Tree Fruit IPM Advisory

Weekly Orchard Pest Update, Utah State University Extension, **June 7 , 2013**

News/What to Watch For:

Examine leaves for fresh powdery mildew lesions on cherry and examine peach fruits for powdery mildew lesions
Aphids, such as green peach aphid, black cherry aphid, and rosy apple aphid will be leaving fruit trees in the next few weeks
Continue to watch apricot, plum, and peach/nectarine leaves for shot hole infections (purplish lesions and holes in leaves)
New spray timing dates for codling moth and peach twig borer, pages 6-7

JUST THE BASICS

APPLE & PEAR

- *Codling moth* treatment should continue at intervals, with a break between generations 1 and 2 (see table on page 6).
- *Fire blight* strikes are showing up and should be pruned out in a timely manner.
- *Woolly apple aphid* and *San Jose scale* are starting to become active. See dates on page 3 for San Jose scale.

CHERRY

- *Western cherry fruit fly* treatment should begin when fruits turn a salmon blush color.

PEACH/NECTARINE, APRICOT, PLUM

- *Peach twig borer* eggs will be hatching soon. See table on page 7 for when to treat.

EXPANDED COVERAGE - Insect and Disease Information

: includes information for residential settings : includes information for commercial orchards

APPLE & PEAR

Codling Moth

The first protective spray for codling moth should have started in most areas. Codling moth is a pest that is around all summer long, and requires repeated sprays for worm-free fruit. The length of time between sprays depends on the chemical used and on the "pest pressure" in your area.

To know which chemical you are using, check the "active ingredients" listed on the lower right or left (in small print) on the front of your product. Sometimes there are several ingredients, sometimes, just one. The ingredient listed there helps to know what insects can be treated, and whether a fungicide is included ("Bonide Fruit Tree Spray", for example, contains captan, malathion, and carbaryl).

The time between sprays for many products is not always listed on the label, especially on residential products. The table at the right provides this information for a few ingredients:

Product	Commercial	Residential
acetamiprid	14 days	14 days
Bt	5-7	5-7
carbaryl	14	14
chlorantraniliprole	---	14-21
codling moth virus	7	7
gamma-cyhalothrin	14	---
lambda-cyhalothrin	---	14-21
malathion	7	7
pyrethrin	5	5
spinosad	7-10	7-10
spinetoram	---	14

The other factor that will determine how often to treat is the "pest pressure" in your area. If you didn't spray, do you think that only 10% of your crop would be affected, or do you think that more than 75% would be affected? If you would have lower injury, then you probably only need to treat once per generation. For higher injury, maintain protection all summer.

Insect and Disease Information, continued from previous page

The table on page 6 lists the dates of "greatest egg hatch". At this short window of time, most of the eggs for the first generation are hatching. We provide this time period so that you can assure that you have "fresh" coverage of insecticide on your fruits. If you applied your first spray of the season early, or if you are using a product with a short residual period, then you may need to make sure your fruit is protected during the period of greatest egg hatch with fresh residue.

We also included the date for the end of egg hatch for most areas. With this information on hand, you can then plan all your remaining sprays for this first generation. Find the date of the end of egg hatch, and plan your last spray to last up to that date (i.e., 7 - 21 days before, depending on the product you're using).

We will report on the start of the second generation in a few newsletters. Typically, there is a "lag time" of about 3-5 days between the end of the first generation and the start of the second.

Commercial treatment options (and days between sprays):
a few options are Assail (14), Altacor (14-21), Delegate (14), Imidan (14-21); for more information, see the Intermountain Tree Fruit Production Guide

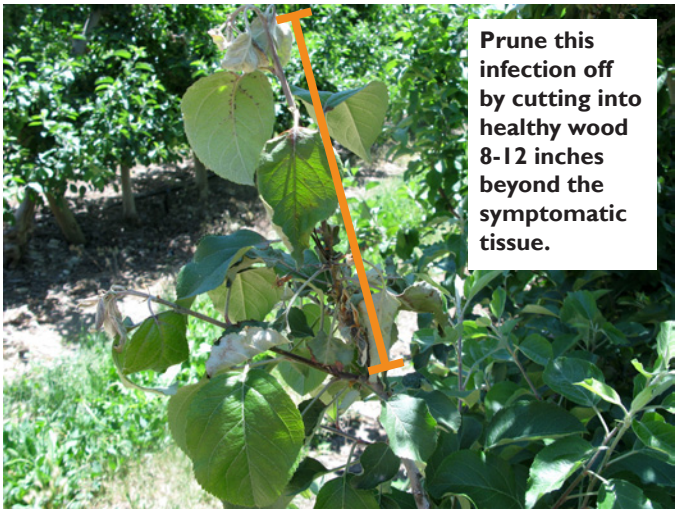
Residential treatment options (and days between sprays):
Spectracide Triazicide (14), Ortho Max Flower, Fruit and Vegetable (10-14), Sevin (14), Bonide Fruit Tree Spray (14), Malathion (7), Monterey Spinosad (5-7)

Fire Blight

On new infections, fruit clusters or shoots will be wilted and dead, and leaves will start to turn blotchy. You may even spot a tiny drop of bacterial ooze.

The weather conditions this spring were prime for fire blight infections because it was so warm during bloom. Fire blight "strikes" (new infections) are easily visible now.

The only thing that can be done (in most cases) about fire blight from now until next spring is to prune out infections as soon as they are visible. This will not only prevent the infections from becoming larger, but also reduce the inoculum (source of bacteria) in the orchard.



Prune this infection off by cutting into healthy wood 8-12 inches beyond the symptomatic tissue.

For commercial growers interested in using Apogee for slowing the growth of fire blight, it is past the recommended timing (petal fall), and will probably not be a good option now.

San Jose Scale

This close-up image shows overwintering San Jose scales on an apple twig.

This armored scale insect attacks a wide variety of hardwood trees, including all fruit trees. In Utah, it is most common on apple. It can be found feeding on twigs, scaffold branches, and fruit. They are often difficult to see with the naked eye; a 10-20x hand lens helps. They feed by sucking sap from plant tissues.

If you applied a dormant oil spray, keep in mind that most overwintering adults will survive that spray. So a treatment targeting newly hatched nymphs (called crawlers) will need to be applied. Adult females produce approximately 200 crawlers each. Crawlers are bright yellow, and slow moving. They walk or are windblown to new sites to settle on twigs or fruit, insert their mouthparts, and feed for the remainder of

Insect and Disease Information, continued from previous page

their lives. Once they form their hard outer covering, they are more resistant to pesticides.

If the scale population is allowed to build on a tree, effects include reduced tree vigor and a decline in yield. It is primarily a problem in standard-sized, poorly pruned trees.

Treatment timing window:

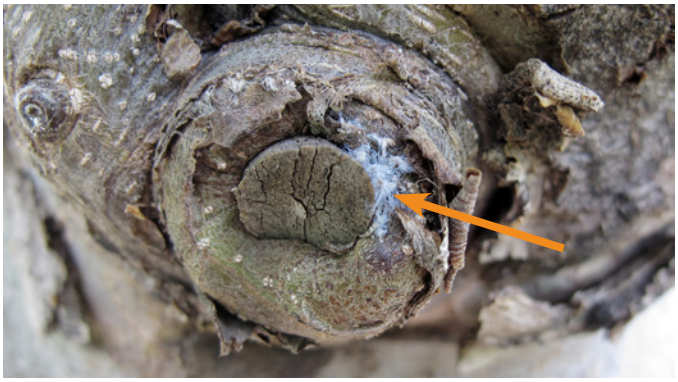
- Cache and Carbon and northern Box Elder Counties: June 30 - July 3
- warmer Wasatch Front locations: June 22 - 25
- cooler Wasatch Front locations: June 28 - July 1
- Iron County: June 21 - 24

(If your area is not listed and you would like to know, please contact me at marion.murray@usu.edu.)

Commercial treatment (and days between sprays):
a few options are Centaur (14), Esteem (14), Admire Pro (14), Ultor, and Diazinon; for more information, see the Intermountain Tree Fruit Production Guide

Residential treatment options (and days between sprays):
insecticidal soap (5); horticultural oil (5-7); see page 8 for more information

Woolly Apple Aphid



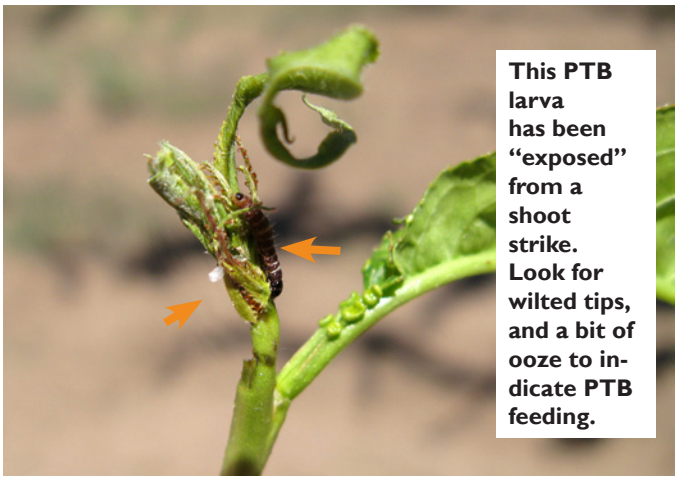
Woolly apple aphids are just starting to appear in cracks and crevices in the tree canopy in warmer areas of the Wasatch Front. If you did not apply Ultor at petal fall, consider an application of a product now before the population size gets too large (and more difficult to treat).

Scout for aphids around the callus wounds of old pruning scars, branch crotches, other cracks and crevices, and on root suckers.

Commercial treatment (and days between sprays):
a few options are oil plus Admire Pro (14), Ultor (more effective when applied at petal fall), or Diazinon; for more information, see the Intermountain Tree Fruit Production Guide

STONE FRUIT

Peach Twig Borer



This PTB larva has been "exposed" from a shoot strike. Look for wilted tips, and a bit of ooze to indicate PTB feeding.

Peach twig borer affects peaches, nectarines, and apricots. Like codling moth on apples, this pest needs to be treated in most areas of Utah to prevent the "worms" (larvae) from entering the fruit. Actually, the larvae prefer to feed on succulent tissue inside twigs. The fruit is the "second best option," when twigs become hardened off and unpalatable. In short, the first generation bores into succulent twigs (hence, its name) while later generations move on to the ripening fruit.

A table has been added on page 7 that shows the starting and ending time range for the first generation of peach twig borer. As explained for codling moth, you may need to apply insecticide regularly so that your tree is protected throughout each generation, or, if you have low pest pressure, you can get away with a single application for each generation (which would be 2 well-timed sprays).

The table provides two start dates for applying a treatment. We recommend the earlier date if you know you have a large population, or had moderate to significant damage last year, and the later date if you had very little damage last year.

Sprays for the first generation will protect shoots from being attacked while later sprays will protect fruit from being attacked. Treatment options are the same as for codling moth.

Greater Peachtree Borer

We have not caught peachtree borer in any of our traps in northern Utah yet. We expect that the moths will probably start to fly the last week of June along the Wasatch Front. As soon as we start to catch them, you will be notified that it is time to start your trunk sprays.

(If using mating disruption, you can hang that any time now.)

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Adult peachtree borer moths lay eggs on the lower 12" of the tree trunk or on nearby soil, and larvae bore into the tree and feed on the cambium for the rest of the summer. They pupate in spring, and when they emerge, they sometimes leave their pupal case stuck in the tree.

Commercial treatment (and days between sprays):
a few options are Lorsban (one spray only; do not touch foliage), Asana (21); products containing permethrin; Isomate-P mating disruption; for more information, see the Intermountain Tree Fruit Production Guide

Residential treatment options (21-30 days between sprays):
products labeled for peaches that contain permethrin or bifenthrin: Bonide Borer-Miner Killer, Enforcer Outdoor Insect Killer, Hi-Yield Broad Use Including Gardens; Lilly Miller Multi-Purpose Insect Spray

Western Cherry Fruit Fly

Treatment for western cherry fruit fly—the worms in the fruit—should begin soon on sweet cherries, and in a week or two on tart cherries. The recommendation is to protect fruit when it has begun to develop a salmon blush color, and we noticed this was the case on some sweet cherries in southern Utah County. Be sure to start your sprays based on the development of fruit on your own trees. Look at the fruit in the sunniest places, and toward the tops of the trees. Trees under stress will also often have fruit that ripens more quickly than others so pay close attention to these special situations and time insecticide sprays accordingly.

Western cherry fruit fly is a serious pest of tart and sweet cherries. Although residential growers can "tolerate" several wormy cherries, please keep in mind that a commercial growers' crop can be rejected by the processing plant if worms are detected. If residential trees are adjacent to commercial orchards, it would be helpful if they were treated for cherry fruit fly.

There is an excellent product called GF-120 that is used by many growers across the country with great success (in Washington, they use this product almost exclusively). If you have a heavy infestation, it will take 1-2 seasons of use to bring 100% control with this product, especially if you can get as many nearby neighbors to use it as well. It contains a bait that attracts the fly to eat it, and the active ingredient is called spinosad. Spinosad is a metabolite from the naturally occurring soil bacterium, *Saccharopolyspora spinosa*. GF-120 must be applied every 7 days, but complete coverage is not necessary. It is expensive ($160 for 2 gallons), and only available for purchase at larger ag supply chains.

Commercial treatment:
many options are listed in the Intermountain Tree Fruit Production Guide

Residential treatment options:
Spectracide Triazicide (14), Ortho Max Flower, Fruit and Vegetable (10-14), Sevin (14), Bonide Fruit Tree Spray (14), Malathion (7), Monterey Spinosad (5-7)

Cherry Powdery Mildew

Cherry powdery mildew can be a serious disease of cherries, particularly tart cherries, because it can reduce photosynthesis which may affect the subsequent year's crop.

Insect and Disease Information, continued from previous page

We noticed small infections starting to show up in Davis County. Cherry powdery mildew overwinters as resting spores in fallen leaves, on the orchard floor, or in bark crevices. Infections on new leaves occurs when spring rains or summer irrigation increases the humidity under the trees, causing the resting spores to release and spread. This pathogen needs 90 percent humidity and temperatures between 50-78 F for infection to occur. Leaves, fruit, and fruit pedicels can all become infected.

Look for the earliest infections on leaves near the trunk, and on the lowest, interior twigs (where humidity is highest). These infections then serve as inoculum for future infections that can be repeated throughout the summer.

Sprays are recommended as soon as the first lesions are spotted, because prevention is the best management option for powdery mildew. Continue sprays at 7 to 14-day intervals until growth hardens off.

Commercial treatment:
many options are listed in the Intermountain Tree Fruit Production Guide

Iron Chlorosis

Iron deficiency is a common sight in Utah orchards, and something growers have to deal with every year. Iron deficiency is not caused by a lack of iron in the soil, but rather the soil pH (which ranges from 7.5 to 8.5). In high pH, iron

is insoluble, and therefore not available for root absorption. Because irrigation water is also very alkaline, trying to manage iron deficiency by reducing soil pH is impossible.

Iron is a nutrient necessary for the formation of chlorophyll. Lack of chlorophyll means reduced photosynthesis, and reduced tree vigor. Some trees are genetically more susceptible to nutrient deficiencies than others.

To prevent or treat iron deficiency, chelated iron can be applied to the soil or foliage, but results are temporary. (Chelated products are readily available for absorption, and are not affected by soil pH.) Soil applications should be worked into the root zone. Foliar sprays (0.1%) with a spreader-sticker provide quick results but must be reapplied at approximately 10- to 21-day intervals. The drawback of foliar sprays is that staining of fruit can occur.

Residential treatment options:
Miller's Ferriplus, Sequestrene/Sprint 138, Lily Miller Sequester

PRODUCTION INFORMATION

It is time to thin apples and peaches. Both of these crops usually set more fruit than the tree can carry to harvest. Although for this year, many of you will have noticed by now a small peach crop due to some spring frosts and winter kill.

Thinning the extra fruit is important not only to get a good crop of fruit this year, but to get a decent crop next year. Excess fruit that remains too long on the tree will impact fruit size, formation of flower buds, crop potential for the following year, and overall tree health. An overload of fruit greatly reduces the tree's carbohydrate reserves and can also affect the tree's ability to withstand disease and winter injury.

Although fruit will naturally drop from the tree ("June drop"), the amount is insufficient to assure optimal fruit size. Natural drops typically stem from unfertilized seed, cold injury, competition between fruit, or excessive shading.

Start thinning peaches when they are the size of a robin's egg, and before apples are 3/8 inch in diameter. Remove the fruit either by hand or, on taller trees, hitting unwanted fruit with children's plastic bats, rubber hoses, or other soft object. (Hand thinning is the optimal option.)

1. pick off the smallest fruits and any that are misshaped or damaged.
2. for apples, reduce clusters to one apple each
3. adequately space the remaining fruits to about 4 to 6 inches apart along the shoot or twigs. A moderate-sized peach tree, for example, should only produce 100 to 150 fruits on the entire tree.

Spray Timing Information - Codling Moth

Please check this table at each advisory as the information may change as the dates get closer. The forecasts use the average temperature for each site. Fruit should remain protected through each generation according to interval provided on your pesticide label.

Codling Moth, First Generation

Continue keeping fruit protected up to the end of the first generation egg hatch. During the "period of greatest egg hatch" (from 340 - 640 degree days, for those who want to know) is the time period where there is the greatest chance of a successful entry by codling moth so be sure that fruit is well protected during this time. (The end of 1st generation is 925 degree days.)

County	Location	*Option A (oil applied previous to this spray)*	Period of greatest egg hatch	End of 1st generation egg hatch
		Apply first spray		
Box Elder	Perry	June 7	June 12 - 27	July 6
	Tremonton	June 15	June 15 - 28	July 15
Cache	River Heights	June 11	June 14 - 30	July 16
	Smithfield	June 14	June 16 - July 1	July 17
Carbon	Price	June 9	June 11 - 28	July 16
Davis	Kaysville	passed	June 8 - 23	July 6
Grand	Castle Valley	passed	passes	June 13
Iron	Cedar City	passed	June 4 - 20	July 5
Juab	Tintic	June 15	June 15 - July 1	July 15
Salt Lake	Holladay	passed	June 1 - 16	June 27
	Taylorsville	passed	June 2 - 17	June 28
Sevier	Monroe	passed	June 1 - 18	July 4
Tooele	Erda	June 7	June 10 - 24	July 11
	Grantsville	passed	June 4 - 20	July 3
Uintah	Vernal Airport	June 10	June 9 - 26	July 11
Utah	Alpine	June 11	June 12 - 28	July 12
	American Fork	passed	June 6 - 23	July 6
	Genola	passed	June 3 - 21	July 4
	Lincoln Point	June 7	June 5 - 22	July 5
	Orem	passed	June 3 - 18	July 1
	Payson	passed	June 5 - 21	July 4
	Provo	passed	June 2 - 18	July 1
	Santaquin	passed	June 4 - 22	July 6
	West Mountain	passed	June 4 - 21	July 3
Weber	Pleasant View	passed	June 4 - 21	July 3
Wasatch	Heber City	June 15	June 19 - July 7	July 24
Wayne	Torrey	passed	May 29 - June 11	June 25

Spray Timing - Peach Twig Borer

Peach Twig Borer, First Generation

If you had moderate to severe PTB damage last year, use the earlier spray date; if you had very little PTB damage last year, use the later date to start sprays. (These two dates correspond to 300 and 360 degree days after biofix, or 5% and 16% egg hatch.) End of egg hatch, where you should "keep fruit protected up to" is at 800 degree days.

County	Location	Start Date (lots of injury last year)	Start Date (little injury last year)	Keep Fruit Protected Up To:
Box Elder	Perry	June 14	June 18	July 9
	Tremonton	June 22	June 25	July 15
Cache	All Locations	no data yet	no data yet	no data yet
Carbon	Price	June 23	June 27	July 21
Davis	Kaysville	June 13	June 16	July 6
Grand	Castle Valley	passed	passed	June 19
Iron	Cedar City	June 15	June 18	July 10
Juab	Tintic	June 25	June 29	July 19
Salt Lake	Holladay	June 12	June 15	July 3
	Taylorsville	June 11	June 13	July 2
Sevier	Monroe	June 11	June 14	July 8
Tooele	Erda	June 14	June 17	July 6
	Grantsville	June 13	June 17	July 6
Uintah	Vernal	June 20	June 24	July 20
Utah	Alpine	June 22	June 26	July 16
	American Fork	June 12	June 15	July 7
	Genola	June 11	June 15	July 6
	Lincoln Point	June 16	June 20	July 10
	Orem	June 14	June 17	July 9
	Payson	June 12	June 15	July 9
	Provo	June 11	June 14	July 4
	Santaquin	June 13	June 16	July 11
	West Mountain	June 11	June 15	July 9
Weber	Pleasant View	June 12	June 16	July 5
Wayne	Torrey	passed	June 9	June 25

Spray Materials - Residential Applicators

Note that these treatments are only recommended if you know you have the particular pest in your trees. We recommend learning about specific pests, and scouting your trees at least once/week.

Target Pest	Host	Chemical	Example Brands	Comments
Codling moth	apple, pear	*Conventional* acetamiprid carbaryl malathion gamma-cyhalothrin *Soft/organic* hort. oil (1%) spinosad codling moth virus	 Ortho Flower, Fruit, and Veg. Sevin, Bonide Fruit Tree Spray, etc. Malathion Spectracide Triazicide Many products Green Light Lawn and Garden Spinosad; Gardens Alive Bull's Eye; Ferti-Lome Borer, Bagworm, Leafminer & Tent Caterpillar; Monterey Garden Insect Spray; Cyd-X	**acetamiprid**: every 14 days **carbaryl**: every 14 days **malathion**: every 7 days **gamma-cyhalothrin**: every 14 days **hort. oil**: lasts 5-7 days for killing eggs; use at beginning of each generation; apply at 1% rate only when temperatures are below 80; follow up with a different product **spinosad**: every 7 days **codling moth virus** can only be purchased online; Peaceful Valley Farm Supply
San Jose scale	apple	*Soft/organic* hort. oil neem oil	 many options Concern, Garden Safe, others	 two applications spaced 7-14 days apart should be enough
Greater peachtree borer	peach, nectarine, apricot	permethrin, bifenthrin, or gamma-cyhalothrin	Bonide Borer-Miner Killer, Hi-Yield Indoor/Outdoor Broad Use; Lilly Miller Multi-Purpose Insect Spray, Spectracide Triazicide	apply every 21 days until mid-September in highly infested areas; apply twice (now and one month later) in low infestations
Peach twig borer	peach, nectarine	*Conventional* acetamiprid carbaryl malathion permethrin *Soft/organic* spinosad kaolin clay	 Ortho Flower, Fruit & Veg Sevin, Bonide Fruit Tree Spray, etc. Malathion Hi-Yield Indoor/Outdoor Broad Use; Lilly Miller Multi-Purpose Insect Spray see 'codling moth' above Surround	see comments under Codling Moth **permethrin**: every 14 days; this ingredient is becoming less available in stores and may cause spider mite outbreaks **Surround**: every 3-5 days; works to repel, not kill insects; only moderate control; must purchase online
Western cherry fruit fly	cherry	*Conventional* acetamiprid carbaryl malathion pyrethrin *Soft/organic* spinosad	 Ortho Flower, Fruit & Veg. Sevin Malathion Concern Multi-Purpose see above	start applications when fruit in sunniest locations develop a salmon blush **spinosad**: every 7 days

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