PURDUE UNIVERSITY

PURDUE EXTENSION

FACTS FOR Fancy Fruit

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In this Issue

Crop conditions:

Grapes are at bud swell to bud break. Blackberries are at 1/2-3/4 inch green. Blueberries are at bud break. Strawberries are at pre-bloom with buds are visible out of the crowns.

In Lafayette apples are at tight cluster and peaches approaching bloom (see bud stages on page 4 in this issue). In more southern areas of the state, apples are in pink and peaches are in bloom. Severe damage to some cultivars from winter cold is showing up.

Early season sprays for grapes:

There are some potential pest and disease problems that require early season sprays. Phomopsis is a major problem on many grape varieties in the Midwest. Mancozeb should be applied starting at 1-3 inch shoots and repeated each 7-10 days, especially prior to a predicted rain event. Colleagues in Michigan and Ohio have been conducting evaluations of dormant fungicide applications for management of this disease. Liquid lime sulfur, Sulforix, and fixed copper (copper hydroxide) have proven to be most effective. A single application at bud swell can provide a significant degree of Phomopsis control (a 50 to 60 percent decrease in disease severity on the grape leaves as well as clusters), but will not reduce the need for the standard recommended fungicide sprays for Phomopsis control during the growing season. It is important to recognize that sanitation is part of a Phomopsis management plan. Prune out dead canes and stubs as much as possible since they are the main sources of Phomopsis spores.

Anthracnose is a less common disease, but one that we are seeing more frequently. This may be due to warmer weather or susceptibility of new varieties. We have seen that Frontenac and Marquette are very susceptible to anthracnose. The delayed-dormant lime sulfur or Sulforix sprays are very effective against anthracnose. While sulfur and copper can be toxic to certain varieties, there is minimal chance of phytotoxicity if the products are applied just prior to bud break (at the bud swell stage).

Grape Flea beetle and climbing cutworm can be problems in vineyards. Grape flea beetle is most common in Indiana. Scout vineyards for this pest and its damage, holes eaten into swelling buds. If more than 4% of the buds show damage, apply an insecticide to prevent further damage. Carbaryl (Sevin) is generally recommended.

See the 2015 Midwest Commercial Small Fruit and Grape Spray Guide (https://ag.purdue.edu/hla/Hort/Pages/sfg_sprayguide.aspx) and Midwest Small Fruit Pest Management Handbook for a complete discussion of grape pest management. (Bordelon)

Sprayer calibration videos:

One of the items on every grower's 'to do' list each spring is to make sure that the sprayer is properly calibrated. If you need a refresher on how to go about doing this, Cornell professor Andrew Landers has posted a couple of videos on YouTube that walk through the process. To find the videos:

1. Go to the YouTube website, https://www.youtube.com/

2. Type 'vineyard sprayer calibration' into the search box at the top. Andrew's videos should appear at or near the top of the list. (Note they are listed "by Bill Larzelere")

The videos are in two parts – "Part 1 Selecting and

Changing Nozzles" and "Part 2 Measuring Liquid Flow". Each video is done in a metric version and one with US units of measure.

Spur® (clopyralid) herbicide labeled for strawberry in Indiana:

A new registration has been issued for a post emergent herbicide for use in strawberries. This information is not in the 2015 Midwest Small Fruit and Grape Spray Guide. Spur® contains clopyralid, a herbicide effective against a number of troublesome weeds in perennial strawberries such as thistle, dandelion, curly dock, common groudsel, clover, etc. It is labeled for use in perennial strawberries only. It can be broadcast at 2/3 pints per acre or used as a spot treatment at 1/4 fl. oz. per gallon. Do not tank mix with other herbicides. Only one application can be made each year. Most common timing would be after harvest during renovation. (Bordelon)

Effect of water quality on pesticides:

Water quality has a profound impact on the performance of pesticides used by fruit growers. Purdue Pesticides Program recently published a very nice guide, The Impact of Water Quality on Pesticide Performance PPP-86, available at the Education Store, 1-888-EXT-INFO or www.extension.purdue.edu/store/. I highly recommend this guide to all growers.

Water hardness: Fruit growers often apply a post-emergent herbicide beneath the tree or vine row in spring to control winter annuals and other weeds. A pre-emergent herbicide may be included in this application. Glyphosate (Roundup) is the most common post emergent systemic herbicide used in fruit crops. In order for glyphosate to be effective, it needs to be absorbed into the weed plant. In soft water weeds readily absorb glyphosate. However in hard water glyphosate will be 'tied up' and not absorbed as readily. Hard water, common in many parts of Indiana, contains high concentrations of soluble salts, calcium and magnesium. When these cations are present they react with the negatively charged glyphosate to form compounds that are not readily absorbed by plants. This results in poor uptake and poor weed control.

The solution to the hard water problem is to add ammonium sulfate to the spray water **before** mixing with glyphosate. Ammonium sulfate ions tie up the calcium and magnesium ions forming conjugate salts. Additionally, some of the glyphosate reacts with ammonium to form a compound that some weeds preferentially absorb. Sprayable ammonium sulfate (AMS) is available in granular and liquid formulations. Follow the label recommendations on the amount of ammonium sulfate to add.

Water pH: Another problem associated with spray water quality is that many fungicides and insecticides break down quickly in high pH water. The pH is a measure of the acidity or alkalinity of water, which refers to the number of hydrogen (H+) and hydroxyl (OH-) ions in a solution. The scale for measuring pH runs from 0 to 14. The lower the pH, the more acidic the solution; a higher pH indicates that the solution is more alkaline. Water at pH 7 is neutral — meaning that there are equal numbers of hydrogen and hydroxyl ions in the solution. Many areas in the Midwest have alkaline water (pH 8.0 or above) with high mineral/iron content. In addition, the pH of water from natural sources can vary throughout the season.

The pH of water can negatively affect the stability of some pesticides. Under alkaline conditions, alkaline hydrolysis occurs, which degrades the pesticide to non-toxic (inactive) forms. In general, insecticides (particularly organophosphates and carbamates) are more susceptible to alkaline hydrolysis than are fungicides, herbicides or growth regulators. The end result is less active ingredient applied and poor pesticide performance. The degradation of a pesticide can be measured in terms of its half-life. For example, if a product has a half-life of 1 hour, its effectiveness is reduced to 50% in 1 hour, to 25% in the next hour, to 12.5% in the next hour, etc. Eventually, the pesticide becomes virtually ineffective.

The effect of pH on pesticides varies from product to product and is also moderated by buffering solutions contained in the pesticide formulation. Tank mixing multiple pesticides can modify the pH of the tank mix. For instance, Captan has a half-life of 32 hours at its optimum pH of 5, but only 10 minutes at pH 8. Similarly, mancozeb has a half-life of 20 days at pH 5, but less than 17 hours at pH 7. Rally, on the other hand, is not affected by pH.

Facts for Fancy Fruit is a newsletter for commercial and advanced amateur fruit growers. It provides timely information on pest control, production practices, and other topics likely to be of interest to fruit growers. All growers and interested persons are welcome to subscribe.

Subscriptions are $15 per year. Subscribers will receive 12-15 issues biweekly during the growing season and monthly otherwise.

To subscribe, send your name, mailing address, and check for $15 (payable to Purdue University) to:

Facts for Fancy Fruit
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West Lafayette, IN 47907-2010
Attention: Lori Jolly-Brown

This newsletter can be accessed free at www.hort.purdue.edu/fff/.

In general, pesticides are most stable when the spray solution has a pH of about 5. Many water sources are more alkaline than this, so it may be necessary to adjust the pH of the spray solution. There are important exceptions to the rule that spray solutions should be acidified. For instance, in the case of copper-based fungicides, copper becomes more soluble at a lower pH and may become phytotoxic to crops. In addition, phosphorous acid and other acid-based fungicides already have a low pH, and lowering it even more can cause them to injure crops. On the other hand, acidifying carbonate salt fungicides, such as Armicarb, may render them ineffective.

Both the Midwest Tree Fruit and Small Fruit and Grape Spray Guides have a discussion of spray tank pH. Spray water can be acidified by adding a specific acidifant, or with food grade citric acid. About 2 ounces of food grade citric acid per 100 gallons of water will lower the pH from about 8.0 to about 5.5. (Bordelon)

The table to the right shows the half-lives of a number of pesticide products as well as the optimum pH (where known) (by Annemiek Schilder from the MSU Fruit Management Guide E-154) (Note: Only a small part of the table is reproduced. See E-154 for the full table).

Product	Active Ingredient	Optimum pH	Half-life (time until 50% hydrolysis)
Insecticids/Miticides			
Admire	Imidacloprid	7.5	Greater than 31 days at pH 5-9
Apollo	clofentezine		pH 7 = 34 hrs; pH 9.2 = 4.8 hrs
Assail	acetamiprid	5-6	Unstable at pH below 4 and above 7
Dipel/Foray	Bacillus thuringiensis	6	Unstable at pH above 8
Imidan	phosmet	5	pH 5 = 7 days; pH 7 < 12 hrs; pH 8 = 4 hrs
Kelthane	dicofol	5.5	pH 5 = 20 days; pH 7 = 5 days; pH 9 = 1hr
Malathion	dimethyl dithiophosphate	5	pH 6 = 8 days; pH 7 = 3 days; pH 8 = 19 hrs; pH 9 = 5 hrs
Sevin XLR	carbaryl	7	pH 6 = 100 days; pH 7 = 24 days; pH 8 = 2.5 days; pH 9 = 1 day
SpinTor	spinosad	6	Stable at pH 5-7; pH 9 = 200 days
Fungicides			
Aliette	fosetyl-al	6	Stable at pH 4.0 to 8.0
Benlate	benomyl		pH 5 = 80 hrs; pH 6 = 7 hrs; pH 7 = 1 hr; pH 9 = 45 min
Bravo	chlorothalonil	7	Stable over a wide range of pH values
Captan	captan	5	pH 5 = 32 hrs; pH 7 = 8 hrs; pH 8 = 10 min
Dithane	mancozeb	6	pH 5 = 20 days; pH 7 = 17 hrs; pH 9 = 34 hrs
Rally	myclobutanil		Not affected by pH
Ridomil	mefenoxam		pH 5-9 = more than 4 weeks

Pixie Crunch:

A number of growers have contacted me asking where they can buy Pixie Crunch trees. This is a relatively new cultivar bred by Dr Jules Janick at Purdue, and is an apple well suited for u-pick and retail orchards. The propagation of Pixie Crunch trees is licensed to Gardens Alive Nursery and is available through their mail order catalog and through their wholesale brand, Early Morning Fruit Nursery; (http://www.earlymorningnursery.com) They have in turn sub-licensed it to Cummins Nursery and Wafler Nursery, both in New York. So between these three nurseries, hopefully growers can buy or order the trees they need. (Hirst)

Current bud stages West Lafayette, IN		
Apple	*Peach*	*Grape*
		
Tight Cluster	*Half-inch green*	*Bud swell*
Black Raspberry	*Strawberry*	*Paw paw*
		
1 inch shoots	*Flower buds emerging from crowns*	*Paw paw flower bud prior to bloom*

Spring 2015:

The development of both plants and insects is determined to a large extent by temperature. Neither plants nor insects develop very much in the spring when temperatures are below 50° F. To predict their rate of development, we can calculate "Growing Degree Days". This is the average daily temperature minus the base temperature (often 50° F is used). Taking the average of the daily maximum and minimum temperatures is the easiest way to come up with the average daily temperature. So if the max is 70° and the minimum is 40, then the average daily temperature is 110/2 = 55° F. So we subtract the base temperature and that day we accumulated 5 Growing Degree Days. Looking up spring temperatures over the last few years allows us to compare years (Fig.1).

Here we see some years such as 2012 were very early, and as many recall, we had the most damage to fruit crops in many years that year. So far this year (black line on graph) we're tracking about the same as the last 2 years. The good news is we're not extremely early as we were in 2010 and 2012, although we're still a little earlier than the long term average (normal on the graph).

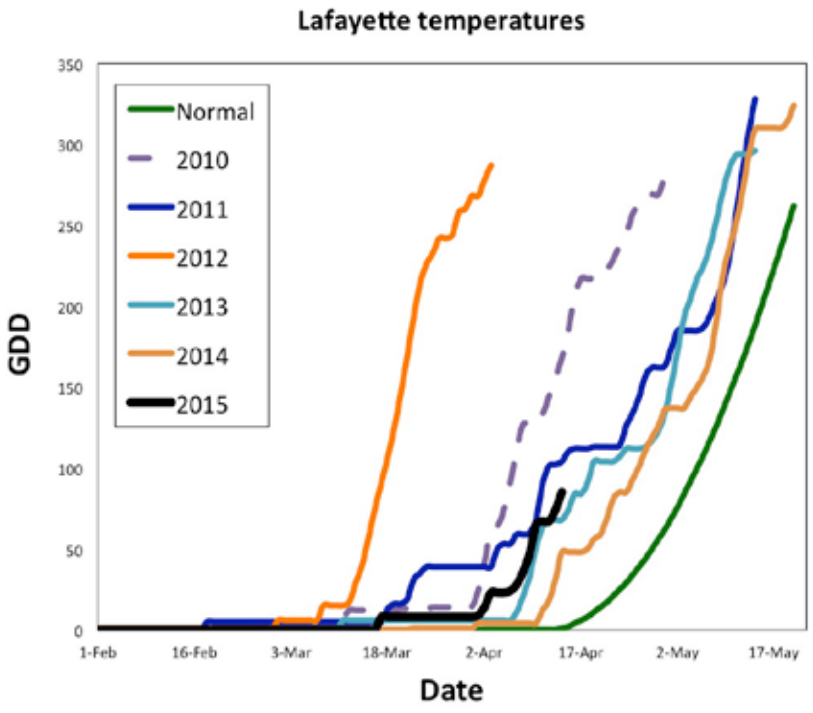

Fig.1 Spring temperatures in Lafayette over the last six years

Apple Scab and Ascospore Maturity:

These photos of apple scab ascospores were taken on March 31, 2015. In commercial orchards, significant spore release occurs when approximately 15% of the spores are mature. Pseudothecia, overwintering sexual structures in the leaf, slowly develop over the winter (Fig. 2). As temperatures warm, sacs (asci) filled with ascospores begin to develop in these pseudothecia, with eight spores per sac or ascus. Multiple pseudothecia can develop in each lesion, and each pseudothecium (sincular) contains thousands of sacs (asci) filled with eight spores. That's a lot of spores! Spore mature when they change color from clear (immature) to a golden olive-green (mature) and will then be shot out of the pseudothecia with as little as 0.1" of rainfall (Fig. 3). This year, spore maturity was advanced compared to tree phenology, as only a few trees were beginning to show green tip at that point. With a few days of warm(er) weather, and a bit of rain, 2015's early infection periods will pose a higher than average risk of scab this year, at least at Meig's. Early season sprays are critical for controlling scab, particularly when spore maturing is 'online' prior to green tip.

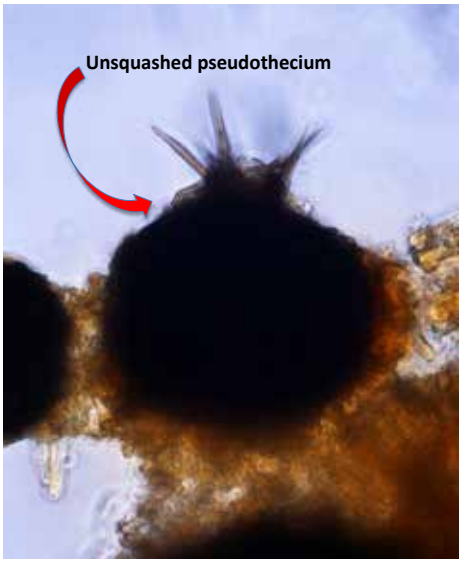

Fig. 2.
An unsquashed fruiting structure that grows in the fallen apple leaves. Each pseudothecium can produce several thousand ascospores.

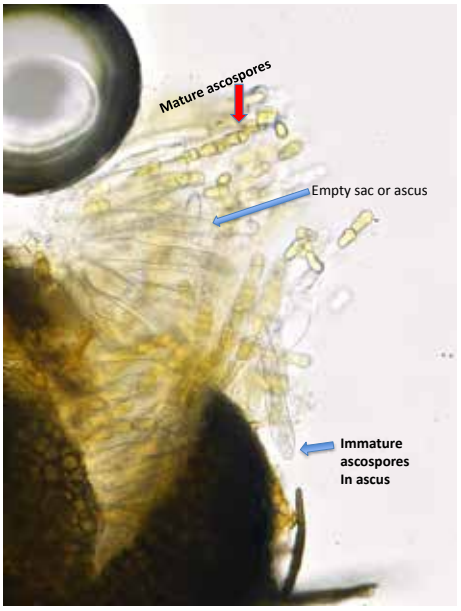

Fig. 3. Squashed pseudothecium with sacs (asci) and spores inside.

There are many factors that contribute to 'bad apple scab years'. Some of these factors include when the first rains occur, with this pre-bloom period being the most critical: Every day of dry weather after bud break delays scab development in trees by one more day. If the weather is dry prior to tight cluster or pink, the earliest primary infections occur too late in the season to drive repeating cycles of secondary spore production before leaves and fruit lose susceptibility to scab. Ascospores will mature and develop but remain stuck in the fruiting body, never to be released. Almost as good is dry weather during bloom and petal fall which also decreases the number of spores and scab cycles that can occur in a year, while terminal buds set thereby limiting any susceptible new leaf growth from developing. Unfortunately, last year's mostly cool and wet summer resulted in a lot of disease and overwintering inoculum, meaning as long as the weather remains cool and wet, trees must be protected from the threat of early season scab. Not only is there a lot of inoculum, but the weather conditions are such that all of that inoculum may make it into the orchard, so protecting that green tissue early is essential! (Beckerman)

Honey Bees and Other Pollinators:

As you all know, virtually all fruit crops are dependent upon pollinators to move pollen from flower to flower. Without adequate levels of pollination, we either get no fruit or fruit of lesser quality. Honey bees are likely the most important pollinators for most of our fruit crops, but other pollinators such as a number of species of native bees and other insects can also provide useful pollination services. In recent years, there has been a lot of attention given to larger than normal die off of honey bee colonies, commonly referred to as colony collapse disorder. There has been a great deal of discussion in the scientific community and in the public about the cause or causes of these colony deaths. Some of the suspected causes include new disease organisms, Varroa mites feeding in the hives, and a relatively new class of insecticides, the neonicotinoids.

Many factors can determine the survival of honey bee colonies, particularly over the winter. According to our apiculturist, Greg Hunt, the average overwintering hive losses in Indiana have averaged about 30%. After the severe winter of 2013-14, losses were about 65% statewide. This year, after a more normal winter, losses were about 29%. In addition to weather, Varroa mites and whether beekeepers treat for them can be important to hive survival. The impact of neonicotinoid use on bee health and hive survival is less clear.

The neonicotinoids have been on the market for about 20 years and have become one of the most popular groups of insecticides in the world. Their success has been the result of their low toxicity to humans and vertebrate wildlife, their effectiveness against both chewing and sucking insects, and their systemic activity, meaning they move through the plant and can kill insects at location throughout the plant. The neonicotinoid insecticides labelled for use on fruit crops include Platinum and Actara (thiamethoxam), Admire Pro (imidacloprid), Assail (acetamiprid), Belay (clothianidin), Calypso (thiacloprid), Venom and Scorpion

(dinotefuran) and Closer (sulfoxaflor). There are also a number of pre-mixes that contain neonicotinoids. All of these are very toxic to honey bees, except for Assail, which is only slightly toxic.

Recent work conducted by Christian Krupke and Greg Hunt in our department has shown that the dust created during planting of agronomic crops with seed treated with neonicotinoid insecticides has the potential for killing bees. Around planting time, they found lots of dead bees in hives near corn fields (which would be pretty much anywhere in Indiana) and found lethal concentrations of neonicotinoid insecticides in those bees and found it to be persistent in the soil. My group completed a study last year that showed that neonicotinoid seed treatments, soil drenches, and foliar treatments on muskmelons resulted in levels of those insecticides in the pollen that could be lethal to bees.

Because of these concerns, the US EPA has charged each state with developing a pollinator protection plan, with a particular emphasis on potential pesticide effects. In Indiana, that responsibility has fallen to the Indiana Pesticide Review Board, on which both Bruce Bordelon and I serve. Recently, we held an open forum that brought together beekeepers, farmers, pesticide applicators, Purdue scientists and educators, environmental groups, and others to establish a dialogue that will eventually result in a protection plan, with best management practices for all parties so that we can all achieve the common goal of continuing to produce our crops without harming honey bees and other pollinators.

As a fruit grower, what can you do to protect bees? First, if possible, don't spray insecticides during bloom. For some fruit crops this is easy, since bloom is a relatively short and well-defined period of time. For other crops, bloom occurs over an extended period and fruit must be protected during that time. Some good approaches to reducing the impact on bees in this scenario is to choose insecticides that are less toxic to bees and spray at night after the bees have returned to their hives. See the Midwest Tree Spray Guide and Midwest Small Fruit and Grape Spray Guide for spray options. If you must use a neonicotinoid insecticide, use Assail since it is not very toxic to bees. Second, if your crop is not blooming but you have a lot of weeds such as dandelions that are, bees will still be visiting and have the potential for harm. Good weed control can reduce the visitation of bees to your planting and protect them from harm. Even mowing between rows to remove the flowers from dandelions and other weeds can reduce the attractiveness of your planting to pollinators when you need to spray a toxic insecticide. Finally, always use IPM (Integrated Pest Management), and only spray when necessary to produce a high quality and profitable crop.
(Foster)

State of the Indiana Hops Industry

(Clayton Nevins, cnevins@purdue.edu, 765-592-6270)

Background:

Rapid growth in the craft beer industry is stimulating Indiana's economy and creating an opportunity for Indiana farmers to start growing hops. In 2012, the Indiana craft brewing industry contributed over 600 million dollars to the state's economy. The industry continues to grow, increasing from 63 breweries in 2013[1] to nearly 100 in 2015, and housing over 6,000+ full-time employees.[2] Hop production has increased over 10% since 2013, with the hops industry in Indiana being no exception.[3] Hop production currently occurs predominantly in the Pacific Northwest, with Washington state leading production at (74%) of the total acreage, followed by Oregon (14%), Idaho (10%), and the rest of the country (2%). However, many hop yards have now taken root in Indiana, with many additional yards currently under construction (Fig. 4).

[1]*Indiana Craft Beer Sales Statistic, 2013:* http://www.brewersassociation.org/statistics/by-state/?state=IN
[2]*Brewers of Indiana Guild About:* http://drinkin.beer/about/
[3]*Hops Growers of America 2014 Statistical Report:* http://www.usahops.org/userfiles/image/1421356603_2014%2Stat%20Pack.pdf

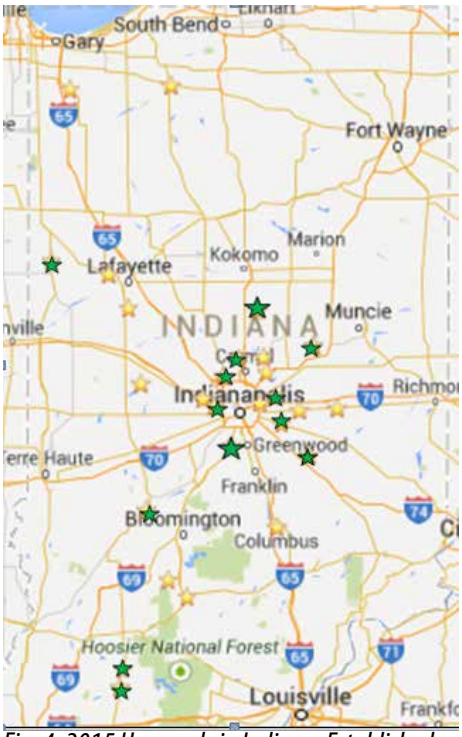

Fig. 4. 2015 Hop yards in Indiana. Established yards are represented with gold stars and planned hop yards in green.

Hops (Humulus lupulus):

Hops are a perennial crop essential for beer production - imparting bitterness and aroma. The plants produce bines that climb over 20 feet during the course of the growing season. The female cones (flowers) (Fig. 5) are harvested in late summer or early fall, and are dried or sent directly to the brewery to begin the process of producing beer. Healthy hop plants have a life span of over 10 years.

Fig 5. Female hop cones at the Boiler Hop Yard

Purdue's Interaction with the Industry:

With a rapidly growing industry comes a need for professional assistance through university research and extension. The Specialty Crop Production Systems Research Lab at Purdue is providing that assistance. Entering its second year, the Boiler Hop Yard is home to

variety trials that aim to identify best adapted varieties, and key insect pests and diseases affecting hops in Indiana. This summer, the lab will travel to established and aspiring Indiana hop yards to collect soil, pest and cone samples to help farm owners optimize their production systems.

Training the next generation of hop growers, researchers and extension educators is another aim of the Purdue Boiler Hop Program, and this summer Clayton Nevins, a senior in Purdue's Department of Agronomy, was hired as an intern to help manage the hop yard and assist with disease scouting and soil analysis throughout the state. In the fall, Clayton will collect cone samples and quantify the essentials oils and alpha and beta acid levels present in the hops in collaboration with scientists in the Department of Food Science. The acids and oils impart bitterness, flavor and aroma in beer. Finally, Clayton will assist with development of extension bulletins aimed at helping aspiring hop growers get started.

Purdue's Hop Yard:
The Boiler Hop Yard, located at the Meigs Horticulture Research Farm south of Lafayette, IN serves as a research and demonstration plot. Two trellis systems were erected last spring: the more common 18+ft trellis and a shorter 10ft "dwarf" trellis. Dwarf trellis systems offer a potential advantage to smaller-scale hop growers because of lower management and input costs. Although costly (roughly $10,000 an acre) and labor intensive, a well-constructed trellis system can last for over 10 years.

The Boiler Hop Yard is home to several varieties of hops including Cascade, Centennial, Nugget, Chinook, Galena, and Zeus. These varieties were chosen for several reasons. First, they are publicly available - meaning that they are available for any aspiring hop farmer to plant. Second, these varieties are popular among the industry, and already had a presence in Indiana hop yards prior to establishment of the Boiler Hop Yard in 2014. Lastly, these varieties are expected to be the most adaptable to Indiana's climate, and some are likely to perform well in dwarf trellis systems.

Purdue's Outreach Activities:
Purdue is hosting several events to help Indiana's established and aspiring hop growers get started and optimize production. This included a workshop at the recent Indiana Small Farms Conference. Representatives from different departments in the College of Agriculture, as well as visiting scholars from the University of Vermont and the University of Minnesota were on hand to give presentations and answer questions about the crop and the industry. Topics covered included trellis construction, practical pesticide use, food safety awareness issues, insurance for specialty crops, insect suspects in Indiana's hop production, as well as information about how important it is to secure legitimacy in a new and expanding market. Over 100 people were in attendance. Copies of the presentations can be found on Purdue's hop website along with links to webinars and other resources for hop growers. https://ag.purdue.edu/hla/Extension/Pages/Hops.aspx. The next outreach activity will be held at the Boiler Hops Yard sometime in late July or early August when the hops are getting close to harvest. Details will be made available on Purdue's hop website.

Getting Connected:
In addition to Purdue's hop website, the GrowINHops active mailing list is also an excellent way to connect with the Indiana hop industry. To sign up for the mailing list go to: https://lists.purdue.edu/mailman/listinfo/growinhops. Additional information or questions regarding Purdue's Boiler Hop Program can be directed to Dr. Lori Hoagland (lhoaglan@purdue.edu) or Dr. Bruce Bordelon (bordelon@purdue.edu).

Indiana spring weather outlook, expect swings in conditions:

As Indiana frees itself from the grip of a harsh late winter, the State Climate Office says a developing weather pattern is likely to produce variable conditions this spring.

A developing El Niño - a cyclic warming of the Pacific Ocean along the equator - is the focus of climatologists giving a glimpse into potential conditions for planting season in April and May.

Studies by the State Climate Office, based at Purdue University, show that when an El Nino is in progress, April temperatures range from below normal in northern Indiana to above normal in the southern counties. April precipitation tends to be below normal in northern Indiana to above normal in the south.

Although some "seasonalization" in temperature patterns is expected, Indiana hasn't experienced "normal" conditions consistently for quite a while and isn't likely to see them anytime soon.

"We are in early days of the El Niño formation, so expect lot of variability and swings in the weather patterns," said Dev Niyogi, state climatologist. "There will be likely little 'normal' of this season as has been the norm for the last few seasons."

But cold temperatures and drier-than-normal conditions are expected through April 1.

This winter was not as severe as a year ago, so it has not been as damaging to plants. But harsh weather in February took its toll on peach buds in southern Indiana because temperatures dipped to 14 degrees below zero at one point.

"There very likely will be little or no crops of peaches in the south," said Peter Hirst, Purdue Extension fruit tree specialist.

Peach trees in the northern part of the state did not sustain as much damage because the temperature drop was not as severe at the time - if by only a less than 10 degrees.

"In the northern area we'll see some peach crops," he said.

Although there are only about 500 acres of peach trees throughout the state, the peach crop can be valuable, Hirst said.

Indiana apple trees, which can withstand colder temperatures than peach trees, fared well over the winter. "The buds look good," he said.

Hirst said cool weather in the coming weeks actually would be good for fruit trees because it would make them less susceptible to cold that could follow an early spring warm-up.

Grape growers are finally getting the chance to help their grapevines recover from the exceptionally harsh cold of last year's winter. Indiana vineyards suffered severe winter injury in 2014; many vines were killed to the ground and since have regrown shoots from the base of the trunks. How to properly handle those vines to re-establish trunks and cordons for future years of production will be the main purpose of a Purdue Wine Grape Team workshop April 8 at Dulcius Vineyards in Columbia City.

There has been some damage this year to grape varieties tender to cold, but Extension viticulture specialist Bruce Bordelon said growers can adjust by pruning.

"It's not a good thing to have any damage while we are trying to retrain vines, but I don't expect it to be a major problem assuming that we get no more sub-zero temperatures," he said.

This winter's weather is unlikely to affect crop insect pests such as corn rootworm, the eggs of which overwinter and are well adapted to Indiana climate in most years, said Purdue Extension entomologist Christian Krupke.

A pattern of warm days followed by freezing in January and February can kill the eggs, but Indiana did not have that weather this year.

"What we are seeing now, a 'typical' warming period for the season, is unlikely to have any adverse effect on corn rootworm egg survival," he said.
(Keith Robinson, Purdue News)

Honeybee die-off less severe this year

WEST LAFAYETTE, Ind. – The honeybee population appears to have survived the winter in better shape than a year ago, but still faces several significant threats, a Purdue University honeybee specialist said.

After the brutally cold, wet winter of 2013-14 in much of the U.S., observers reported one of the largest bee die-offs ever recorded, with a mortality rate of about 65 percent for Indiana, said Greg Hunt, professor of entomology. Based on his primary investigation and discussions with beekeepers, Hunt estimated this year's losses at about 29 percent.

"It seems much better than the year before, even though it was another cold winter," Hunt said.

Honeybees are essential to agriculture because they pollinate food plants such as fruits, nuts and vegetables. According to the U.S. Department of Agriculture, honeybee pollination is worth about $15 billion a year in crop production.

But the honeybee population has been declining for years, with the U.S. losing about one-third of its hives annually, Hunt said. Experts estimate the number of honeybee colonies in the U.S. dropped from about 4 million in the 1970s to about 2.5 million now.

The reasons for the bees' decline aren't entirely clear, Hunt said, although there are likely a number of contributing factors.

Especially baffling is a phenomenon known as colony collapse disorder, when adult worker bees disappear from their hives for no apparent reason, leaving the immature bees in the colony to starve.

"Although colony collapse disorder has generated a lot of attention, symptoms haven't been seen in Indiana or in other states in the past two years," Hunt said.

A class of insecticides called neonicotinoids, commonly used on soybean and corn seeds, has also been identified as a threat. In a 2012 study, Hunt and other researchers found high levels of concentrated neonicotinoids in dead bees around agricultural fields.

It is believed the neonicotinoids are absorbed by the talc used in planting and spread to surrounding plants and soil when the talc is released as exhaust from the planting machinery.

Another significant danger facing the bee population is a parasite known as a Varroa mite. The mites feed on bee larva and transmit viruses. If left unchecked, a mite infestation can destroy an entire colony.

The reddish-brown mites are tiny, but visible to the unaided eye. Beekeepers who notice too many mites in their hive should use a commercially available pesticide designed specifically to control Varroa mites, Hunt said.

"The earlier an infestation is identified, the better chance you have of saving the colony," he said.

Replacing a hive that has been lost or damaged by Varroa mites or other causes can be expensive and time-consuming, Hunt said.

"Normally, the bees are ready to pollinate in mid-May," he said. "If a beekeeper has to replace a colony, pollination could be delayed until mid-June."
(Darrin Pack, Ag Answers)

Upcoming events:

June 23-24:
Indiana Horticultural Society summer meeting and field tour, Purdue Meigs farm, Lafayette, IN.

Jan. 19-21, 2016:
Indiana Horticultural Congress, Wyndham Hotel, Indianapolis, IN
http://www.inhortcongress.org/

Please visit our Purdue HLA Extension website under the Events tab for further event details.
https://ag.purdue.edu/hla/extension

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