



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://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.

In this issue ...

- **Upcoming programs** (an extensive list of educational programs for beginning and established growers)
- **Fruit and Vegetable Production and Pest Management** (presentations from major programs available online; pruning and cold-hardiness of fruit trees)
- **Local Foods Issues** (new Extension Educator – Bronwyn Aly)
- **University of Illinois Extension Educators and Specialists in Fruit and Vegetable Production and Pest Management**

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>.

- **Local Food Systems & Small Farms Team Winter Webinar Series, Thursdays, continuing through March 27, 2014.** 1:00-2:30 p.m. Multiple topics for small farms. Sessions are presented by U of I Extension Educators and Specialists. No cost. For a list of topics and to register, see <http://go.illinois.edu/winterwebinar>.
- **"Putting Small Acres to Work" Workshops, multiple locations, continuing through April 5, 2014.** The University of Illinois Extension Local Food Systems and Small Farms Team is coordinating a series of workshops on topics that help people learn ways to put a few acres to use. Remaining locations include Lincoln Land Community College (Springfield), on March 22; Kankakee Community College on March 29; Lincoln Land Community College (Litchfield) on April 5. See http://web.extension.illinois.edu/state/calendar_event.cfm?ID=64513).
- **11th Annual Central Illinois Composting Symposium, "What's the Dirt on Composting," February 19, 2014.** 9:00 a.m. – 3:00 p.m. \$30.00 registration fee. For more information and to register, contact Deborah Cavanaugh-Grant at 217-782-4617 or cvnghgrn@illinois.edu; see at <http://web.extension.illinois.edu/lms>
- **Kankakee Fruit and Vegetable Growers Symposium, February 20, 2014.** 8:30 a.m. – 4:00 p.m., Kankakee Community College, 100 College Drive, Kankakee IL 60901. Registration fee is \$25 (which includes lunch and handout materials) or \$35 (which includes lunch, handout materials, and the *2014 Midwest Vegetable Production Guide*) if paid by February 14, 2014. To register, see <https://webs.extension.uiuc.edu/registration/?RegistrationID=9535> or call James Theuri at the University of Illinois Kankakee County Extension Office at 815/933-8337 for more information.

- **Hydroponic Production Workshop, St. Charles, IL, February 25-26, 2014.** University of Illinois Kane County Extension Office and the St. Charles Horticulture Research Center. A 2-day workshop on basic hydroponic principles and practices, with classroom and hands-on lab activities. \$95 per person, with one guest per registrant at an additional \$45. For more information or to register please, email Shelby Henning at shenning@illinois.edu or call 630-584-7254.
- **MOSES Organic Farming Conference, February 27-March 1, 2014.** La Crosse Center, La Crosse, WI. For more information and to register, see <http://mosesorganic.org/conference/>.
- **Illiana Vegetable Growers Symposium, March 4, 2014 (rescheduled).** Teibel's Restaurant, Schererville, IN. For more information and to register, see <https://www2.ag.purdue.edu/hla/fruitveg/Pages/Events.aspx> or contact Purdue Extension-Lake County at (219) 755-3240. For questions on the program, contact Liz Maynard at (219) 531-4200 Ext. 4206.
- **High Tunnel Soil Management Workshop, March 5, 2014.** Jackson County Extension Office (high tunnel on-site), 402 Ava Road, Murphysboro, IL. To register (free), call 618-687-1727 by March 3.
- **Northern Illinois Strawberry Symposium, March 5, 2014.** Dining on the Green, 349 Main Street, Park Forest, IL 60466. For more information and to register, see http://web.extension.illinois.edu/state/calendar_event.cfm?ID=64515.
- **Tree Fruit Pruning Workshop, March 8, 2014.** Shover Family Orchard, 3 miles west of Barry, IL. See <https://webs.extension.uiuc.edu/registration/?RegistrationID=9376>.
- **Midwest School for Beginning Grape Growers, March 16-18, 2014.** Wisconsin Dells, Wisconsin. See <http://www.cias.wisc.edu/midwest-school-for-beginning-grape-growers/> or call Regina Hirsch at 608-335-7755. Registration is \$375; see <http://www.cias.wisc.edu/wp-content/uploads/2014/01/grapeschoolfinal-3.pdf>.
- **Cover Crop Field Tour for Fruit and Vegetable Production, April 3, 2014.** Beginning at Rendleman Orchards, 9680 Illinois Rt. 127, Alto Pass, IL. Sponsored by Jackson and Union County SWD and University of Illinois Extension. To register (free), call the Union County SWD at 618-833-5666, ext. 3, or the Jackson County SWD at 618-684-3064, ext. 3, by March 28.
- **University of Illinois Short Course – Bees and Beekeeping, April 5, 2014.** 9:00 a.m. to 6:00 p.m., Urbana, IL. See <http://www.life.illinois.edu/entomology/bee-course.html> or call 217-265-7614 to register (\$100). Registration is limited to 50 ... register early.
- **Fruit Tree Grafting Workshops, April 19 (Woodford County) and 26 (Livingston County), 2014.** See <http://web.extension.illinois.edu/registration/?RegistrationID=9119> or contact Bill Davison at 309-663-8306 or wdavison@illinois.edu for information. Registration fee is \$10.00.

Fruit and Vegetable Production and Pest Management

2014 Illinois Specialty Crops, Agritourism, and Organics Conference presentations available online

Power Point presentations from the 2014 Illinois Specialty Crops, Agritourism, and Organics Conference are available in pdf format at the Illinois Specialty Growers Association (ISGA) website (www.specialtygrowers.org). From the home page, use the link to Conference Speaker Presentations 2014 on the right-hand side to see the list of presentations at <http://www.specialtygrowers.org/conference-speaker-presentations-2014.html>. Note that from the home page you also can use links to view presentations from 2012 and 2013 conferences. Also scroll down the home page to see additional resources available for download.

For those who are not members of ISGA, now would be a great time to join and support the organization that works to promote your industry. The membership form is available from a link on ISGA's homepage (www.specialtygrowers.org).

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

2014 Southern and Southwestern Commercial Tree Fruit Schools Presentations available online

Power Point presentations from the 2014 Southern and Southwestern Commercial Tree Fruit Schools held in Hardin and Mt. Vernon on February 4 and 5, respectively, are available online in pdf format at

<http://web.extension.illinois.edu/mms/cropPresentations/4535.html>. At the same site, links to presentations from several 2013 programs (tree fruits, small fruits, strawberries, and vegetables) also are available. Presentations from the small fruit, strawberry, vegetable, and small acreage programs held February 11-12, 2014, will be posted soon.

Elizabeth Wahle (618-344-4230; wahle@illinois.edu)

Pruning and Cold-Hardiness of Fruit Trees

A couple of weeks ago Chris Doll forwarded the article below by Rich Marini of Penn State University on winter injury in fruit trees. Chris commented ... “This is about as good as it gets on the subject – some observations and a little research. It might ... answer some growers’ questions after this winter of 2014. For the record, my suggestions were always to stop pruning a few days ahead of abnormal lows, and of course wait for it to warm up to working temps.”

From <http://extension.psu.edu/plants/tree-fruit/news/2013/effect-of-pruning-on-cold-hardiness-of-fruit-trees>, posted on January 18, 2013, Rich Marini wrote ...

It seems that we are experiencing more unusually warm periods during mid- and late-winter [in 2011-12 and 2012-13], so trees may be more susceptible than in the past to moderately low winter temperatures. Lessons from years in which there was a sudden drop in temperature indicate that trees most injured were those that lacked adequate vigor, those that were too vigorous, and those that had been pruned before the cold event.

During the past century there have been several extreme cold events that have damaged orchards in the eastern U.S. Following the winter of 1935-36 there were a number of observational reports from the Midwest and the East describing how winter injury seemed to be related to various cultural practices and varieties. A summary of a survey of Pennsylvania apple orchards, published in the *Proceedings for the American Society for Horticultural Science* by Anthony, Sudds and Clarke (1936), described tree injury following a very rapid decline in temperatures in mid-January 1936.

In general trees that were most injured were those that lacked adequate vigor, those that were too vigorous, and those that had been pruned before the cold event. Trunk injury was greater than I would have expected considering that the lowest temperature was only -15°F, but this was accompanied by a rapid drop of 40 to 50°. There was another report from Indiana by Burkholder (1936), describing observations in the orchard at Purdue University. Students in the Tree Fruit course had heavily pruned some trees in November as part of their pruning lab exercises. The first half of January was fairly mild followed by a ten-day stretch of temperatures below zero with a minimum temperature of -20°F. By the following September all 43 heavily pruned ‘Jonathan’ trees were dead or nearly dead, the 8 trees that were lightly pruned had slight trunk injury, and none of the non-pruned trees were injured. Other reports of orchard observations suggested that trees pruned shortly before a cold snap were injured more than trees that were not pruned. Similar observations have also been reported for woody ornamentals. These lessons from the past may be important because it seems that we are experiencing more unusually warm periods during mid- and late-winter, so trees may be more susceptible than in the past to moderately low winter temperatures. In this review I will summarize the current state of knowledge concerning pruning and cold hardiness of fruit trees.

Acclimation/De-acclimation

Cold acclimation is the process leading to the development of freezing tolerance in plants. Fruit trees, like other woody plants, gradually acclimate to low temperatures in the autumn in three stages. Short photoperiods, sensed by the leaves, trigger the onset of the first stage of acclimation and plants will develop 10 to 15 degrees of cold tolerance as the days become shorter. Warm temperatures (60 to 70°F) combined with short days promote maximum hardening due to increased metabolic activity. Following a period of warm temperature preconditioning, cold acclimation is continued by a period of cool nonfreezing temperatures (60° days and 40° nights). A second stage of acclimation occurs upon exposure to subfreezing temperatures (23 to 27°). This increase in hardiness is very rapid and trees may be as much as 10° hardier the day after a frost than they were the previous day. The final stage of acclimation,

resulting in maximum cold tolerance, is initiated by exposure to temperatures approaching zero degrees F.

During the winter, trees remain hardy as long as the temperatures remain fairly cold. However, trees de-acclimate in response to warm temperatures. Trees can also re-acclimate when warm temperatures are followed by normally cold winter temperatures. A mid-winter severe cold snap may not injure plants unless it is immediately followed by unseasonably mild conditions. Later in the winter, when the chilling requirement has been satisfied, trees begin to lose the ability to re-acclimate to hardiness levels obtained earlier in the winter, and may only partially re-acclimate. The chilling requirement for most apple varieties is about 1,000 hours of temperatures between 50 and 35° F. Most peach varieties grown in the Northeast require about 800 hours of chilling, but varieties from southern or California breeding programs may require less chilling. During the winter, the temperature required to kill peach flower buds may vary by as much as 10°F. During bloom, the frost tolerance of an open blossom may vary by about 5°F depending on the temperature conditions for several days before a frost. This is why it is so difficult to predict the temperature that may kill trees or flower buds during the winter and even during bloom.

What is Cold Hardiness?

Cold hardiness is the ability of a plant to withstand low temperatures. "Cold hardiness" is a vague and often misleading term because low temperature injury can vary depending on when the low temperatures occur (early vs. mid- or late-winter), how fast the temperature drops, what the temperatures were during the previous few days, and how long the low temperatures are sustained. For this reason every cold event is fairly unique and a plant may be affected differently by different cold events. For example, the peach rootstock 'Siberian C' survives sub-zero temperatures in Ontario where winter temperatures are consistently low, but it is winter killed at above zero temperatures in the South where winter temperatures fluctuate. So 'Siberian C' is considered "cold hardy" in Ontario, but not in South Carolina.

Pruning Influences Cold Hardiness

Although there is quite a bit of anecdotal evidence indicating that pruning early in the winter can reduce the cold hardiness of woody plants, there have been few controlled experiments to determine how hardiness is affected by time of pruning, how long the pruning effect may last, and if pruning severity is involved. Some of the best research on time of pruning of peach trees was done in South Carolina (Nesmith and Dowler, 1976) and Georgia (Prince and Hutton, 1972) in an attempt to identify practices that contributed to peach tree short life (PTSL). PTSL is a complex disorder of peach trees in the southeastern U.S. causing excessive mortality of trees less than 10-years old. Conditions contributing to PTSL seem to include nematodes and other soil pathogens, rootstock selection, and fall pruning. A series of experiments conducted during the 1960's and 1970's showed that fall-pruning of trees on sites with a history of PTSL were susceptible to late winter cold injury that killed the trees. Trees on sites with no history of PTSL were less affected by fall pruning. Pruning studies with other woody species, such as grapes (Wolpert and Howell, 1984), crape myrtle and cypress (Hayns, et al., 1991) showed that pruning in the fall reduced the cold hardiness of the plants during the winter. A couple of interesting facts have emerged from these studies.

- Pruning in November tends to reduce the cold hardiness of woody plants until late February, so the effects of pruning are fairly long-lasting.
- Pruning experiments with peach show that fall-pruned trees had higher levels of the growth regulator indoleacetic acid (IAA). This is the naturally occurring auxin that is mimicked by the synthetic auxins that are used commercially, including NAA, 2,4,5-TP and 2,4-D.
- Cambial activity (the tissue in the bark responsible for cell division contributing to trunk and stem radial growth) seems to be stimulated by the increased IAA levels following pruning. Peach trees pruned in November exhibited enhanced cambial activity in February.
- More recently, summer pruning of peach trees in August was shown to delay leaf abscission and cold acclimation, so flower buds on summer pruned trees were less cold hardy than non-pruned trees in the early winter, but not in the mid-winter. I also made the observation a few years ago that peach trees that were pruned in the pink stage had more injury than non-pruned trees when a frost occurred two days after

trees had been pruned. Based on observing peach trees that were approaching bloom, I think that in some years pruned trees begin to bloom and leaf out a little earlier than trees that were not yet pruned. Based on everything that has been published we can conclude that woody plants do not attain maximum cold hardiness when they are pruned in the fall. Trees are affected more by heavy pruning than light pruning. There is still much that we don't know about the practical implications of how pruning affects cold hardiness. We especially don't know how rapidly pruning causes de-acclimation, or if de-acclimation is similar in the early-, mid-, and late-winter, and we don't know how long the trees remain de-acclimated. We also don't know if the de-acclimation following pruning is affected by mid-winter warm spells, which we seem to be experiencing more frequently. This is an area of research that I am interested in pursuing during the final stage of my career, and I hope to have answers to some of these questions before I retire.

Again, the article above was written in January of 2013 by Dr. Rich Marini of Penn State University and posted at <http://extension.psu.edu/plants/tree-fruit/news/2013/effect-of-pruning-on-cold-hardiness-of-fruit-trees>.

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Local Foods Issues

New Local Food Systems and Small Farms Educator in Southeastern Illinois – Bronwyn Aly

Bronwyn Aly has begun work as a new Local Food Systems and Small Farms educator for Gallatin, Hamilton, Hardin, Pope, Saline, and White counties in southeastern Illinois. Many in Illinois will remember that Bronwyn worked for several years at the Dixon Springs Ag Center in far southern Illinois, both with Jeff Kindhart and independently when Jeff was away in other positions for a few years. She has helped to organize and contributed information to the Illinois Small Fruit and Strawberry Schools, the Southern Illinois Vegetable School, and the Illinois Specialty Crops, Agritourism, and Organics Conference. She brings a wealth of horticultural experience to the job, both from her work at Dixon Springs and as a small farm operator in southern Illinois. Contact Bronwyn at baly@illinois.edu or at the University of Illinois Extension Office in Carmi at 618-382-2662.

Less seriously ...

FOR LEXOPHILES (LOVERS OF WORDS)

- A bicycle can't stand alone; it is two tired.
- A calendar's days are numbered.
- A boiled egg is hard to beat.
- He had a photographic memory which was never developed.
- Santa's helpers are subordinate clauses.
- She was only a whisky maker, but he loved her still.
- A rubber band pistol was confiscated from algebra class because it was a weapon of math disruption.
- A dog gave birth to puppies near the road and was cited for littering.
- Atheism is a non-prophet organization.
- I wondered why the baseball kept getting bigger. Then it hit me.
- A small boy swallowed some coins and was taken to a hospital. When his grandmother telephoned to ask how he was, a nurse said, 'No change yet.'

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