

FANCY FRUIT

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A Newsletter for Commercial and Advanced Amateur fruit growers.

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Peach at 15 mm



Grapes at bloom



Raspberry at petal fall



Apples at 10 mm



Blackberry in bloom

Crop Conditions

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

Temperature Swings and Variable Precipitation Continues... Hot, Dry Conditions Forecasted to Return

(Austin Pearson, pearsona@purdue.edu)

A break from the heat has commenced as average temperatures dropped to 2-6°F below normal this week. From May 8-14, average temperatures ran from 5°F above normal in the southeast to 13°F above normal in the northwest. Across the entire Midwest, there were 858 maximum and 659 minimum high temperature records broken or tied (Figure 1). The third week of May also trended warmer with southeastern Indiana 6-7°F above normal and departures 2-3°F above normal in northwestern Indiana. These warmer temperatures enhanced vegetation growth, allowed row-crop agriculture to resume planting, and gave modified growing degree day (MGDD) departures to catch up to near normal for most in the state (Figure 2). In fact, central and south-central Indiana is now showing above normal MGDDs.

The northern part of the state received normal precipitation from May 15-22, with heavier amounts falling in southern Indiana. Heavy rains associated with thunderstorms accounted for 175300 percent of normal precipitation for this section of the state (Figure 3). Ten stations in southern Indiana reported that daily precipitation records were broken or tied from May 15-21. Franklin County recorded 5.13 inches of rain, which was 4.07 inches above normal for the week. Their largest single day maximum precipitation (2.80 inches) occurred on May 15. In contrast, there has been some concern with

drying along the Indiana/Kentucky border, but not enough to introduce abnormally dry (D0) into the US Drought Monitor. On May 21, there were [three confirmed tornadoes](#) that occurred in Brown County (EF-0), Johnson County (EF-0), and Shelby County (EF-1). Fortunately, there were no injuries or deaths reported, but the region did experience damage to building structures and trees. Heavy rains slowed progress of planting across the state. Furthermore, wind continued to present challenges as many stations across Indiana reported wind gusts in excess of 30 mph on May 20.

After widespread opportunities to receive 0.75-1.5 inches of precipitation through May 28, weather models call for a decrease in precipitation, providing an opportunity to finish the 2022 planting season. The 6-10 day outlook (May 30-June 3) and 8-14 day outlook (June 1-7) both call for enhanced confidence in above normal temperatures and below normal precipitation. The Climate Prediction Center June Outlook (Figure 4) also calls for higher confidence in above normal temperatures and equal chances in above or below normal precipitation.

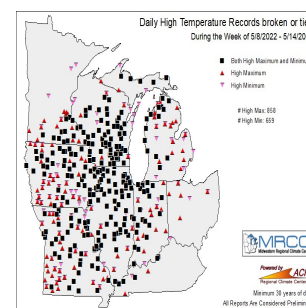


Figure 1. Midwestern daily high temperature records broken or tied from May 8 - 14.

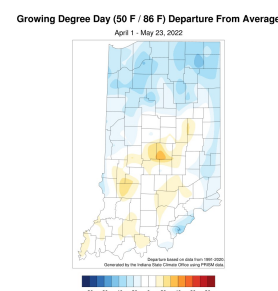


Figure 2. MGDD accumulation from April 1 – May 23, 2022, represented as the departure from the 1991-2020 climatological average.

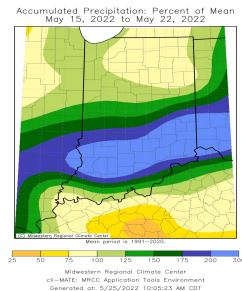


Figure 3. Accumulated precipitation from May 15-22, 2022, represented as a percentage of the 1991-2020 climatological average.

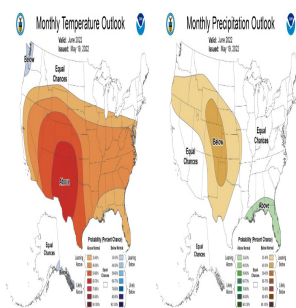


Figure 4. Climate Prediction Center June 2022 temperature and precipitation outlooks.

Spotted Lanternfly Nymphs Hatch Begins

(Miranda Purcell, mrpurcel@purdue.edu)

As of March 2022, Indiana has one known county with a confirmed Spotted Lanternfly (SLF) population: Switzerland County (Figure 1). Penn State University has created a SLF egg hatch prediction map that estimates the emergence of the first SLF instar based on temperature conditions (Figure 2). Please note: this map does not show where SLF currently exists, only hatch predictions to be used for early detection. Keep an eye out for older or hatched egg masses (Figure 3) or early instar nymphs. Newly hatched nymphs (first instar) are ~ 1/4 inch in length with black and white spots (Figure

4). Nymphs develop a red pigment with age (Figure 5). For more information on how to identify: <https://ohiograpeweb.cfaes.ohio-state.edu/blog/may-14-2022-1159am/slf-egg-masses-begin-2022-hatch>

Anyone that spots signs of the spotted lanternfly should contact DEPP by calling 866-NO EXOTIC (866-663-9684) or send an email to DEPP@dnr.IN.gov. For more information on this or other invasive pests see the following link <https://www.in.gov/dnr/entomology/pests-of-concern/spotted-lanternfly/>

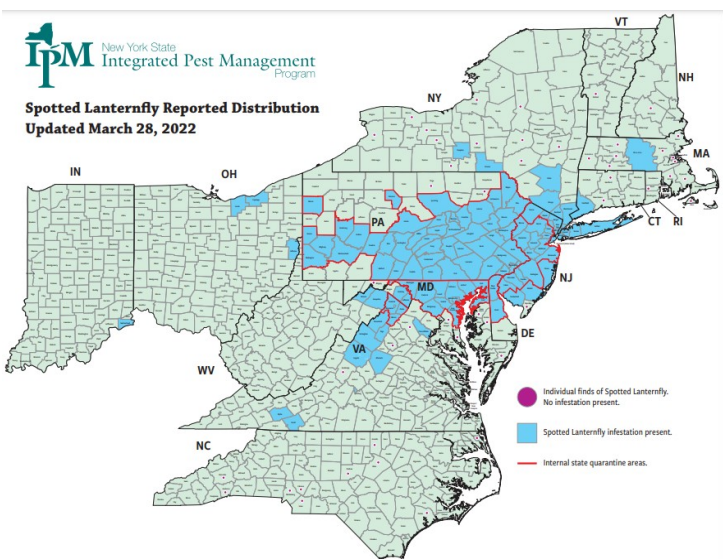


Figure 1. The current SLF distribution map (<https://nysipm.cornell.edu/environment/invasive-species-exotic-pests/spotted-lanternfly/>)

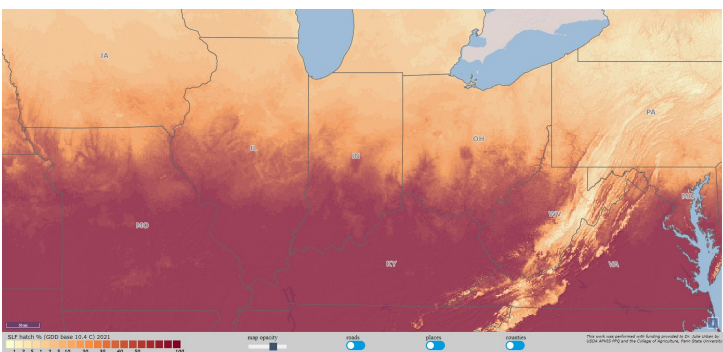


Figure 2. SLF egg hatch prediction map (<https://tools.cei.psu.edu/slf/>)

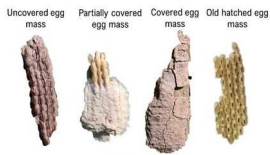


Figure 3. SLF egg masses at various ages and coverings
(<https://extension.psu.edu/what-should-you-do-with-spotted-lanternfly-egg-masses>)



Figure 4. Spotted Lanternfly early instar nymph.
Photo: L. Barringer, PA Dept. of Agriculture
(<https://bugwood.org>)

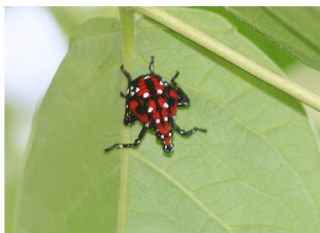


Figure 5. Spotted lanternfly 4th instar nymph.
Red pigment is acquired at this stage. Photo: Tim Weigle, NYSIPM

Blueberry Grower's of Indiana (BGIN) Annual Meeting

(Miranda Purcell, mrpurcel@purdue.edu)

2022 Blueberry Growers of Indiana (BGIN) Annual Meeting

Thursday, June 2nd

Community Bible Church

814 N. Halleck St.

DeMotte, IN 46310

5:00 PM (Central Time)- Potluck Dinner, please bring a side dish or dessert to share

The BGIN meeting will follow the meal

Strawberry Chat

(Wenjing Guan, guan40@purdue.edu)

Topics of June strawberry chat are strawberry quality and marketing. Our guests will be Anya Osatuke and Adrienne Held. Anya is a berry specialist at Cornell Cooperative Extension. She will discuss her research and share insights on factors affecting strawberry quality. Adrienne is the owner of Holly Berry Farm in Santa Claus, IN. Adrienne will join the discussion and share her experience and knowledge in running a strawberry farm business.

Register for the June strawberry chat, on June 1, 12-1pm EST.

<https://purdue-edu.zoom.us/meeting/register/tjccuCtpzgoG9yh-rNaBvuV58C3AejrQWVA>

After registering, you will receive a confirmation email containing information about joining the meeting.

Here is the record of May strawberry chat: Spring Disease Management & Freeze/Frost Guidance

Timely Management | Shoot Thinning Grapevines

(Miranda Purcell, mrpurcel@purdue.edu)

Shoot thinning is a canopy management practice that involves removing shoots in the grapevine canopy to reduce shoot density and help balance vegetative and reproductive growth.

Potential benefits of shoot thinning:

- Improved air circulation
- Improved sunlight penetration
- Reduction of disease pressure
- Increased spray penetration

*shoot thinning and positioning not only affects the current season's growth, but it has an impact

on the productivity in the following year as sunlight encourages the development of fruitfulness in the buds for next year's crop

Timing

The ideal time for shoot thinning is when the shoots are between 6-12 inches long. Shoot thinning after the shoots reach 12 inches in length may be more difficult due to lignification of the shoot base; pruning shears should be used at this time to reduce injury to the vine.

How much to shoot thin

The preferred shoot density for different types of varieties is listed below:

Hybrids: 4-6 shoots per foot

Vinifera: 3-5 shoots per foot

Native or Labrusca: < 15 shoots per foot



Figure 1. Optimal shoot density (~4 shoots per linear foot of cordon) in Merlot; Photo by Cain Hickey

Tips for deciding which shoots to keep

Health: Shoots with a pencil-width diameter, good internode lengths that are otherwise healthy-looking are preferred over weak, diseased shoots

Positioning: In a spur-pruned vines, priority should be given to fruitful primary shoots from count nodes 1-2 on each spur

For more information:

Best Viticulture Practices: Shoot Thinning:
<https://ohiograpeweb.cfaes.ohio-state.edu/blog/may-21-2022-1031am/best-viticulture-practices-shoot-thinning>

Canopy Management- Shoot Thinning and Positioning:

<https://extension.umd.edu/resource/canopy-management-shoot-thinning-and-positioning>

Shot hole disease

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

Wet weather has led to an uptick in shot hole disease, caused by the bacterium *Xanthomonas arboricola* pv. *pruni* (XAP). We started to see a significant uptick in shot hole on peaches, cherry and plum already. Leaves and fruit susceptibility to XAP infection decreases after pit hardening. Keep in mind that any change to warm, wet weather can drive this disease.

Symptoms

Symptoms of this disease includes circular to irregular, water-soaked spots about 1 to 5 mm in diameter on leaves. Spots often turn red, purple or brown and can be seen surrounding the infected tissue along with surrounding healthy tissue. Eventually, the leaf spot will drop out, leaving a hole in peaches and plums (Fig. 1). Leaves can have one to multiple shot holes and/or spots, and severely infected leaves may prematurely drop (Fig. 2). After the bacteria get into the leaves and begin to reproduce, symptoms develop. These symptoms usually appear between the leaf veins resulting in discrete, angular spots contained by leaf veins.

Yellow or red halos often develop around the lesion. As lesions coalesce, the damage may appear more like blight, as opposed to a discrete spot

On fruit, dark brown or black spots sunken, cracked spots develop with a water-soaked margin (Fig. 3). These spots may be surrounded by a yellow halo. On cherry, fruit infection that occurs early in the season often results in distorted fruit; in peach and plum, larger spots may crack and ooze a combination of bacteria and gum. Peach scab is often confused for bacterial spot (Fig. 4) but will not have the oozing and gummosis.

In summer, other cankers may develop as dark water-soaked lesions around infected lenticels. On twigs, gum may ooze from cracks when humidity is high and cracking or pitting may be observed between infected and healthy tissue. As these cankers increase in size, they become darker and sunken. As they expand and girdle the twig, dieback ensues. For apricot and plum, cankers persist and continue developing in younger (2- to 3-year-old) twigs and branches.

Laboratory diagnosis is necessary for confirmation of the bacterial pathogen; the fungal pathogen *Wilsonomyces carpophilum* also causes similar shot-hole symptoms on leaves, as does copper phytotoxicity. Other bacterial pathogens, like *Pseudomonas syringae*, cause bacterial shoot blight and can also be confused with XAP.

Lifecycle

The bacterium persists and overwinters in small lesions and cankers on the twigs and branches. In the spring, bacteria ooze from the cankers and spread to additional branches or trees by wind-driven rain, insects, birds, and pruning tools. The bacteria infect via blossoms, lenticels and cracks on trees, and can easily infect through natural openings, wounds, and leaf scars. A weakened

tree is much more prone to the infection than vigorous ones.

Bacteria are microscopic, single-celled microorganisms. Their lives are sort of boring: They take in nutrients, they grow, and when they get to a certain size, they split in two. This can happen in as little as 20 minutes, and twenty minutes later, those two daughter cells split into four, and twenty minutes later, those four are eight...and by the end of the day, the bacteria could have reproduced to a degree ($2^{72} = 4,722,366,482,869,645,213,696$ —more than four-sextillion!) that makes rabbits seem like underachievers. It is important to understand this level of bacterial growth for three reasons: 1) you realize that the bacteria are everywhere, even when you don't see symptoms, 2) they will become epidemic quickly when conditions meet their needs, and 3). Sextillion is an actual number.

Bacteria enter through wounds, and natural openings in the plant, including stomata (microscopic openings on leaves). Once inside the plant, they produce toxins that kill cells, enzymes that turn cells into mush, hormones that make cells grow in odd ways, chemicals called effectors that suppress plant defense, or a type of slime (called exopolysaccharides) that block water conducting vessels. You might know this slime by another name—xanthum gum—a food additive used in salad dressings to thicken it, and make it stick to the leaves. Yum! These bacteria stick to plants as well as French dressing sticks to lettuce!

Even with a microscope, most plant infecting bacteria look surprisingly boring, like a pill—A very, very small pill. A key point to remember is that different species of *Xanthomonas* infects different plants, which is indicated by the term 'pathovar', meaning variety of bacteria pathogenic to one host. *Xanthomonas arboricola*

pv. *pruni* infects stone fruit, whereas *Xanthomonas vesicatoria* infects tomatoes and peppers. So, if you have infected peaches, this pathogen will not spread to your tomatoes or peppers, but will spread between stone fruit (nectarines, peaches, plum, cherries, apricots). Keep in mind that conditions that favor any bacterial disease (warm, wet, humid conditions) pretty much favors them all.

Management

Regardless of which bacteria you are battling, there are certain key management strategies that reduce bacterial growth and spread. Bacterial diseases of the foliage are favored by prolonged periods of leaf wetness, and high relative humidity. Due to bacterial reproduction, they are everywhere, including all over asymptomatic plants. With a stressed or injured host, and wet conditions, splashing water easily spreads bacteria to overlapping and nearby plants. These bacteria then enter the leaf through injuries and natural openings, with water facilitating spread and infection. Thus, the longer the plants are wet, the greater the opportunity there is for infection to occur, and the more you handle or work around plants, the more likely they will end up damaged.

Susceptibility to this pathogen varies between species of stone fruits and varieties (Table 1). Some varieties react to infection with necrotic leaf spots, yellow halos and yellow leaf tips, and others may exhibit only necrotic leaf spots. Varieties with greater fruit resistance may show only slight skin-flecking.

Table 1. Reportedly XAP resistant and susceptible varieties.

Fruit	Resistant Cultivar	Avoid (Susceptible)
Peach	Belle of Georgia, Biscoe, Bounty, Candor, Comanche, Contender, Desiree, Garnet	Babygold S, Blake, Elberta, Halehaven, Jersey Queen, Jerseyland, July Elberta, J.H.
	Beauty, Harbrite, Harken, Late Sunhaven, Loring, Madison, Norman, Pekin, Raritan Rose, Redhaven, Redskin and Sunhaven	Hale, Kalhaven, Rio-Oso-Gem, Suncling, Suncrest, Sunhigh.

Plum, European	Bradshaw, Bruce, Green Gage President, Robusto, Segundo, 98 Rubysweet, Shropshire, Yellow Gage; Blue Damson	Abundance, Formosa, Frontier,
Plum, Japanese		Black Amber, Early Golden, Queen Rosa, Ruby Queen, Satsuma, Shiro*, Wickson
Nectarine	Avalon, Brigantine, Silver Gem	Eastern glo, Sunglo, Flavortop, Redgold,

Cultural practice is very critical to reduce the severity of the disease. Always avoid overhead irrigation to reduce transmission of the disease between branches or trees. If a new tree is scheduled to be planted, avoid planting it adjacent to a diseased tree.

Control of shot hole disease is not easily achieved through chemical sprays. THE antibiotic oxytetracycline (Mycoshield or FireLine) provides good control when properly applied but is only labeled for peaches. For best results, use oxytetracycline at 12 oz. per 100 gals. of dilute spray. Use dilute or 2x; higher concentrates are not effective and may be phytotoxic. Spraying the entire tree once per week is essential. If you spray only one side of the tree (alternate row middle), make certain to spray the other side of the tree within 3-4 days. Begin sprays at shuck split and continue at 7-day intervals until three weeks before harvest.

Protection against bacterial shothole for plums and cherries requires the careful use of copper-based pesticides. Copper is a multi-purpose biocide, capable of killing bacteria, water-molds and fungi—and damaging plants if care isn’t taken. When using copper, be sure to use non-acidified water to minimize the risk of phytotoxicity. Keep in mind that this is copper, and it is definitely not a ‘silver bullet’, or even a copper one! Copper sprays, applied for peach leaf curl at leaf drop, also may help control bacterial spot. Copper can also be applied until pit hardening to suppress outbreaks, with the rate of copper decreasing over the growing season. On peaches, copper can cause injury to leaves and appears as reddish spots and shot-

holes with some very mild defoliation when using an effective rate of copper. In peach, the multiple (5+) copper applications for bacterial spot suppression makes it likely that the pathogen will evolve significant resistance to copper. In walnut, the use of mancozeb has aided in XAP control. There are no pesticides that will cure plants or provide adequate protection from bacterial diseases. Thus, prevention is the key. When pruning, any tools used to prune out cankers should be disinfected (bleach, trisodium phosphate, or commercial disinfectant).

For more information and excellent images, see: <https://planthealthportal.defra.gov.uk/assets/factsheets/x-arboricola-pv-pruni-factsheet.pdf>

And Learning from Peach Bacterial Spot Epidemics: Potential Strategies for Reducing Fruit Losses” (David Ritchie, North Carolina State University) at <https://plantpathology.ces.ncsu.edu/wp-content/uploads/2013/06/Learning-from-Peach-Bacterial-Spot-Epidemics.pdf?fwd=no>

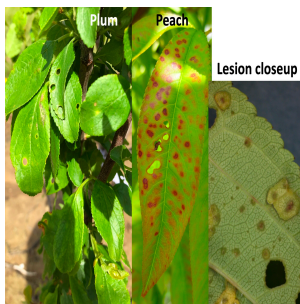


Figure 1. XAP leaf spot symptoms on various stone fruit. Photo by Janna Beckerman



Figure 2. Defoliation by XAP on peach occurs on highly susceptible varieties, especially when it is warm and wet. Photo by Janna Beckerman



Figure 3. XAP damage on fruit. Photo by U. Mazzucchi.

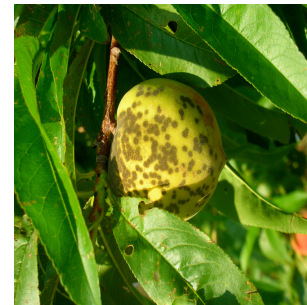


Figure 4. Peach scab is often mistaken for XAP. Note the fuzzy lesions. Confirmation can be obtained by simply using a handlens to confirm the presence of the fungus. All photos by Janna Beckerman, unless specified otherwise. Photo by Janna Beckerman

It may be time to begin codling moth management in your orchard

(Elizabeth Yim Long, long132@purdue.edu)

Depending on where you are in the state, your fruit trees may be nearing the end of petal fall or already beginning fruit set! This is an important time to pay close attention to your pheromone-baited monitoring traps for captures of codling moth (Figure 1) that you are all likely familiar with. You’ve likely already captured adult moths in your traps at this point in the season; here at our fruit research orchard in Lafayette, we’ve captured codling moths on and off in pheromone-baited traps since May 14, 2022, with the highest

number of captures in a day reaching 6 moths (<https://extension.entm.purdue.edu/longlab/extension/#reports>). With that being said, activity in the traps has been a little unusual this year with the cooler temperatures we've seen this spring, such that we haven't seen consistent captures of more than 1 moth. However, for those of you who have seen consistent captures of 3-5 moths in your baited traps, you've likely reached biofix: the date when pheromone traps detect sustained flight of moths. After this date, you should begin to calculating cumulative degree days to time your first and second cover sprays for this pest. In the case of codling moth, begin tracking cumulative degree days and apply insecticides 50-250 degree days after trap-based biofix. As with many insect pests in the orchard, proper timing of insecticide application is key! The closer you can get to optimal timing, the better management of the pest will be. For those with history of plum curculio in the orchard that were unable to apply an insecticide at petal fall, you might also consider applying an insecticide that manages both codling moth and plum curculio for your first cover spray.

You can find more information about timing of first codling moth sprays and insecticide options on page 34 of the [2021-2022 Midwest Fruit Pest Management Guide](#). For best management, it is recommended that the first spray be followed by a second spray 10-14 days later. As always, if you have questions, reach out to your local extension educator or specialist so we can help!



Figure 1. Codling moth, with wings spread, in a trap.
Photo: John Obermeyer, Purdue University

Thought Leadership | Crop Insurance – Protect the Farm, US apple Association

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



USApple

Why Should I Buy Crop Insurance?

It's still the number one question farmers ask me. And I know what they're really asking is, does crop insurance actually pay? Is it worth it?

In the end, that's up to you to decide, but it's important to understand the role crop insurance plays in the long-term success of your business. Crop insurance is a risk management tool that provides a safety net for you and your family. If you end up having a low production year or unmarketable apples due to certain types of loss, crop insurance will help you make good on your financial obligations. This may include payroll, operating costs, equipment loans and lines of credit. Crop insurance does not offer a profit, but

it may allow you to keep farming.

Most people buy homeowners insurance and vehicle insurance. Although the cost for these insurance products is substantial, you would still prefer to never have to use it. These products are purchased as a safety net. The same could be said for apple growers insuring their pack houses, farm equipment or storage buildings. You are better in the long run never having to collect an insurance claim, but you'll sleep better knowing that your crop insurance policy will cover you in most cases.

A 100-acre apple orchard can produce revenue of more than \$1,000,000. Would an orchard like that be able to afford a year or two without that revenue?

What Types of Insurance are Available?

The most widely used policy is Multiple Peril Crop Insurance (MPCI). MPCI is subsidized by the federal government. The apple policies offered are subsidized at 55 to 67 percent. That makes it very affordable whether or not you have to use it. MPCI provides protection due to weather, wildlife damage, fire, disease and other catastrophes. However, it is only available in 33 states in certain counties.

The supplemental coverage option (SCO) has become more popular in the past few years because it can cover up to 86 percent. Sales closing on MPCI is November 20 in all states for the following crop year, except for California, which is January 31.

Apple tree coverage is a new pilot program that is also subsidized. It is available in Idaho, Michigan, New York, Oregon, Pennsylvania and Washington. The deadline to sign up is April 15. Another subsidized product is Whole Farm Revenue Protection. And it's available in all counties in all states. This policy covers all commodities on the farm from a loss in revenue.

The deadline for Whole Farm is also April 15.

For counties where MPCI is not available, you can get a subsidized product through the Non Insured Crop Assistance Program (NAP) through your local FSA office.

Private, unsubsidized products are available throughout all 50 states. The most common private product is hail insurance. Despite its name, hail insurance covers more than just hail damage. It also covers damage from fire and lightning, transit to your first place of storage, fire department service charges and vandalism. Rates and deadlines for hail insurance vary by company.

Another private program available is weather insurance. Weather insurance is sometimes purchased to insure against frost damage during crucial times of the growing process. But it can also cover loss or damage due to drought, excess moisture, excess heat and other weather-related events. The weather insurance pays based on weather conditions in your area, not necessarily by what happens on your particular orchard.

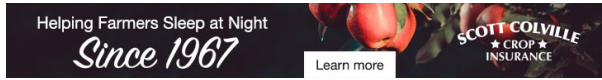
There are other private products available, but hail and weather are the most common.

Storytime with Scott

Over the past five years, we have witnessed more frost events later in the spring than ever before. These events have caused substantial losses in many parts of the country. We've worked with farmers who had 100 percent losses on their U.S. Extra Fancy crops and had to sell them for cider. Without crop insurance they might have lost their farms. In addition to that, weather forecasters are also saying the frequency and intensity of hailstorms has been increasing.

Contact a trusted crop insurance agent to determine what crop insurance products will work best for you and your farm. You can then

sleep better at night knowing that your livelihood is safe!



<https://www.colvillecrop.com/>



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