



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, 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.

If you receive this newsletter by US Mail, your 2011 subscription expires next month; a subscription form is attached. Those who receive email notification of new issues do not need to re-subscribe to continue to receive notifications.

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Presentations from the 2012 Illinois Specialty Crops, Agritourism, and Organic Conference

Many of the PowerPoint presentations from January's Illinois Specialty Crops, Agritourism, and Organic Conference are available in pdf format on the Illinois Specialty Growers Association's web site. Use <http://www.specialtygrowers.org/2012-iscaoc-speaker-presentations.html> to reach a list of presentations in alphabetical order by speakers' last names. A few presentations are still lacking, and we'll try to get those posted in the near future as well.

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

Upcoming Programs

For commercial fruit and vegetable growers ...

- **Small Farms & Local Foods Webinars, January 24 – March 29** ... a series of webinars on a variety of topics that relate to small farms and local foods will be held at University of Illinois Extension offices throughout the state. For a schedule, see <http://web.extension.illinois.edu/smallfarm/events.cfm> or contact Steve Cravens at scravens@illinois.edu or 309-342-5108, ext. 131. *Are You Farm to School Ready?* will be the topic for the February 28 (7pm) and the March 1 (1 pm) webinar.
- **Illinois Small Fruit and Strawberry Schools, March 6-7, 2012**, at the Mt. Vernon Holiday Inn, Mt. Vernon, IL. March 6th will feature presentations on brambles and blueberries and include information on fertility management for small fruit growers. March 7th will focus on strawberries including information on both matted row and plasticulture production. For more information please contact Jeff Kindhart at 618-695-2770 or jkindhar@illinois.edu.
- **Central Illinois Sustainable Farming Network Annual Meeting and Dinner, Saturday, March 10, 2012**, 5:30 to 8:30 p.m. at the Illinois Department of Agriculture Auditorium on the Illinois State Fairgrounds (off of Sangamon Ave, Gate 11)

in Springfield. See <https://webs.extension.uiuc.edu/registration/?RegistrationID=6412> or contact Deborah Cavanaugh-Grant at 217-782-4617 or cvnghgrn@illinois.edu for more information and to register. This event is open to non-members.

- **GAPs - Good Agricultural Practices for Safer Fresh Produce, March 16, 2012**, 8:30 a.m. – 4:00 p.m. at U of I Extension's Sangamon County Office in Springfield. Preregistration is required by March 12. For more information and to register, see <http://web.extension.illinois.edu/units/event.cfm?UnitID=483&EventID=56933> or call 217-782-4617.
- **Meet the Buyers Event for Fruit and Vegetable Farmers, March 27, 2012**, at the Champaign County Farm Bureau Building, 800 N. Country Fair Drive, Champaign, IL. Programming from 8:30 a.m. to 5:00 p.m. will include presentations on MarketReady, GAPs, food hubs, and the Edible Economy Project, and buyers who will be present to talk directly with growers will include Schnuck's, Central Illinois Produce, Strawberry Fields, Common Ground, Feeding Illinois, Feeding America, Hendrick House, and University of Illinois Food Services. There is no charge for growers to attend but pre-registration is requested – call 217-352-5235.
- **Meet the Buyers Event for Fruit and Vegetable Farmers, April 4, 2012**, at John A. Logan Community College, 700 Logan College Drive, Carterville, IL. Programming from 8:30 a.m. to 5:00 p.m. will include presentations on MarketReady, GAPs, and food hubs, and produce buyers who will be present to meet directly with growers include a health food co-op and health food store, a restaurant, a foodservice distributor, university food services, food banks, and a grocery chain capable of taking direct store deliveries). There is no charge for growers to attend but pre-registration is requested – call the Williamson County Farm Bureau at 618-993-2609.
- **SW Illinois Orchard Twilight Meeting, April 12, 2012**. Joe Ringhausen Orchards, located 24748 Reddish Rd., Fieldon, IL. Program begins at 6:00 p.m. and will include discussions led by UI Extension on early season insect and disease management in fruit crops. For more information contact Andrew Holsinger at 217-532-3941 or aholsing@illinois.edu.
- **SW Illinois Orchard Twilight Meeting, May 24, 2012**. Eckert's Grafton Farm, 20995 Eckert Orchard Lane, Grafton, IL. Program begins at 6:00 p.m. For more information contact Andrew Holsinger at 217-532-3941 or aholsing@illinois.edu.

Notes from Chris Doll

Some spring-like weather has returned after a couple of weeks of near the prescription weather that I ordered after the last discussion. The prescription calls for 20- to 40- degree weather for 40 days after initial bud swell is seen. The 25 to 45 degree temperatures of much of the last two weeks have not caused much advancement. Now on Washington's birthday, it is nearing the mid 60"s, so everyone will be watching for an Alberta Clipper or two.

There hasn't been much rain recently nor has there been much drying of the soil. So field work has continued, and with the calendar's first day of spring being only 4 weeks away, normal orchard practices of pruning, brush removal, fertilizing, herbicide application, and getting the sprayers ready are ongoing. Tree planting can be started soon if the snow and rains hold off much longer. The winds are blowing as I write this, which is about par for the course when the spray season begins.

After a long winter that included a lot of reading, I feel for growers who try to stay ahead or at least abreast of all the developments in pesticides, herbicides, fertilizers, varieties, rootstocks, etc. Many new products are available that are supposed to help one grow the biggest, prettiest, and best quality ever. I appreciate the improved writing and reporting in publications like the American Fruit Grower, Goodfruit Grower, Fruit Growers News, and many others.

And then there are the numerous fruit meetings that provide an excellent forum for the visual and verbal reports from specialists, including growers, industry, and academic. Our Illinois meetings contained excellent content for the increased number of attendees the past month. For the local fruit schools, our visiting speaker was Matt Moser of Moser Fruit Tree Sales, Coloma, Michigan. Matt was so good that I attended two meetings just to hear him. His topics were primarily varieties and rootstocks, based on his experiences in growing and nursery sales. He talked about the "one in ten" rule for varieties, which roughly says that for every ten new varieties that are developed, one might be a winner for you. Many of the new peach varieties that have been introduced in the Midwest in recent years have come from two of Matt's neighbors, Paul Friday and Jim Friday's, and Matt discussed how they are performing in Michigan. Beaumont from the MSU program is doing well in that area. He also gave some of the facts of life in the nursery business and gave the reasons why ordering nursery trees, especially new clones or new apple rootstocks, are difficult to get ahold of without advance ordering.

There is one more meeting for me this year, and that is the Illinois Small Fruit and Strawberry School at Mt. Vernon on March 6 and 7. Jeff Kindhart and Elizabeth Wahle have a good program lined up and relevant details are elsewhere in this newsletter. I hope to see some of you there.

Chris Doll

Local Foods Issues

Multiple Routes of Pesticide Exposure for Honey Bees Living Near Agricultural Fields

There has been a lot of discussion in recent weeks about a research report (title above) by Christian Krupke, Greg Hunt, Brian Eitzer, Gladys Andino, and Krispn Given that documents neonicotinoid insecticides in dead honey bees. All the authors except for Brian Eitzer are from the Department of Entomology at Purdue University; Eitzer is an analytical chemist at the Connecticut Agricultural Experiment Station. Their research suggests that neonicotinoids used as seed treatments on corn and soybeans may be playing a role in the deaths of bees. The entire paper is available online at: <http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0029268>. Here is the abstract (summary):

Populations of honey bees and other pollinators have declined worldwide in recent years. A variety of stressors have been implicated as potential causes, including agricultural pesticides. Neonicotinoid insecticides, which are widely used and highly toxic to honey bees, have been found in previous analyses of honey bee pollen and comb material. However, the routes of exposure have remained largely undefined. We used LC/MS-MS to analyze samples of honey bees, pollen stored in the hive and several potential exposure routes associated with plantings of neonicotinoid treated maize. Our results demonstrate that bees are exposed to these compounds and several other agricultural pesticides in several ways throughout the foraging period. During spring, extremely high levels of clothianidin and thiamethoxam were found in planter exhaust material produced during the planting of treated maize seed. We also found neonicotinoids in the soil of each field we sampled, including unplanted fields. Plants visited by foraging bees (dandelions) growing near these fields were found to contain neonicotinoids as well. This indicates deposition of neonicotinoids on the flowers, uptake by the root system, or both. Dead bees collected near hive entrances during the spring sampling period were found to contain clothianidin as well, although whether exposure was oral (consuming pollen) or by contact (soil/planter dust) is unclear. We also detected the insecticide clothianidin in pollen collected by bees and stored in the hive. When maize plants in our field reached anthesis, maize pollen from treated seed was found to contain clothianidin and other pesticides; and honey bees in our study readily collected maize pollen. These findings clarify some of the mechanisms by which honey bees may be exposed to agricultural pesticides throughout the growing season. These results have implications for a wide range of large-scale annual cropping systems that utilize neonicotinoid seed treatments.

An interview with Krupke is at <http://www.purdue.edu/newsroom/research/2012/120111KrupkeBees.html>. There are lots of unanswered questions posed by these researchers' findings, but they suggest we may need to rethink the ways in which neonicotinoid insecticides are used. This is a topic we'll all want to keep following.

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

Survey on Use of Social Media for Marketing

Katie Abrams, an assistant professor in agricultural communications at the University of Illinois, is researching areas of need for training in online marketing techniques and tools for farmers and ranchers and has developed an online survey to better understand what you would like to know about online marketing. The results will be used to develop training materials and programs to be delivered throughout the state over the next two years.

This survey was designed to take no more than 15 minutes to complete, and if you participate, your responses will remain confidential, and all results will be reported as a summary to protect the identity of each individual respondent. Your participation in this study is completely voluntary, and you can skip questions you do not want to answer. If you have any questions about this study, please contact Katie Abrams at kabrams@illinois.edu or 217-244-3682.

To fill out the survey, use: https://ufacecd.qualtrics.com/SE/?SID=SV_8Dga485NKHQ4DQ0. Thanks in advance to those who participate.

Katie Abrams (217-244-3682; kabrams@illinois.edu)

Fruit Production and Pest Management

Woolly Apple Aphid Management

Last spring's newsletter included a fairly lengthy discussion of woolly apple aphid (WAA). I'll not repeat it all here, but the article, which covers the insect's life cycle, cultural controls, scouting methods, and the effectiveness of several insecticides, is still available at <http://ipm.illinois.edu/ifvn/volume16/frveg1618.html>. Woolly apple aphids move up and down from roots to twigs and back throughout the season, and controlling them with foliar sprays of insecticides in midsummer has not worked very well for most growers. Last year I mentioned that applications of Delegate and Rimon may be killing important natural enemies of woolly apple aphid and that prebloom application of Lorsban has been shown to be effective for control. Recent reports from growers tend to support both of these ideas.



Woolly apple aphid colony on shoot (R. Bessin, Univ. of Kentucky)

Last year's article included a discussion of why woolly apple aphid populations have increased in recent years. I noted that the two recurrent themes in answers to this question are: (1) key insecticides that previously killed this insect – Lorsban and PennCap M) are no longer labeled for use after bloom; (2) insecticides used to kill codling moth also kill the natural enemies of WAA (a predaceous fly and a parasitic wasp) but not the pest itself, allowing it to increase in the absence of natural controls. On the natural enemy side of the story, David Biddinger of Penn State University has linked repeated applications of Delegate or Rimon to increases in WAA infestations, and preliminary evidence indicates that Delegate kills the parasitic wasp and possibly the syrphid flies that are important natural enemies of WAA. He notes that Delegate sprays are not always causing WAA flare-ups, but they increase the probability of flare-ups. A couple of Illinois growers have observed WAA in blocks where Delegate or Rimon have been used, so that association seems to accurate here as well.

Last year's article also included a recommendation for the use of Lorsban before bloom (along with oil in the spray applied to control European red mites, rosy apple aphid, and San Jose scale). Again, Illinois growers who used Lorsban in 2011 on blocks where WAA was a severe problem in 2010 reported excellent control. It's not needed everywhere, but if WAA has been a problem, prebloom application of Lorsban (4E, 50W, or 75WG) should work well. Thorough coverage is important for successful control. The [2012 Midwest Tree Fruit Spray Guide](#) lists rates for the different formulations of Lorsban. See <http://www.nysipm.cornell.edu/factsheets/treefruit/pests/waa/waa.pdf> for Cornell University's fact sheet on woolly apple aphid.

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Vegetable Production and Pest Management

Insecticide Modes of Action ... Pyrethroids

This is the second of a few notes we'll include in this newsletter on modes of action of insecticides. We covered organophosphates in Issue 18, and pyrethroids are the topic for this issue.

First, the name ... pyrethroid insecticides are so named because early insecticides in this group were somewhat similar to naturally occurring compounds called pyrethrins. Pyrethroid means pyrethrin-like. Pyrethrins are the active components of pyrethrum – an insecticide derived from a plant known as a pyrethrum daisy (*Tanacetum*

(=*Chrysanthemum cinerariifolium*). Pyrethrum insecticides derived from these flowers have been used for centuries. Natural pyrethrins are very short-lived, lasting only a few hours when exposed to sunlight on plants, so insecticide chemists began work in the mid-1900s to synthesize similar compounds that might last longer – but not too long – in the environment. Early pyrethroids resembled the natural pyrethrins (at least somewhat) in structure, but later compounds in this group are much more complex. Most of the pyrethroids now in agricultural use were developed from the 1970s through the 1990s. In general, they persist for a few to several days on treated plants or in soil.

Soil applied pyrethroids, such as Fortress and Force, are commonly used to manage subterranean insect pests, and the active ingredient permethrin is sometimes used as a seed treatment. Pyrethroids such as Pounce, Warrior, Mustang, Brigade, and many others, are used to kill everything from moth larvae and beetles to grasshoppers and stink bugs. In general, they don't work well against aphids or mites, and they often kill the naturally occurring predators and parasites of these pests and can trigger their increase.

So how do pyrethroids work? In our previous article we explained that nerve impulse transmission is both chemical and electrical in nature. The electrical charge that flows through the nerve cell is chemically induced, and transmitting that impulse from one neuron to the next (or to a muscle cell) requires that a chemical signal be released from the “sending” cell to the “receiving” cell. The chemical signal that functions between the two cells is called a neurotransmitter, and it allows charged atoms (ions) to enter the receiving cell where it attaches. The organophosphate and carbamate insecticides interfere with breakdown of the neurotransmitter that carries the signal from one cell to the next (acetylcholine). Pyrethroids, in contrast, interfere with the transmission process within a single nerve cell. The part of the nerve cell that carries an impulse away from the cell body and toward another cell is called the axon, and pyrethroids are “axonic poisons.”

Understanding how pyrethroids work depends on understanding transmission along an axon. The electrical impulse that moves along an axon depends upon the opening and closing of “gates” on the nerve fiber that allow sodium and potassium ions (again, ions are electrically charged atoms) to move in and out of the axon. As these ions flow in and out of the axon, the net charge at each micro-portion of the axon reverses from negative to positive and the neuron “fires.” Pyrethroids interfere with the function of these sodium gates and allow sodium to leak into the cell when it normally would not ... they wedge open the sodium gates that should open and close very rapidly. As a result, the neuron continues to fire. It takes little imagination to understand why this is not good for the organism. Keeping muscles moving normally requires that important information freely flow from the brain to muscles, and pyrethroid insecticides prevent that.

Now, a link to the practical matters ... The mode of action of the pyrethroids is pretty much the same as the mode of action of DDT. That helps to account for the fact that insect populations that were resistant to DDT also show resistance to pyrethroids. Modes of action of insecticides have been characterized by the Insecticide Resistance Action Committee (IRAC), and a chart that shows modes of action and groups chemicals with similar modes of action is available on the IRAC web site – <http://www.irac-online.org/wp-content/uploads/MoA-classification.pdf>. Where resistance management is a goal, as it should be for fruit and vegetable growers who use insecticides, rotating among modes of action (not just products that might have the same mode of action) is an important step.

For an illustration of how pyrethroids and DDT work, see the following link to the Introduction to Applied Entomology course at the University of Illinois: <http://cpssc270.cropsci.illinois.edu/syllabus/DDT.ppt>.

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Less seriously ...

A very zealous soul-winning young preacher recently came upon a farmer working in his field. Being concerned about the farmer's soul the preacher asked the man, "Are you laboring in the vineyard of the Lord my good man?" Not even looking at the preacher and continuing his work the farmer replied, "Naw, these are soybeans." "You don't understand," said the preacher. "Are you a Christian?" With the same amount of interest as his previous answer the farmer said, "Nope my name is Jones. You must be lookin for Jim Christian. He lives a mile south of here." The young determined preacher tried again asking the farmer, "Are you lost?" "Naw! I've lived here all my life," answered the farmer. "Are you prepared for the resurrection?" the frustrated preacher asked. This caught the farmer's attention and he asked, "When's it gonna be?" Thinking he had accomplished something the young preacher replied, "It could be today, tomorrow, or the next day." Taking a handkerchief from his back pocket and wiping his brow, the farmer remarked, "Well, don't mention it to my wife. She don't get out much and she'll wanna go all three days."

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