PURDUE UNIVERSITY
PURDUE EXTENSION
FACTS FOR Fancy Fruit
Issue: 19-06
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In This Issue

Apples past 15mm – fruit drop complete

Raspberry- fruit developing and approaching harvest

Strawberry- harvest underway

Crop Conditions

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

Despite the large amounts of rain, crops are flourishing at Purdue Meigs Farm!

Grape – fruit set

Blackberry – early bloom

Indiana Climate Weather Report

(Austin Pearson, pearsona@purdue.edu)

06/03/2019

As we close the doors on May for the year, one of the biggest stories throughout the month was the precipitation. The entire state was above normal. Northwestern Indiana was 3.41" above normal and southeastern Indiana was 0.18" above normal for the month (Figure 1). Temperatures were near normal in the northern and above normal in the central and southern tiers of the state. Some stations in Central Indiana recorded rainfall on 24 out of 31 days.

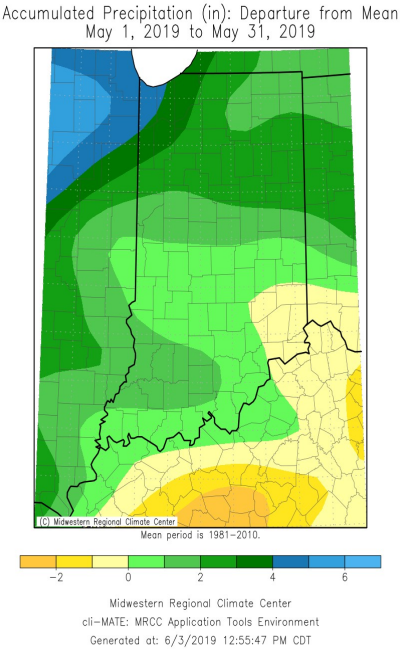

Figure 1: Indiana Precipitation – Departure from Mean May 2019

The good news is that many areas saw dry conditions set in the last week of May and beginning of June and helped alleviate some of the saturated soils. This actually provided a very limited window of opportunity for the agriculture industry. Unfortunately, the weather looks to turn off wet again with 1 to 4 inches of rainfall projected through June 10th. The wet pattern looks to continue through the first three weeks of June with higher confidence in below normal temperatures and above normal precipitation (Figure 2 & 3).

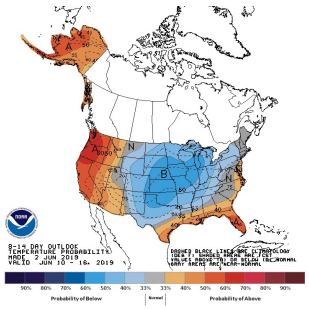

Figure 2: 8-14 Day Temperature Outlook

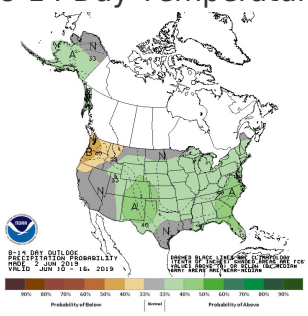

Figure 3: 8-14 Day Precipitation Outlook

Taking this forecast into consideration, it is extremely important to keep an eye on vegetation as conditions may be favorable for disease development. Purdue Extension has various publications about disease management that may be utilized to assist with various diseases. For the row crop industry, producers should already be contacting insurance agents and agronomists to decide on their plan of action for the 2019 growing season. Hybrid maturities will definitely need to be reduced in the central and northern sections of the state. Dr. Bob Nielsen, Purdue Extension Corn Specialist, has a great article about decisions for late planted corn and can be found here: https://www.agry.purdue.edu/ext/corn/news/articles_19/LatePlantedCorn.html

By: Austin Pearson, CED/ANR Educator
Purdue Extension – Tipton County

Phytophthora

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

Current wet weather is increasing the risk of Phytophthora diseases in the orchard.

Phytophthora is a major problem on apples and pear; stone fruit are also susceptible, with plums being the most resistant to this disease. In addition to excessive soil moisture and flooding, moderate temperatures, wounds (mechanical or through herbicide damage), and rootstock susceptibility all factor into Phytophthora infection.

Early spring symptoms of this disease include delayed bud break, smaller than normal and/or discolored leaves, along with twig or small branch dieback. Trees often look 'unthrifty' and sparse (Fig. 1). Unfortunately, these symptoms can be mistaken for nutrient deficiency, winter injury, or even herbicide (Fig. 2) or flood damage. It can also resemble fire blight infection of the rootstock. Examination of the crown is an essential aspect of diagnosing this problem. Peeling away the bark may reveal discoloration, cankering or rotting at or below the graft union, with healthy green tissue distinct from diseased tissue that is orange to brown in color (Fig. 3). Cankers may be weeping or gumming. Later in the season, if weather turns dry, trees will 'collapse' and suddenly fail if the stem is completely girdled and can no longer supply the leaves with sufficient water or the roots with sufficient nutrients.

Fig. 1. The sparse, unthrifty appearance of Phytophthora infected trees. Photo by Janna Beckerman.

Fig. 2. Herbicide injury creates infection courts for opportunistic pathogens like Phytophthora, or Schizophyllum commune, shown here. Photo by Janna Beckerman

Fig. 3. Orange to brown discoloration of the dying rootstock. Photo by Mike Ellis.

Root rot is the most difficult aspect to diagnose of this disease. Root examination is often tricky. Look for soft, brown, punky roots, if the infection is widespread (or you are extremely lucky in selecting your sampling site!). Trees that have root rot but not crown infections often present with unthrifty growth, small leaves and even a heavy fruit set. Just like a girdling canker, root rot infections can result in tree 'collapse' when compromised roots can no longer supply the tree with sufficient water should weather turn dry. Unfortunately, unhealthy stems lead to unhealthy roots, and vice a versa, so a conclusive laboratory assessment is essential in the diagnosis of Phytophthora crown and root rot, and to rule out fire blight. Keep in mind that most rootstock infections of fire blight occur in orchards with a history of fire blight.

Disease Cycle:

The disease is caused by members of the genus Phytophthora, including but not limited to *P.*

cactorum, P. cambivora, P. citricola, and *P. plurivora*, all of which are found in Indiana. Although not a true fungus (and more correctly called a chromista, oomycete, or stramenopila), and commonly called a 'water mold', it thrives in excess moisture and cool temperatures for infection and reproduction. Infection occurs most commonly in spring and fall, but can happen whenever excess soil moisture and favorable temperatures coexist. Phytophthora species can produce three different types of spores (mobile zoospores that swim; oospores, and chlamydospores) all of which can infect the roots, the crown and the collar of the tree. Infection can even splash or spread to the scion, if the scion is susceptible.

Management:

Rootstocks are the best way to manage this disease, and avoiding those rootstocks that are highly susceptible. Different species of Phytophthora vary in their pathogenicity (ability to infect) and all Phytophthora vary in the virulence (how aggressive they are after infection), making the evaluation of rootstocks and the management of this disease challenging.

Rootstock	Susceptibility
G.16	tolerant[2]
G.41	tolerant[2]
G.935	tolerant[2]
G.202	tolerant[2]
B.9	MR
G.11	tolerant[2]
M7	MS[1]
M9	LS-MS[1]
M 26	MS[1]
MM 104	MS[1]
MM 106	HS[1]
MM 111	MS[1]

Tolerant; MR = Moderate Resistance, LS = Low Susceptibility, MS = Moderate Susceptibility, HS = High Susceptibility.

Avoid planting in low spots and minimize ruts to reduce puddling, when possible, or fill in promptly. The disease is most common in low-lying areas, particularly when the soils are heavy clay, and poorly drained. Excessive rain, and even ruts, can serve as focal points for Phytophthora to collect (Fig. 4).

Fig. 4. A river runs through it. Photo by Janna Beckerman.

Fungicides Drenches:

- Mefenoxam (RidomilGoldSL) at 2 quarts/acre in sufficient water to move it into the root zone. Will slow cankering with continued treatment but will not rescue trees with more than 50% of the stem girdled. FRAC CODE 4 fungicide. 48-hr reentry.
- Metalaxyl (MetaStar2E) at 2 gal/acre or 6 fl oz/1000 sq ft. Treat the entire root zone as a banded application FRAC CODE 4 fungicide. 48-hr reentry.**Foliar sprays:** Unlike most fungicides, the mono-and di-potassium salt fungicides are amphimobile, meaning application to leaves will redistribute to the roots.
- Phosphorus acid, Mono-and di-potassium salts (Agri-Fos, Alude, etc.). Do not apply if copper fungicides have been used for the management of other diseases. FRAC Code 33 fungicide.
- Fosetyl AL (Aliette WDG) for bearing and non-bearing apples. For cherry non-bearing trees only. Do not use with copper. FRAC Code 33 fungicide.1. Carisse, O., and S.

Khanizadeh. 2005. “Relative resistance of newly released apple rootstocks to *Phytophthora cactorum*.” *Canadian Journal of Plant Science* no. 86:199-204.2. GENEVA APPLE 2. ROOTSTOCKS COMPARISON CHART v.2 online at: https://www.canr.msu.edu/uploads/236/100348/GENEVA-Apple-Rootstocks-Comparison-Chart.pdf

Indiana Horticultural Society Summer Meeting

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

Indiana Horticultural Society Summer Meeting
Co-sponsored by Indiana Vegetable Growers’ Association
June 25, 2019 Huber Orchard and Winery, Starlight, IN

You are warmly welcomed to join us for the summer meeting of the Indiana Horticultural Society, held in conjunction with the Indiana Vegetable Growers’ Association. It will be held Tuesday June 25 at Huber Orchard and Winery, in Starlight, IN. Huber’s is one of the largest and best agri-tourism destinations in the Midwest. The meeting will focus on commercial production of fruits and vegetables, and farm marketing. All those interested are welcome to attend.

HUBER ORCHARD AND WINERY

The history of Huber Orchard and Winery began when Simon Huber emigrated from Germany in 1843 and settled in Starlight, Indiana. One branch of the family now operates Huber Orchard and Winery. While farming operations started in 1932, it wasn;t until the 1960s that the transition to direct farm marketing took place. Hubers is now one of the premier farm market destinations in the Midwest.

The owners, cousins Greg and Ted Huber, are the 6th generation of Hubers to run the farm and the 8th generation are currently being raised on the farm. For many years Greg has run the field operations, but his son AJ is now assuming this responsibility. Greg’s wife Jan and daughter Marcie take care of book keeping and administration, and daughter Allie runs Plantation Hall events. Ted is the wine maker and runs all winery operations including distilling, and his son Christian has recently returned to the operation full time and is involved in wine making and distilling. while Ted’s wife Dana coordinates distribution and public relations. This is indeed a family owned and operated business.

Huber Orchard and Winery comprises about 700 acres, with about 80 acres of grapes (mostly wine grapes but also a few seedless), 50 acres of apples, 30 acres of peaches, 8 acres of blackberries, 25 acres strawberries, 100 acres of vegetables such as sweetcorn, green beans and tomatoes, with a further 80 acres of pumpkins and gourds. Christmas trees take up another 30 acres or so. Most crops are sold U-pick and all is sold on the farm. Excess fruit is used in the winery for the production of fruit wines, infusions and other winery products. At the peak of the fall season, over 300 employees are needed to help with the various operations on the farm. While the fall is their busiest time, they are also looking at expanding their season with blueberries, strawberries, music, weddings and corporate events.

Prior to our last Hort Society summer visit to Huber’s in 2012, they have purchased some additional land to provide for expansion and more flexibility with plantings and operations. The other major development is their distillery, that was opened in 2014. They now grow a number of grain crops that are used for the distilling operation. The Hubers have focused on diversification and value-added products. For example, not only do they grow apples and sell

them fresh, but they make apple cider, apple butter, apple wine, and apple brandy. Speaking of apples, the Hubers mostly grow Golden Delicious, Gala, Winesap and Fuji, although GoldRush is also becoming quite popular. They recently planted some Evercrispâ so are interested to see how they perform.
Banquets of up to 1000 people can be held on-site for weddings, corporate picnics, and special events. All catering is done in-house. They also offer school tours and have a 30 acre children's farm park. The farm market is open year-round with bakery items and wine available over the winter. The have reconfigured their children's zoo and it is now a Children's Farm Park, with miniature tractors and various activities for the little ones.
While Huber Orchard and Winery is on a much larger scale than many of the orchards and farm markets in the state, all growers are likely to learn useful information during our tour. Their focus on the customer and providing exceptional customer service is applicable, not matter what the size of the operation. For more information, visit their webpage:
http://www.huberwinery.com/

Schedule (subject to change)

(all Eastern Daylight Time):

Tuesday, June 25

9:30 am Convene and registration at Huber Orchard and Winery.

10:00 am Introductions, brief walking tour of facilities – winery, market, ice cream store, banquet hall

10:30 am Field tour – apples

11:45 pm Lunch – $10 – RSVP requested (see below)

1:00 pm Field tours – peaches, vegetables, small fruit

4:00 pm Wrap up and conclude

Optional winery and distillery tour for those interested

Registration

A registration fee of $5.00 per family or farm is payable at registration.

Lunch

A catered lunch will be served onsite. This will most likely be fried chicken with vegetables and drinks. There is a $10/person charge for lunch, collected onsite. Please go to the following website to RSVP so we can plan for the right amount of food:

https://purdue.ca1.qualtrics.com/jfe/form/SV_6oqUlioijOUNb0x

Directions:

Hubers is much easier to get to with a new road to the farm. Rather than print maps and directions, here's the address so enter this into your phone or maps:

Huber Orchard and Winery,
19816 Huber Road,
Starlight, IN 47106
Alternatively, directions are available on Huber's website:

https://www.huberwinery.com/hours-directions/

Events

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

June 25, 2019 Indiana Horticultural Society Summer Meeting
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June 27, 2019 Southwest Purdue Ag Center Field Day
Southwest Purdue Ag Center
Contact Barb Joyner, **joynerb@purdue.edu**
Horticultural related topics include: Organic Tomato Production, High Tunnel Grafted Cucumber & Specialty Melon Production, Applying IPM Principles across Cropping Systems to Increase Insect Pollination and Profitability, Annual Strawberry Production. A meal will be included, and PARP classes also will be available after lunch. To register, email joynerb@purdue.edu, call 812-886-0198, or go online at https://purdue.ca1.qualtrics.com/jfe/form/SV_8pnF8z1CwyglrGl by Monday, June 17.

July 9, 2019 Turf & Landscape Field Day
Daniel Turf Center, West Lafayette, IN
https://turf.purdue.edu/field-day.html
The Purdue Turf and Landscape Field Day is an annual one-day event with the objective of providing professional turf and landscape managers exposure and educational opportunities with the latest research and technical resources. The Field Day features research tours, afternoon workshops on current topics, and a tradeshow with over 40 exhibitors displaying equipment and turf and landscape products.

July 18, 2019 Meigs High Tunnel Field Day
Purdue Meigs Farm
https://purdue.ca1.qualtrics.com/jfe/form/SV_0HXQwDluRiOnwAB
Contact Lori Jolly-Brown, **mailto:ljollybr@purdue.edu**
The field day at Meigs Horticulture Farm, presented by the Horticulture Department and the Department of Entomology, will focus on high tunnel production of cucurbit crops. It will feature tours of conventional and hydroponic high tunnel cucumber and melon production. The use of insect-exclusion screens to control cucumber beetles and bacterial wilt will be on display in the conventional high tunnel systems. Vegetable grafting and future research in tomato systems will be presented. Attendees will also have an opportunity to discuss current challenges and future directions of research areas for high tunnel production systems.

August 1, 2019 Small Farm Ed Field Day
Daniel Turf Center, Purdue Student Farm
https://purdue.ca1.qualtrics.com/jfe/form/SV_3qQfl05iryF3COp
Lori Jolly-Brown, **ljollybr@purdue.edu**
The Small Farm Education Field Day presented by Horticulture & Landscape Architecture will have classroom educational sessions at the Daniel Turf Center followed with lunch catered by Juniper Spoon at the Purdue Student Farm. Tours, workshops and vendors!
Rototiller vs. power harrow demonstration
High tunnel tomato and pepper product
Solar dryers for post-harvest processing of fruits, vegetables
Wash pack demonstration
Food safety plans and certification process for gardeners
Dynamic enterprise budgets
Scheduling crops in high tunnels
Cover crop choices
Soil restoration in urban farms

September 5, 2019 Hydroponics & Greenhouse workshop
Purdue University, Deans auditorium, HLA

greenhouse
https://tinyurl.com/yxm5ttb9
Contact Lori Jolly-Brown, **ljollybr@purdue.edu**
Participants will learn about optimal conditions for growing hydroponic lettuce, including nutrient recipes, production systems, artificial lighting practices and optimal temperatures for lettuce. Workshop attendees will also have the opportunity to tour the department's greenhouse and hydroponic facilities where several hands-on activities will take place. Krishna Nemali, professor of controlled environment agriculture, will lead the workshop. Nemali's research centers on enhancing sustainable growing practices in controlled environments, like greenhouse and indoor vertical farms.

October 17, 2019 Indiana Flower Growers association conference
Purdue University, Daniel Turf Center
Contact Lori Jolly-Brown, **ljollybr@purdue.edu**
Horticulturists and greenhouse operators will have an opportunity to network with industry experts and Purdue Extension specialists. Educational sessions to include technology and automation, electrical conductivity sensors, marketplace opportunities, greenhouse production, worker production standards, as well as networking with other flower growers across the state.

February 11-13, 2020 Indiana Horticultural Congress
Indianapolis Marriott East Hotel:
Contact Lori Jolly-Brown, **ljollybr@purdue.edu**
https://www.inhortcongress.org/
The Indiana Horticultural Congress, presented by Purdue University, is an educational meeting designed to meet the needs of fruit, vegetable, wine, organics, greenhouse, high tunnel, specialty crop growers and marketers in Indiana and surrounding states. Over 500 registrants and more than 70 vendors attend each year.

February 11-13, 2020 Indiana Green Expo
Contact Brooke Ponder, **bponder@purdue.edu**
Indiana Convention Center, Indianapolis, IN
Indiana's largest, most comprehensive green industry event of the year!
Offering over 75 educational seminars plus a Spanish track, certification opportunities, in-depth workshops, numerous CEUs and CCHs to be earned, and a two-day trade show!

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