PURDUE UNIVERSITY
PURDUE EXTENSION
FACTS FOR Fancy Fruit
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In This Issue

Crop conditions

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

Fruit crops are beginning development, especially in the southern part of the state. Brambles are at 1/2 to 3/4 inch green in the south, and just pushing buds in the Lafayette area. Grapes are at early swell in the south, but still dormant in the Lafayette area, though some are bleeding when pruned. Peaches are at pink in the south Apples and peaches are still dormant in the Lafayette area. Based on the climate outlook, crops should continue normal development over the next few weeks.

If you haven't already made them, it is time for the delayed-dormant applications on lime sulfur or Sulforix on brambles, blueberries, and grapes.

Positive Climate Outlooks for the Next Several Weeks Across Indiana

(Beth Hall, hall556@purdue.edu)

Over the past 30 days, southern Indiana has received above-average precipitation which has caused some flooding and well-saturated fields. Northern Indiana has received near-normal precipitation, yet there are localized areas of pooled water. Snowfall across the state has been below normal throughout the entire season, mostly due to temperatures staying above freezing. As the dormant season is wrapping up, accumulated chilling hours (35°F-45°F) are well ahead of normal (Figure 1), which is hopefully a good sign for perennials! Growing degree days (base 50°F) have started to accumulate (Figure 2), which will also encourage plants to start emerging and leafing out. Unfortunately, Indiana is statistically likely to still experience at least one more hard frost. The average date of the last frost with temperatures 28°F or lower is between April 3-10 across most of the state (Figure 3).

Climate outlooks over the next few weeks are showing increased confidence of above-normal temperatures and below-normal precipitation. This will hopefully help dry things out enough to be able to start preparing for this upcoming growing season! Unfortunately, the climate outlook for April is suggesting increased confidence of above-normal precipitation for the southern half of Indiana, but at this time those amounts do not appear to be as high as they were in 2019.

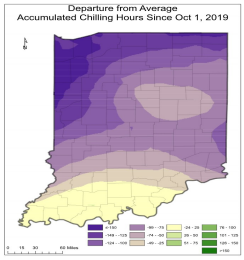

Figure 1. Accumulated chilling hour (35°F-45°F) departures for 2019 October 1 through 2020 March 24 compared to the 1986/1987 – 2015/2016 base period.

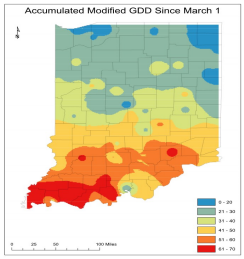

Figure 2. Accumulated modified growing degree days (base 50°F) since 2020 March 1.

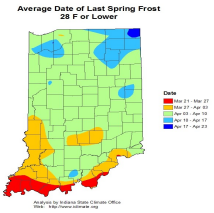

Figure 3. Average date of the last frost with temperatures at or below 28°F.

Will Low Tunnels Make a Difference in Annual Plasticulture Strawberry Production?

(Wenjing Guan, guan40@purdue.edu)

Strawberry production with the annual plasticulture system is successfully used in southern states. Plug plants are planted in fall and strawberries are harvested in spring the next year. The planting is usually not carried over to crop a second year. Compared with matted row system, annual plasticulture system has advantages such as easier weed and disease management and faster crop harvest after planting. Strawberry growers in Indiana are interested in annual strawberry production, but experiments have shown using this system is challenging in Indiana because of lower fall temperatures compared with southern areas that have a long, warm fall. That makes it difficult to achieve adequate yield that compensate the production cost.

Tunnel systems including high tunnels and low tunnels are widely used to extend the production season of many vegetable crops. Can the systems be used on strawberries and make the annual production system feasible in Indiana? Research trials were initiated at Southwest Purdue Agricultural Center to evaluate annual strawberry production under different tunnel systems. This article provides an update for a trial using low tunnel system for the fall planted strawberry plants (Figure 1).

Figure 1. Install low tunnels with a mechanical low tunnel layer.

Strawberry plugs were planted on Sep. 10, 2019. Low tunnels were used from Oct. 10 to Jan 2. Figure 2 is a comparison of plants grown under low tunnels and without low tunnels. The picture was taken after low tunnels were removed in early Jan. larger canopy size was observed for plants grown under low tunnels for most varieties. Figure 3 shows the recorded temperatures with and without low tunnels.

Figure 2. Picture on the left shows the size of strawberry plants grown under a low tunnel from Oct. 10 2019 to Jan. 2, 2020. Picture on the right shows the size of strawberry plants grown without a low tunnel during the same period.

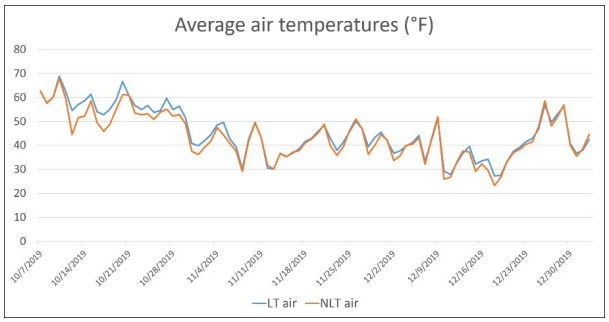

Figure 3. Daily average air temperatures with low tunnels (blue line) and without low tunnels (red line)

To better understand what the difference in temperatures and plant sizes mean in regard to crop yields, we will review a few important strawberry physiological facts.

Yield is directly determined by the number of inflorescences. Inflorescences develop at the terminal growing point of crown. Therefore, the number of crowns determine the level of yield. When the plugs are first planted, they have a small crown with axillary buds. As the crown grows bigger, axillary buds may develop into runners, branch crowns or leaves depending on the environment. Environmental conditions play a role in determining the fate of each axillary bud. For short-day cultivars, day length shorter than 14 h (from end of August to end of April in southern Indiana) is an essential factor for developing branch crowns and inflorescences. Temperature is another important factor. Crowns develop at temperatures above 50°F and inflorescences develop at temperatures less than 59°F.

Reviewing the recorded temperatures this past fall, ideal conditions for developing branch crowns lasted throughout October. Low tunnels provided a clear advantage for plant growth. On average, they increased temperatures about 4 degrees. Temperatures dropped very quickly last fall, and temperatures were below 50 °F during most of November and early December, regardless of using low tunnels or not. As a result, the advantage of using low tunnels this past year may be limited.

Our consideration for removing low tunnels in early January is to prevent plants from blooming too early in the spring. We covered

the beds with floating row covers (winter protection) at the time when low tunnels were removed. Floating row covers were removed in early March. Currently, plants are actively growing with no flower buds visible yet.

We will continue provide update about this trial and answer the question about *Will Low Tunnels Make a Difference in Annual Plasticulture Strawberry Production*?

Straw removal in matted row strawberries

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

The proper time to remove straw from matted row strawberries is when the bare-soil temperature at 4 inches averages about 40-43˚F. This usually coincides with mid to late March in central Indiana. This year is about average with most parts of central and northern Indiana at 40˚F or above as of 3/22/20. Plants begin pushing new leaves as the soil temperatures rise steadily so the straw should be raked off the tops of the beds and into the row middles before leaves emerge. Leaving some straw on top of the beds for plants to grow up through provides a clean surface for fruit. Straw should be removed from beds before the plants grow enough to cause yellowing of foliage. Allowing the leaves to become etiolated (yellowed with long petioles) due to late straw removal can reduce yields by as much as 25%. However, uncovering the plants early may promote early growth and increase chances of frost or freeze injury. The difference between early removal and late removal may increased first harvest by about three days, so there is no real advantage. After the straw is removed the frost protection irrigation equipment should be set up and tested and made ready for frost during bloom.

New leaves emerging in strawberries

Anthracnose disease of brambles

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

The most important spray of the season for control of anthracnose on brambles is the delayed dormant spray of lime sulfur, Sulforix or copper hydroxide. Delayed dormant is when buds are fully expanded and new leaves are exposed about a half inch. If you have a problem with anthracnose, this is one spray that you can't afford to miss. In my experience anthracnose is mainly a problem on black raspberries. Most modern cultivars of blackberries and nearly all red raspberries are resistant. That said, delayed dormant applications can reduce overwintering inoculum of a number of important pathogens.

Black raspberry at 1/4 inch green

Apache blackberry at early swell. Note small spider visiting

Heritage red raspberry at 1/4 inch green

Peach Disease Management 2020

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

As this outbreak unfolds, please feel free to contact me with any questions by phone or email. I am so grateful for the essential and important work that you all do and will help and support you in any way I can. In the meantime, I'll provide you with the updated information on plant diseases and their management, including information on new products and new spray guide formats that you expect at a time when nothing is going as we expected.

I look forward to seeing you all on the other side of this outbreak—please be careful and safe.

Janna

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This publication (See Indiana Peach Disease Management Guide, below) provides a disease management schedule for Indiana commercial peach growers.

The application rates presented in these tables are based on the amount of product to apply per acre. Each table presents the diseases to control at each peach growth stage and the products that are labeled for their control.

Successful application and control depends on many factors, including the type of application equipment, how well that equipment is maintained, proper spray volume, tree phenology, tree height, row width, target pest, tractor speed, frequency of application, the appropriate pesticide, and the chemical rate per acre used. Some product labels require minimum and/or maximum recommendations for spray volume (the amount of water to use per acre when spraying).

As always, follow label precautions when tank-mixing oils, fungicides, and insecticides. *Materials are listed alphabetically*.

Fungicides work best when used prophylactically, and also when used before a rain event. Fungicide efficacy varies, and factors that impact this include the cultivar of the vine treated, vine growth, the type of fungicide being used, the environmental conditions, and the level of inoculum present. Protectant fungicides like copper, sulfur or mancozeb is ~ 7 to 14 days; Systemic fungicides like Rally, Ridomil, or Abound(FRAC Code 3,4, 11) are 10 to 21 days. During periods of rapid tree growth, or during frequent rains, shorten intervals between treatments.

Careful planning also will avoid the use of too much chemical, as many of the fungicides have seasonal limits on how much can be used. Your overall spray schedule should take into account early tree growth, weather conditions that favor scab or powdery mildew, and the properties of the various fungicides available for use. Bloom applications are particularly important when the weather is wet.

When only one product is used exclusively to control a disease, fungicide resistance in that pathogen will evolve, reducing fungicide efficacy and disease control. Tank mix or alternate materials that have a different mode of action (different FRAC code), or utilize pre-mixes (e.g., Pristine, Merivon, Switch, Luna Sensation, Luna Experience, etc.). This table was developed to help growers manage peach diseases.

Follow this link to view the tables:
peach-2020-schedule

A Look at One of the New Closed Transfer Systems for Paraquat-Containing Herbicides

(Stephen Meyers, slmeyers@purdue.edu)

In an October 2019 Hot Topics article on the Facts for Fancy Fruit website, I referenced the new regulatory changes to herbicides containing the active ingredient paraquat. One of the new requirements is for closed system packaging. To quote the Environmental Protection Agency (EPA):

"New closed-system packaging (is) designed to prevent transfer or removal of the pesticide except directly into proper application equipment. This will prevent spills, mixing or pouring the pesticide into other containers or other actions that could lead to paraquat exposure."

Earlier this month I had a chance to see one of the ways chemical companies are complying with the new regulation.

At the Weed Science Society of American Annual Meeting, Syngenta presented their closed system packaging and transfer system. It contains a closed system cap that cannot be removed or opened by hand (Figures 1 and 2). In order to remove herbicide from the container, the cap must be connected to an adaptor (Figure 3) which can be attached to the mix bowl, eductor tank, or spray tank. The adapter will be distributed through chemical company representatives and chemical retailers.

The process of using the new closed transfer system:

1. Remove the dust cap (Figure 1).
2. Invert the jug and place it onto the adapter (Figure 4).
3. Rotate the jug clockwise to start the flow of herbicide.
4. Regulate flow by how much the jug is turned: counter-clockwise to slow flow, clockwise to speed it up.
5. Once the desired amount of herbicide has been dispensed, turn the jug counter-clockwise and remove it from the adapter.
6. When the entire contents of the jug have been emptied into a tank, the jug can be rinsed by attaching a hose to the rinse port on the side of the adapter. The adapter is designed to prevent back-flow.

The side of the jug has volume marks that can be read in both the upright and inverted positions (Figures 5 and 6).

Figure 1

Figure 2

Figure 3

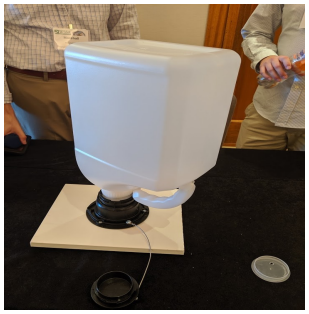

Figure 4

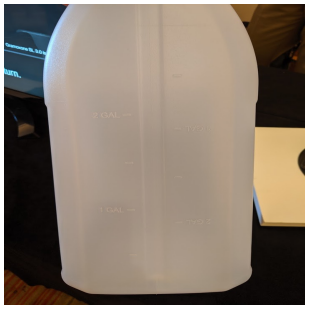

Figure 5

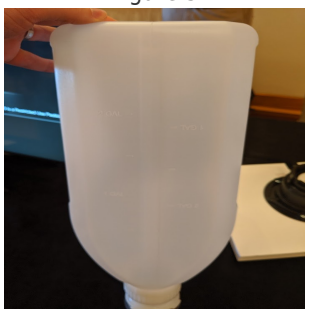

Figure 6

It is expected that all non-bulk paraquat containers less than 120 gallons will be in closed system packaging by fall of 2020. Start planning now to be prepared to implement the new closed transfer systems into your farm operation.

To see a video demonstration of the closed transfer system, feel free to visit the Syngenta webpage at: http://www.syngenta-us.com/herbicides/gramoxone-sl-3.0

Extension Events

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

Due to the COVID crisis, all Purdue Extension meetings have been cancelled until further notice. Some may be offered by distance education, but no in-person meetings will be allowed.

Most Purdue Extension staff are working from home. We are available to answer your questions by email, phone or through social media. Our contact information is at the end of the newsletter.

TBA 2020 Hydroponics Workshop
Deans Auditorium/HLA Greenhouse
Contact Lori Jolly-Brown, ljollybr@purdue.edu

May TBA 2020 Strawberry production workshop
SWPAC
Contact Wenjing Guan, guan40@purdue.edu

July 30, 2020 Small Farm Education Field Day
Daniel Turf Center, Purdue Student Farm
Contact Lori Jolly-Brown, ljollybr@purdue.edu

September 10-12, 2020 Purdue Extension Master Gardener State Conference
Sponsored by the Hamilton and Howard County Master Gardener Associations
Hamilton County Fairgrounds, Noblesville, IN (September 10 and 11)

Tours of Howard County gardens, Kokomo, IN (September 12)

> 2020 State Conference Guide

(Registration open to Purdue Extension Master Gardener volunteers and Extension staff only)

October 16, 2020 Indiana Flowers Growers Association Conference
Daniel Turf Center
Contact Lori Jolly-Brown, ljollybr@purdue.edu

January 19-21, 2021 Indiana Green Expo
Indiana Convention Center, Indianapolis, IN
Contact Brooke Ponder, bponder@purdue.edu

January 20 & 21, 2021 Indiana Horticultural Conference & Expo
Indianapolis Marriott East
Contact Lori Jolly-Brown, ljollybr@purdue.edu

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