

FANCY FRUIT

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A Newsletter for Commercial and Advanced Amateur fruit growers.

In This Issue

- [Crop Conditions](#)
- [Weather & Climate](#)
- [Freeze](#)
- [New Strawberry Disease](#)
- [Share Your Experience about the Freeze Event](#)
- [April freeze](#)
- [Early season disease & pest management in grapevines](#)
- [Extension Events](#)



Peach petal fall



Apple pink



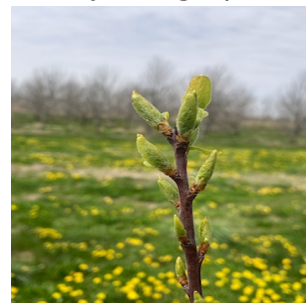
Raspberry – shoots 3" long



Apple flowers covered in snow on 4/20/21. Photo:
Tristand Tucker



Freeze injured grape shoots



Plum ½ inch green



Black Currant



Blackberry shoots 1" long

Weather & Climate

(Beth Hall, hall556@purdue.edu)

Does snow in April mean global warming is not happening?

This week, much of Indiana got to see some snow falling as we were hoping that winter weather was behind us. It is not unusual for some to ask when this sort of event happens how “global warming” could be real when things are feeling so cold. The start of my answer is pointing out the word “global”. While Indiana was experiencing below-normal temperatures this past week, many other places around the earth were experiencing above (if not much above) normal temperatures. When averaged across the planet, that global temperature is still showing increasing trends. The other part of the answer is about variability. Every year, there are going to be days that are cooler than normal and days that are warmer than normal. When averaged over a month, season, or year, temperatures have been increasing. Finally, our daytime high temperatures may not be showing a noticeably strong trend (though, there is even a slight

warming trend that has been occurring), but nighttime low temperatures have been warming at a greater rate. Therefore, if our average daily temperature is an average of the daily maximum and minimum temperature, if just one of those is increasing, then the average will increase.

Will these cooler temperatures and risk for snow continue this spring? Climate outlooks at this point are favoring above-normal temperatures (Figure 1) and forecasts for the next 10 days suggest a strong warming with high temperatures in the upper 70s and lower 80s as early as next week. Perhaps our last snow date of the season is behind us. Even precipitation should stay near-to-above normal over the next several weeks (Figure 2) – offering the potential for abnormally dry conditions in our northern counties to not worsen.

With the recent cold spell, growing degree-day accumulations have slowed down this past week, but total accumulations are still ahead of where things were last year (Figures 3 and 4).



Figure 1. The 8-14-day climate outlook showing probabilities slightly favoring above-normal temperatures for April 29 through May 5, 2021.

Source: NOAA Climate Prediction Center



Figure 2. The 8-14-day climate outlook showing probabilities favoring near-normal precipitation amounts for April 29 through May 5, 2021.

Source: NOAA Climate Prediction Center

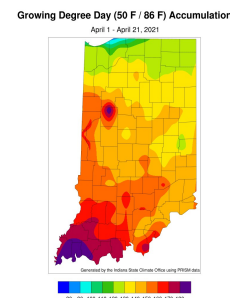


Figure 3. Modified growing degree day accumulation from April 1-21,2021.

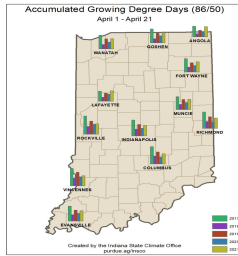


Figure 4. Comparison of 2021 modified growing degree day accumulations from average for April 1-21 to the past four years.

Freeze

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

Freeze:

There really isn't much that can be added to the wonderful and unfortunately timely article about Frost. Critical Temperatures and Frost Protection by Rob Crassweller at <https://extension.psu.edu/frost-critical-temperatures-and-frost-protection>

With a frost to freeze expected to cover most of the state on April 21 and 22, there will certainly be crop damage and loss (Fig. 1). The extent of the damage we can expect will be highly variable. Our mild winter, followed by an early and mild spring, has resulted in many trees at Meigs (and throughout the state) having buds that are at different stages of development, from silver tip to bloom, all on the same tree (Fig. 2). That may be a silver lining in what is shaping up to be another tough year.

Some of this is due to weather, and some of this variation is genetic. Even with some cultivars more prone to this type of erratic growth than others you can still find adjacent trees of the same scion and rootstock showing marked differences. As a result, the buds on these trees are not equally susceptible to damage. How much damage that does occur will depend upon

cultivar (some are more sensitive to freeze than others, like Delicious) and will depend upon the health of each tree (even though they are clones). In the case of individual trees, healthy and vigorous trees will weather these insults better than trees that are already struggling.



Figure 1. Freeze damage to apple blossom buds. Photo by Janna Beckerman.



Figure 2. In 2021, the mild winter and cool spring resulted in asynchronous phenology of many apple trees at Meigs. This image was taken 4/6/2021. Note the variation from silver to tight cluster.

Apples and Pears:

Despite the loss of fruit crops, disease management, particularly for fire blight, is of the utmost importance right now. Improper management of trees from this point on can profoundly affect future harvests. Freeze injury, much like hail injury, results in damage to young and succulent shoots and leaves, providing a means for the fire blight bacterium to cause shoot blight. Running both Cougar Blight and MaryBlite right now shows zero risk of infection, as temperatures remain below 60 degrees F. However, temperatures in the 70s will return by the weekend.

For those trying to preserve their crop (or who haven't given up just yet), streptomycin will provide protection against fire blight. If the crop is lost (full bloom, temperatures below 28 degrees F even for a few hours), a low rate of copper (0.2 -0.6 lb of metallic copper/acre depending on tree row volume) can be used to minimize the risk of fire blight. Keep in mind that copper can cause injury on some varieties, and application should occur after the temperatures are above 50 degrees F to prevent phytotoxicity. Suggested coppers include Cuprofix, Kocide, or C-O-C-S. Turner Sutton, at North Carolina State University reports using the 0.2 and 0.4 lb rates on Golden Delicious during the summer without any problem. If you think you might have a crop on a copper sensitive variety, use streptomycin if you are concerned about possible injury and may still have a small amount of fruit to harvest.

According to the prevailing wisdom, dead flowers that don't fall off are not good hosts for the fire blight bacterium. Many of our apple varieties at Meigs seem to be asynchronous with their bloom time this year and any of these slow to flower side blossoms or "rat tail" blooms that are still alive can become infected. Continue monitoring until bloom is over, and apply streptomycin as needed, not to exceed four applications per season.

If your orchard has a history of fire blight, or to just manage the vigorous growth due to last year's crop loss, I would strongly encourage you to consider applying Apogee (Prohexadione-Ca). Apogee is a growth regulator that does not directly kill the fire blight bacterium, but reduces shoot growth, thereby increasing plant resistance by reducing host vigor. Apogee suppresses apple shoot growth when applied near petal fall as a single spray, or as several applications over time. Apple response to Apogee depends upon the cultivar, timing, rate of application, crop load,

and even geographical location. Regardless of this variability, Apogee remains the best management tool available for controlling the shoot blight phase of fire blight that growers may be faced with after a freeze, particularly after the vigor that may result after crop loss.

Despite the potential, or real loss of crop, it is imperative to maintain at least a minimum spray program to protect future harvests. Failure to do so will result in defoliated trees that fail to produce next year, or may not survive the next winter. Normally, the greatest risk of scab would be right now, from pink to bloom. However, nothing is normal about this year. For these reasons, I am recommending:

- EDBC fungicide (3 lb/acre) program through bloom. Alternate with copper or sulfur from second cover on to remain under label limits. Remember to stay within the 21.0 lb/acre/season limit for your EBDCs. I like the EBDCs as they also protect against bitter rot, black rot and white rot. Use this schedule if cedar-apple rust is a particular problem.
- Alternatively, Captan can be used earlier in the season for better scab control instead of the EBDCs, but provides no control of rust or powdery mildew.
- **NOTE:** Do not use Captan 50 Wettable Powder in combination with or closely following or in alternation with wettable sulfur products, or oil. Sulfur sensitive varieties of apples such as Red Delicious, Staymen, and Baldwin, can suffer severe injury and defoliation. Captan 50 WP has a 64 lb limit per acre per year.

One other option that can be used is copper (0.2 - 0.6 lb metallic copper per acre based on tree row volume) + sulfur (6-30 lb/acre depending on brand/formulation) every 10-14 days between now until the first week in June, depending upon

weather conditions. Suggested sulfur formulations include Thiolux, Microthiol Disperss, or Microfine Wettable sulfur. This spray program protects against scab and mildew, and slightly against rust. Remember, copper can russet fruit, and should not be used if you want to use your crop for anything except cider. **Do not use sulfur if temperatures are going to exceed 90 degrees F, or drying conditions are extremely poor. Do not use sulfur or copper within two weeks of an oil application.**

Neither of these programs is going to provide complete scab control but should reduce leaf infections. Organic trials in both Michigan and North Carolina regularly apply 6 lbs of sulfur per treatment without any reported phytotoxicity due to temperature.

If powdery mildew is particularly bad, you may wish to consider applying a FRAC 3 like Rally or Procure, or a FRAC 11 like Flint or Sovran prior to second cover to knock down powdery mildew and reduce the likelihood of it overwintering in bud tissue, particularly are on higher value cultivars (like Honeycrisp, Jonagold, etc). Reducing inoculum levels to maintain plant health while reducing overwintering inoculum is important for long-term plant health, and to reduce inoculum buildup which contributes to fungicide resistance.



Figure 3. Fire blight still caused infection of freeze-killed blossoms in highly susceptible varieties like Gala and Fuji, or in quince, as seen here. Photo by Janna Beckerman.

Managing Diseases on Stone Fruits:

Late spring freezes and severe winter cold regularly causes stone fruit crop losses to approach 100%. With this level of irregular cropping, disease management must focus on protecting foliage to ensure a good potential crop for next year, while reducing over wintering spore loads. Copper is fairly phytotoxic to peaches and should be avoided. Bravo is another low(er) cost alternative if disease pressure become high, but fruit is absent.

- Captan at the 1.3 lb/ 100 gallon rate should sufficiently control brown rot twig blight, scab on peaches and cherry leaf spot.
- If the season is excessively wet, higher rates of captan may be required.
 - Captan will not control powdery mildew.
- Wettable sulfur at the 6 lb per 100 gallon rate is probably the least expensive material you can use and provides excellent control of powdery mildew of all stone fruit
- Wettable sulfur should aid in controlling brown rot twig blight, and peach scab.
- Flame Out (Oxytetracycline) or Mycoshield should be used to control bacterial spot on peaches, particularly if the weather is wet in late June and July.

For more information, see: BP-179 Disease Management for Fruit Trees After Crop Loss at <https://www.extension.purdue.edu/extmedia/BP/BP-179-W.pdf>

New Strawberry Disease

(Dan Egel, egel@purdue.edu)

A new strawberry disease has been found in

Indiana and researchers are looking for samples to determine the extent of the problem. The disease, caused by a species of the fungus *Neopestalotiopsis*, has been reported in several southeastern states and other countries where it causes leafspots, fruit spots and a plant decline. In Indiana, the disease has been reported to cause a leafspot (Figure 1) and a plant decline. Researchers are asking commercial growers who believe that they may have observed the disease to contact the Purdue University Plant and Pest Diagnostic Clinic. The PPDL will waive sample handling fees for these samples until the researchers obtain the desired number of samples for the survey. Updates will be posted to the Hotline and to the PPDL website. Samples from multiple strawberry varieties and different types of production fields (matted row, plasticulture, high tunnel) are encouraged.

Information required for each sample:

1. Strawberry variety
2. Growing method: Matted row or plasticulture
3. Location (state and county) where grown
4. Approximate date of planting or year of matted row culture.
5. Symptoms observed: Leaf spot, fruit rot, crown rot, or a combination of these.

This research will attempt to determine where the disease exists in Indiana and how the disease may be controlled. Results of these studies will be reported here when completed. The North American Strawberry Growers Association is sponsoring this research.



Figure 1. A leaf spot caused by *Neopestalotiopsis* sp., a new strawberry disease to Indiana.

Share Your Experience about the Freeze Event

(Wenjing Guan, guan40@purdue.edu) & (Janna L Beckerman, jbeckerm@purdue.edu, (765) 494-4628)

Fruit growers, we would like to hear your story about the freeze event on Apr. 20 and 21. What crops are you growing? Did you take protective actions? Did it cause damage to the crops? Hearing your stories would help us better design our extension programs. If you allow, we would like to share your experience on newsletters that may help other growers learn from the event. If you are willing to share your stories, please contact Janna Beckerman at janna@purdue.edu or Wenjing Guan at guan40@purdue.edu (352) 870-4696 (cell)

April freeze

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

Snow and cold overnight lows blanketed the state on Tuesday and Wednesday nights last week (April 20-21). Many parts of the state received temperatures of 26-29 F, which caused some damage to open flowers. More northern

areas of the state were not very far along in terms of crop development (early pink in apples, early bloom in peaches) so the damage was limited. The snow cover probably reduced the amount of damage. At the Purdue Meigs farm, we hit a low of 21.9F and damage to apples is extensive. See photos taken April 22. Thankfully, most areas of the state were not hit this hard. Where damage has been found, growers with crop insurance should not delay in reporting the damage so that inspectors can verify any losses.



Early season disease & pest management in grapevines

(Miranda Purcell, mrpurcel@purdue.edu)

Grapevines are in various stages of early growth throughout Indiana, ranging from bud swell to 2-4 in shoot growth. A cold weather event came across the state from 4/20-4/22 bringing temperatures as low as 27 F. Damage is still being assessed, but if significant primary bud damage occurs we will expect to see emergence of secondary shoots.

With rising temperatures and a high chance of rain expected over the next 2 weeks, it will be

important to monitor pest populations and take preventative measures for disease control. Climbing cutworms can cause damage all the way from bud swell to when shoots are 10-15 cm long. Scout your vineyard to identify regions with high cutworm pressure. Grape flea beetle can cause damage during this time as well, but usually only until the buds are ½ inch long.

Insecticide application is recommended if more than 10% of the buds are showing damage. IRAC 3A products (Baythroid, Danitol) and Carbaryl/Sevin are effective on climbing cutworm & flea beetle.

Bud swell is also the most important time to control for Phomopsis. Many varieties grown in Indiana are especially susceptible to phomopsis, including Traminette, Seyval, Chardonel, La Crescent and Marquette. A lime-sulfur application is recommended at bud swell to get rid of inoculum that has overwintered and prevent spread to cluster stems & developing berries. A lime-sulfur application can also help reduce incidence of powdery mildew. Phomopsis can also be controlled with captan or mancozeb. Mancozeb is a broad-spectrum that also control black rot and downy mildew. Captan and mancozeb are protectant fungicides that must be applied before the next rain event and reapplied after a major rain event. Fungicide applications are recommended at a 7-day interval through bloom.

Please see the [Midwest Fruit Pest Management Guide](#) for more information.

Extension Events

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

Small Farm Education Field Day July 29th, 2021
at the Purdue Student Farm.

Small Farm Education Field Day Webinar Series
August 2, 4, 6, 9, 11, 13, 2021.

Watch for details at the Purdue Student Farm

website

<https://www.purdue.edu/hla/sites/studentfarm/>

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