

# FANCY FRUIT

Issue: 24-02  
April 11, 2024

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

## In This Issue

- [Crop Conditions](#)
- [Weather impacts from eclipse](#)
- [Apple Disease Management Notes for April](#)
- [Insect Spotlight: Two-spotted lady beetle](#)
- [Request \(or vote!\) for a fruit-insect topic you'd like to see in Facts for Fancy Fruit in 2024](#)
- [Purdue Fruit and Vegetable Field Day 2024](#)

## Crop Conditions

*(Chloe Rose Henscheid, richa267@purdue.edu)*

There has been a lot of movement just in the last two weeks. We are seeing a lot of trees about to flower or in full flower. The grapes are swelling and some early varieties are at bud burst. Our field Strawberries are at tight bud or popcorn stage now. The Strawberries in the high tunnels are now producing fruit.



Peaches: Full Bloom



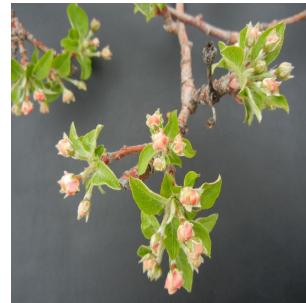
Aronia: Bud Development



Grapes: Bud Swell



Apple (Pixie Crunch): First Pink



Apple (Roaslee): Full Pink

# Weather impacts from eclipse

(Beth Hall, hall556@purdue.edu)

Something exciting happened this past Monday that many of you might be glad is over and no longer filling your news feed - the total solar eclipse. The Indiana State Climate Office, however, is now getting a chance to dig into the data collected from the Purdue Mesonet - a collection of 14 weather stations around the state - to see the various weather impacts from the event. While 3-second data was collected throughout most of the daylight hours on Monday (and yet to be analyzed), the public can view changes in the 5-minute data on the [Purdue Mesonet Data Hub](#) by clicking on a station, then scrolling down through the time series of various variables. All stations across Indiana experienced a drop in incoming solar radiation (no surprise there), but most stations also recorded at least a 5-degree drop in temperature (Figure 1) and a decrease in wind speed of approximately 5 miles per hour! Check out the data for the station closest to where you were and recall if you felt those various changes!

Precipitation continues to be above normal with most of Indiana having received at least 200 percent of normal amounts since the beginning of April (Figure 2). While last week has been on the drier side, by the middle and near end of this week more rain has come, keeping amounts high enough to eliminate any drought with only southwest Indiana counties in Abnormally Dry category according to the U.S. Drought Monitor (Figure 3).

Modified growing degree days since April 1<sup>st</sup> are within 5 units of normal as of April 11<sup>th</sup> with accumulations ranging from 70 units in southern Indiana to as low as 30 units in northern Indiana. Hopefully, this product will get more exciting with time, particularly since the national Climate Prediction Center (CPC) is strongly favoring



Pears: Full Flower



Plums: Full Bloom/ Past Bloom



Paw Paw: Bud Development



Blackberry: Bud Development



Black Currant: Bud Development

above-normal temperature over the April 16-20 period. The CPC is also strongly favoring above-normal precipitation over this same period with a possible continuation of wetter-than-normal conditions likely for the following week.

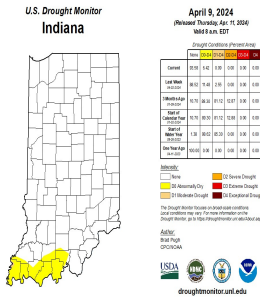


Figure 3. U.S. Drought Monitor map for Indiana based on data through the morning of Tuesday, April 9th.

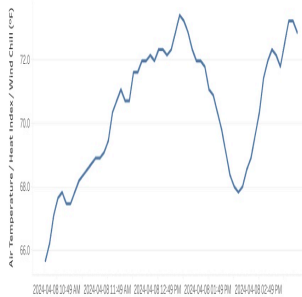


Figure 1. Example time series of temperature during the total solar eclipse that peaked around 2:00 PM local standard time (note: this is 3:00 PM local daylight time) for a station in Randolph County.

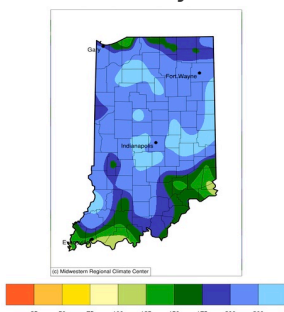


Figure 2. Percent of normal precipitation based upon the 1991-2020 period for April 1st through the morning of April 11th, 2024. Areas above 100 percent are wetter than normal.

## Notes for April

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

All that new, succulent growth needs to be protected to prevent primary (and even secondary!) scab (Fig. 1). We’re past the point where copper can be safely used, so protectant fungicides for scab control at this stage include mancozeb, ziram and captan. As an added bonus, all of these protect against the summer rots, and mancozeb provides some protection against rust. Early applications of FRAC M fungicides (captan, ziram, mancozeb) improved bitter rot management, in particular. Keep in mind that with warmer weather, scab infection can occur in as little as 6 hours (See Table 1. Mill’s table below). Making sure trees are thoroughly protected before the infection periods is essential, as there are no guarantees of orchard entry after heavier rainfalls (or, more correctly, getting out of the orchard).



Figure 1. Apple scab infects all green portions of the plant. Be sure to look at both sides of the leaf! If your FRAC M fungicides aren’t coating the leaf undersides, half the tree is unprotected! Photo by Janna Beckerman.

In addition to protecting against scab, keep your eyes out for powdery mildew, which tends to be worse after a mild winter. For powdery mildew and/or rust issues (Fig. 2, 3), include any FRAC 3



(Cevya, Rally, Indar, Procure or Topguard) OR FRAC 7-11s (Luna Sensation, Merivon, Pristine). Both the 7-11 fungicides and FRAC 3 fungicides prevent scab, rust and powdery mildew. Or, just use the FRAC 7s (Aprovia, Fontelis, or Sercadis) and save your FRAC 11 fungicides (QoI, or quinone outside inhibitors, like Flint, Flint Extra or Sovran) for later in the season for bitter rot. Remember, captan does not control powdery mildew or rust!



Figure 2. Powdery mildew of apple. Symptoms include leaf curl (left) whereas the white coating is a diagnostic sign of disease. Photos by Janna Beckerman.



Figure 3. Juniper rust is coming in hot off the junipers, to infect susceptible apple and pear trees. The orange spore horns are dessicated in dry weather but will rehydrate and release spores. Photo by Janna Beckerman. Link to video shows the rehydration process! Photo by Janna Beckerman.

For those to the north, and at tight cluster through pink: Assuming trees have less than 3" of new growth, you can still apply Apogee. Early applications of Apogee will help prevent fire blight in what is shaping up to be a warmer, wet spring. With temperatures flirting with 70, fire

blight needs to be on your radar—apply Apogee if you still can!

For those at bloom: Balancing spraying demands between the potential for fire blight and the constant reality of apple scab, powdery mildew, summer rots and rust, (and insects!) is a challenge, which is why we refer to this period as ‘crazy tank mix time’. During this time, let’s not forget about protecting pollinators: We need them, and they need us to be mindful of what and when we are spraying! We also need to remember that blooms are delicate—and captan is pretty ‘hot’. Avoid captan at this time, and use mancozeb or ziram for scab, rust and rot control for your tank mix partner or protectant chemical of choice. Again, on-going studies suggest that the summer rot pathogens, but especially bitter rot, infect susceptible varieties earlier than previously believed, especially when weather is warm and wet, and that secondary infection period continues throughout the growing season.

For fire blight control on those susceptible varieties, like Jonathan, Fuji, Gala, Ginger Gold, etc., be sure to use streptomycin as we have not identified any streptomycin resistance in Indiana to date. Streptomycin is most effective when applied with Regulaid during slow drying conditions (like at night) at king bloom, and then repeated every 3-5 days after until petal fall. As an added bonus, you’ll protect your pollinators. Repeated application of streptomycin+Regulaid until petal fall ensures efficacy (streptomycin breaks down after a few days) and reduces the risk of resistance. Keep in mind that Regulaid, as a penetrant, does increase your risk of phytotoxicity (Fig. 1). Forewarned is forearmed. Table 1. Number of days required for lesions to appear after infection has been initiated. No further wetting is required. Additional days may be required if conditions are unfavorable for lesion development (prolonged periods above

80° For very dry weather). Data of MacHardy & Gadoury (1989); and Stensvand, Gadoury, & Seem (1997).

Table 1. Revised Mills Table. Approx. hours of wetting necessary to produce primary apple scab infections, and approx. number of days required for lesions to appear, at different average temperatures. From the NEWA website at:  
<http://newa.cornell.edu/index.php?page=revised-mills-table>

| Temperature (°F) | Hours [1] | Lesions Appearance (days) [2] |
|------------------|-----------|-------------------------------|
| 34               | 41        | -                             |
| 36               | 35        | -                             |
| 37               | 30        | -                             |
| 39               | 28        | -                             |
| 41               | 21        | -                             |
| 43               | 18        | 17                            |
| 45               | 15        | 17                            |
| 46               | 13        | 17                            |
| 48               | 12        | 17                            |
| 50               | 11        | 16                            |
| 52               | 9         | 15                            |
| 54-56            | 8         | 14                            |
| 57-59            | 7         | 12-13                         |
| 61-75            | 6         | 9-10                          |
| 77               | 8         | -                             |
| 79               | 11        | -                             |

For those at petal fall: A FRAC 3 + mancozeb will provide varying degrees of protection against all the major diseases assuming coverage is adequate. Just like during bloom, inclusion of mancozeb provides additional protection against the summer rots, especially bitter rot. With its 77 day PHI, this may be your last, or close to your last application.

### Stone Fruit

Blossom rot (Fig. 4) never sleeps, and is particularly active under wet, moderate temperatures, like we have now. For those of you lucky enough to still have peaches and other stone fruit, be sure to protect your crop with iprodione (Rovral, Meteor) at bloom. Do not apply iprodione after petal fall.



Figure 4. Brown can be a problem even when there isn't a crop. Here, it is infecting a young shoot. Photo by N. Lalancette.

If bacterial spot has been a problem, apply fire line or mycoshield at 7-day intervals from petal fall/shuck split to first cover. Avoid copper if the conditions are wet, and see the [Midwest Fruit Pest Management Guide](#) for more information, because it is complicated, and you don't want to make any mistakes.

To control blossom rot and peach scab at shuck split, I like a final application of Bravo Weatherstik (FRAC M), but other options include FRAC 11 (Abound; FRAC 7-11 Luna Sensation, Merivon or Pristine); FRAC 1(Topsin M) with or without captan; and FRAC 3(Indar, Inspire Super, Rhyme/Topguard Specialty Crop) or the premix Topguard EQ (FRAC 3+11). FRAC 3 fungicides improve powdery mildew management, if you are struggling with PM control in your stone fruit.

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## Insect Spotlight: Two-spotted lady beetle

(Isabela Arias, [iarias@purdue.edu](mailto:iarias@purdue.edu)), (Samantha Anne Willden, [swillden@purdue.edu](mailto:swillden@purdue.edu)) & (Laura Ingwell, [lingwell@purdue.edu](mailto:lingwell@purdue.edu))

The Two-spotted lady beetle, *Adalia bipunctata*, is a common insect predator, meaning it feeds on other, smaller bugs. Native to North America and Europe, the Two-spotted lady beetle is distinguished from other lady beetles by its oblong shape and two large black spots on either

of its back, as well as its large white spots near its head (Fig. 1). Beetles go through complete metamorphosis, transitioning from tiny orange eggs (1mm in diameter) to larvae (up to 6 mm; Figs. 2-3), pupa (Fig. 3) and then adults (3-4mm). *A.bipunctata* will lay eggs in clusters (Fig. 4), often on the underside of leaves, of numerous plant species, as long as food is nearby. Larvae are scaled and spikey, black and brown in color, often referred to alligator-looking (Fig.2). They mature into adults in less than a month. The adults live for approximately 1 to 2 years. *A. bipunctata* are commonly found in wooded habitats in temperate regions, where they overwinter as adults. In the warmer months, they can be found near most kinds of vegetation. Common locations to find lady beetles include meadows, forests, gardens, and fields.

The Two-spotted lady beetle is an intrinsically important insect within an ecosystem: one of their key characters is their carnivorous nature at both the larval and adult stage. When compared to other common insects used for pest management, like a parasitoid wasp which is only capable of predating on pests as an adult, *A. bipunctata* consumes pests for its entire life cycle. These insects consume a wide range of small, soft-bodied pests such as aphids, psyllids, scale insects, or mealybugs. For this reason, lady beetles in general are used widely as biological control agents for pest management in specialty crops systems.

When it comes to picking which predator (or lady beetle in particular) to deploy for biological control, Two-spotted lady beetle is not only an effective option but is Native to Indiana and therefore fits perfectly into the existing ecosystem. Compare this to the Asian lady beetle, *Harmonia axyridis* (Fig. 3), which was introduced to do the same task as the Two-spotted lady beetle. However, due to its non-

native nature, the Asian lady beetle has quickly overrun many native populations, including the Two-spotted.

To tip the scales back in the favor of native species, the use of *Adalia bipunctata* is recommended over other species such as the Asian lady beetle. When purchasing these insects, it is important that they are sustainably sourced, meaning they are reared in a controlled environment for IPM use, rather than harvested from the wild population. The best way to recognize this is to note if adults are being sold or if the insects are being sold as larvae or eggs. If it is the latter, then it is likely the beetles are sustainably sourced.

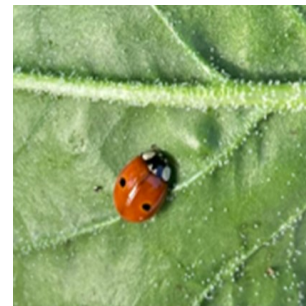


Figure 1: *Adalia bipunctata* on spinach (Photo by Samantha Willden).



Figure 2: Larva under microscope, lying on empty eggs (Photo by Isabela Arias).



Figure 3: Asian lady beetle larvae and pupae on leaf (Photo by John Obermeyer).





Figure 4: Asian lady beetle eggs (Photo by John Obermeyer).



## Request (or vote!) for a fruit-insect topic you'd like to see in Facts for Fancy Fruit in 2024

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

Happy spring everyone, and I hope you're all looking forward to another productive growing season in the Hoosier Heartland!

As I did last year, I'd like to invite our readers to suggest, or vote for, insect-related topics that you'd like to learn more about this year! I did receive a few helpful topics last year, but I'd sure love to hear from more of you regarding what you'd like to read and learn about. Whether it's questions you have about insect identification, monitoring, management, or just an insect you're curious about, I welcome your feedback!

I've created a [1-question poll](#) using Google Forms with topics you can vote for, and note there's a fill-in-the-blank option for you to suggest other ideas. You can click the link above to respond, or you can scan the QR code provided below.

Scan this QR code to vote for, or suggest a topic for *Facts for Fancy Fruit* this season!

If you'd like to weigh in, please respond to the poll by **Wednesday, April 24<sup>th</sup>**. I'll use your feedback to decide which fruit insect topics I should write about for this season's edition of *Facts for Fancy Fruit*.

If you are not able to access the poll, you can also email suggested topics to me at [eylong@purdue.edu](mailto:eylong@purdue.edu). Thank you in advance for your feedback, and I look forward to providing articles that address the questions and curiosities that you have!

## Purdue Fruit and Vegetable Field Day 2024

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

REGISTRATION OPENING IN MAY!

SAVE THE DATE  
*Purdue Fruit and Vegetable Field Day*  
THURSDAY, JULY 18, 2024  
Purdue Meigs Ag Center  
9101 S 100 E, Lafayette, IN 47909  
PURDUE UNIVERSITY Extension

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