PURDUE UNIVERSITY

PURDUE EXTENSION

FACTS FOR Fancy Fruit

July 1 2015
Volume 15 • Issue 7

In this Issue

Crop conditions:

Grapes are at the bunch closure stage in central and northern areas. Strawberry harvest is essentially over and renovation has begun. Summer bearing red and black raspberry harvest has begun and spotted wing Drosophila are prevalent. All the rain has caused poor berry quality. Blueberry harvest is underway in the south and will start soon in central and northern areas. Overall, berry crops look very good considering all the rain.

The cooler summer has resulted in slower growth of tree fruits but crops are still looking good. Those with sweet cherries have obviously seen a lot of rain cracking.

Spotted Wing Drosophila are Here!

Two weeks ago, Bruce Bordelon found the first SWD larvae in raspberries at the Meigs Farm near Lafayette. Unfortunately, we didn't find the first flies in the traps nearby until last week week. I think the message here is to not wait until you catch flies before you start spraying. So, if you have raspberries, blackberries, grapes, or blueberries that are beginning to ripen, you should initiate your spray program. The insecticides labeled for each crop varies and growers need to pay special attention to the pre-harvest intervals (PHIs) and re-entry intervals (REIs).

An important consideration in the selection of which insecticides to spray is the potential for SWD to develop resistance to those insecticides. To avoid resistance, we usually like to avoid subjecting two consecutive generations of the insect to the same mode of action, or class of insecticide. In the heat of the summer, SWD has a life cycle that is close to one week, so we can assume that each week we are seeing a new generation. So, for example, if you sprayed your raspberries with Mustang Max, a pyrethroid insecticide, this week, you would not want to spray next week with Brigade because it is also a pyrethroid. You would want to choose an insecticide from another insecticide class, such as Malathion (an organophosphate) or Delegate (a spinosyn). Ideally, in this example, I would like to see you spray a pyrethroid one week, Malathion the next week, and Delegate the following week. Then you could go back to a pyrethroid and start the rotation again. If you choose to spray twice per week, I would recommend using the same insecticide class for both applications during a single week. Please notice that each insecticide on each crop has limits on the interval between sprays of the same product and also on the total amount of insecticide or number of sprays that can be applied. Again, note PHIs for each product on each crop. Some of those PHIs are so long that it becomes

impossible to use those products during the harvest season.

Organic growers have limited insecticide choices. Entrust is effective and Pyganic is moderately effective. Notice that you are limited to 5 or 6 applications of Entrust, depending on the crop, so use those judiciously. Pyganic tends to be a knockdown product with little residual activity. It is preferable to use a lower rate of Pyganic, sprayed more frequently rather than a higher rate applied less frequently.
(Foster)

European Red Mites:

Despite the cool and very wet weather, I have received some reports of the beginning of mite outbreaks. Growers should be diligently monitoring their apples for mites for the next month or so. We are very fortunate to have a number of effective rescue miticides available for use on apples. For a more thorough discussion of mite management, please go to http://extension.entm.purdue.edu/publications/E-258.pdf.
(Foster)

Endosulfan:

Remember that endosulfan (Endosulfan, Thionex, Thiodan) cannot be used on apples or blueberries after July 31, 2015. The phase-out for endosulfan will be complete on July 31, 2016 when all uses on fruit crops (the last being strawberries) will be terminated.
(Foster)

Black rot of grapes:

I've received several reports of black rot on grapes this year (see picture to right). This is not surprising considering all the rain we've had. Although the symptoms are showing up now, the infections likely occurred 2-3 weeks ago. Grape berries are highly susceptible from bloom through 4-5 weeks after bloom. Fruit develop resistance naturally afterwards. At this point in the season we are about 4 weeks post bloom in the Lafayette area, so berries may still be susceptible. Southern growers are likely past the risk for further infections so there are probably no additional infections occurring. However, since it takes about 2-3 weeks for the symptoms to show up, more fruit may begin to rot over the next week or so.

Control measures are aimed at the most susceptible period, from bloom through 4-5 weeks post bloom as mentioned in a previous issue of the newsletter. At this point in the season the possible options include:
1. captan or Ziram plus one of the DMI/SI fungicides (Bayleton, Rally, Mettle, Procure, Tebuzol),
2. a pre-mix that contains a DMI/SI (Inspire Super, Quadris Top, Revus Top),
3. one of the strobilurin fungicides (Abound, Sovran, Flint) or
4. a pre-mix containing a strobie (Pristine, Quadris Top).

At this point in the season, central and northern growers should make one or two more sprays for black rot. After that, they should be past the period of greatest concerns for fruit rot problems. At that point, it becomes a situation where weekly scouting for disease and insect problems is the best approach. See the articles below about downy mildew and Japanese beetles.

It is important to realize that sanitation is critical to black rot control. If black rot has been a problem in the past and mummified clusters are left in the vines, they produce spores over an extended period and make the disease much harder to control. Removal of all mummies and cluster stems during dormant pruning is critical.
(Bordelon)

Black rot

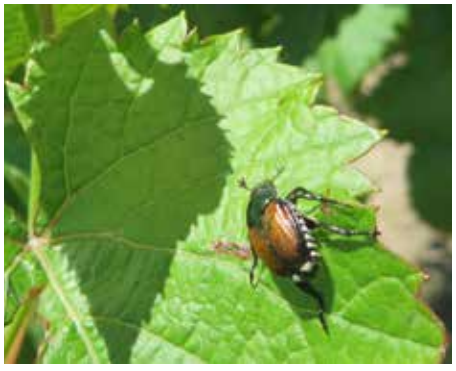
Japanese Beetles:

Japanese Beetles begin showing up over the past week or so. They can be a serious concern for grapes and berry crops. In grapes, they are a problem almost every year, even though the damage they cause may be minimal. They feed exclusively on the foliage and there are considerable differences in preference among varieties. They tend to be attracted to thin leaved varieties rather than labrusca types with thick leaves. They can be serious in young plantings, or those being retrained. Serious defoliation can

occur in a few days if the beetles are not controlled. It is best to scout for beetles and their damage at least twice each week. They tend to congregate in hot spots, especially along the ends of rows and outside rows. Remember the concept of threshold of damage. Some leaf damage is acceptable and will not affect yield or fruit quality. And since they may be concentrated on the outside edges of the vineyard, perimeter spraying is an option. You may not need to spray the entire block.

On small fruits the situation is a bit different. Japanese beetles feed directly on the fruit, rather than the leaves. They are particularly a problem in blueberries and raspberries.

Sevin (carbaryl) is one of the recommended insecticides. It is very effective on Japanese beetle adults. However, Sevin is also toxic to bees and beneficial insects. There are many options listed in the Midwest Small Fruit and Grape Spray Guide. (Bordelon)



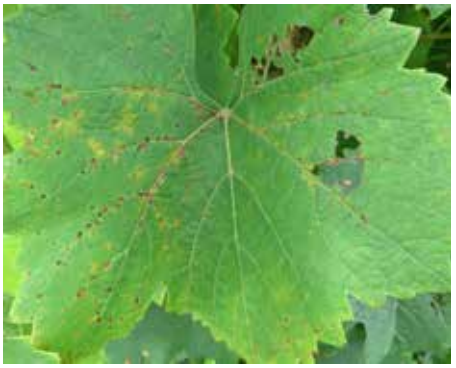
Japanese Beetle

Downy mildew of grapes:

I've received reports of downy showing up early this season. Since the past two years have been very bad "downy" years, growers should scout regularly for this disease and treat appropriately to keep it from getting established

Downy is normally a late summer disease in the Midwest that, left unchecked, will cause early defoliation. Premature defoliation leads to poor hardening for winter and poor bud and wood survival. So control is especially important for vine health. Susceptible varieties include several commonly grown such as Vidal, Traminette, Chardonel, Corot noir, Vignoles and La Crescent. Varieties that are less susceptible include Chambourcin, Foch, Frontenac, Marquette, and Norton. Table 4 in the Midwest Small Fruit & Grape Spray Guide has a list of varieties.

There are several options for managing downy mildew. At this point in the season it is too late to apply long PHI products such as mancozeb (66 days), Ridomil Gold Copper (42 days), or Ridomil Gold MZ (66 days). However several fungicides with PHIs shorter than 30 days are available. Protectant products such as captan, ziram and phosphorous acid are effective. Phosphoric acid products have a short residual, but very good antisporulant activity. There are several newer fungicides specifically for downy mildew such as Forum, Presidio, Ranman, Revus and Zampro. Several pre-mixed products such as Quadris Top and Revus Top are effective. Some of the strobilurin fungicides are also effective against downy. However, resistance development is a major concern, especially with the strobilurin fungicides. Resistance has developed on the east coast so growers should avoid relying solely on strobies such as Abound, Sovran, Flint, Pristine, etc. Always rotate to a fungicide from a different FRAC group, or tank mix with a protectant. (Bordelon)



Downey mildew upper leaf surface

Downey mildew lower leaf surface

Edema on Apples Looks A Lot Like Blister Spot:

Edema (or oedema) is a physiological disorder that results when the plant takes up more water through the roots than the leaves can give off through the stomates or lenticels (transpiration). The excess water usually accumulates in the leaf cells, causing them to enlarge and sometimes burst. As cells become engorged with water, small blisters may appear on the upper or lower surface of the leaf, or on the fruit (Fig. 1).

Fig. 1

The affected cells often have a dark green water-soaked appearance surrounding these swollen cells and may suggest bacterial disease, like blister spot. Over time, these blisters may develop a corky appearance. Blisters may eventually harden to form white, tan, brown or rusty pustules on the fruit (Fig. 2) or leaves. In severely affected plants, edema can develop on petals, petioles, and stems, and apparently, fruit. The appearance on fruit is fairly unusual. In the case of many herbaceous plants, and houseplants, continued conditions may result in leaves that droop, turn yellow, and fall off (abscise).

Fig. 2

On apples, this problem could be easily mistaken for blister spot. Unlike blister spot, no bacteria can be observed in the pustules. However, at least in this case, Mutsu was one of the few unaffected varieties of apples!

Most apple growers who grow Mutsu (or Crispin) are concerned with the blister spot, caused by a bacterium Pseudomonas syringae. Symptoms of blister spot appear months after petal fall. Like edema, symptoms begin as small, green, water-soaked, lesions that develop into raised blisters (Fig. 3).

Fig. 3

Symptom development occurs at the lenticels on the fruit. As the fruit grows and develops, the blisters expand as well, growing to be about 3/16 inch and become darkened and purplish. Although Mutsu is most susceptible to this pathogen, many cultivars including Golden Delicious, Cortland, Red Delicious, and Jonagold are susceptible to this disease as well. Problems on the other cultivars usually develop when these susceptible cultivars are planted beside a block of the infected Mutsu cultivar.

The bacteria that causes blister spot spread when the rain spreads the bacteria onto the fruit. The bacteria infect through the lenticels and require only a misting rain or brief shower to spread the bacteria to new infection sites. The bacteria overwinter in buds, leaf scars, and diseased fruit that are left from the previous season. The bacteria multiply on developing leaves without causing obvious symptoms during the spring and are rain-splashed to leaves and other plant surfaces throughout the orchard.

It is too late now, but if blister spot is a problem, apply streptomycin at 1/2 pound per 100 gallon dilute rate at first and second cover. If the weather pattern of rain continues, two additional sprays should be applied at weekly intervals. Streptomycin-resistance has been documented in commercial orchards in the northeastern United States.

In the case of edema, severe rainfall is probably the culprit in this problem so management options are limited, particularly after the fact. In apples, certain varieties are apparently more susceptible than others, and the role of rootstock remains uncertain. (Beckerman)

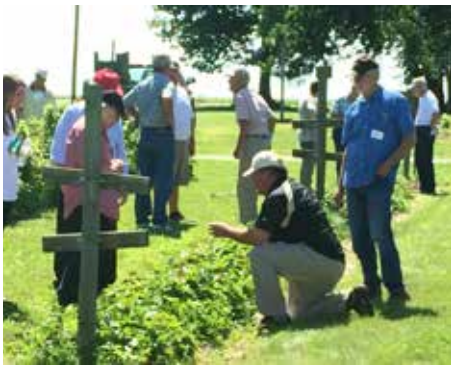
Current bud stages West Lafayette, IN

Apple	**Grape**	**Raspberry**
		
Fruit at around 2" diameter	*Bunch closure (berry touch)*	*harvest continues*
Peach	**Blackberry**	**Strawberry**
		
Fruit starting to develop color	*Fruit developing red color*	*Renovation has begun*

Successful Hort Society summer meeting:

Over 70 growers joined us at the Purdue Meigs farm last week for the summer meeting of the Indiana Horticultural Society. We enjoyed beautiful weather (probably the best day so far this summer) and saw both research and management strategies for apples, grapes, berries as well as sweetcorn. The growers I spoke to found the day to be both enjoyable and worthwhile. The morning session on sprayer calibration and quality of spray water was also popular with growers. If you have thoughts or suggestions regarding future summer meetings, please send me a quick email and share your ideas. Our hope is that in the future we can have summer field days that are as valuable, informative and well attended as this one.

(Hirst)



Upcoming events:

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, Jeremy Lutter

•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

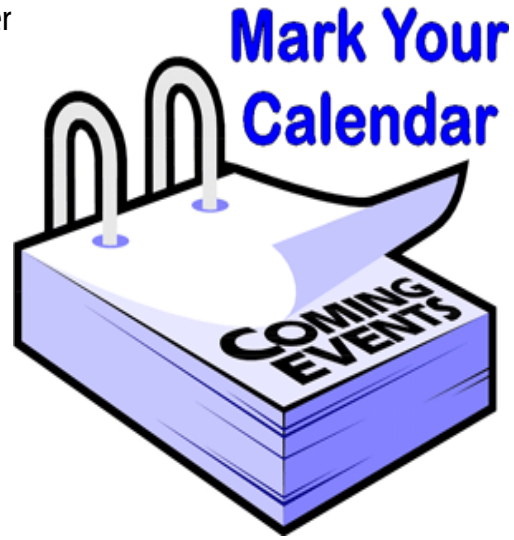
Jan. 19-21, 2016:

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

Reference to products in this publication is not intended to be an endorsement to the exclusion of others that may be similar. Persons using such products assume responsibility for their use in accordance with current directions of the manufacturer.

Follow us on:

FaceBook *Twitter*

PURDUE UNIVERSITY

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