

FANCY FRUIT

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A Newsletter for Commercial and Advanced Amateur fruit growers.

In This Issue

- Crop Conditions
- From sweaters to shorts – Indiana spring keeps us guessing
- Wet weather & apple scab
- Early season grapevine disease management
- 2022 Pesticide Clean Sweep
- Bloom through petal fall are key times for codling moth and dogwood borer mating disruption strategies



Grape- 2-6 inch shoots



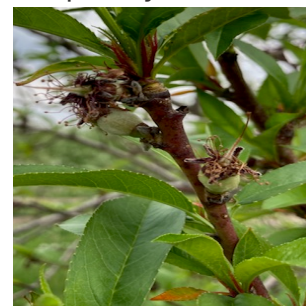
Red raspberry- 6 inch shoots



Black raspberry- 3 inch shoots



Apple- full bloom



Peaches- still in the shuck

Crop Conditions

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

From sweaters to shorts – Indiana spring keeps us guessing

(Beth Hall, hall556@purdue.edu)

Last week was marked by cooler temperatures and lots of rain. Field days were limited and

flowers were waiting to be planted. Then came this week. Temperatures are reaching the upper 80s to low 90s with dew point temperatures over 70F (anything over 60F or 65F starts to really feel muggy). The statewide rain spigot has turned off with only intermittent rain possibilities until this weekend when the chance for more rain and thunderstorms will increase across the state. What happened? Did we blink and miss spring? It can certainly feel that way, but alas, these swings back and forth between extreme conditions seem to be our new norm.

The good news is Indiana has made it past any reasonable climatological risk of a hard freeze still occurring. Severe weather has spared Indiana so far this season, and a brief period of warm dry weather could be welcomed! However, it would be a problem if the state did not receive any more significant rain for an extended period and temperatures stayed high. The current climate outlooks are favoring above-normal temperatures, but there is too much uncertainty among the climate models to provide guidance on whether precipitation over the next several weeks to months will be above or below normal. Seasonal drought outlooks (through the end of July) are suggesting our region will be spared any major drought developing, though brief periods of dryness are always possible.

La Niña is continuing to linger in the equatorial Pacific Ocean. Forecast models are favoring this La Niña to gradually weaken but not fully transition to the neutral phase until later this summer or early fall. Climatologically, La Niña events in the summer have been associated with much warmer-than-normal temperatures and precipitation amounts that are near or slightly below normal across Indiana. La Niña events have also been associated with fewer tornadoes but a higher frequency of hail events. This is still severe weather season, so the risk continues to

have severe weather.

Modified growing degree-day accumulations have been lagging the climatological average for this time of year (Figures 1 and 2), however this week's heat event may help them catchup.

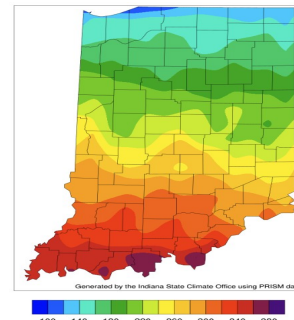


Figure 1. Modified growing degree day (50°F / 86°F) accumulation from April 1-May 10, 2022.

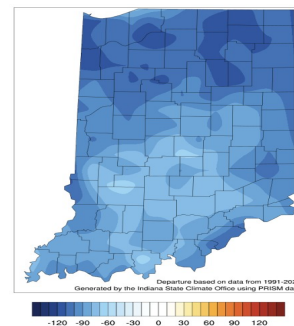


Figure 2. Modified growing degree day (50°F / 86°F) accumulation from April 1-May 10, 2022, represented as the departure from the 1991-2020 climatological average.

Wet weather & apple scab

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

Indiana seems to experience the entirety of US weather, sometimes in the same day. The recent spate of cool, wet weather has left apple scab one happy fungus (Fig. 1). Most of the state just underwent an extreme scab period, and unfortunately, few of us could do anything about it because of the combination of rain (inches) and wind (Fig2).



Figure 1. Apple scab on leaves



Figure 2. Sometimes it is better to serve as a horrible warning, instead of an excellent example. See <https://www.youtube.com/watch?v=9P3JbUP9h8Y> for more tractor disasters.

Infection Events Summary

Download CSV

Events: Dry Wet

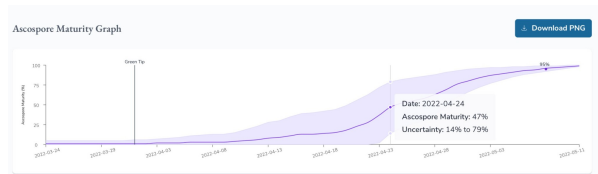
Date (2022)	Infection Events	Average Temp (°F) for wet hours	Leaf Wetness (hours)	Hours > 90% RH	Rain Amount
May 4	no	47	9	9	0
May 5	combined	55	14	16	0.65
May 6 Forecast	combined	56	24	19	0.56
May 7 Forecast	yes	50	9	0	0.03
May 8 Forecast	no	-	0	0	Night: 0% Day: 0%
May 9 Forecast	no	-	0	0	Night: 1% Day: 1%
May 10 Forecast	no	-	0	0	Night: 1% Day: 5%
May 11 Forecast	no	-	0	0	Night: 9% Day: 9%

Infection events, shown in red above, are based on the [Revised Mills Table](#) and are calculated beginning with 0.01 inch of rain. The word "Combined" means the wetting event on this day is being combined with another wetting event using the following rule: two successive wetting periods, the first started by rain, should be considered a single, uninterrupted wet period if the intervening dry period is less than 24 hours. When an infection event is in the 5-day forecast, the actual weather data logged may or may not translate into an actual infection event. Therefore, the table output may change once actual weather data are logged.

Infection Events Summary

The recent wet spell, occurring with 50 degree temperatures, and approximately 50% ascospore maturity (at the [NEWA apple scab site](#), go to the lower left corner, toggle the ascospore maturity graph to show development and then put cursor over graph to see the image below) resulted in a

scabsplosion in our orchard. We are really looking forward to seeing how our fungicide trial performs under these conditions. We were just entering bloom at the time of the scabsplosion, just as nature intended.



Ascospore Maturity Graph

Unfortunately, days of cold rain provide the perfect infection period for scab. The kicker is the fact that infection develops really slowly under these cool, wet conditions. This means symptoms may not show up for another two to three weeks. When those symptoms do appear, everyone is thinking 'Fungicide resistance!', as opposed to what really happened—heavy rains that washed off any trace of fungicide before infection became established, plus a long, cool wet infection period that delayed symptom development.

Obviously, we are past the point of rescue sprays. Furthermore, for those of you with the heaviest rains, you may have needed a canoe, kayak or small boat to get into the orchard. Heavy winds might (or should) have prevented spraying, too. So, what is a grower to do?

Keeping fruit protected is the key. For those varieties still under the 77-day PHI, I cannot stress the use of mancozeb enough to provide a tank mix partner (where needed), as it provides good scab control plus excellent summer rot protection. Most importantly, it allows you to save captan for later sprays. Plus, in this period of crazy tank mixes (bloom to 2nd cover), minimizing captan use (and risk) is always a good thing.

Keep in mind that our heavy rains will work against powdery mildew, but drive apple scab,

and even bitter rot if the weather turns warm. Alternating between the DMI fungicides (FRAC 3: Inspire, Cevya, Indar, Topguard, and Rally if you don't have significant resistance), strobilurins (FRAC 11: Flint, Sovran), FRAC 11+7 Pristine, Merivon, Luna Sensation) and SDHIs (FRAC 7: Aprovia, Fontelis). All of these fungicides will control scab, and have varying efficacy on powdery mildew, rust and some summer rots.

I started this post by mentioning that Indiana seems to experience the entirety of US weather, sometimes in the same day. It's cold, wet and generally gloomy right now. Next week, as the weather gets hot (August happens later this week), the pressure of scab will shift to bitter rot. Captan provides very good control of scab and bitter rot, especially when pressures aren't severe. Be sure the pH of your water is below 7.5 to maintain captan efficacy. The use of LI-700, ProPhyte, or other acidifiers may be needed. Our water at Meigs is so alkaline (pH 8.3-8.9), if we didn't use an acidifier, by the time we get the sprayer to the orchard we would lose at least half the efficacy! By the time we finish spraying, the application would be only 25% effective (2 half-lives).

For continued protection against bitter rot, captan can and should be rotated with Merivon/Pristine/Luna Sensation (FRAC 7+11) OR Aprovia (FRAC 7). Keep in mind that Aprovia has a 30-day PHI. The application of a FRAC 7+11 just before harvest improves storage life.

Early season grapevine disease management

(Miranda Purcell, mrpurcel@purdue.edu)

Grapevines are in early stages of growth across the state, from bud break to 10 inch shoots. Significant shoot growth is expected with the

warm weather predicted for this week. This is a very important time to maintain preventative control over major grape diseases including Phomopsis, black rot, powdery mildew and downy mildew. Fungicide application should begin at 1-3 in shoot growth and should be repeated at 7-10 day intervals according to label instructions and environmental conditions through bloom, especially prior to a predicted rain event. See Table 1 for Foundation Fungicide Program for Early Season Control of Grapevine Diseases.

Please note that downy and powdery pathogens are especially prone to fungicide resistance. To avoid this, do not apply back-to-back applications of any one systemic fungicide class.

Foundation Fungicide Program for Early Season Control of Grape Diseases¹

Product and formulation	Active ingredient	FRAC ²	Black rot	Downy mildew	Phomopsis	Powdery mildew	REI ³ PHI ³	Max amt ⁵ Max app ⁶
Captan 80 WDG		M3	1.2-2.5 lb.	1.2-2.5 lb.	1.2-2.5 lb.	1.2-2.5 lb.	48h	12 lb.
	captan		F	G	E	i	0d	NA
Microthiol Dispers		M	x	x	3-10 lb.	3-10 lb.	12h	NA
	sulfur		x	x	F	E	0d	NA
Ridomil Gold Copper		4+M	x	2 lb.	x	x	48h	8 lb.
	mefenoxam + Copper Hydroxide		x	E	x	x	42d	4
Ridomil Gold MZ		4 + M	x	2.5 lb.	x	x	48h	10 lb.
	mefenoxam + mancozeb		x	E	x	x	66d	4
Roper DF Rainshield		M	1.5-4 lb.	1.5-4 lb.	1.5-4 lb.	x	24h	24 lb.
	mancozeb		E	E	E	x	66d	6

E = excellent control G = good control F = fair control [r] = fungicide/insecticide resistance possible s = suppression only i = ineffective u = unknown efficacy
x = not not on this label

Table 1. Foundation Fungicide Program for Early Season Control of Grapevine Diseases.

For further information, see the [Midwest Fruit Pest Management Guide](#).

2022 Pesticide Clean Sweep

(Miranda Purcell, mrpurcel@purdue.edu)

Participate in the 2022 Office of the Indiana State Chemist (OISC) Pesticide Clean Sweep Project, which is designed to collect and dispose of suspended, canceled, banned, usable, opened, unopened or just unwanted pesticides (herbicides, insecticides, rodenticides, fungicides, miticides, etc.). This is a great opportunity to

legally dispose of unwanted products at little or no cost. This disposal service is free of charge up to 250 pounds per participant. Over 250 pounds will be charged at \$2.00 per pound.

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

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

WHERE: August 16, 2022: Ceres Solutions (Wabash County) 573 East 700 South, Wabash, Indiana 46992

August 17, 2022: Bartholomew County Solid Waste District 720 S. Mapleton Street, Columbus, Indiana 47201

August 18, 2022: Daviess County Highway Department. 5247 East 100 North, Montgomery, Indiana 47558

August 23, 2022: Davis Purdue Agricultural Center (DPAC) (Randolph County) 6230 IN-1, Farmland, Indiana 47340

August 24, 2022: Co-Alliance (Porter County) 210 East 400 South, Valparaiso, Indiana 46383

August 25, 2022: Hendricks County Fairgrounds 1900 E. Main St., Danville, Indiana 46122

HOW: Complete the enclosed Pesticide Clean Sweep Participant Form to the best of your ability. Mail, fax or e-mail the completed form to Nathan Davis at 765-494- 4331 or cleansweep@groups.purdue.edu no later than Fri., August 5, 2021. Then bring your 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.

For further information:

https://oisc.purdue.edu/pesticide/clean_sweep.html

Bloom through petal fall are key times for codling moth and dogwood borer mating disruption strategies

(Elizabeth Yim Long, long132@purdue.edu)



Figure 1. Codling moth captured in a wing trap. Photo: John Obermeyer, Purdue University

Time flies and now we're in May! I'm guessing that most fruit trees throughout the state are somewhere between bloom and petal fall, so now is the time for tree fruit producers to use mating disruption strategies against tree fruit pests, like codling moth and dogwood borer, especially if you've had issues with these insects in your orchards.

Some may be wondering if there's a difference between pheromone traps and mating disruption for tree fruit insect pests and the answer is 'yes!' Although both strategies use attractive chemical cues to lure focal insects, in the case of pheromone traps an odor that mimics the smell of a female moth is used to attract adult males to traps where they are easily detected by you or a member of your team, so you know the pest is actively flying. This is especially helpful if you are tracking degree days to predict when eggs might be laid or when they will hatch. However, in mating disruption, the strategy is a bit different: the goal is to overwhelm the local environment (your orchard)

with the smell of a female moth, so that males are “confused” and unable to find a female, or if they do, they are unable to perform normal courtship behavior, so mating does not occur. To give a human example, imagine your entire home, filled with the odor of French fries or popcorn (two of my favorites, ha!) and searching every room by smell alone to find a single fry or kernel – it would be challenging! This is the basic idea of mating disruption, except I’ve used food odor examples rather than pheromones, which are the focal odors used in mating disruption. Nevertheless, when applied properly and at the correct timing, mating disruption can stop reproduction altogether, so no eggs are laid, and no pests emerge to attack your fruits.



Figure 2. Example of a manual dispenser for codling moth mating disruption: CheckMate® CM-XL 2.0 Dispenser. Photo credit: Suterra.com



Figure 3. Example of an aerosol emitter for codling moth mating disruption: CheckMate® Puffer CM-O. Photo credit: Suterra.com

Mating disruption products may be manual dispensers (Figure 2) or sprayable and aerosol emitters that are hung from trees (Figure 3), or polymer mixtures that are applied as a dollop directly on the tree trunk or branch. These products can last from several weeks to several months. This is pretty amazing technology and can dramatically reduce the number of insecticide applications for key insect pests in your orchard as well!

The best time to apply mating disruption against the codling moth is during bloom, so depending on where you are in the state, it may be time now or it may be getting a bit late. The best time to apply mating disruption for the dogwood borer is bloom through petal fall. Last but not least, mating disruption is most likely to be successful in blocks of at least 5 acres and when deployed at the correct timing, so you truly stop mating and reproduction throughout the time period when moths are searching for mates. You can find more information about mating disruption products on page 27 of the [2021-2022 Midwest Fruit Pest Management Guide](#). As always, if you have questions about mating disruption strategies and products, reach out to your local extension educator or specialist so we can help!

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