

FACTS FOR *Fancy Fruit*



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Crop Conditions:

Crops in the northern half of the state remain mostly dormant. In more southern areas crops are just starting to push and showing a little bit of green. Warmer temperatures forecast over the next week will accelerate crop development.

Indiana Horticultural Congress:

It was good to see so many growers at the recent Hort Congress. Over 600 growers attended the Congress and the trade show was again sold out. The wine industry held an anniversary celebration to mark 40th years of existence as an organization. Our usual program topics were held covering agritourism, farm marketing, fresh vegetables, fruit, organics, processing vegetables, and winegrapes. In addition, special sessions were held on food safety and high tunnels, both of which proved popular with growers and were well attended. Plan to attend the 2016 Hort Congress and put the dates on your calendar now: Jan 19-21, 2016.

Indiana Cider Contest:

This year saw another round of the annual Indiana cider contest held in conjunction with the Indiana Hort Congress. Beasley's Orchard produced the winning apple cider, while both Apple Hill Orchard and Tuttle Orchard were among the top 3 places.

Dr Dick Hayden – Lifetime achievement award:

The Indiana Horticultural Society was pleased to present a lifetime achievement award to Dr. Dick Hayden at the Indiana Hort Congress. The citation read: "The Indiana Horticultural Society and Purdue University have great pleasure in recognizing Dr. Richard A. Hayden, Professor Emeritus, for his lifetime of service and dedication to the Indiana

fruit industry. The citation was signed by Sarah Brown, president of the Indiana Horticultural Society, Dr. Hazel Wetzstein, head of the Department of Horticulture and Landscape Architecture and Dr. Jay Akridge, dean of the College of Agriculture. Many growers were pleased to welcome Dick back to the Hort Congress after a hiatus of a few years and to have the opportunity to congratulate him on his award. It was also fitting that Dick's wife Helen could also be in attendance. This is the first time the Society has granted this award, and no one could be more deserving than Dr. Hayden.

Indiana Hort Society Summer Meeting:

The summer meeting of the Society will be held June 23-24 at the Purdue Meigs farm, about 8 miles south of campus. The general plan is for a one-day tour of the farm concluding with a cookout. The following day we plan to provide tours of various facilities on campus for those who wish to stay. More details will be provided in future issues of this newsletter but put the dates on your calendar now and plan to attend.

Winter temperatures:

While most of Indiana escaped winter with minimal damage to fruit buds, some areas in southern Indiana received temperatures around -15°F in February. This caused severe damage to sensitive crops such as peaches. In more northern areas of the state, low temperatures hovered around -10°F and we expect minimal damage to fruit crops as a result.

Pheromones and Pheromone Traps:

One way insects communicate with individuals of the same species is with pheromones. Pheromones are volatile chemicals released by an insect that usually can be detected only by individuals of the same species. There are a number of different types

of pheromones, but the most common type is the sex pheromone. Usually the females will emit a tiny amount of a chemical that attracts the male to her and increases the likelihood of mating. Because the chemical is volatile, air currents carry it. The male detects the pheromone in the air with receptors on his antennae. He then flies upwind to find the source of the pheromone, a prospective mate. The chemical compositions of pheromones for a number of pest species have been identified and synthetic copies can be produced in the laboratory. Synthetic pheromones can be used in conjunction with traps to catch male insects.

There are a number of fruit pests that can be monitored with pheromone traps. For growers who have not used traps before, I suggest starting out by trapping for codling moth, spotted tentiform leafminer, or peachtree borers. As you gain experience with the traps and learn how they can improve your pest management practices, you may want to begin trapping for additional pests. The proper timing for setting out pheromone traps for fruit pests are:

Pest	Start Trapping
Redbanded leafroller	Green tip
Spotted tentiform leafminer	Green tip
Oriental fruit moth	Pink (in peaches)
Codling moth	Pink
Fruit tree leafroller	Pink
Lesser peachtree borer	Late April

Obliquebanded leafroller	Mid-May
Peachtree borer	Late May

Monitoring with pheromone traps lets you know when the insect is active. This allows you to better time control practices or, in some cases, to determine if control is even necessary. If you choose to control spotted tentiform leafminers with sprays targeted at the adults, having pheromone traps will help you know when the moths are flying in large numbers. For codling moth control, we can use a combination of pheromone trap catches and degree day accumulations to better time sprays. This will be covered in more detail in the next issue of Facts for Fancy Fruit.

Listed below are some, but certainly not all, of the suppliers of pheromones and traps:

Gempler's; P. O. Box 270; 100 Countryside Dr.; Belleville, WI 53508; 800-382-8473; www.gemplers.com

Great Lakes IPM; 10220 Church Rd., NE; Vestaburg, MI 48891-9746; 989-268-5693; www.greatlakesipm.com

Scentry Biologicals Inc.; 610 Central Ave.: Billings MT 59102; 800-735-5323; www.scentry.com

Trece Incorporated; P.O. Box 129. 1031 Industrial St.; Adair, OK; 866-785-1313; www.trece.com

Just a few notes about using pheromones.

1. It is preferable to use more than one trap for each insect pest for which you are trapping. Sometimes, for reasons we

don't entirely understand, a trap placed at a particular location may not catch many moths, which could give you misleading information. If you have two or three traps, you can be a lot more confident in the results.

2. Pay attention to how frequently the lures need to be replaced. When you replace a lure, don't throw the old lure on the ground. If you do, it may compete with the lure in the trap and lower your trap catch.

3. If you are trapping for more than one insect, don't handle more than one type of lure with your bare hands. You can contaminate the lure with the other pheromone and it will lose effectiveness.

4. When monitoring for the clearwinged moths such as the peachtree borers, remember that these pheromones are not as species specific as most pheromones. Therefore, you may catch some moths that are not pests of fruit. So, you will need to identify the moths in the trap to make sure they are peachtree borers.

(Ricky Foster)

Oil Sprays:

One of the first and most important parts of a good insect and mite management program is the application of an early season oil spray to control European red mites, San Jose scale, and several species of aphids. Scales overwinter on the tree as nymphs and European red mites and aphids overwinter as eggs. Because two-spotted spider mites do not overwinter on the tree, oil sprays are not an effective control measure for that species. Although scales, European red mite eggs, and

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.

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

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Purdue University
Department of Horticulture & Landscape Architecture
625 Agriculture Mall Drive
West Lafayette, IN 47907-2010
Attention: Lori Jolly-Brown

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

aphid eggs may appear to be inactive, they are living organisms and, therefore, must respire, or breathe. The application of the oil creates an impervious layer over the pests that will not allow the exchange of gases, causing the pest to die of suffocation. We have seen a resurgence of San Jose scale in recent years in some orchards. If you had scales on your fruit last fall, then a well-timed oil spray is highly recommended. Earlier oil sprays are more effective than late sprays for San Jose scale control.

Oil sprays should be applied between 1/2-inch green and tight cluster. Apply a 2% rate at the 1/2 inch green stage or a 1% rate at tight cluster. Oil sprays should not be applied during, immediately before, or immediately after freezing weather. For best results, apply when temperatures are 45°F or above, and not just before rain showers. Remember that oils are not directly toxic to the pests. They only work by suffocation. Therefore, the better the coverage, the better control you will receive. Our data have shown that mite control is improved if oil is applied at tight cluster rather than at 1/2 inch green.

One question that has arisen as a result of our research that showed that predator mites overwinter on the tree is: What effect will early season oil sprays have on predator populations? In other words, will the oil sprays kill the predators and create more serious European red mite populations? Our research showed that oil sprays, whether applied at green tip or tight cluster, had no detrimental effect on mite predators. Therefore, we recommend the use of early season oil sprays as a good management practice.

If you plan to use a preventive miticide this year, a reasonable question to ask is: Is it still necessary to apply an early season oil spray? I believe that the oil application is still a good idea, for two reasons. First, it will provide control of aphids and scales, as well as European red mites. Secondly, I believe that the use of oil will reduce the likelihood of developing resistance to these miticides.

Therefore, I still recommend oil sprays even if other miticides are going to be used. The addition of an insecticide with your oil spray will give some increase in aphid control but will not improve control of mites or scales. (Ricky Foster)

Endosulfan Updates:

Endosulfan (Thionex, Thiodan) is being phased out. Its use on nectarines, peaches and sweet cherries expired on July 31, 2012. The label for pears expired on July 31, 2013. It cannot be used after July 31, 2015 on apples or blueberries and July 31, 2016 is the last day it can be used on strawberries. Endosulfan cannot be used on any crop after July 31, 2016. Again, existing stocks cannot be used after the listed dates. (Ricky Foster)

Mite Management in Apples :

When I first started working at Purdue over 25 years ago, the management of European red mites was one of the greatest challenges facing apple growers. We had very few effective miticides, and the ones we had were not all that good. With the assistance of many growers and several very talented graduate students, we were able to develop an effective system for managing mites that reduced our reliance on miticides and instead focused on maximizing the impact of natural enemies, primarily predatory mites, on the European red mite population. That program is still effective today, but now we are blessed to have a wide variety of very effective miticides at our disposal. In this article I will outline what I think is the most effective approach to managing European red mites on apples.

1. Put on a timely Superior oil spray-
See the article above.

2. Conserve predator mites-
If properly conserved, the predator mites, primarily *Amblyseius fallacis*, will usually control about 90% of the mite population. The best way to conserve those predators is to avoid using insecticides that are toxic to them.

The most highly toxic pesticides that should be avoided include Asana, Baythroid, Danitol, Decis, Permethrin (Ambush/Pounce), Proaxis, Warrior, Carzol, Lannate, Vydate, Dicofof, and Nexter. Sevin is also toxic to predators so it should only be used as a thinning agent. As the brown marmorated stink bug becomes more damaging, it may become necessary to use one of pyrethroid insecticides to protect your crop. If you do so, be aware that you may create a mite outbreak because of the toxicity to the predator mites. Fortunately, we now have a number of excellent rescue miticides available to choose from.

3. Preventive miticides-

Some miticides such as Agri-Mek, Apollo, Savey, and Zeal can be used early in the season before you know if you are going to have a problem this year. Only use these products if you had a serious mite problem last year. This is a change from previous years when I recommended using these products every other year as part of a rotation. We now have enough rescue miticides available and overall mite populations have diminished enough that we no longer need to use these products on a regular schedule.

4. Scout-

You should begin scouting shortly after petal fall. Most growers will know where they usually see mite problems first and scouting efforts should begin there. Often that will be in Red Delicious trees or along a gravel road. Pick four leaves from each of five trees and select the leaves from different parts of the tree, high, low, inside, outside, etc. Use a 10X hand lens to look for mites. Also, notice any predators that you might see. The treatment threshold varies during the season, 2.5 mites per leaf before June 15, 5 mites per leaf in the remainder of June, 7.5 mites per leaf from July 1 – 15, and 10 mites per leaf from July 16 – 31. After August 1, you can stop sampling whenever the population falls below 10 mites per leaf. My observations over the years has been that populations will usually start to decline after about July 20.

5. Rescue treatments-

Treatments should be made when the threshold is exceeded. There are a number of good to excellent rescue miticides available. Check page 22 of the Midwest Tree Fruit Spray Guide (ID-168) (<https://ag.purdue.edu/hla/fruitveg/Pages/bulletinsmain.aspx>). Notice the column that lists the MOA or mode of action. To avoid the development of resistance and to keep this valuable tools available, rotate between modes of action. For example, if you use Nexter (MOA group 21), don't follow that up with an application of Portal (also MOA group 21).

For more information on European red mite management, go to <http://extension.entm.purdue.edu/publications/E-258.pdf>. (Ricky Foster)

Woolly Apple Aphid:

A number of growers have experienced increasing problems with woolly apple aphids over the last several seasons. Part of the reason for the increased populations may be related to the changing spectrum of insecticides you are using to control other pests. Our experience has been that many of the aphicides that are available that provide excellent control of other aphids are not producing good results with woolly apple aphids. After checking with several of my colleagues in other states, it appears that most growers are getting good to excellent results by applying Lorsban as a prebloom spray. Applying Lorsban prior to bloom used to be a common practice for many growers but some have gone away from it in recent years. If you have had significant woolly apple aphid problems, it would be a good idea to incorporate this application into your spray schedule.

(Ricky Foster)

Follow Me on Twitter :

I'm trying something new this year. I plan to tweet out what I am seeing as far as insects in fruit and vegetables as I see it, rather than

waiting for the next edition of the newsletters to come out. My twitter address is "Rick Foster@PurdueFVInsect". If you currently have a twitter account, please consider following me. If you don't, it's not hard to set one up. I was able to do it with only a little help from someone younger than myself. (Ricky Foster)

Insecticides and Pollinators:

There is continuing and even increasing concern about protecting pollinators, including honey bees, and one of the concerns is about the impact of insecticides. The Indiana Pesticide Review Board, which Bruce Bordelon and I both serve on, has been charged with developing a pollinator protection plan for the state. A first step in that process was an open forum on March 31, 2015 at the Beck Center at Agronomy Farm near campus. A follow-up discussion will be held at the next meeting of the IPRB June 10 in Lafayette, IN. There are a few common sense steps that you can use to protect bees.

1. Don't ever spray insecticides during bloom.
2. Controlling flowering weeds such as dandelions in your orchard to reduce bee visits at times when you do make insecticide applications.
3. When possible, choose insecticides with the least possible toxicity to bees. See this publication which summarizes the toxicity of various pesticides.

<http://extension.entm.purdue.edu/publications/E-53.pdf>.

(Ricky Foster)

Cold injury assessment and pruning in grapes:

This has been a long cold winter but nothing like 2014! We are fortunate that we experienced more "normal" temperatures this year across the northern half of the state with a winter minimum of about -10° F. A late February event brought temperatures of -12 to -18° F to southern Indiana, resulting in damage to grape buds on tender varieties. So there is likely some winter injury in grapes

across the state. That can be a problem because many growers are rejuvenating vines that were damaged last year by saving canes to replace old trunks. Damage to those saved canes can complicate trunk and cordon replacement. It's a wait and see situation now. We can evaluate winter injury and adjust pruning severity to make up for cold injury. Bud damage is assessed by collecting canes from positions that would normally be left at pruning, bringing those canes indoors to warm up for 48 hours or more, then cutting through the buds with a razor blade to evaluate bud health. Live buds will be bright green while cold injured buds will be black or brown.

Adjusting pruning: Typically, if less than 25% of the buds are damaged you can prune normally. If 25-50% of the buds are damaged then you'll want to adjust the number of buds retained accordingly. For example, if 40% of the buds are damaged then 60% are alive. If you need 50 buds per vine for the proper crop load, then you'll have to leave 83 buds to end up with 50 primary shoots. To determine how to adjust the bud number multiply the inverse of the percent live buds (1/.60) times the desired number of buds (1/.60=1.7; 1.7 x 50 = 83 buds). If more than 50% of the buds are damaged then you'll probably want to do minimal pruning now and wait until after bud break to determine where live buds occur in order to have an adequate number for balancing the vines.

We have cut hundreds of buds from our vines in Lafayette and find that several varieties have some bud damage, but not nearly as bad as last year. Here is the rundown:

- Tender vinifera have essentially 100% bud damage
- Tender hybrids such as Chambourcin, Cayuga White, and Vidal have 40-60% bud damage.
- More hardy hybrids such as Traminette, Noiret, Corot noir, and Seyval have about than 25% bud damage.

- Labrusca varieties such as Concord, Steuben and Catawba have 10-20% bud damage.
- Hardy hybrids such as Foch, and Minnesota and Elmer Swenson varieties have less than 10% bud damage.

My recommendations for retraining vines is to leave 2-6 canes per vine if possible and adjust crop load after fruit set. This applies to both hardy and tender varieties. Even if growth from some saved canes is from secondary shoots, those shoots will make acceptable fruiting spurs for next season.
(Bruce Bordelon)

Double pruning to avoid spring freeze injury:

Spring freeze damage can also be a significant economic problem for Midwest grape growers. Widespread damage occurred in 2007 and 2012 from a warm March followed by the freezing temperatures in April. Obviously this has not been a warm March so perhaps we will escape frost damage this year. Over the past few years frost damage has been sporadic in Indiana. A technique called long pruning or double pruning helps avoid spring frost and freeze damage, especially on varieties that tend to bud out early. This type of pruning is only applicable to spur or no-tie training systems. The procedure utilizes the apical dominance of buds on a cane. The first buds to begin growing are those on the tip of a cane, while buds closer to the cordon begin growth later. To perform long pruning, select canes to be used for fruiting spurs during the normal pruning practice, but leave those canes long, with 10-15 more buds than desired. Spurs are normally pruned to 3 to 4 nodes for fruiting, but if they are not cut back, then the extra buds will help delay the development of the desired basal 3 to 4 buds, which helps avoid frost injury. After the date of the last probable spring freeze has passed, the canes are shortened to the desired length to properly adjust the shoot number for the vine. Growth of the basal buds can be delayed as much as two weeks if weather conditions

are favorable. While this procedure requires an extra trip through the vineyard, it can mean the difference between a full crop and little or no crop.
(Bruce Bordelon)

Straw removal on strawberries:

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, however this year soil is cooler than normal. Plants will begin pushing new leaves as the soil temperatures rise steadily through the month, so the straw should be raked off the tops of the beds and into the row middles. 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 increase 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.
(Bruce Bordelon)

Spring weed management in strawberries:

There have been several herbicide label changes for strawberries. There is a new formulation of Gramoxone, a revised supplemental label for Sinbar, and labels for Prowl H20, Aim, Blazer, Chateau and Goal. Growers should read the 2015 Midwest Small Fruit and Grape Spray Guide (https://ag.purdue.edu/hla/Hort/Pages/sfg_sprayguide.aspx) to familiarize themselves with these changes. Changes that may influence weed management decisions for

early spring are listed below.

Gramoxone Inteon is the formulation available for strawberries. This formulation is designed to be safer to the user. However it is still restricted use and the signal word is still "Danger". Gramoxone Inteon contains an "algininate" which is made from seaweed and slows absorption into the bloodstream. There is also an alerting agent that smells like decaying grass, and emetic and purgative, and a green dye. The new formulation also comes with some rate changes. Rates for the new formulation are 2.5 to 4 pints/acre.

Chateau (flumioxazin) is registered for pre and post emergence weed control in dormant strawberries. In dormant strawberries, the rate is 3 oz/acre. Also apply a crop oil concentrate at 1% or a non-ionic surfactant at 1/4% by volume. Chateau will control emerged chickweed, field pansy, and oxalis if sufficient contact is made with the weeds. Chateau will not control all emerged weeds. Scout the field and check the labels. 2,4-D amine may still be required to control other emerged weeds.

Select Max (clethodim) is a grass specific herbicide registered in strawberry. It is applied at 6 to 8 ounces per acre. It is effective on small, actively growing grasses. It has improved activity over Poast on cool-season and perennial grasses. Add 1 qt/100 gal spray of crop oil concentrate. Repeat application at 14 days for perennial grasses. Ammonium sulfate can be added at 2.5 lb/acre to improve activity on perennial grasses. Do not apply within 4 days of harvest. Select will not kill old established grasses. Avoid spraying on hot humid days or some crop burning will result.

Ultra Blazer 2E (acifluorfen) is registered for use in annual and perennial strawberries. In matted row plantings, applications can be made after renovation and when plants are dormant during fall or early spring. The PHI for matted row strawberries is 120 days, so growers need to carefully consider spring application dates. (Bruce Bordelon)

Spring weed management in grapes and berries:

Early spring is a good time to make the first herbicide application of the year. There are several options for grapes, brambles and blueberries including both pre- and post-emergent herbicides. In most situations, there will be some emerged weeds present in the planting at this time of the year. That means a post-emergent herbicide will need to be used to kill those established weeds. A pre-emergent material can be tank mixed at this time to provide residual weed control. Most pre-emergent herbicides will provide only 6 to 8 weeks of control. So, if applied in the early spring, they may not provide sufficient control of summer grasses (foxtail, barnyard grass, goosegrass, crabgrass, etc.). If those are the main weeds on concern, growers may want to delay application of pre-emergent herbicides until a bit later in the season. A good option is to apply a broad spectrum post-emergent herbicide such as glyphosate (Roundup, Touchdown, etc.) now, then come back in about 4 weeks with a second application of glyphosate tank mixed with a pre-emergent herbicide. That should provide reasonably good season-long weed control. One word of caution for bramble growers: we have seen significant damage from applications of glyphosate in recent years, likely due to improved surfactants in the formulations. Be especially careful if using glyphosate products, especially in blackberries. Growers should review the weed control chapter in the 2015 Midwest 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 weed management in small fruit crops.

(Bruce Bordelon)

Raspberry anthracnose:

The most important spray of the season for control of anthracnose on brambles is the delayed dormant spray of lime sulfur, Sulfurix or copper hydroxide. If you have a problem

with anthracnose, this is one spray that you can't afford to miss. One of these materials should be applied when new leaves are exposed 1/4 to 3/4 inches; if you are late in your application and don't spray until a few leaves have unfolded, cut the rate to reduce the risk of leaf burn. See the 2015 Midwest Small Fruit and Grape Spray Guide (https://ag.purdue.edu/hla/Hort/Pages/sfg_sprayguide.aspx) and the product labels for complete information on rates and timing. (Bruce Bordelon)

Pruning brambles:

March is a good time to finish pruning summer-bearing brambles. Last years fruited canes should be removed now if they were not removed last summer or fall. Remove weak or spindly floricanes and thin to 4-6 canes per foot of row. Laterals on blackberries and black and purple raspberries should be trimmed back to about 2/3 to 3/4 of their original length to promote flowering on strong wood. Red raspberry canes can be tipped if desired, but should not be tipped more than 1/4 of the cane length. If the planting is trellised, the canes should be tied to the wires now before growth starts. Fall bearing types can be mowed to the ground now for a fall-only harvest, or the fruited tips can be removed if a summer and fall harvest is desired. Remove and destroy the prunings to help prevent anthracnose and botrytis. There may be some winter injury this year in blackberries. I will not be surprised to see floricanes completely fail to leaf out, or leaf out then collapse during the first hot weather. This is especially true in the southern half of the state where temperatures in late February reached -15°F or colder.

(Bruce Bordelon)

Pruning blueberries:

Spring is the best time to prune blueberries. Practice "renewal pruning." Try to establish an even number of canes of various age classes. A well-pruned blueberry bush should have about 15-25 canes (depending on age, cultivar

and growth habit) with approximately 1/3 in the 5-7 year-old class, 1/3 in the 2-4 year-old class, and 1/3 new canes for renewal. Pruning should open the center of the bush to encourage new canes to grow upright. Also, remove low, drooping branches. Detailed pruning to remove weak growth in the tops of the canes will reduce the number of fruit and improve fruit size.

(Bruce Bordelon)

Early season tree fruit disease management:

Pruning to remove diseased wood from last year is a great way to begin your 2015 disease management. If you haven't already, remove prunings from orchard. If you haven't finished pruning out and removing any fire blight or cankered wood, you should be making an extra effort now. One more reminder: In case it hasn't been said already, be sure to calibrate all your spray equipment.

It is probably still too early in most of the state, but start monitoring for apple scab. In addition to pruning out any overwintering inoculum, a late, dormant application of copper can be used on almost all tree fruit (apple, peach, cherry, plum etc.) to help control a variety of diseases (fire blight, apple scab, peach leaf curl, bacterial canker, black knot, etc.). This is not a silver bullet (remember, it's copper!) but it does work to knock back fire blight and protect against scab.

Copper comes in many forms-oxides, hydroxides, sulfates, linked to fatty acids, the list is long! There are approximately 40 different labeled copper fungicides, so it is difficult to generalize. Most "dormant" copper products applied at or near bud-break are "fixed coppers" that have low solubility in water. After application, these copper particles slowly release copper ions over time, providing continued protection . . . and continued risk of phytotoxicity if weather suddenly warms and we go from silver tip to tight cluster to pink in a matter of days. Since this is Indiana, I would caution anyone from using the highest rates of

copper, especially finely ground coppers that have the ability to stick around, and could result in fruit russetting on early flowering varieties.

Where apples are just beginning to show green-tip, it is definitely time for protective fungicides such as captan or EBDCs, especially if you skipped the copper. Remember, you want that first spray for scab management to go on before the first infection period—in other words, once green tissue is visible in a block. How to decide which one to use depends upon the stage of growth and the weather. If you are still at silver or not yet at half-inch green, consider using copper, to knock back the bacteria that cause fire blight, while providing scab control, too. An early application of copper is as effective as 3 lbs./acre of mancozeb at controlling apple scab and may also reduce overall fungicide resistance levels in an orchard by knocking back those fungicide-resistant isolates. Do not use copper if frost is anticipated. If you are at or past the half-inch green stage, stick with captan if the forecast consists of light rains, or mancozeb if the rains are expected to be heavier. Captan is a slightly better fungicide against scab, but not effective against rust. Keep in mind that there were reports of phytotoxic reactions between captan and Fontelis. This damage appears to also be associated with cool, overcast weather and slow drying conditions.

Of course, you can always split the difference and take the captan (3lbs captan+ 3lb mancozeb) approach. Mancozeb at 3 lbs./acre may be adequate for scab control at green tip in blocks that had little scab the previous season. Tank-mixing mancozeb with captan may be advantageous if you carried over more scab than you should have last year. Assuming you don't have a significant resistance problem,

Syllit (dodine) is labeled for use up to petal fall. Be sure to tank mix with captan (2lbs/A) or mancozeb (2.25 lbs/A). Syllit can cause some damage if conditions get to freezing or near freezing. Other tank mix

options if you think you have dodine resistant scab include Scala or Vanguard. Keep in mind that these don't redistribute as well as Syllit, and perform best when temps are below 70° F. Finally, hold off using your DMI fungicides (Rally, Indar, Inspire, Topguard, etc.), strobilurins (Sovran, Flint), or SDHIs (Fontelis) or SDHI mixtures like Pristine (SDHI+QoI), Luna Sensation (SDHI+QoI), Luna Tranquility (SDHI+AP), and Merivon (SDHI+QoI) UNTIL after tight cluster, when you have significant green tissue and the systemic and translaminar activity of these fungicides are put to their best use for you. Many of these products are also very effective against powdery mildew. If there is a bright spot to start 2015, it is that unusually cold temperatures, (particularly those below -11° F) should continue to reduce overwintering powdery mildew inoculum. After the unusually wet weather last year, coupled with the unusual cold, should push our powdery mildew 'back to normal'. Remember that you will still need to use an SI or strobilurin fungicide from bloom to first cover on the really susceptible varieties, like 'Jonathan', 'Ida Red', 'Ginger Gold', and 'Cortland', to name but a few.

(Janna Beckerman)

From Purdue Agriculture News Indiana spring weather outlook, expect swings in conditions:

WEST LAFAYETTE, Ind. - 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 Niño 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.

Writer: Keith Robinson, 765-494-2722,
robins89@purdue.edu

Sources: Dev Niyogi, 765-494-6574, climate@purdue.edu

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

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

Christian Krupke, 765-494-4912, ckrupke@purdue.edu

Ag Communications: (765) 494-2722;

Keith Robinson, robins89@purdue.edu

Agriculture News Page

Upcoming events:

April 7. Eastern Indiana fruit meeting. 6:30 pm. Heartland Hall, Delaware Co Fairgrounds, Muncie, IN.

April 8. Viticulture Workshop, Dulcius Vineyard, Columbia City, IN.

April 16. Grafting workshop, Lake County extension office, 880 E. 99 Court, Suite A, Crown Point, IN. 1:00 pm (Central time). Reservations required. \$10 fee to cover cost of rootstocks. For information, contact Nikky at 219-755-3240 or nikky@purdue.edu
<https://extension.purdue.edu/lake/Pages/article.aspx?intItemID=9642>

April 16. Sunrise Orchard fruit meeting, Goshen, IN. 6:30 pm.

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

Please visit our Purdue HLA Extension website under the Events tab for further event details.

<https://ag.purdue.edu/hla/extension>



Janna Beckerman

Purdue University
Department of Botany &
Plant Pathology
915 West State Street
West Lafayette, IN 47907-1155
(765) 494-4614
jbeckerm@purdue.edu

Bruce Bordelon

Purdue University
Department of Horticulture &
Landscape Architecture
625 Agriculture Mall Drive
West Lafayette, IN 47907-2010
(765) 494-8212
bordelon@purdue.edu

Rick Foster

Purdue University
Department of Entomology
901 W. State St.
West Lafayette, IN 47907-1158
(765) 494-9572
rfoster@purdue.edu

Peter Hirst

Purdue University
Department of Horticulture &
Landscape Architecture
625 Agriculture Mall Drive
West Lafayette, IN 47907-2010
(765) 494-1323
hirst@purdue.edu

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Facts for Fancy Fruit
Purdue University
Department of Horticulture & Landscape Architecture
625 Agriculture Mall Drive
West Lafayette, IN 47907-2010