

FACTS FOR *Fancy Fruit*



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June 23, 2015
 IHS Summer meeting
 Purdue University Meigs
 Horticultural Research Farm
June 24, 2015
 Campus & facilities tour

**Indiana Horticultural Society
 summer meeting don't miss it!**

You are warmly invited to join us for the summer meeting of the Indiana Horticultural Society. The meeting will be held June 23 at the Purdue Meigs Horticultural Research Farm, Lafayette, IN with tours of campus facilities the following day for those who wish to stay. All growers and those interested in fruit crops are invited to attend. While we encourage membership in the Indiana Horticultural Society, membership is not required to attend the field day. We are proud of the Meigs farm and look forward to showing growers the farm and the research being conducted.

Samuel Gilman Meigs Horticultural Facility:
 Purdue has eight regional research centers located around the state. Researchers from diverse agricultural disciplines use the eight

regional Purdue Agricultural Centers (PACs) to test ideas that are created and developed on campus. The PACs offer tremendously diverse land and soil types as well as extensive resources for study and testing. These farms enable scientists to advance agricultural research in real-world conditions and to take risks that eventually might benefit producers in each area. Each year, scientists conduct over 340 research projects on more than 40 different crops at the eight centers. Researchers are assisted by 29 PAC staff members spread across 11,000 acres.

The closest PAC to campus is the Throckmorton Purdue Agricultural Center (TPAC) which is comprised of 567 tillable acres. Dr. George Throckmorton gave the farm to Purdue Agriculture in 1935 in memory of his father Edmund. It was deemed the "Edmund Throckmorton Farm Memorial" as a tribute to this pioneer leader of Tippecanoe County.

The Samuel Gilman Meigs Horticultural Facility is part of the Throckmorton farm. In the late 1990s, horticultural research was relocated from the old Horticultural and O'Neill Memorial Farms to the Meigs Farm. The first apple trees and grapevines were planted at Meigs in 1999. The Meigs Farm itself is 240 acres, of which 145 acres are set up for drip and overhead irrigation. The Meigs facility has a state-of-the-art pesticide

handling facility, a full spectrum of specialty crop equipment, and six high tunnels. After struggling with high deer pressure for a number of years, an 8' high permanent deer fence was constructed in 2012.

Current work at TPAC and Meigs involves more than 30 different crops. Research focuses on weed management, insect management, soil fertility, agronomic crop production, ornamentals, fruit and vegetable production, biological controls, systems engineering, hardwood production, woodland and habitat management, and resistance management of weeds and insects. New areas of interest include organic and high tunnel vegetable production. Researchers from the departments of Agricultural and Biological Engineering, Agricultural Economics, Agronomy, Botany and Plant Pathology, Entomology, Forestry and Natural Resources, and Horticulture and Landscape Architecture are currently working at TPAC and the Meigs Farm.

The Meigs Farm is located about 8 miles south of Lafayette, one mile east of US 231.

<http://mapq.st/1Km9ivZ>

Program

9:00 am Registration

9:30 am Welcome and program overview

9:45 am Sprayer calibration and determining the quality of spray water.

11:45 am Exhibitor introductions

12:00 pm Lunch at the farm

12:45 pm Begin field tours

- Dwarf apple tree management
 - Avoiding biennial bearing on Honeycrisp
 - Grape variety performance after the 2014 Polar Vortex: The good, the bad, and the ugly!
 - High tunnel growing Pest control on sweetcorn
 - Spotted wing Drosophila in berries
 - Less is more: Utilizing adjuvants to manage common apple diseases
- 5:00 pm Social Hour
Optional wagon tour of the farm highlighting other research plots and crops, precision agriculture applications, hops, berries, vegetables, paw paws, etc.
- 6:00 pm Dinner at the farm
8:00 pm Adjourn

Meals

A boxed lunch (\$10) and evening dinner (\$15) will be offered to provide time for networking among growers and exhibitors.

Registration and costs

Registration is \$10 per person, lunch is \$10 per person and the evening dinner is \$15 per person. Both registration and meal costs will be collected on site. However we ask that those planning to attend RSVP to assist with our planning for meals and other arrangements. To register, visit

<http://tinyurl.com/o55wph2>

or contact Lori Jolly-Brown
ljollybr@purdue.edu, 765-494-1296.

Accommodations

We are not planning a room block, but the following is some hotel information for those who are interested.

<http://www.union.purdue.edu/hotel/>

<http://hiltongardeninn3.hilton.com/en/hotels/indiana/hilton-garden-inn-west-lafayette-wabash-landing-LAFWLGI/index.html>

<http://www.fourpointswestlafayette.com/>

<http://www.ihg.com/holidayinn/hotels/us/en/lafayette/lafin/hoteldetail>

Facts for Fancy Fruit is a newsletter for commercial and advanced amateur fruit growers. It provides timely information on pest control, production practices, and other topics likely to be of interest to fruit growers. All growers and interested persons are welcome to subscribe.

Subscriptions are \$15 per year. Subscribers will receive 12-15 issues biweekly during the growing season and monthly otherwise.

To subscribe, send your name, mailing address, and check for \$15 (payable to Purdue University) to:

Facts for Fancy Fruit
Purdue University
Department of Horticulture & Landscape Architecture
625 Agriculture Mall Drive
West Lafayette, IN 47907-2010
Attention: Lori Jolly-Brown

This newsletter can be accessed free at www.hort.purdue.edu/fff/.

EPA's Proposal to Protect Bees:

On May 29, 2015, the EPA issued a proposal to protect bees from acutely toxic pesticides. As stated in the announcement, "EPA is proposing to prohibit the application of pesticides that are highly toxic to bees when crops are in bloom and bees are under contract for pollination services. These restrictions would prohibit application of most insecticides and some herbicides during bloom." The criteria used to determine which products would be prohibited from use during bloom were" 1) Liquid or dust formulation as applied; 2) Foliar use (applying pesticides directly to crop leaves) directions for use on crop; and 3) Active ingredients that have been determined via testing to have high toxicity for bees (less than 11 micrograms per bee)." To see the details of the proposal including the list of active ingredients that would be affected by this proposal, go to: <http://tinyurl.com/nd9tbnz>. These proposed changes have the potential to drastically alter pest management practices for insect pests that must be controlled when crops are blooming, particularly those that bloom over an extended period of time. EPA is accepting comments from interested parties for a period of 30 days after the announcement. Growers who are concerned about the possible effects of these restrictions are encouraged to comment to EPA at <http://tinyurl.com/njofehe> (Foster)

Spotted Winged Drosophila:

Our limited experience with this invasive pest has shown that it usually makes its first appearance in traps around mid to late June. Therefore, small fruit growers should be putting traps in place soon. Again, at this point in the development of a pest management program for this insect, we are recommending that you begin a regular spray program when you catch the first SWD fly and your crop is in a vulnerable stage, which is in general just when they start ripening. (Foster)

European Red Mite:

I have received no reports of damaging infestations of European red mites so far. The cool, wet weather had not been conducive to the buildup of mite populations. Now is the time, however, when growers should begin regular scouting for mites. Scout first in the blocks where you typically see mites first or worst. For more details about scouting procedures, treatment thresholds and treatment option, go to <http://extension.entm.purdue.edu/publications/E-258.pdf>. (Foster)

Important Sprays for Grape Disease Management:

Grapes are at the critical post-bloom time period, which is a key time to control important diseases such as Phomopsis, black rot, downy mildew, and powdery mildew. The next few sprays will be critical in controlling fruit infections. Growers should pay extra attention to getting thorough coverage and use the best fungicides available. Recent widespread heavy rains may dictate shorter time intervals and appropriate use of adjuvants. The Midwest Small Fruit and Grape Spray Guide lists a wide range of products recommended. The most common approach is a tank mix of one of the sterol inhibitors (aka demethylation inhibitor) such as Rally or generic tebuconazole for black rot and powdery mildew plus a protectant for downy mildew and Phomopsis. The 66-day PHI for mancozeb means it can no longer be used in most situations, so another protectant such as captan, ziram or phosphoric acid is recommended. Rotating with one of the strobilurins such as Abound, Sovran, or Flint, or combinations products that contain them such as Pristine, Quadris Top, or Adament, is a good option.

Read the caution regarding fungicides that contain difenoconazole on page 16 of the Midwest Small Fruit and Grape Spray Guide. These include Inspire Super, Quadris Top, and Revus Top. Use caution when applying these to labrusca varieties and labrusca hybrids. Avoid adding adjuvants

that may increase uptake or leaf burning may occur. I suggest you use these with caution until you know how your varieties respond.

Note that while phosphoric acid products are good protectants for downy mildew, they are quickly absorbed into the plant so very rain fast, however they have limited residual activity. Don't expect them to provide protection for more than 10 days. If downy has been a problem (and it has been for the past two years) consider including one of the downy mildew specific products such as Forum, Ranman, Revus, or Zampro. These next few sprays are critical to producing sound, clean fruit. (Bordelon)

Leaf removal in grapes:

Immediate post-bloom through about 3 weeks post bloom is the most effective time for leaf removal on tight clustered varieties such as Vignoles, Seyval, and Pinot gris. Removal of 1 to 3 leaves in the cluster zone can greatly reduce risk of Botrytis bunch rot. Exposure to sun makes the berries less susceptible to Botrytis and removal of leaves opens the canopy so that sprays can penetrate the cluster zone. Delaying leaf removal increases the risk of sunburn, as does removal of too many leaves, especially on the west side of the canopy. Most growers remove leaves only on the east side (on north-south running rows). (Bordelon)

Strawberry problems:

Strawberry harvest is underway across the state and the usual problems are showing up. Rain the past two weekends has not helped the u-pick traffic, but overall berry quality has been excellent. Some of the most common problems on strawberries in the Midwest during harvest are slugs, sap beetles, and Botrytis gray mold. A quick look through my row of berries at the Meigs Horticulture Research Farm found at least two of these culprits.

Botrytis gray mold is a diseased caused by the fungal pathogen Botrytis

cinerea. Botrytis is a common pathogen of a number of fruit crops. In most, but especially strawberries, the fungus invades during bloom and infects the dying flower parts. The fungus remains latent until the fruit begins to ripen then progresses into the ripening berry to cause a rot. You often find infections starting at the top of the berry near the cap, where the dying flower parts remain. (Fig. 1.)



Fig. 1 Botrytis gray mold on strawberry

Sap beetles (*Stelidota geminata*), are a common pests of strawberries. The adult beetles invade the plantings as the fruit ripens and feed on berries, leaving deep cavities and tunnels. This damage often leads to development of secondary rots (Fig. 2).



Fig. 2 Sap beetle damage and resulting rot

Botrytis or any number of bacterial or fungal opportunists can cause these rots. The adult beetles are small, about 1/8 inch long, oval, and mottled brown in color (Fig. 3).



Fig. 3 Sap beetle adults on berry

They are difficult to see because they usually drop to ground when disturbed. Growers are often surprised by the size of the cavities considering the small size of the beetles (Fig. 4).



Fig. 4 Large cavities eaten by strawberry sap beetles

We often hear complaints of bird pecking, but I suspect most of the damage we see is from sap beetles, not birds.

Picnic beetles (*Glischrochilus* species) are another potential pest of strawberries, though they are more commonly found on raspberries. They are, however, opportunists and can be found feeding on strawberries as well. The adults are larger than sap beetles, about 1/4 inch long, dark in color, usually with four orange spots on the back. One distinguishing characteristic is that they have knobbed antennae (Fig. 5.)



Fig. 5 Picnic beetle fleeing the scene of the crime. Note the sporulation from gray mold beginning to develop on the sunken lesion, and the dead stamen on the cap near where the infection started.

Slugs (*Deroceras* species) are molluscs, not insects. But they cause damage to strawberries that resembles damage from sap beetles. They chew deep holes in the surface of the berries, especially under the cap. Those found is strawberries are usually small, less than one inch long, though certain specimens can be much larger.

Control: Sanitation is the key to managing pests and diseases in the strawberries. Growers use straw mulch to prevent berries from coming into contact with soil and being infected that way. However, straw also provides an ideal habitat for beetles and slugs, so there is some trade off. But growers can accomplish both disease and insect management by keeping rows narrow to allow the surface of the mulch to dry. Minimize nitrogen fertilizer in the spring to avoid excess vigor. And lastly, since beetles are attracted to overripe fruit, pick often and discard all damaged fruit away from the planting. Use of insecticides for sap beetles is not recommended during harvest due to frequent harvests. Assail, Brigade, Danitol and Rimon are labeled for strawberry sap beetle and have short PHIs. Bait buckets can be effective alternative on both beetles and slugs. For Botrytis fungicides should be applied during bloom, which is when infections are likely

to occur. If effective control is accomplished early, the need for fungicide application near harvest is greatly reduced. And, if berries are already infected, harvest applications of fungicides are not effective at controlling the disease.

(Bordelon)

Fire blight:

Fire blight continues to be a threat this season, if last night's (June 8) pea-sized to nickel-sized hail is any indication. Hail can physically damage the tree, and allow entry of the bacteria (Fig. 6) and secondary spread of the pathogen.



Fig. 6 Apple hail damage

Secondary spread of fire blight develops when stormy weather (especially hailstorms) occurs after the primary (blossom) infections. The amount of fire blight that develops after severe weather appears to be directly related to the amount of disease in the orchard, with inoculum levels highest near infected blossoms, cankers, or blighted shoots that were not previously removed. For this reason, growers should monitor their orchards for fire blight strikes, removing any and all infected shoots, sterilizing between cuts, if the incidence of the disease makes this possible. Growers can use a spray bottle of 10% bleach, or any other disinfectant (Lysol, trisodium phosphate, quaternary ammonium compounds), to sterilize between cuts, as poor sterilization techniques can inadvertently

spread fire blight. Keep in mind that pruning of large trees may be impractical because of the difficulty of doing a thorough job of blight removal. Furthermore, pruning can sometimes stimulate additional shoot growth; new growth is always more susceptible to disease, so discretion is advised. In these instances where pruning poses a greater risk than not, delay until the dormant season to properly prune with minimal risk of spreading disease. I do not recommend the "ugly stub method". Subsequent studies have shown mixed results with this approach, which still leaves fire blight inoculum present, and presents an excellent infection court for black rot, white rot and other opportunistic pathogens. The rapid and complete removal of fire blight strikes is the only proven method to limit secondary spread and is essential for minimizing loss. That said, keep in mind that pruning may not be effective during severe fire blight outbreaks.

It is important to stress that THE ONLY effective chemical control for trauma blight (that secondary infection that results from severe weather) currently available is streptomycin. Streptomycin needs to be applied within 4 to 12 hours to maximize control, especially if there are active fire blight cankers or strikes in the orchard or if the trauma event resulted in extensive foliar damage. The sooner streptomycin can be applied after the event the more effective it is in killing the bacteria before they infect and spread. Do not apply streptomycin later than 18 hr. The repeated use of streptomycin sprays after petal fall encourages the selection of streptomycin-resistant *Erwinia amylovora*, the bacterium that causes fire blight. We don't need to add Indiana to the list of states with strep-resistant *E. amylovora* (Missouri, California, Washington, Oregon, New York and Michigan). Finally, streptomycin should never be sprayed as a preventive measure for shoot blight. This is not an effective use of this material and only promotes the development of streptomycin-resistant strains. (Beckerman)

Notes on Recent Pollinator Health Initiatives:

Indiana is working on a state pollinator protection plan, which is being spearheaded by the Office of the Indiana State Chemist with input from various stakeholders, including growers, farm chemical company representatives and beekeepers. A large part of the plan will involve protecting bees from pesticides. This plan is part of a national movement initiated by the president last year. A "national strategy to promote the health of honey bees and other pollinators" was released on May 19 by the newly established Pollinator Health Task Force.

The national plan offers an assessment of the decline of honey bees, wild bees and monarch butterflies. The decline in honey bees coincided with the introduction of parasitic mites but other factors including pesticides play a role. Last year the nation lost 40% of its hives. Beekeepers had to scramble to make new hives to pollinate the nation's crops. The annual loss has been about 30% for the past ten to twenty years. There are over 4,000 species of native bees in addition to honey bees in North America. Honey bees were introduced by the colonists. It is assumed that policies that improve the health of honey bees will also benefit native species but there are some initiatives aimed at native bees. The plan recognizes that the monarch butterfly is only a minor pollinator but that it is a major indicator of ecosystem health. For example, the area covered by overwintering monarchs in Mexico has decreased by about 90% in the last twenty years.

There are three main objectives:

- (1) returning honey bee colony health to acceptable levels (approximately 15% overwintering loss, a level from which beekeepers are capable of successfully dividing surviving healthy colonies to remain economically viable);
- (2) increasing monarch butterfly populations to historic averages to ensure successful continuation of annual migrations; and

(3) increasing and maintaining cumulative pollinator habitat acreage in critical regions of the country.

Most new funding will be funneled to research on causes and cures for pollinator declines, which will be about \$ 29 million in 2016. This will be a great boon to those who are studying factors influencing bee losses, or those interesting in surveying existing bee and butterfly populations in various habitats, or looking at the value of habitats and other practices as benefits to pollinator populations. The stated goal for objective 3 is to restore or establish 7 million acres of land for pollinators over the next 5 years. There will be some funds for habitat restoration but most of this should be accomplished through changes in policies for federal and state lands, and reallocation of existing funds. There will be opportunities to enhance pollinator habitat in private lands in the conservation reserve program, or CRP. The plan proposes better coordination involving many federal agencies and state agencies to help make this happen. For example, the federal wildlife service will partner with the Association of Fish and Wildlife Agencies to include monarch butterfly and pollinators in their State Wildlife Action Plans. This will allow states to use a portion of their state wildlife grant funds for pollinator conservation.

Another major area discussed in the plan is pollinator public education and outreach. Federal agencies will be encouraged to develop educational websites and the public will be engaged through initiatives such as National Pollinator Week, which is the third week in June. The National Park Service, the DOE and USDA will play important roles in designing educational materials and events. All in all, this plan looks like great news for pollinators, for our food supply and for the health of our environment.

(Greg J. Hunt)

Indiana Grown Initiative:

The Indiana State Department of Agriculture is officially launching the Indiana Grown

Initiative on 7 July 2015. This free marketing program will enable all Indiana agricultural and food products to be labeled and marketed with an Indiana brand. It is a very comprehensive program that will include many market channels and farm products. This program has immense potential to create new local and regional market channels for Indiana agricultural and food businesses through three initiatives: 1) Educate consumers on the importance of buying Indiana Grown products; 2) Increase networking and sales opportunities for Indiana farmers; and 3) Expand support for Indiana processors in their effort to process more Indiana Grown products. There are four categories for the program:

***100% Indiana** - Must be grown and/or all ingredients from Indiana

***Prepared in Indiana** - Ingredients can be sourced elsewhere, but 100% of production is in Indiana

***Partner** - Company or institution that will assist in marketing Indiana grown products and members

***Indiana Grown** - All others







Addressing initiative #2 (above), the ISDA and Tiny Footprints Distribution will be hosting a food show for Kroger on 26 June 2015 at the Hendricks County Fairgrounds. Kroger will be placing 107 Indiana Grown kiosks in their Indiana stores, and they are seeking producers of shelf-stable, fresh, frozen, proteins or seafood products to feature. As a result of these marketing kiosks, some of these brands may find a future place on permanent shelves in Kroger stores throughout their distribution. This is a fantastic opportunity for those of you who are interested in selling your Indiana products to this retailer. These businesses do not need to be absolutely ready to sell to Kroger, but need to have a quality product that will sell. Kroger will assist with the requirements necessary to bring that product into these Indiana Grown kiosks. Even if you grow fresh produce and cannot bring

your product to the show, you may be able to attend this event. Please contact David King using the information on the flyer to attend the Kroger Product Selection Show.

The Kroger event, and future events with retailers, distributors, and other buyers, will all require that you are a member of Indiana Grown. This free application can be completed on line or in paper format and mailed to the ISDA. Information is included in the application: <http://in.gov/isda/2513.htm>. As an Indiana Grown member, you gain the right to use the Indiana Grown label on your products, receive marketing support and have access to a community of buyers and producers seeking to increase their supply of Indiana Grown agricultural products. For more information, please contact David King at the ISDA, dking@isda.in.gov or 317.607.9797.



Current bud stages West Lafayette, IN

<i>Raspberry</i>	<i>Grape</i>	<i>Peaches</i>
		
<i>Post bloom, berry sizing</i>	<i>Pea sized</i>	<i>2 inch diameter</i>
<i>Apple</i>	<i>Blackberry</i>	<i>Strawberry</i>
		
<i>1 inch diameter</i>	<i>Bloom</i>	<i>Harvest continues</i>

Upcoming events:

June 23-24:

Indiana Horticultural Society summer meeting and field tour, Purdue Meigs farm, Lafayette, IN.

All tree fruit, grape and berry crop growers are invited to attend. We have a program planned that should be of interest to all, especially the sprayer calibration demonstration and discussion of water quality issues. A campus tour including visits to the Hort greenhouse, Turf research center, horticulture labs, enology labs and vine library will be offered on June 24 for those who wish to stay.

Meals

A boxed lunch (\$10) and evening dinner (\$15) will be offered to provide time for networking among growers and exhibitors.

Registration and costs

Registration is \$10 per person, lunch is \$10 per person and the evening dinner is \$15 per person. Both registration and meal costs will be collected on site. However we ask that those planning to attend RSVP to assist with our planning for meals and other arrangements. If you would like to join us, please register [here](http://tinyurl.com/o55wph2)

<http://tinyurl.com/o55wph2>

July 21, 2015:

Indiana Winery and Vineyard Association Summer meeting. Country Heritage Winery, LaOtto, IN.

Agenda for the Meeting

- In the Vineyard – Vineyard Tour, Bruce Bordelon
 - Board Report, IWVA Board
 - Mobilegeddon
 - Lunch
 - Legislative Update & Shipping Direct to Consumer, Lisa Hays
 - Shipping Direct to Consumer Implementation
 - Interpretation & Compliance
 - Winery Implementation
 - Age Verification & On-line Processes
 - Order Processing Options
 - Packaging Options
 - Pick Up & Delivery
 - ATC Update - Introduction, Meeting Recap, Bulk Wine, Rick Black
 - Conclusion, Winery Tour
- Registration fees include lunch.

Register now

<http://tinyurl.com/pg6kqlc>

For further information

<http://tinyurl.com/nwsbrhk>
or contact: Laurie Aldrich
Indiana Winery and Vineyard Association
info@indianawinevine.org
800-232-8762

Driving directions:

<http://tinyurl.com/of5ln7v>

July 26-29, 2015 :

The Second International Workshop on Vineyard Mechanization and Grape and Wine Quality, Fredonia, New York.

<http://www.ishs.org/symposium/428>

Jan. 19-21, 2016:

Indiana Horticultural Congress, Wyndham Hotel, Indianapolis, IN

<http://www.inhortcongress.org/>

Please visit our Purdue HLA Extension website under the Events tab for further event details.

<https://ag.purdue.edu/hla/extension>



Janna Beckerman

Purdue University
Department of Botany &
Plant Pathology
915 West State Street
West Lafayette, IN 47907-1155
(765) 494-4614
jbeckerm@purdue.edu

Bruce Bordelon

Purdue University
Department of Horticulture &
Landscape Architecture
625 Agriculture Mall Drive
West Lafayette, IN 47907-2010
(765) 494-8212
bordelon@purdue.edu

Rick Foster

Purdue University
Department of Entomology
901 W. State St.
West Lafayette, IN 47907-1158
(765) 494-9572
rfoster@purdue.edu

Peter Hirst

Purdue University
Department of Horticulture &
Landscape Architecture
625 Agriculture Mall Drive
West Lafayette, IN 47907-2010
(765) 494-1323
hirst@purdue.edu

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Facts for Fancy Fruit
Purdue University
Department of Horticulture & Landscape Architecture
625 Agriculture Mall Drive
West Lafayette, IN 47907-2010