PURDUE UNIVERSITY

PURDUE EXTENSION

FACTS FOR Fancy Fruit

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In this Issue

Crop Conditions:

Apples, peaches and cherries are in bloom.

In Lafayette grapes are at bud break to 1-inch shoots. Blackberries are at 1-inch shoots and raspberries are at 2-3 inch shoots. Blueberries are at pink tip. Strawberries are pre-bloom with flowers visible out of the crowns. Frost occurred on 4/23 and 4/24 in the Lafayette area with lows of 31˚F and 28˚F respectively. Minor damage occurred to early grape varieties that were at 1-inch shoots. Less than 10% of the shoots were damaged so there should be no effect on yield. Later grape varieties were not damaged. Minor damage occurred in strawberries. Even though blooms were not open, the king blossoms that were out of the crowns were killed. This probably represents less than 10% yield loss. See pictures here.
(Bordelon)

Frost damaged strawberry flower

Normal (undamaged) strawberry flower

Marquette grapes with frost damage & undamaged buds

Current bud stages West Lafayette, IN		
Apple	*Grape*	*Peach*
		
Almost full bloom	*1 inch shoots*	*Full bloom*
Sweet Cherry	*Black Raspberry*	*Strawberry*
		
Full bloom	*2 inch shoots*	*First bloom*

Spring Temperatures:

In terms of accumulated growing degree days, we started off the season slow but recent warm temperatures have us tracking ahead of normal, although not as early as 2012 (Figure 1).

Remember that accumulation of Growing Degree Days are important for determining the rate of both plant and insect development. (Hirst)

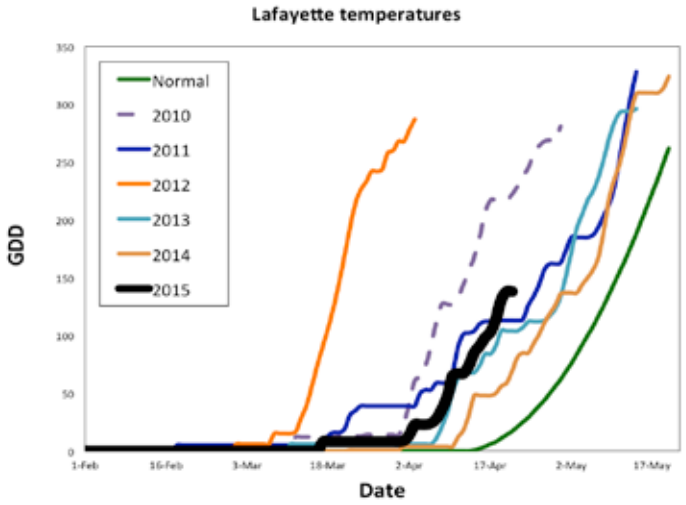

Fig. 1 Spring temperatures in Lafayette over the last six years

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:

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

Spring Frost:

It seems every year there are parts of the state that are hit by spring frosts. This year is no exception and we've seen widespread frosts that have hit the state over the last week or so. Fortunately the frosts have been pretty light and for short durations. At the Pinney Purdue station, 26˚F was recorded (but only for an hour) and 27-28˚F was seen in a number of other places. In all cases the temperature stayed at minimum levels for only a couple of hours. Many crops are most cold sensitive at bloom time and in much of the state these frosts came at around the time of bloom. However when we look at the critical temperatures (see the last couple of pages of the Tree Fruit Spray Guide), we see it takes 28˚F to cause 10% damage in apples and peaches at bloom, and 25˚F to cause severe damage (90%). Given the short duration of cold temperatures, we would not expect to see a lot of damage from the recent frosts. In Lafayette we cut some apple buds and found 5-10% dead. This is not enough to cause any noticeable effect on yield. So the bottom line for most growers is that we dodged a bullet so far, so stock up on chemical thinners.
(Hirst)

Chemical Thinning:

We're getting close to the time when growers need to make chemical thinning decisions – for many the most perplexing and risky decision they will make all year. This is usually a tricky call to make, even more so when we have had spring frosts. Luckily in most places the spring frosts have not been severe enough to affect the crops to any great extent.

As apple crops approach petal fall, it's time to start chemical thinning. Pollinating weather has generally been favorable and with every passing day, the risk of a damaging frost is reduced.

The effectiveness of a chemical thinner application depends on many factors and to hit it just right takes as much art as science. That's a fancy way of saying that we don't really understand why different orchards respond differently to a given thinner application. But we know they do. That's why it's impossible to develop a recipe approach to thinning. So let me explain a little about how thinners work, then discuss some specific strategies.

From the time of bloom and for the next month or so, there are thousands of flowers and developing fruitlets on the tree, struggling to get enough resources to grow. By resources I mean food in the form of carbohydrates. These carbohydrates come from stored sources in the tree but especially from leaves taking light energy and converting it to carbohydrates through the photosynthetic process. At this time of the year, leaf area for photosynthesis is limited, so there is a shortage in the supply of carbohydrates. Because the demand exceeds the supply, fruitlets compete for carbohydrates and the strong survive. The weak flowers or fruitlets lose out and drop off, which we call fruit drop or June drop. The thinners we commonly use in Indiana exacerbate this shortage, so that even more fruitlets drop off. Some, like NAA, reduce photosynthesis so there is less carbohydrate supply. Others (such as Sevin) decrease the flow of carbohydrates from leaves to fruitlets, thereby also decreasing the supply. The Maxcell-type thinners increase respiration, burning up more carbohydrates so less is left over for developing fruitlets. So in these 3 different ways, thinners increase the shortfall of carbohydrates resulting in increased fruit drop. Keeping this in mind allows growers to predict the response to thinners from year to year. For example, a lot of cloudy weather soon after bloom means less light for photosynthesis, less carbohydrate and increased fruit drop. In that situation growers may want to back off a little with their thinner rates. Thinners work best when the weather is warmer. The optimal temperature is around 70˚F and below 60 you may as well not bother – most thinners are not going to have much effect when it's that cool. When the temperature is 80˚F or above, be careful – thinners can have very strong effects at those temperatures.

It turns out that some of our most biennial varieties (Fuji, Golden Delicious) are also some of the more difficult to thin. So not only is thinning more difficult, the consequences of inadequate thinning are greater. Keep in mind your own experience on your orchard, but with Fuji you might want to start with a full rate of Maxcell soon after petal fall. Wait a full 2 weeks to see the response to the thinner application before applying more thinners. If another application is needed, I'd suggest ONE of the following, depending on how aggressive you want to be. In order from conservative to most aggressive, I suggest:

Maxcell again

Sevin

Maxcell + sevin

Maxcell + ethrel

Maxcell + oil

Keep in mind these are general thoughts based on my experience and published research, but as you know things work a little differently on different farms, so mix these thoughts with your own experience to come up with a plan. Most products do not thin Fuji enough. I'd put NAA/NAD, carbaryl and ethephon in this category. I'd stay away from NAA and NAD because of the tendency to form pygmies. Starting at petal fall gives you some time for a follow up application 2 weeks later if necessary and spreads the risk. The single application approach is putting all your eggs in one basket and too risky for many growers.
(Hirst)

Sooty Mold on Bark:

I've received a few samples from growers in the last week or two with concerns about 'fire blight' because of the black limbs that were observing. Fortunately for everyone, the problem was only 'really bad' sooty mold (Fig. 2).

One easy way to identify sooty mold is to simply rub the affected area with your finger (and a bit of spit) to see if you can easily remove the 'soot' (Fig. 3).

Fig. 2 Sooty mold

Fig. 3 Sooty mold removal

Sooty mold is made up of different types of fungi, most often living in the excrement (also called 'honeydew') of aphids and other sucking insects. In this instance, we were not able to observe any insect pests. It is important to stress that sooty mold lives in the reportedly sweet, sticky excrement left by the insect; sooty mold does not infect the plant. The only possible damage that sooty mold can cause is if extensive areas of foliage become covered, blocking photosynthesis. For this reason, there is no management in this instance because it simply isn't a problem.

Fire blight is a very different disease, and one growers need to be familiar with. Fire blight produces several different symptoms depending on the host and site of infection. The most commonly observed symptom is the characteristic "shepherd's crook" that develops on wilting twigs, shoots and leaders. The name "fire blight" aptly describes the blackened leaves characteristic of infections on pears—not apples. In apple, leaves of infected branches often turn reddish brown to brown.

One of the most important aspects of successfully managing fire blight in an orchard is recognizing it early and removing it quickly. As we enter bloom in the northern part of the state, protecting those blooms with streptomycin and limiting growth with apogee are two of the best tools that can be used to prevent fire blight from becoming established.

https://www.extension.purdue.edu/extmedia/BP/BP-30-W.pdf

(Beckerman)

Insecticide Spray Schedules When You Have No or a Partial Crop:

After harsh winters or late freeze events, growers are often faced with either a complete loss of their crop or at least a reduced crop. A common question in those situations is how to adjust the insecticide spray schedule to account for less than a normal crop. If you have no crop, you can eliminate all the insecticide applications that are targeted at insects that attack the fruit. For example, on apples there is no need to spray for plum curculio, codling moth, Oriental fruit moth or apples maggots. Essentially, your goal should be to make the minimum number of sprays necessary to keep the plants healthy. Pests that attack parts of the plant other than the fruit should still be controlled, such as aphids, mites, scales, peach tree borers, etc. Usually, this will mean that you can severely reduce the number of insecticide applications.

The trickier situation is if you have a partial crop. It is my belief that if you are intent upon producing a marketable crop, you should maintain a full spray schedule whether you have a full crop or 10% of a full crop. You should include the cost of this complete spray schedule when you are deciding if you have enough of a crop to be worthwhile protecting. If you decide that a full spray schedule would be too expensive for the size crop you have, you may want to just write off that crop this year. There are no short cuts. You shouldn't say "Since I only have half a crop I will only spray half as much insecticide." If anything, if you have fewer fruit and the same number of insects attacking them, you could have more damage per fruit than you would in a normal year.

(Foster)

Spotted Wing Drosophila:

As you might expect for a relatively new pest like SWD, we are learning a lot about how to manage it each year. The recommended trapping system continues to evolve. According to Dr. Rufus Isaacs at Michigan State University, the current recommendation is to use deli cups with holes drilled in them as in the past, but the traps should be baited with a dual lure produced by Trece and available from vendors such as Great Lakes IPM. The liquid in the trap can be soapy water. Having sorted through a few of the sugar/yeast traps (students did most of the work), I can tell you that this is a welcome change.

Another recent research finding is that populations of SWD may build up in wooded areas before we catch any in the traps. It's really unclear what plants they are feeding on in the woods at this point. Even though we are recommending that you start spraying insecticides when you catch the first fly in your trap, it's possible that you may see damage before you catch any flies. Therefore, it would be a good idea to do a salt flotation test on some of your early fruit to look for maggots, or otherwise look for maggots in the fruit. I personally find it easier to do direct observations, particularly on raspberries and blackberries.
(Foster)

Codling Moth Pheromone Traps:

Apple growers should remember to put their codling moth pheromone traps in the orchard by bloom. My traps near Lafayette have been out for about a week now. I haven't caught any moths, which may be related to the 33° nighttime temperatures we seem to be having all too often lately. Temperatures are forecast to gradually warm up to the mid-70s by the weekend so insect activity should be picking up soon. For more information about pheromone traps, see the first edition of FFF for 2015.
(Foster)

Orange Slime on Grapevines:

The Polar Vortex during January 2014 caused significant trunk damage in grapevines. Consequently, lots of trunks have been cut off as vines are being renewed. This spring we are seeing many instances of an orange goo growing on the cut trunks (Fig's 4 & 5). It looks very alarming, but it is actually a harmless slime mold that is growing on the sap that flows from the large cuts. It is the organism Cryptococcus macerans (perfect stage Cystofilobasidium macerans) a type of yeast. It does not harm the vines and will not spread to other plants. It can, however, be potentially dangerous to humans, causing a form of meningitis. So look and it but don't touch it. The organism will eventually dry up and flake away (Fig's 6 & 7).
(Bordelon)

Fig. 4 Orange slime mold growing on a grapevine trunk

Fig. 5 Orange slime mold growing on a grapevine trunk

Fig. 6 Orange slime mold as it dries

Fig. 7 Dried Orange slime mold

More on Effect of Water Quality on Pesticides:

I wrote about water quality impacts on pesticide performance in the last issue of Facts for Fancy Fruit Newsletter. I've received some questions about water hardness and water pH. These are separate issues. Water pH is the measure of the number of hydrogen ions (negative log of the hydrogen ion concentration). It can be very important with some fungicides and insecticides as mentioned in the article in the last issue. Adding an acidifier to the tank such as citric acid, LI-700, etc. will reduce the water pH and prevent alkaline hydrolysis, but will not reduce hardness. Water hardness is caused by dissolved minerals, usually iron, calcium and magnesium. Water is considered hard if it has 200 ppm or more of these positively charged (cation) minerals. Water is considered softened when the calcium and magnesium cations are replaced with sodium or potassium ions. Adding ammonium sulfate is recommended for many herbicides, especially glyphosate, to prevent calcium and magnesium ions from reacting with the glyphosate molecules. Ammonium sulfate has minimal affect on water pH. It is not clear to me what impact hardness has on fungicides or insecticides and most labels do not mention water hardness. But it makes sense to read the labels completely and to know the quality of the water used in the sprayer. There are several adjuvants on the market specifically designed to adjust pH and "condition" hard water. Test kits for both pH and hardness can be purchased at many box stores. Look in the swimming pool supply aisle.
(Bordelon)

Off to a Good Start

"Apple IPM for Beginners" is a new guide for beginner growers who want to grow apples. This series of fact sheets (.pdfs) will help you address the major apple pests, but does not guarantee perfect fruit. These fact sheets and scouting guides are a compromise between the most accurate, complex information researchers have to offer and the amount of information a beginner can take in. Read the first four chapters carefully to start this new venture, then follow the Scouting Calendar as apple stage of growth advances week- by-week. Go to our website to order your copy: http://www.fruit.cornell.edu/orchard-ipm/.
Deb Breth, Lake Ontario Fruit Program, Albion

Upcoming events:

Fruit Growers meetings:

May 5, 2015:
Eastern Indiana Horticulture Society: Tuttle Orchards at 6:00 PM. We are located 5 mi. south of Fortville at the intersection of 300 West and 600 North. 317-326-2278. Please check our web page for more info. tuttleorchards.com

June 2, 2015:
Eastern Indiana Horticulture Society: James Heasley's "Slice of Paradise" at 6:00 PM. Jim has an extensive variety of plantings of all kinds of small fruit and tree fruit. Located at 3912 S. Felton St., Marion IN. This is close to the intersection of S.R. 15 and 38th. St. 765-674-3791 There will only be street parking.

June 11, 2015:
Blueberry Growers of Indiana Spring Meeting and potluck. 4:00 pm at Country Heritage Winery, LaOtto, IN. More information will follow.

June 23-24:
Indiana Horticultural Society summer meeting and field tour, Purdue Meigs farm, Lafayette, IN.

July 21, 2015:
Indiana Winery and Vineyard Association Summer meeting. Country Heritage Winery, LaOtto, IN. More information will follow.

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

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