefit from uniform moisture, so added irrigation is highly recommended now that temperatures are soaring and rain is hit or miss.

Peaches and sweet corn were in markets in time for Father's Day. In the northwest corner of the region, some of the peach cultivars in harvest include Garnet Beauty (almost finished), Gala, White Lady, and PF15A. For the most part, main season field tomatoes are closing in on ripe green. Cantaloupe is in harvest as well as cucumbers.

Japanese beetles are still abundant, showing up prominently on grapes, cherries, and brambles. Because of its large size (less surface/insecticide contact), a more frequent (tighter) spray schedule is most likely needed to maintain adequate control. As also, make note of PHI's and other timing restrictions. (See the article on this insect in the previous issue of this newsletter).

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In the northern region, moderate temperatures at the end of June have given way to hot weather in early July, with highs in the 80s and 90s. This follows record-setting rainfall amounts for several locations in June and many sites receiving 6 to 12 inches of rain for the month. Along with flooding in some areas, hail damage was reported at some sites. The first week of July has been fairly dry (0.05 – 0.8 inches of rain at various locations), and with high temperatures fields have dried rapidly. Irrigation equipment is in use in some fields, and flooded fields have been replanted.

Orchardists are continuing with summer spray programs. Apple fruits are sizing well, and some early season varieties will be ready for picking at least one week earlier than usual. I have received reports of apple scab on apple leaves and damage to apple fruits due to feeding by multicolored Asian lady beetle. [Editor's comment: this may well be accurate, but a far more common problem this early in the summer is feeding by Japanese beetle on ripening fruits of early apples (and lots of peach varieties).] Peach fruits are sizing well and some European plum varieties are ready for picking. Sour cherry picking is done in many orchards in the region.

Grape growers in the region are winding up cluster thinning, leaf removal, and shoot positioning. Japanese beetles are abundant, and growers need to scout their tree fruits and small fruits. Strawberry picking is done on most farms in the region.

Many early plantings of sweet corn have reached dry silk, and some growers started picking sweet corn ahead of the July 4 weekend. There are reports of corn earworm and corn borer catches in the region. Other insect pests such as cucumber beetles and squash bugs are present on cucurbits, and it is also time to scout for squash vine borer in squash and pumpkins. Imported cabbage worm, cabbage looper, and diamondback moth were observed in cabbage, broccoli, and other cole crops. The wet weather in mid June led to late pumpkin planting in some areas, but harvesting of cabbage, beets, green beans, cucumbers, summer squash, green onions, mustard greens, and collards is proceeding a little ahead of schedule, and muskmelon and watermelon are starting to set fruit. I observed bacterial spot and early blight in tomatoes on some farms in the region, as well as bacterial leaf spot on cucurbits. I also got reports of suspected tomato late blight.

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Notes from Chris Doll

June passed as a warm month with average rainfall of 4.2 inches in Edwardsville. That was enough water for sustenance with the above average temperatures, but not enough to fortify the crops for July and August. However, an inch of rain on the 8th has helped growth and maturity of ripening crops. Several early apple and peach varieties are being picked, and blackberry harvest is ongoing. Japanese beetle numbers are down locally but may continue to feed on ripe peaches, nectarines and blackberries, plus leaves of grapes and Honeycrisp apple. Regular cover sprays that include an insecticide should reduce the numbers except on the ripening fruits.

Degree-days continue to accumulate and are now at 1596 for the local codling moth biofix. Wetting hours were down last week, but now total 228 for the sooty blotch/flyspeck records.

Some signs of Nature at work in 2010:

- Scorched pear leaves that may drop on varieties like Moonglow and Starkrimson are most likely caused by heat combined with low soil moisture. Trees seem to survive.
- White drupelets on thornless blackberries are most likely caused by sun and heat in the absence of adequate soil moisture. I feel that the water levels should be kept above 50% water holding capacity. The presence of the white drupelets on the shady side of the row can be caused by reflective heat.
- Dying primocanes on thornless blackberry might have been caused by cold winter temperatures, cane borers, orange felt (cane blotch), and cane botrytis. The latter two are caused by pathogens that are favored by warm, humid weather in heavy canopies like we had last year, and maybe again this year. Pruning for aeration and coupled with a fungicide spray program should help this year's planting.
- A light fruit set of grapes in Kentucky coincides with my planting in the Back-40. With a light crop, vegetative growth is running wild.
- A variable crop of apples caused by weather and thinning conditions is similar to that in some orchards in Illinois and North Carolina.
- Leaf spotting and drop on peach trees that received a little too much copper in sprays for bacterial spot. How much is too much is difficult to determine.

July is the month for collecting leaf samples for nutrition analysis, with the 15th as the suggested early date for apples and peaches. Since the season continues to run 10-14 days ahead of "normal," this task might be done earlier too.

Chris Doll

Planning for Dicamba or 2,4-D-Tolerant Soybeans

Seed and agrochemical companies are racing to market "triple-stacked herbicide-tolerant" corn and soybean varieties. It is expected these varieties will be widely sold sometime after 2014 and allow application of a growth regulator herbicide (i.e. dicamba, 2,4-D) with glyphosate and glufosinate (Ignite, Liberty). These new genetics will be combined with new herbicide formulations to address glyphosate-resistant weeds, improve weed management, and provide new products.

Monsanto and BASF have signed an agreement introducing soybeans tolerant to dicamba (Clarity, Marksman), glufosinate, and glyphosate. The Genuity™ Roundup Ready 2 Yield soybean platform will only be available with the triple stacked technology. This will allow preplant burndown or postemergence applications of glyphosate and dicamba tank mixtures. Dow AgroSciences and DuPont are jointly introducing soybean and corn varieties tolerant to glyphosate, glufosinate, and 2,4-D. The soybean varieties are tolerant up to two times the current maximum label rate of 2,4-D. Also, corn varieties will be tolerant to FOP herbicides (Fusilade, Assure II) and stacked with Smart Stax™ insect resistance technology.

What are the implications for specialty crop growers? The new herbicide-tolerant soybean and field corn varieties will increase the use of growth regulator herbicides (both 2,4-D and dicamba). Growth regulator herbicides will be applied either in April and early May for burndown before soybean planting or in June after soybeans, corn, and weeds have emerged. April is when fruit trees are blooming and leaves emerging; protected production of tomatoes and transplants

is underway; and farmers are making early plantings of legumes. In June, susceptible fruit, vegetable, and organic soybeans are established. Thus, there is a potential for greater injury of specialty crops. All companies are developing formulation technologies and education programs to minimize drift. The formulations need to be widely tested before we know if they minimize growth regulator herbicide injury to specialty crops. Everyone wants this new technology used safely.

What can be done by specialty growers? Make sure that your concerns are addressed by seed and agrochemical companies, regulators, and politicians. Participate in comment periods with USEPA and other regulators. The Illinois Department of Agriculture is responsible and needs adequate funding for education on pesticide use (through the Pesticide Safety Education Program) and for enforcing the Illinois Pesticide Act. Review the Illinois Pesticide Act (see <http://www.agr.state.il.us/Laws/index.html>) and make sure it sufficiently addresses pesticide misuse (i.e. herbicide drift injury to nontarget crops). The Illinois General Assembly is responsible for enacting any changes. Talk to your neighbors and custom applicators in your area about the crops you are growing and their sensitivity to growth regulator herbicides. Most problems are avoided through “education across the property line.” Establish multispecies buffers along your property lines to reduce air movement and drift. Establish sentinel plantings – sensitive plants such as tomato or grapes that are not harvested but indicate herbicide drift. I am hopeful that with planning and foresight we can avoid specialty crop injury as dicamba and 2,4-D tolerant soybeans are widely planted.

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Fruit Production and Pest Management

Apple Maggot Management

In the latest issue of New York’s *Scaffolds* newsletter (<http://www.nysaes.cornell.edu/ent/scaffolds/2010/>), Art Agnello included quick reminders on apple maggot damage. His recommendations apply equally well in northern Illinois where apple maggot is serious pest, so here is what Art had to say ...

Trap catches [of apple maggot adults] should be increasing in traditional high-pressure sites, owing to rainfall and soil conditions that are ideal for maggot development and adult emergence. Stings and larval tunneling could soon be detected in early and favored varieties such as Ginger Gold and Honeycrisp. If you aren’t monitoring in specific orchards and haven’t yet applied a protective spray against AM (and aren’t using Delegate or Altacor for other pests – both of which have some activity on AM), prudence would suggest attention to this pest. Hanging a few volatile-baited sphere traps on the edge of susceptible plantings can provide a world of insight on when (and whether) immigrating flies are posing a threat. Growers on a Delegate or Altacor program for internal leps (codling moth) should get some protection against moderate AM pressure. [Imidan also is effective.] For those not using OP cover sprays, Assail and Calypso will both provide excellent control of apple maggot as well as internal leps.

Fujimite Now Sold as Portal

I’ve been slow to include a note on a name change for the miticide fenpyroximate. This active ingredient has been sold for a few years by Nichino America as Fujimite but is now marketed in the eastern United States as Portal. Like Fujimite, Portal is labeled for use on grapes, apples, and fruiting vegetables such as peppers, eggplant, and tomatoes.

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

Tips for Storing Peaches and Nectarines



With peach and nectarine harvest nearing full swing, some fruits will likely be kept in storage for later sales. Unlike apples, peaches and nectarines do not store for a long time at low temperature. The alternative for many is to plant varieties of different maturity dates in order to extend the season. One of the biggest problems with storing peaches and nectarines at low temperature, below 40°F, is that they develop a mealy or wooly texture. Wooliness or stringiness is a chilling injury response to low temperature storage. It is well known that during normal ripening of peaches, enzymes that break the cell wall, causing the fruits to soften, such as polygalacturonases and pectinmethylesterase, are activated. However, when fruits are stored at 32 to 36°F, the activity of some of these enzymes is reduced substantially. Without these cell wall breaking enzymes, peach and nectarine fruits will not soften properly even when kept at room temperature for a long time; instead the fruit becomes stringy or mealy. Several methods have been used to avoid wooliness or stringiness in peaches, including harvesting fruits at full maturity or early ripe stages, intermittently warming the fruits during storage, treating the fruits with ethylene, and spraying fruits in the field with gibberellic acid, GA₃.

Harvesting fruit at full maturity is somewhat difficult to predict precisely because most peach and nectarine varieties on the market are high coloring. One of the methods used to estimate fruit maturity is to use ground color as an indicator of when to harvest. Ground color is the color of the skin away from the sun on the shaded side of the fruit. If the color has any tinge of green, then the fruit has not reached full maturity. In the photo below you can distinguish the sunny side from the shaded side. Fruits will store 10 to 14 days longer (develop less wooliness) when they are picked when the shaded side has turned yellow or deep orange. For high coloring cultivars, it is difficult to use ground color as an indicator of early ripening or full maturity. You might use either days from full bloom or degree-day models to decide when to harvest. If the fruits are picked too soon, you can expect between 20 to 35% of the fruit to be wooly after 3 weeks in storage.



Intermittent warming during cold storage is another way to reduce wooliness of peaches and nectarines. Warm Fruits coming from the field should not be put in storage immediately after harvest. Fruit should be kept in a shed or in a cool storage (65 to 70°F) for several hours, before they are placed in cold storage. Chilling injury is much worse when fruits are put in cold storage immediately (when they are hot) than when they have cooled. For this reason it is best to harvest fruit very early in the morning than in the middle or late in the day. You can also reduce chilling injury by washing

fruit with cold water 55 to 60 °F before it is placed in storage. Studies have shown that fruits that have been picked early in the morning, cooled for a few hours in a shed or by drenching with cold water may be placed in cold storage at 35 to 40 °F for up to four weeks without developing significant wooliness, especially if the fruit are taken out of storage every two week for 12 to 18 hours, placed in a cool place (65 to 70 °F), then returned back to the cold storage at 35 to 40 °F. In other words, by taking the fruits out of storage for a few hours every two weeks they will not likely be stringy when they soften. It is a tedious process, but it seems to help the fruit ripen after storage.

Another method that has been used to reduce wooliness is to treat fruit after harvest with 10 to 15 ppm ethylene. Ethylene is the hormone that causes the fruits to ripen. Peaches are classified as climacteric fruits. Climacteric fruits are those that need ethylene to ripen (such as bananas and tomatoes). Peaches produce some ethylene, but when the fruits are kept at low temperature the ethylene synthesis process is damaged. By treating the fruit in storage with ethylene, the enzymes that cause the fruits to soften are stimulated and wooliness is reduced. I have not seen this being applied commercially, but it is worth experimenting with if you have the tools to inject ethylene. You may also store fruits that produce higher levels ethylene with peaches and nectarines, like apples. Unfortunately apples mature at later dates than peaches and nectarines.

Storing peaches under controlled atmosphere has also been shown to have some positive effect on reducing wooliness in peaches, but the effect is not consistent. Controlled atmosphere is used extensively to store apples, but has little effect on extending the storage of peaches. One experiment have shown that treating fruits with gibberellic acid delayed ripening of peach and reduced wooliness, but the results have not been confirmed

Last year, I bought fruits from our local grocery store in mid-August that were stringy and never softened. Here are a few tips on how to avoid this. Harvest fruits during the cold part of the day (early morning); avoid putting fruit in storage when they are hot; acclimate the fruit at 60 to 70 °F for a few hours before storage or at least keep them in a cool shed; store fruits at 35 to 40 °F but take them out of storage for a few hours every two weeks.

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Grape Research at the St. Charles Horticulture Research Center

Since 1998 grapes, particularly cold-hardy wine grapes, have been a subject of research at the University of Illinois St. Charles Horticulture Research Center. Initiated by Dr. Robert Skirvin and Alan Otterbacher, a trial of 26 grape varieties was planted on a southwest facing slope (the only one available!) in May of 1998. Bill Shoemaker, Superintendent at the St Charles Horticulture Research Center and Sr. Research Specialist for the University of Illinois, partnered with them to carry out the work. This set the stage for a grape research program that, along with the northern Illinois grape industry, has grown considerably since then.

The current program at St Charles includes three areas of research; cultivar evaluation, cultural research, including IPM, and breeding new varieties of grapes. All three areas are important for this young industry. The vast opportunity to breed new varieties has been demonstrated by successful releases of new varieties from Cornell University, the University of Minnesota, and a set of private breeders in the upper Midwest. These private breeders were primarily inspired by Elmer Swenson, a breeder who released many new varieties of cold-hardy grapes that performed well for growers in areas that couldn't previously grow wine grapes. His effort stimulated the development of the cold-climate wine grape industry across the upper Midwest and into the Northeast and Canada. At St. Charles we're simply following that example and exploiting the wealth of grape genetics available in the Midwest, breeding for varieties that are better adapted to our unique growing conditions.

Cultural practices are all the methods growers use to manage the grape crop. These include vineyard establishment, training systems, canopy management, fertility, water management, and pest control. Pest control is very important, as grapes are popular with many pests. There are several fungal diseases which can infect current varieties, and seasons such as the last few put high pressure on grapes. There are insect challenges that occur at every point in the growing season, especially during harvest. Weeds, particularly perennial weeds such as Canada Thistle, are constantly challenging growers and their grape crops. And perhaps worst of all are the animals which love grapes. Birds can flock in large numbers a decimate vineyards with ripe grapes. We have a 1-acre vineyard of Frontenac grape which was established as a research platform in 2006. We knew we needed a vineyard dedicated to providing an opportunity to study the cultural practices growers use, or need to use, to successfully grow grapes for high quality wine.

This year we have three projects in the Frontenac vineyard. First, we partnered with Steve Jordan and Dr. Patty McManus of the University of Wisconsin to study a sensor and software model for predicting the risk of black rot disease. We are comparing a routine application versus no application and a model-predicted application of fungicide for control of the disease. Frontenac is moderately susceptible to black rot, and we have had high pressure this season. Second, we used the vineyard as an opportunity to make crosses between Frontenac and European wine grapes. Seeds from these crosses will be introduced into our breeding program. Third, Dr. Rick Weinzierl and I are looking at control of Japanese beetle. We are evaluating three pesticide regimes and two cultural controls for the pest. The pesticides include Sevin, Danitol and Altacor (currently labeled for GBM in grapes), a new material and chemistry from DuPont. We are also looking at spun-bonded polypropylene row covers over the top of the vines as an exclusion barrier to the beetle. This could be attractive to organic grape growers if there are no deleterious effects on the vines or fruit development.

Cultivar evaluation is a big job. The Europeans, especially the French, created thousands of varieties of interspecific hybrids, many of which have never been grown in the Midwest. Most never will, as they were not exported to North America. But many were and some are planted at St Charles. There are also new varieties and breeding lines being released for evaluation by both public and private grape breeding programs. We are evaluating these varieties and breeding lines at St Charles so we can identify which have the greatest potential for our industry. We'll keep you informed.

Support for this work has been generously provided by the State of Illinois and the Illinois Grape Growers and Vintners Association (IGGVA) since 2005. We have used that support to build a significant grape research program for northern Illinois. Over time I'll try to keep everyone informed on progress and new developments. I'll also be busy looking for new sources of support, as the state has discontinued support for the next fiscal cycle. I am currently working with colleagues from 10 states on a USDA-SCRI proposal that will include support for our grape research program. If successful, we'll be in a position to maintain our current level of research activity.

We will also explore other options, but it's critical that you understand that support for all specialty crop research is more volatile than before. Your efforts to help generate funds for our all of our specialty crop research programs are sincerely appreciated. Help keep us in business so we can help you stay in business.

Bill Shoemaker (630-584-7254; wshoemak@illinois.edu)

Vegetable Production and Pest Management

Bean Leaf Beetles, Cucumber Beetles, and Corn Rootworm Beetles

Among the many small beetles in gardens and fields around Illinois now and later into the summer are the bean leaf beetle, striped cucumber beetle, spotted cucumber beetle, and western and northern corn rootworm beetles. Although these beetles are somewhat similar in appearance, distinguishing among them is important. The cucumber beetles are vectors of the pathogen that causes bacterial wilt of cucumbers and muskmelons; the others are not. Bean leaf beetles are more likely to cause serious damage to beans than the other species (although spotted cucumber beetle will feed on bean foliage and pods). Here are the key characters that help in identifying these species ...

BEAN LEAF BEETLES vary in color and marking, some with black spots or bars on the elytra (shell-like forewings), and some without these marks. All are marked with a black wedge immediately behind the prothorax. SPOTTED CUCUMBER BEETLES resemble bean leaf beetles but always have 12 distinct spots on the elytra. The front, center spots are distinct and do not form a triangle as they do on the bean leaf beetle. STRIPED CUCUMBER BEETLES have distinct black stripes along the inner and outer edges of the elytra, and the stripes run all the way to the ends of the elytra. The underside of the abdomen is black. All of these insects overwinter as adults and move into fields and gardens in April through May, as soon as temperatures warm up and their food plants become available. They lay eggs at the base of their host plants, and larvae develop below ground, feeding on the roots. Two summer generations of adults of these species emerge and feed, mate, and lay eggs; adults of the latter of these summer generations overwinter. As spring adults of the striped cucumber beetle began to disappear in recent weeks in central Illinois, the first generation of summer adults has begun to build.



Left to right: bean leaf beetles, spotted cucumber beetle, striped cucumber beetle.

WESTERN CORN ROOTWORM BEETLES resemble striped cucumber beetles because of the stripes on their elytra. The edges of these stripes tend blur or fade on the western corn rootworm, and they do not extend all the way to ends of the elytra. The underside of the abdomen of the western corn rootworm is yellowish. NORTHERN CORN ROOTWORM beetles have no stripes and no spots ... they're uniformly yellowish green. These two species overwinter as eggs in the soil. Larvae that hatch in the spring feed on the roots of corn, then eventually pupate and emerge as adults, usually beginning in July. Western and northern corn rootworm adults undergo just one generation per year. The adults present in later summer and fall mate, and females lay eggs in the soil; those eggs overwinter to start the cycle again the next spring. These beetles feed on the silks of sweet corn and on the fruits of cucurbits.



Western (left) and northern (right) corn rootworm beetles.

For listings of insecticides registered to control these beetles on specific vegetable crops, consult the [2010 Midwest Vegetable Production Guide](#).

Twospotted Spider Mite

Now is the time to begin scouting for twospotted spider mites in tomatoes, eggplants, cucumbers, and watermelon. For listings of miticides registered to control twospotted spider mites on specific vegetable crops, consult the [2010 Midwest Vegetable Production Guide](#).

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Less seriously ...

From NPR's "Says You" last weekend ... words that should be in Webster's dictionary:

Dejamoo ... the inescapable sense that you've heard this line of bull before.

Ignowrench ... someone who looks into a tool box and has no idea what anything is used for.

Bazookacidal ... the self-destructive urge to run up and pop someone else's bubblegum bubble.

Prepuptual agreement ... a contract entered into before getting a puppy, specifying who takes care of it and cleans up after it.

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