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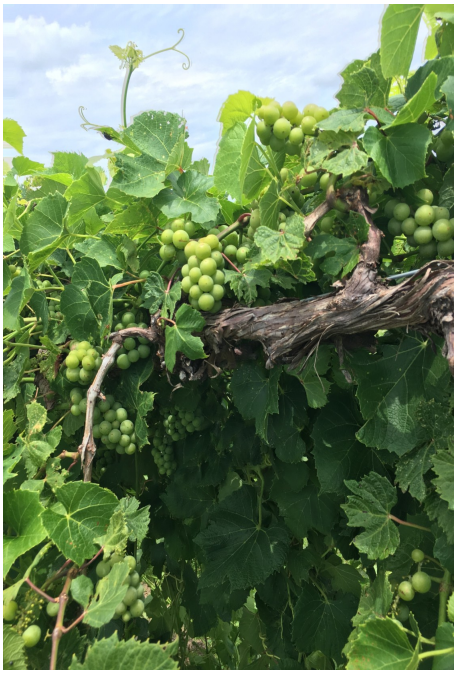
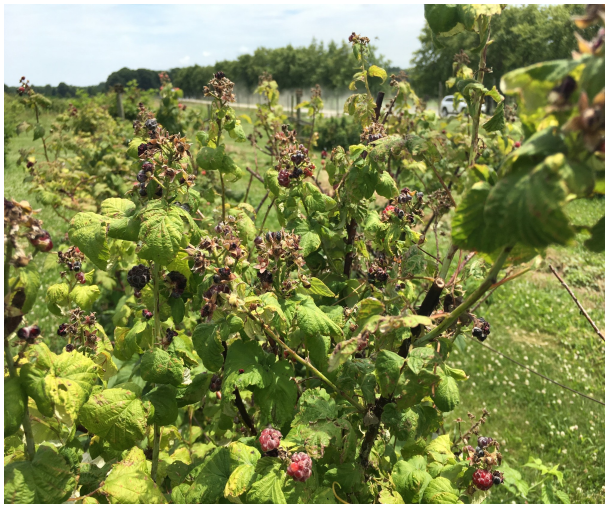
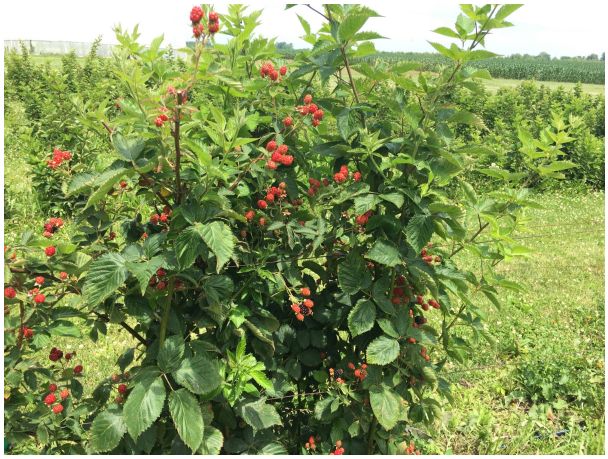
In This Issue


Grapes at bunch closure

Crop Conditions

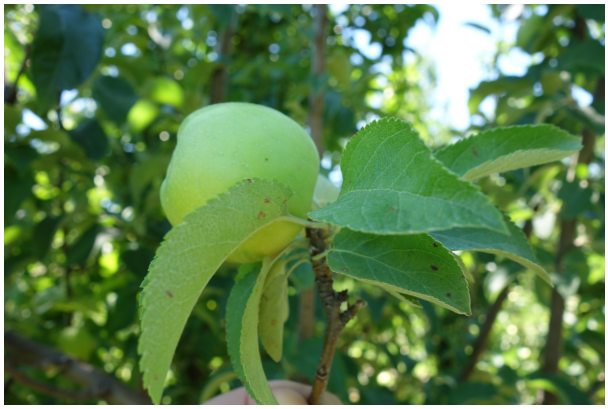
Summer bearing brambles are showing the full extent of the freeze and frost damage from earlier this year. Many floricanes are failing to produce a decent crop. Primocanes are growing well and are initiating flowers now. Early types are beginning to bloom. Grape are at bunch closure with veraison not far away for early varieties. Strawberry renovation should be complete and new runners plants taking root.


Black raspberries with very poor fruit set on floricanes due to freeze injury.



Quachita blackberry at the start of harvest

Early apples almost ready for harvest.
Peach harvest will begin soon.



Honeycrisp Apple

Powdery Mildew

Figure 1

Fig. 2

Fig. 3

Since 2012, apple powdery mildew(PM) has been part of new normal of apple growing in Indiana. As many of you remember (but would like to forget), 2012 was the year when much of the state lost the crop due to a late season freeze. This was then followed by one of the driest years on record. The loss of fruit resulted in many growers greatly reducing their fungicide applications, or using just captan or mancozeb, which, although effective against scab, are not effective against powdery mildew. This led to a build-up of PM inoculum, and continued management issues surrounding this problem.

Powdery mildew symptoms can range from the subtle (Figure 1) to the incredibly obvious (Figure 2), and everything in between. As these Honeycrisp terminal buds break due to excessive rainfall, new growth is very susceptible to powdery mildew. Cover sprays should include either Pristine, Merivon or Luna Sensation, Sovran (if the PHI is acceptable), Flint, or a DMI fungicide like Rally, Indar or Topguard. In Indiana, as in many places, the following cultivars are susceptible: Jonathan, Ida Red, Cortland, Baldwin, Granny Smith, and Mutsu. We are starting to see an increase of symptoms of PM on Honeycrisp, too. Although no one cares about the foliage, PM also infects fruit, and can cause a russetting of the skin that some consumers find objectionable (Figure 3).

One of the most effective fungicides against PM is Rally, if resistance is not an issue. The strobilurins (Sovran, Flint) or the 7-11s (Merivon, Pristine, Luna Sensation) are also excellent mildewcides. Although too late for this year,

sprays to control mildew should begin at tight cluster through about fourth cover.

Cold weather in winter (below -11 degrees F) will kill mildew-infected buds, reducing overwintering inoculum, and may be the only reason to hope for a cold winter!

Japanese Beetles on Grapes and Berries

Rick Foster noted in the previous issue that Japanese beetles were out. Wow are they ever! I haven't seen them this bad in years. Small fruit growers should monitor their crops and control the beetles if necessary. Japanese beetles will feed on ripening fruit of brambles and blueberries, and on foliage of all small fruit and grapes. Heavy beetle feeding can stunt young fruit plants that are not yet in production (and not receiving regular insecticide treatments). Fortunately, Japanese beetles are fairly easy to manage. Sevin or any of the pyrethroid insecticides will provide good control. Organic growers can spray neem, which acts as a repellent. Several applications may be required. Grape growers should note that Sevin has an extended 6 day Re-Entry Interval (REI) when shoot positioning, etc. so Assail, Baythroid, Brigade, Danitol, or Mustang Maxx might be better options. (Note that the table on page 99 of the spray guide is incorrect. Read the label!)

Japanese beetle feeding on red raspberry foliage

Quachita blackberry with minor Japanese beetle damage

Japanese beetle feeding on flowers of primocane fruiting blackberry

Japanese beetles feeding on grape leaves

Brown Marmorated Stink Bugs

Last year some apple growers reported damage from brown marmorated stink bugs, particularly in the northern counties. BMSB will also attack peaches and other fruit, as well as a number of vegetables. Now is the time that growers should be watching for BMSB and its damage. There are a number of commercially available traps that will help you to detect them. I suggest that you put one or more of these traps in several different areas of your orchard, depending on the

size of your farm. The more spread out your plantings, the more traps you should put out. If you catch BMSB in your trap, you should begin inspecting your trees for either the bugs or signs of their feeding, which is puncture wounds in the fruit. Often, the damage will not be apparent for a couple of weeks after feeding, so the presence of the bugs in the traps or trees may be the better indicator. Some products that have been found effective include many of the pyrethroids (Capture, Warrior, Danitol), as well as some of the neonicotinoids (Actara, Assail, Belay, Venom/Scorpion) and an older product, Lannate. As I described in my article in the March 30 edition of FFF, products like the pyrethroids are likely to cause European red mite outbreaks as a result of killing the predators that normally keep the European red mites under control. However, the potential losses from BMSB and the availability of a suite of very effective miticides demands that growers control BMSB first and deal with the consequences (mite outbreaks) later if they occur.

Spotted Wing Drosophila

For those of you who follow me or Peter on Twitter, you know that last week I found SWD larvae in raspberries at the Meigs Farm near Lafayette. Small fruit growers should be into their rigorous spray schedules now. If fruit are ripe or ripening, growers should be spraying approximately every 5 days. The available insecticides depend on the crop so check the Midwest Fruit Pest Management Guide for your options. It is important to rotate between different classes of insecticides to avoid the development of resistance. For conventional growers that might mean a pyrethroid, Delegate, and malathion, for example. For organic growers, the only two choices are pyrethrin and Entrust. When spraying pyrethrin, use the lower end of the rate range and spray more frequently because pyrethrin has little or no residual activity. Whatever products you spray with, be sure to notice the pre-harvest intervals, which can be problematic in some crops.

Pre-veraison Canopy Management and Fruit Thinning in Grapes

Veraison, the start of the fruit ripening process, signals the final opportunity for effective canopy management and fruit thinning in grapes. Once veraison has started, thinning and canopy management are far less effective in improving overall fruit quality. Growers should assess the need for fruit thinning by evaluating cluster number and size relative to shoot length. Short shoots should be de-fruited to eliminate inferior quality fruit. Second crop (summer) clusters should be removed as they will not ripen with the rest of the crop. Canopy management might consist of removal of laterals in the fruiting zone, tipping excessively long shoots, and leaf removal to increase sunlight exposure to the fruiting zone. At this time of the year, pressure from fruit rots is minimal but scouting should continue for leaf diseases downy and powdery mildew.

Determining Apple Maturity

Making the decision on when to harvest can be a very tricky and complicated issue. The longer you intend to store the fruit, the more precise your timing needs to be. For summer apples, most growers only intend to store fruit until their better quality fall apples come on stream, so storage times beyond a week or two are not that common. For example, very early season apples such as Lodi and Pristine should only be stored

for a few weeks until Gala harvest begins. Even for fall apples, many Indiana growers aim to sell the majority of their crop immediately to the consumer, and try to be done by mid November or so. So since storage times are relatively short, harvest maturity is less important than for longer term storage. This being the case, apples should be harvested when they are fully ripe. This will maximize their flavor, and although it reduces their storage potential, this is not too important for many direct market growers. There are various tests for measuring fruit maturity and degree of ripeness, but taking a bite out of a few apples will give a good enough indication for fruit being stored for short periods where flavor is important but long storage life is not. Obviously this also applies to apples intended for U-pick.

Bear in mind that even in cold storage, fruit continue to ripen, just at a slower rate. Therefore, fruit intended for longer term storage should be harvested when they are less ripe. There is no single test that will give you the answer but factors such as calendar date, heat unit accumulation, fruit firmness, soluble solids concentration, starch content and ethylene evolution all give answers to a piece of the puzzle. As you can see, this gets complicated real fast. In fact, states with large apple industries have labs dedicated to performing these tests and measurements are fed into complex mathematical models to determine the optimum harvest time for fruit for long-term storage.

Beyond the taste test, if you are going to perform one test I suggest looking at starch index. As fruit ripen, enzymes convert starch in the fruit to soluble sugars, which explains why fruit become sweeter as they ripen. This test provides an estimate of how much of the starch in the apple has been converted to sugar. This test is quick, easy, and doesn't require expensive equipment.

For more details look in Chapter 7 of the Tree Fruit Pest Management Handbook, ID-93, available at http://www2.ca.uky.edu/agc/pubs/id/id93/id93.htm

Pristine™ apple

Although Pristine™ was selected in 1982, its history goes back to the early days of the PRI breeding program. From an original cross of Rome Beauty with Malus floribunda 821, selections and hybridizations were made incorporating Golden Delicious, McIntosh, Starking Delicious and Cazumat along the way. The cross that resulted in Pristine™ was Coop 10 x Cazumat made in 1974 at Rutgers University in New Jersey, and Pristine™ was selected at the Purdue Hort. Farm in 1982.

Pristine™ is a very early maturing apple usually ripening in late July in Lafayette. It is very attractive with a clean finish (see Fig. 2). For such an early apple, it has very good eating quality, certainly much better than other very early apples such as Lodi or Transparent. The texture is crisp and flavor has a good acid/sugar balance. If fruit are allowed to become over-mature, pre-harvest drop can be severe, but with timely pickings this should be a minimal problem. Fruit stores well for up to a month or so, but usually growers will probably only store the fruit until better quality, main season fruit comes along, such as Gala. Pristine™ has good field resistance to apple scab, and seems to have quite low susceptibility to fireblight and powdery mildew. Russet and skin disorders are rare, but bruising can be severe so careful handling is required.

For direct marketers, Pristine™ may be a very good way to kick off the apple season, or to transition from peaches into apples. But only grow them in such quantities that you can have

them sold by the time main-season apples are ready.

Timing Retain Sprays

ReTain (AVG) is a plant growth regulator that blocks the production of ethylene. When ReTain is applied to apple, several ripening processes are slowed, including preharvest drop, fruit flesh softening, starch disappearance, and red color formation.

In order for ReTain to be effective it must be applied well in advance of the climacteric rise in ethylene production that signals the onset of fruit maturity. If applied too early the effects may wear off prematurely. If applied too late, a significant portion of the crop may not be responsive to AVG, having already begun to produce autocatalytic ethylene. A second reason for avoiding late applications of ReTain is the 21 day preharvest interval (PHI), which, combined with a late spray date could result in an undesirable delay in harvest.

The label recommends applying ReTain four weeks before anticipated harvest (WBH). This has sometimes caused confusion, as the grower is timing the spray relative to some future, unknown date. A more scientific basis for timing would be to state that ReTain should be applied four weeks before the natural climacteric rise in fruit ethylene, but this is still a future event with an element of uncertainty. The good news is that there is a fairly wide window when ReTain can be applied with optimal results, and a fairly easy way to determine when to apply it.

The best application window for ReTain is about 10 days wide and centered on the 4 WBH date. For early season varieties, such as Gala and McIntosh, start by estimating when you would normally expect to begin harvesting the variety if no ReTain or ethephon (Ethrel, Ethephon II) were used. Now take into consideration the season. Adjust the anticipated harvest date according to how early or late you estimate the season is, then count back four weeks on the calendar. Now mark the calendar from that date through the next seven days. This is your application window for that early season variety.

Watch for good spray conditions with at least six hours drying time within that week and apply the material at the first opportunity. Congratulations! Your ReTain is on at the right time.

Now mark your calendar for 21 days after the spray was applied. This is the PHI, as required by the label. You can’t legally harvest before this date.

Repeat the same thought process for later varieties, but keep in mind that later varieties are usually less affected by seasonal variation in maturity than stone fruits or early apple varieties. It is usually unnecessary to account for seasonal variation in fruit maturity for Empire and later varieties. (Dr. Jim Schupp, The Fruit Times, Penn. State University)

Control Of Preharvest Drop with NAA

Preharvest drop refers to the process where fruit fall from the tree prior to harvest. Not all apple varieties are affected, but with some, such as McIntosh and Pristine, pre-harvest drop can be extreme. Several growth regulator materials are available to growers to help reduce pre-harvest drop. These materials are often referred to as “stop-drop” or “sticker” sprays. The traditional material used to help prevent pre-harvest drop on apples is NAA (Fruitone N), a synthetic auxin. Other synthetic auxins you may have heard of include 2,4-D and 2,4,5-T. Of course you also know Fruitone N as a chemical thinner. Early in the season NAA knocks fruit off the tree and later

towards harvest it sticks them on. This highlights the importance of timing when using plant growth regulators.

Another newer stop drop material is ReTain (see articles by Schupp and Schwallier in this issue). Although both NAA and ReTain can reduce preharvest drop, they do this in different ways. ReTain delays apple maturity whereas NAA does not delay maturity (and may even hasten it) but just reduces the fruit dropping. As Dr Schupp highlights in his article, ReTain must be applied well ahead of the anticipated harvest date so a considerable amount of planning is required. NAA on the other hand needs to be applied just before apples start dropping, so in this regard can be viewed as a rescue treatment.

Once NAA is applied it takes about 3 days for the activity to kick in. After that you can expect about 7 days of drop control. Rates of 10-20 ppm are usually effective, but knowing exactly when to apply it can be tricky. If the application is made too soon, the effect may wear off before harvest is complete. If the NAA is applied too late, then too many apples will have dropped on the ground before the NAA starts having an effect. Wait until you start to see a few apples drop, and perhaps assist this by bumping a few branches and seeing if any apples drop. Then it's time to apply the NAA. Longer stop-drop control can be obtained with a split application, 10 ppm applied 7-14 days apart. NAA works best when applied in slow drying conditions and when temperatures are warm (70-75F). Bearing this in mind, many growers apply their stop drop sprays early in the morning when there may be some dew on the trees and when temperatures are rising. Be aware that high rates of NAA (20 ppm) can advance fruit maturity.

NAA can be tank mixed and is compatible with a wide range of products. Always conduct a small test before mixing NAA with materials you haven't tried previously. Apply in enough water to ensure good coverage.

Indiana Hort Society Summer Field Day

Approximately 80 fruit and vegetable growers attended the Society's summer field day last week hosted by Tuttle Orchards in Greenfield. Thanks go to Ruth-Ann, Thomas, Mike and Helen and all the Roney family and crew who made this event such a success. Those attending also had the opportunity to pause for a moment to remember and farewell a number of outstanding growers who have passed recently, including of course Tom Roney of Tuttle Orchards.

All who attended were treated to seeing one of the best diversified fruit, vegetable and greenhouse agritourism operations in the state.

The next meeting of the Indiana Hort. Society will be at the Hort. Congress, Feb. 13-15, 2018 at the Indianapolis Marriott East Hotel. As details come to hand, they will be posted at the IHC website: https://inhortcongress.org

In Memoriam

Shirley Reisner Janick

It is with great sadness we report the passing of Shirley Janick. Shirley was the wife of Dr Jules Janick for almost 65 years. Shirley was born on August 11, 1932, in New York City, the eldest of three daughters and lived in Israel in her early years. She attended the New York's prestigious High School of Music and Art in 1950 as a voice and piano student, was a student at Brooklyn College and Hunter College, and graduated from Purdue University in 1953 in speech and audiology.

She married the love of her life, Jules Janick, in 1952, nearly 65 years ago. She was the proud

mother of Peter Aaron Janick (wife Beth), of Okemos, Michigan, and Robin Janick Weinberger (husband Alan), of Alton, Illinois, and adored her four grandsons, Noah (wife Annalise) and Lee Weinberger, and Nathan and Aaron Janick. She is survived by two sisters, Rachel Seldin and Bernice Kosowsky, and many nieces and nephews.

Shirley sang in the Bach Chorale, and served for many years as secretary to the Board of Temple Israel. She traveled widely with her husband Jules, and lived in Hawaii, Brazil, Italy, and England. Shirley was a lover of chamber music and opera and was a voracious reader, especially fond of the works of Jane Austin and Anthony Trollope. Devoted to her family, Shirley was a loyal friend and confidant, beloved by all who knew her; she had an indomitable spirit and a kind and generous heart. She will be missed.

The Hort Society sent flowers and I know all growers will join me in expressing our heartfelt condolences to Dr Janick.

John Milton Beasley

John Beasley, 68, of Danville, passed away on June 9, 2017. John was born on Dec. 4, 1948 in Indianapolis to Milton L. and Helen Irene (Scott) Beasley. He was a 1966 graduate of Danville High School. John Married Debra Derrickson in 1983; she survives.

He was a farmer and owner of Beasley Orchards in Danville, which was established in 1946. John was a member of St. Augustine Episcopal Church in Danville, as well as the Indiana Horticulture Society and the Fruit and Vegetable Growers Associations. He served his country in the U. S. Navy during the Vietnam War. Surviving with his wife, “Debbie” are his son, Calvin Beasley of Plainfield; step-children, Lyra (Adam) Baitis of Plainfield, Seth (Jill) Aichinger of Battleground; granddaughters, Gloria, Maya, Bryn and Faye; and a sister, Shirley Walters of Danville.

A memorial celebration of John’s life will be held on Wednesday, June 14th, 2017 at 11:30 a.m. at St. Augustine Epsicopal Church with visitation there from 9:30 a.m. until the time of service. Burial of his cremains will take place in St. Augustine Episcopal Gardens at a later date. In lieu of flowers, contributions may be given to the church, and/or The Michael J. Fox Foundation.

John was well known to growers around the state as a quiet and thoughtful person. He was a longtime faithful member of the statewide fruiting fraternity and will be sorely missed by growers around the state. On behalf of all growers we offer our condolences to Debbie and the Beasley family and our thoughts are with them.

Upcoming Events

Meigs High Tunnel Field Day
July 18, 2017
10am-1pm Lunch provided!
Meigs Horticulture Research Farm
9101 S 100 E Lafayette, IN
For more information contact Lori Jolly-Brown at ljollybr@purdue.edu, 765-494-1296

Indiana Winery and Vineyard Association
Summer Meeting and Vineyard Tour
July 18-19, 2017
Brown County Inn, Nashville IN
Butler Winery vineyard tour
Contact Eric Harris of Two-EEs Winery for more details. eric@twoees.com

Indiana Horticultural Congress
February 13-15, 2018
Indianapolis Marriott East
Indianapolis, IN
For further information contact Lori Jolly-Brown @ljollybr@purdue.edu or visit www.inhortcongress.org for more details.

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