

# FANCY FRUIT

Issue: 23-06  
June 8, 2023

*A Newsletter for Commercial and Advanced Amateur fruit growers.*

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Floricane Fruiting Blackberry- full bloom/ fruit set



Black Currant- fruit development

## Crop Conditions

*(Chloe Richard, richa267@purdue.edu)*

At the Meigs Horticultural facility we are harvesting Strawberries, planting Melons, and cover spraying our grapes and fruit trees. We did notice anywhere from a 30-80% fruit loss on our fruit trees from a combination of the frost on April 24<sup>th</sup> and poor pollination from a cool spring.



Field Strawberries- second harvest



Grapes- full bloom/ buckshot



Grapes- full bloom/ buckshot



Watermelons- planted 6/31/23



Plums- fruit development



Pears- fruit development



Apple: (Rosalee): fruit development

through June 7. The entire state received amounts less than normal (where normal would be 100 percent on the map) with central and northeastern Indiana having received less than 25 percent of normal amounts. This has resulted in browning lawns, lowered ponds and streams, and most vegetation starting to look stressed. Why is this happening and how long will it last?

While the El Niño - Southern Oscillation (ENSO) global teleconnection pattern is shifting from the La Niña phase (that has been around for the better part of three years, now) to the El Niño phase, it is difficult to attribute this dryness to ENSO. Historically, ENSO phases have had weaker correlations to temperature and precipitation in the Midwest - particularly in the transition seasons of spring and fall. However, atmospheric patterns are shifting and so the Midwest has been the host of a high-pressure system that has effectively been blocking major storm systems from pass through the area. We can thank this high-pressure system for the smokey skies from the Canadian fires, and states south of Indiana can thank the high-pressure system for keeping them relatively wet. That high pressure system has not been all bad for Indiana, though. It has kept humidity low and winds rather calm. Being outdoors has seemed far more pleasant these past few weeks than typical for this time of year! Unfortunately, those lower humidity values and clear skies have also encouraged higher evapotranspiration rates, further drying things out.

As soon as that high pressure can get pushed out of the region, there is a chance that precipitation (and higher humidity) will return. That is indeed what the forecasts and climate outlooks are calling for! Current forecasts are predicting one to two inches of precipitation over the next 7 days (Figure 2). The historical average (1991-2020) for that same period from June 8

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## How serious is this drought and will it continue?

*(Beth Hall, hall556@purdue.edu)*

The last several weeks have seen very little precipitation across Indiana. Figure 1 illustrates how much was received compared to the climatological normal amount from May 9

through June 15 is between 1.0 and 1.75 inches across Indiana. In other words, precipitation should be returning to our area and in amounts that are typical for this time of year. As one looks beyond June 15<sup>th</sup>, the climate outlooks are favoring above-normal temperatures with near normal precipitation. While this *may* not make up for the lack of precipitation seen over the past several weeks, it should provide some hope that the current abnormally dry and moderate drought conditions should not worsen. At least for a while.

The most recent U.S. Drought Monitor illustrate how drought conditions across much of Indiana have worsened over the past week (Figure 3). Except for a few counties in far southern Indiana, the rest of the state has either been categorized as Abnormally Dry (D0) or in Moderate Drought (D1). Because of this continued deterioration over the past several weeks, one may start referring to this as a “flash drought”. There are many definitions of “flash drought” but one of them is to have a rapid onset of drought intensification over a short period of time (e.g., 2-3 weeks) and then sustain those intensely dry conditions for several more weeks. One could argue that we have met the first condition. Will we meet the second condition? Let us hope those optimistic forecasts and climate outlooks are correct and we can all breathe a sigh of relief that we do not.

Modified growing degree-day (MGDD) accumulations have been moving along nicely across Indiana since April 1<sup>st</sup>. Figures 4 and 5 show the actual accumulations and departure from normal, respectively. Northwestern into central Indiana has accumulated more MGDDs than normal whereas areas along the Ohio River is slightly below normal.

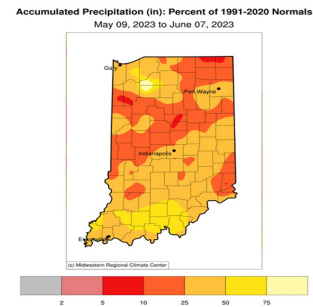


Figure 1. Precipitation from May 9 – June 7, 2023 represented as the percent of what normally fell during that same period from 1991-2020.



Figure 2. Forecasted precipitation amounts (inches) for June 8 through June 15, 2023.

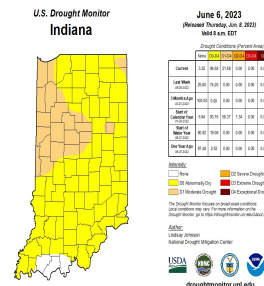


Figure 3. U.S. Drought Monitor for Indiana as of June 6, 2022. Source: <https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?IN>

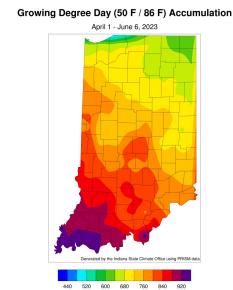


Figure 4. Modified growing degree day (50°F / 86°F) accumulation from April 1-June 6, 2023.

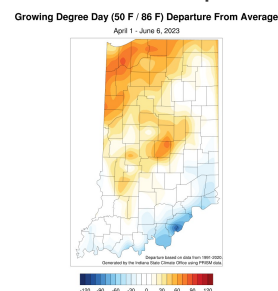


Figure 5. Modified growing degree day (50°F / 86°F) accumulation from April 1-June 6, 2023, represented as the departure from the

1991-2020 climatological average.

developing apples. Photo by Janna Beckerman.

Figure 3. U.S. Drought Monitor for Indiana as of June 6, 2022. Source:

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## Apple powdery mildew

(Janna L Beckerman, [jbeckerm@purdue.edu](mailto:jbeckerm@purdue.edu), (765) 494-4628)

Currently, the US Drought Monitor (<https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?IN>) places Indiana in the 'abnormally dry' category. With no rain in our 10 day forecast, I expect that to only get worse, and with it, powdery mildew on all fruit crops.

Powdery mildew is identified by the white, powdery growth on leaves and shoots that consist of the fungal body and spores (Fig. 1). Leaves infected along the leaf margin may become curled, crinkled, or folded along the midrib. On apples, if you are fortunate enough to have them this year, fruit is often russeted (Fig. 2).



Figure 1. Powdery mildew on leaves may be difficult to identify, particularly on those "hairy" leaved (tomentose) cultivars!



Figure 2. Powdery mildew causes russeting on

The hot, dry weather has set the stage for a severe powdery mildew outbreak, which will first appear in southern Indiana, and continuing to show up in the northern part of the state in late June early July. Disease development is favored by hot days and cool, moist nights with the disease most severe when hot, dry summers follow mild winters, like the winter of 2023. Leaves are most susceptible to infection in the first few days after they open, particularly on highly susceptible cultivars like Cortland, Jonathan, Gala, Ginger Gold, Granny Smith, Ida Red, Stayman Winesap and Rome. Honeycrisp is also showing symptoms of infection at Meigs (Fig. 3). Our wet spring in much of the state may have reduced that initial inoculum level, but recent dry weather has allowed PM to get a foothold. Keep an eye on the terminals of susceptible varieties, especially Jonathan, which is one of the most PM-susceptible varieties.

One of the biggest problems in managing powdery mildew is our unfamiliarity with it. Growers know to fear wet weather, and the diseases that coincide with it, and usually stay on top of spray programs. Dry weather is often viewed as an opportunity to save money on the costs of pesticides, particularly in a year in which many growers do not have a crop. Powdery mildew serves as both an example and warning of what happens when disease management practices lapse and reminds us that pesticides residues are reduced by photodegradation, normal chemical decomposition and simple leaf growth, not only rain wash-off.

Chemical control of powdery mildew is usually done with controls for scab, and fungicides are almost always necessary to control the disease when powdery mildew-susceptible varieties are grown under susceptible conditions. DMI

fungicides like Rally, Avelyo and Topguard have been repeatedly shown to provide better control of powdery mildew than Indar and Inspire. During a normal growing year (what is that, exactly?), the application should be timed at tight cluster to pink and continuing at 7-10 day intervals until terminal buds have set and shoots are no longer producing new leaves that are susceptible to infection.

**Why is this important right now?** Right now, buds are forming, particularly on younger trees, and these buds may become infected with powdery mildew. Disease occurring now will increase the percentage of infected buds, resulting in increased levels of primary inoculum next spring. If the drought continues (as predicted) and the disease is particularly severe, it will reduce flower bud formation, with the potential to reduce or eliminate the crop next year. Recall that the severity of this may be reduced if temperatures dip below -20 degrees C during the winter, not a common occurrence in Indiana. But then again, neither is powdery mildew of apple.

**To spray or not to spray?** As we enter mid-season (3 to 9 weeks post-bloom), monitor secondary infection by determining the percent of leaves with infection on ten terminal shoots on each sample tree. Keep in mind that you may not easily see PM infection and could overlook symptomatic leaf curling caused by PM (Fig 3). Twenty percent leaf infection indicates a weakness in the control program, a high level of risk for fruit and bud infection, and a recurrent problem with chronic yield reductions in subsequent years. Despite using captan for summer rot control, it is important to remember that *captan provides no control against powdery mildew!* FRAC 11 (or 7+11) have not been found to be as effective on PM as the FRAC 3 chemistry, so reliance on a typical summer cover schedule

may leave you exposed to PM outbreaks.



Figure 3. Powdery mildew infection can cause curling of leaves, in addition to the more typical symptoms shown in Figure 1. Photo by Janna Beckerman.

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## Important bloom time grape sprays

(Miranda Purcell, [mrpurcel@purdue.edu](mailto:mrpurcel@purdue.edu))

Shoots are at various stages of development across the state with some shoots at or near bloom. The most important time of the year for fruit disease control is from pre-bloom to 4-5 weeks past fruit set. The potential for fruit infection drops significantly 4-5 weeks post-bloom. Important diseases to control during this time include black rot, downy mildew and powdery mildew. Fruit of the most commonly planted varieties is resistant to black rot, downy mildew and powdery mildew, but rachises (stems) and leaves remain susceptible. Therefore, protection against these fungal pathogens is required throughout the growing season.

A list of recommended products can be found in [The Midwest Fruit Pest Management Guide](#). It is important to get good coverage in the fruit zone. Also, beware that downy and powdery

mildew pathogens are especially prone to fungicide resistance, so avoid back-to-back applications of any one systemic fungicide class (i.e. FRAC 3, 7 or 11).

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## Updates on Codling moth, Oriental fruit moth, and Spotted-wing Drosophila captures in pheromone-baited monitoring traps

(Elizabeth Yim Long, [long132@purdue.edu](mailto:long132@purdue.edu))

I hope the growing season is going well for all fruit producers! For this issue, I am sharing a quick update on what we're seeing in pheromone-baited monitoring traps placed in orchards at the Purdue Agricultural Center in Lafayette, Indiana (Tippecanoe County), as well as orchards of collaborating Indiana growers (thank you!) in Tippecanoe and Stark Counties. Together, we are monitoring codling moth, Oriental fruit moth, and the invasive spotted-wing drosophila to track the seasonal activity of these insects in tree fruit and blueberry production. We've just started monitoring for the invasive brown marmorated stink bug this week, and will share updates on activity in future issues!



Figure 1. Universal bucket trap baited with pheromone lure to monitor codling moth. Photo: E. Y. Long

### **CODLING MOTH & ORIENTAL FRUIT MOTH.**

This season, we are monitoring codling moth and Oriental fruit moth activity at the Purdue Research Center orchard using two, green universal bucket traps and the Scentry pheromone lure for each moth species (Figure 1). Both the codling moth and Oriental fruit moth can attack several kinds of fruit trees, but codling moth is typically a problem in apple, while Oriental fruit moth is typically a problem in peach and apple. The damaging life stage of these two fruit tree pests is the caterpillar, which burrows into fruits, making them unmarketable cosmetically or destroying the fruit entirely. There can be several generations of these pests each year, so it is important to monitor capture of adult male moths in the traps so that insecticide applications can be timed properly to protect fruit.

So far, we've captured 52 codling moths during the month of May at the Purdue Research Center orchard, with peak capture occurring the week of May 8, 2023. Interestingly, we have not detected any Oriental fruit moths in pheromone traps at the orchard this season, but we will continue to monitor!

Date	Codling moth		Oriental fruit moth	
	Tippecanoe Co. (total from two traps)	Codling moth Total in May (total from two traps)	Tippecanoe Co. (total from two traps)	Oriental fruit moth Total in May (total from two traps)
Week of May 8	26		0	
Week of May 15	15	52	0	0
Week of May 22	8		0	0
Week of May 29	3		0	0



Figure 2. Scentry monitoring trap (A), and Trece sticky card monitoring trap (B) for the invasive Spotted-wing drosophila, both available from Great Lakes IPM. Photo: E. Y. Long

**SPOTTED-WING DROSOPHILA.** This season, we are monitoring Spotted-wing Drosophila (SWD) with two kinds of traps: 1) the commercial Scentry monitoring trap and lure with 25% apple cider vinegar solution (Figure X), which we've been using the last 3 years, and 2) a newer SWD trap from Trécé that uses a red sticky card trap and lure. We are comparing the capture of adult male SWD using both kinds of traps this season to see if there are differences in accuracy and ease of use! Both kinds of traps have been placed in blueberry orchards and a blackberry patch in two counties in Indiana. As a reminder, SWD is a small vinegar fly that attacks several small fruits, especially raspberry, blackberry, and blueberry, as the berries are ripening. The damage caused by the female fly as she cuts the fruit to lay eggs can provide an entry point for disease, and the presence of larvae (maggots) in fruit can, of course, make your berries unmarketable.

So far, we haven't detected any SWD on either kind of monitoring trap this season, but this is not surprising, since we do not typically see activity until mid- to late-June. We will keep you posted!

Date	Starke Co.		Tippecanoe Co.	
	Blueberry orchard (Scentry jar trap)	Blueberry orchard (Scentry jar trap)	Blueberry orchard (Trécé sticky trap)	Blueberry orchard (Trécé sticky trap)
Week of May 22	0	0	0	0

If you are interested in monitoring insect pests in your orchard, it's never too late to start! Anyone can learn how to set and use these traps, and they can help you better time your pest management strategies by more easily detecting the presence and activity of these important fruit pests in your orchards. As we move forward this summer, you can visit the Long Lab website for updates on trap activity as we have it:

<https://extension.entm.purdue.edu/longlab/extension/#reports>.

As always, if you have questions about fruit insect pest identification or how to place and use monitoring traps, reach out to your local extension educator or specialist so we can help!

## Purdue Fruit & Vegetable Field Day 2023

(Lori K Jolly-Brown, [ljollybr@purdue.edu](mailto:ljollybr@purdue.edu))

### REGISTER HERE

Purdue Fruit & Vegetable Field Day 2023  
Thursday, July 20, 2023  
Purdue Meigs Ag Center  
9101 S. 100 E, Lafayette, IN 47909

Coordinator: Petrus Langenhoven  
Extension Staff: Lori Jolly-Brown, Jay Young, Chloe Richard, and Paul Howard

### FIELD DEMONSTRATIONS

- Sweet Corn Pest Management Updates
- Silage Tarps for Weed Management in Potatoess
- Watermelon Weed Management
- Summer 2023 Collard Insect Management Trial
- Black Soldier Fly Composting and Specialty Crop Production
- Two-year Plasticulture Strawberry Research

Update

☐ High Tunnel Diversification and Biological Control

☐ Does Increasing Soil Health Improve Pepper Yield?

☐ Unmanned Aerial Vehicle Demonstration

Contact [Lori Jolly-Brown](#) or [Petrus Langenhoven](#) if you have any questions.



## Purdue Small Farm Education field day 2023

(Lori K Jolly-Brown, [ljollybr@purdue.edu](mailto:ljollybr@purdue.edu))

[REGISTER HERE](#)

### 2023 FIELD DAY SCHEDULE

Thursday, July 27, 2023

Registration 8:00 – 9:00 am EST

Demonstrations at 9:00 am – 12:00 pm EST

Coordinator: Petrus Langenhoven

Extension Staff: Lori Jolly-Brown, Lais McCartney, and Patrick Williams

Please join us for the 2023 Small Farm Education Field Day!

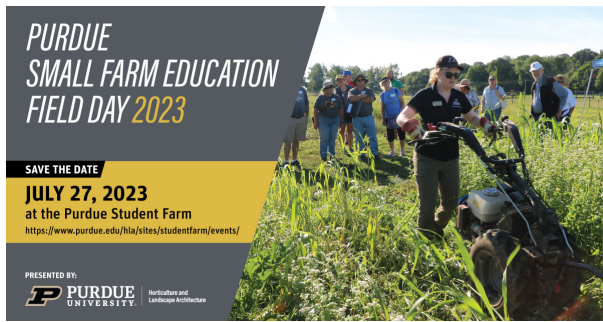
The EMT food truck will be on site for those who would like to purchase lunch after the educational demonstrations end. The Kona Ice truck will also be on site for a FREE cool summer treat for all attendees, compliments of Purdue Extension and Purdue Horticulture and Landscape Architecture!



### Demonstrations at the Field Day

- High Tunnel Table Grape Production  
Miranda Purcell
- High Tunnel Pepper Production and Variety Selection  
Petrus Langenhoven and Dennis Gustavo Toc Mo
- Growing Grains on the Small Farm - Dry Edible Bean Variety Trial  
Wil Brown-Grimm and Ashley Adair
- Predator-Prey Dynamics in High Tunnel Crop Production  
Sam Willden
- Biorational Pesticide Efficacy for Controlling Caterpillars and Flea Beetles in Crucifer Crop Production  
Laura Ingwell
- Black Soldier Fly Composting and Specialty Crop Production  
Milena Agila and Laura Ingwell
- Raised Garden Beds for Vegetable Production  
Amy Thompson and Nathan Shoaf
- Postharvest Food Safety Demonstration  
Scott Monroe and Amanda Deering
- Silage Tarps and Their Potential Uses on Small Farms  
Steve Meyers and Josue Cerritos
- Choosing Fertilizer Injectors for Drip Irrigation for Small Plots  
Wenjing Guan





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