



In This Issue

- Crop Conditions
- Indiana Pesticide Clean Sweep Project
- Determining Apple Maturity
- Control Of Preharvest Drop with NAA
- Pristine™ Apple
- Timing Retain Sprays
- Almost August Tree Fruit Update
- Dicamba Drift Moves Beyond Soybean Fields and Into the Public Eye
- Upcoming Events

Crop Conditions

(Peter M Hirst, hirst@purdue.edu, (765) 494-1323) & (Bruce Bordelon, bordelon@purdue.edu, (765) 494-8212)

Early grapes are just beginning to soften and color (veraison). Summer raspberry harvest is winding down and fall bearing types are flowering. Blueberry harvest continues. Japanese beetle numbers continue to be relatively high in the Lafayette area. Peach harvest (for those fortunate to have a crop) has begun. Early apple cultivars are approaching harvest.



Grapes at the beginning of ripening (veraison)



Primocane fruiting blackberry – bloom



Apple – early apples such as Pristine approaching harvest

Indiana Pesticide Clean Sweep Project

(Bruce Bordelon, bordelon@purdue.edu, (765) 494-8212)

An **Indiana Pesticide Clean Sweep Project** designed to collect and dispose of suspended, canceled, banned, unusable, opened, unopened or just unwanted pesticides (weed killers, insecticides, rodenticides, fungicides, miticides, etc.) is being sponsored by the Office of Indiana State Chemist (OISC). This disposal service is free of charge up to 250 pounds per participant. Over 250 pounds there will be a \$2.00 per pound charge. This is a great opportunity for you to legally dispose of unwanted products at little or

no cost.

WHO: All public and private schools, golf courses, nurseries, farmers, ag dealers, cities, towns, municipalities and county units of government or others receiving this notice are eligible to participate.

WHEN/ 9:00am to 3:00pm Local Time

WHERE: **August 14, 2018: Steuben County Fairgrounds in Angola, IN**

August 15, 2018: Jasper County Fairgrounds in Rensselaer, IN

August 16, 2018: Henry County Fairgrounds in New Castle, IN

August 21, 2018: Gibson County Fairgrounds in Princeton, IN

August 22, 2018: Washington County Fairgrounds in Salem, IN

August 23, 2018: Hendricks County Fairgrounds in Danville, IN

HOW: Complete the **Pesticide Clean Sweep Planning Form** (available at this link: https://www.oisc.purdue.edu/pesticide/clean_sweep.html) to the best of your ability. Mail, fax or e-mail the completed form to Garret Creason at 765-494-4331 or gcreaso@purdue.edu no later than **Mon., August 1, 2016**. Then bring your labeled, leak free and safe to transport containers to the collection site. DO NOT mix materials. In case of an emergency, you should bring with you a list of products you are carrying and a contact phone number.

*NOTE: OISC reserves the right to cancel this Pesticide Clean Sweep Project if there is not adequate demand. Participants submitting the enclosed planning form by August 1, 2016 will be contacted immediately if cancellation is necessary.

Determining Apple Maturity

(Peter M Hirst, hirst@purdue.edu, (765) 494-1323)

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 higher 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. 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 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 precise 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. So in Figure 1, the fruit with a rating of 0 (completely black) are full of starch and not ready to be harvested. The fruit with a rating of 6 have almost complete conversion of starch to sugar and are ready for immediate consumption. 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>

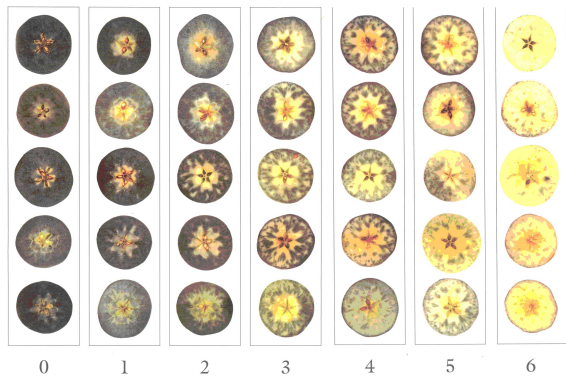


Figure 1. Staining of starch of apple fruit by misting with iodine solution. Fruit 0-2 are unripe with much starch remaining. At ratings of 5-6, most of the starch has disappeared (converted to soluble sugars) and are ready for harvest

Control Of Preharvest Drop with NAA

(Peter M Hirst, hirst@purdue.edu, (765) 494-1323)

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.

Pristine™ Apple

(Peter M Hirst, hirst@purdue.edu, (765) 494-1323)

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. In most seasons it will be a couple of weeks ahead of Gala. It is very attractive with a clean finish. 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 harvesting 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 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 (such as Gala) are ready.



Pristine™ apple

Timing Retain Sprays

(Peter M Hirst, hirst@purdue.edu, (765) 494-1323)

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)

Almost August Tree Fruit Update

(Janna L Beckerman, jbeckerm@purdue.edu, (765) 494-4628)

Stone Fruit:

At our orchard, we lost our stone fruit with the -20 degree F temperatures this winter. For those of you fortunate enough to have fruit, frequent and heavy rain present problems multiple problems, namely bacterial spot and brown rot. Three weeks before harvest, cease bacterial spot sprays, even though bacterial spot may continue to be an issue with this hot wet weather. You can still manage brown rot. To maintain and protect fruit, be sure to rotate chemistries by FRAC Code to minimize the risk of fungicide resistance. Some options to consider (choose one from each column and then choose a different column-do not repeat a column back to back, and always used the highest labeled rate).

FRAC Code 1	FRAC Code 3	FRAC Code 7	FRAC Code 7 +11	FRAC Code 11	FRAC Code M4
Topsin M 1-day PHI	Indar 0-day PHI	Fontelis 0- day PHI	Luna Sensation 0-day PHI	Flint Extra 0-day PHI	Captan 0-day PHI
	Inspire Super 0-day PHI		Merivon 0-day PHI		
	Quash 0-day PHI		Pristine 0-day PHI		

Dicamba Drift Moves Beyond Soybean Fields and Into the Public Eye

(Bruce Bordelon, bordelon@purdue.edu, (765) 494-8212)

Here's an excellent story from The Progressive Farmer on dicamba drift.

<https://www.dtnpf.com/agriculture/web/ag/news/crops/article/2018/07/20/dicamba-moves-beyond-bean-fields-eye>

Upcoming Events

(Lori K Jolly-Brown, ljollybr@purdue.edu)

August 4, 2018 Hop Harvesting Workshop

Crazy horse Hops, LLC, 8875 S Co. Rd. 925W, Knightstown, IN 46148

Contact afthompson@purdue.edu.

Register here: <http://bit.ly/hopharvest812018> or call 812-349-2575

August 30, 2018 Small Farm Education Field Day

Purdue Daniel Turf Center

Contact Lori Jolly-Brown, ljollybr@purdue.edu

or 765-494-1296

Register here: <http://www.cvent.com/d/hgqx6g>

September 5, 2018 Greenhouse & Indoor Hydroponics Workshop

Purdue University, PFEN 1159 & Purdue Horticulture Greenhouse

Contact Lori Jolly-Brown ljollybr@purdue.edu

Register here: <https://tinyurl.com/yaxd4k2z>

October 17, 2018 Indiana Flower Growers Conference

Daniel Turf Center

Contact Lori Jolly-Brown ljollybr@purdue.edu

January 8, 2019 Illiana Vegetable Growers Symposium

Teibel's Family Restaurant, Schererville, IN

Contact Liz Maynard emaynard@purdue.edu
<https://ag.purdue.edu/hla/Extension/Pages/IVGS.aspx>

February 12-14, 2019 Indiana Hort Congress

Indianapolis Marriott East Indianapolis, IN

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

<http://www.inhortcongress.org>

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