

News/What to Watch For:

- Spider mite populations are starting to build
- Second generation San Jose scale crawlers emerging soon
- Iron chlorosis is evident on new foliage of peach, plum; consider getting leaf nutrition analysis in early August
- If 4-6 hr rains occur during peach ripening stage, may need to apply fungicide to prevent coryneum infection
- Codling moth and peach twig borer spray timings, pages 6&7
- Spray materials, page 5

Insect and Disease Activity/Info

APPLES/PEARS

Codling Moth

Except for the coldest areas (Cache, Wasatch counties) all other areas are in the middle of second generation egg hatch, so maintain protection of fruit. The end of egg hatch for this generation will occur August 11 - 20. There will be a full third generation this year, with no real "down time" between the second and third. So basically, in those areas that have high pest pressure, keep fruit protected from now through the middle of September (when you can stop, even if harvest has not begun yet).

San Jose Scale



San Jose scale will have a second emergence of crawlers, coming up soon in many areas. This pest is usually treated primarily with the dormant oil spray and with treatment of the first crawler emergence. But if you have a heavy infestation, or missed the window for the first emergence, consider a treatment for the timing below. One treatment is all that

is necessary, with 1% horticultural oil (evening or early am to avoid 85+ temps) or Esteem.

Box Elder: July 22 - 25

Cache: August 6 - 10

Davis: July 24 - 28

Iron: July 30 - August 3

Salt Lake: July 22

Tooele: July 21 - 24

Utah, Uintah: July 25 - 29

Wasatch: August 17 - 21

White Apple Leafhopper



Where present, leafhopper feeding damage on leaves can now be seen. The second generation has begun, and nymphs are active on the undersides of leaves. If you saw heavy leafhopper earlier, now would be a good time to treat because the nymphs are more susceptible and easier to treat than the

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adults. Adult activity will become very noticeable by mid to late August.

Feeding on the foliage will not affect apple yield or tree health, but this pest can become a nuisance to pickers late in the season during apple harvest.

Pear Psylla



If you had not noticed the presence of pear psylla this spring, damage is evident now. They are active from spring to fall, and if left unchecked, can build to damaging levels. Not only do they excrete honeydew, but their feeding kills the plant tissue.

At this point in the growing season, adults, eggs, newly-hatched nymphs and older nymphs can be found. The best timing for treatment is in spring, but if necessary, horticultural oil can be applied (when temperatures are below 85-90 F). Commercial growers can use Assail, Centaur, Clutch or Provado.

STONE FRUITS

Peach Twig Borer

Most areas are at the beginning of or are just approaching second generation egg hatch for peach twig borer. Peach twig borer larvae prefer feeding in shoots over fruit, but once the shoots harden off, adult moths will instead lay eggs on the ripening fruit, which is why the second generation can be more damaging.

Most growers can get away with one spray (on the appropriate date) per generation. But keep in mind that the warmer summer will speed up egg hatch and larval development, and if you are harvesting peaches late into August and/or early September, you may need to apply a second application to protect the ripening fruit.

Peach Silver Mite



Peach silver mite is a microscopic eriophyid mite that feeds on the bottoms of leaves. Where it occurs, it is present all season, but only becomes noticeable in mid summer when populations build to high numbers in the heat. Their feeding causes leaves to look silvery in appearance.

Trees can tolerate high populations, but when leaves start to droop and fall, a miticide or 0.5 - 1% horticultural oil application should take care of the problem. Alternatively, they can be treated in early spring (at budbreak) with oil.

Spotted Wing Drosophila Update

Spotted wing drosophila (SWD), an invasive vinegar fly that was introduced into the U.S. in 2009 and has since spread to almost two dozen states, was detected in Kaysville in August 2010. There were a few detections in 2011, in three sites in Davis County.

This season, Cory Stanley, USU Coordinator for the Cooperative Agricultural Pest Survey (CAPS) program has set up traps throughout Davis County and southern Weber County. Trapping sites include areas where raspberries, sweet cherries, tart cherries, and peaches are grown, as well as fruit stands. Traps are baited with yeast and sugar solution, which is replaced weekly when trap contents are removed and examined for SWD presence.

To date, no SWD have been confirmed yet this year.

Spider Mites

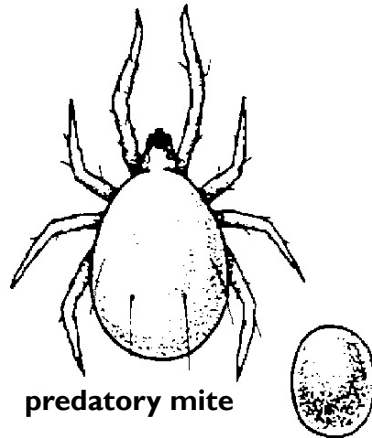
The spider mite species that cause damage to fruit trees in Utah are two-spotted and McDaniel, with two-spotted being the most common. They share the same life cycle and appear similar.

Spider mites can be found in large numbers by this time of year, as they thrive in hot, dusty conditions. Their feeding

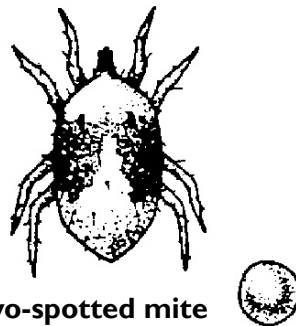
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causes leaves to look stippled with tiny white spots. In heavier feeding, leaves will start to bronze. Monitor for spider mite damage on all fruit crops by looking at the undersides of the leaves for a dirty appearance, and use a hand lens to get an estimate of the number of mites per leaf. If you see approximately 1 predatory mite per leaf and/or fewer than 5-10 damaging mites per leaf, then there is no need to spray. But by the time damage is obvious, the population is much greater than this.



predatory mite



two-spotted mite

Ideally, spider mite populations are held in check by the presence of the western predatory mite (*Galendromous occidentalis*). Predatory mites are very sensitive to certain insecticides, especially pyrethroids (any ingredient ending in “-thrin”, which is why we recommend keeping pyrethroid sprays to a minimum (especially early in the season).

Predatory mites are teardrop shaped, translucent in color, and usually have longer legs. They can be spotted easily with a hand lens because they move rapidly through the slower-moving spider mite colonies.

Cat-facing injury

Cat-facing injury is a generic term used to describe a symptom caused by feeding of true bugs (lygus and stink bugs) on



Stink bug nymphs can be seen in the orchard now.



young fruit. Although these insects are considered minor pests, most commercial and residential orchards will see a certain level of damage each year.

True bugs feed by inserting their proboscis into the fruit flesh. They excrete a salivary enzyme that breaks down the cells, and then suck up the dissolved food juices. The damage caused to the fruit will look different depending on when the feeding occurred. Trying to distinguish which insect may have caused the damage is almost impossible to discern because their feeding habits are so similar. Scouting for adults throughout the season will help to determine which is most common in your tree or orchard.

Both lygus bugs and adult stink bugs can feed on very young, developing fruit, but they leave the orchard for other crops (alfalfa, weeds) to breed and feed until later in the season. When alfalfa is cut or weeds die back, lygus and stink bugs will come back to the orchard as adults.

If your orchard is bordered by lots of weedy areas, watch closely for signs of feeding damage on the fruit. By late-August, stink bugs move on to overwintering sites.

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Severely dimpled fruit indicates that feeding occurred earlier in the season. Early to mid-season feeding by lygus bugs will cause strings of oozing gum and sometimes, a water-soaked appearance. Feeding closer to harvest does not cause gumming, and may not be noticeable until later, when the flesh appears brown and corky or even decayed. Sometimes, injury does not show up until fruit is brought out of storage.

If possible, remove weed hosts in the orchard (mullein, ironweed, horse-weed) or keep them mown within and on orchard edges.

The most effective products on adult true bugs are the broad spectrum insecticides (carbaryl and pyrethroids). Only consider a treatment if it is worth the cost of killing beneficial insects that may be feeding on other pests.

Post-harvest Control of Western Cherry Fruit Fly

Tart cherry harvest began last week, and will continue for another few weeks. If sprays need to be applied, consider spinosad (or GF-120) or carbaryl (Sevin) where the pre-harvest interval is short (0 days or 3 days).

After harvest is finished, commercial growers that still have fruit remaining on the trees should consider a post-harvest application to clean up later emerging flies. Cherry fruit flies become more numerous later in the season, and females will continue to lay eggs in ripe/overripe fruit as long as possible. Protecting unharvested fruit is wise because you are decreasing the overwintering population in your orchard.

For commercial growers, dimethoate is the best option (cost-wise), as is a generic imidacloprid registered on fruits.

Homeowners should remove and destroy all fallen fruit (including sweet cherries), and if possible, pick your cherry trees clean to remove egg-laying sites for late-emerging fruit flies.

Earwigs



Even though this summer has been dry, European earwig populations are still high, especially due to the moist seasons of 2010-11. They do not like dry conditions, so they concentrate in areas that are irrigated and have moist, cool places to hide during the day. They feed mostly at night, leaving behind trails of black frass. Keep in mind that earwigs are omnivorous, and can be considered beneficial insects in that they feed on insects such as aphids and insect eggs.

We mostly see earwigs on peaches. They will usually not start feeding on fruit until it softens. Often they enter fruit through the stem end, and feed around the pit. They may exit through the stem end or through a new exit hole. You may also see shallow gouges on the fruit surface or a single deep hole. The riper the fruit, the more appealing it is to feeding.

To manage earwigs, use a variety of options:

1. *Trap regularly.* Options are: cat food or tuna cans, with 1/2-inch of fish or bacon oil in the bottom; rolled-up newspaper; rolled up corrugated cardboard; bamboo sticks; or short pieces of hose. Place traps on the soil or wrapped around the tree trunk and empty traps into soapy water, or change them out, daily. Continue until you are no longer catching earwigs.
2. *Remove refuge sites.* Keep mulch away from trees, remove weedy growth or groundcovers from the base of trees. Remove tree suckers or any limbs touching the ground. Remove loose bark on fruit trees where earwigs can hide.
3. Pick fruit as soon as they start to ripen.
4. *Insecticides.* Spinosad kills earwigs when they feed on the residual material. It can be used either as a spray or bait sprinkled at the base of trees (Sluggo Plus). (In this method, the bait must be used before the earwigs enter the tree. Otherwise, sprinkle bait in tree crotches.) Carbaryl (Sevin) can also be used, applied to the tree trunk and scaffold limbs, but again, it must be applied as soon as earwigs are starting to enter the tree.

Iron Deficiency

Iron chlorosis is common this season, as it is almost every year. The problem 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 deficiency is exacerbated by frequent springtime irrigation, prolonged soil wetness, or an uneven root to shoot ratio.

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Iron is a nutrient necessary for the formation of chlorophyll. Lack of chlorophyll means reduced photosynthesis, and reduced tree vigor. Iron-deficient leaves have interveinal chlorosis (yellowing between veins). In severe symptoms, leaves may show blackened scorching, curling, or premature drop. Some trees are genetically more susceptible to nutrient deficiencies than others.

To prevent or treat iron deficiency, chelated iron should be applied to the soil in spring before budbreak. Usually one application is good for the entire season, but must be repeated again the following spring. Adding iron to the soil later in the season is also an option, but takes longer to see results. 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.

Iron amendments for high pH soil should be chelated, meaning that it is readily available for absorption, and not affected by soil pH. The best form of chelated iron to use is EDDHA, sold as Sequestrene or Miller's Ferriplus.

To be sure of the correct nutrient deficiency, the USU Analytical Lab (435-797-2217) can test foliar and soil samples. Iron chlorosis symptoms usually show up later in the season, but research has shown that nutrient analysis of peach flowers in spring can be used for predicting iron deficiency.

Upcoming Monitoring/Insect Activity

Pest	Host(s)	Monitoring Action
San Jose scale	apple mostly	Crawler emergence early June; treat in late June
White apple leafhopper	apple	Adults of first generation form in late June; nymphs of second generation start showing up in mid-July
Cat-facing insects (lygus, stink bugs)	peach	As peaches start to ripen, these piercing-sucking insects will become attracted to feeding on the flesh.

Spray Timing - Codling Moth

Codling Moth, Second and Third Generations

Second generation egg hatch is still underway; continue protecting fruit until SEPTEMBER 15. The content below is for information purposes only because there is no long "break" between second and third generations.

County	Location	Beginning of 2nd Gen. Egg Hatch	End of 2nd Gen. Egg Hatch (2100 DD)	Beginning of 3rd Gen Egg Hatch (1150 DD)
Box Elder	Perry	passed	August 12	August 14
	Tremonton	passed	August 21	August 24
Cache	River Heights	July 21	after August 22	after August 22
	Smithfield	July 20	after August 22	after August 22
Carbon	Price	passed	August 20	August 22
Davis	Kaysville	passed	August 13	August 14
Iron	Cedar City	passed	August 20	August 23
Salt Lake	All Regions	passed	August 5	August 7
Tooele	Tooele	passed	August 8	August 10
Uintah	Vernal	passed	August 17	August 19
Utah	Alpine	passed	August 22	August 25
	American Fork	passed	August 14	August 16
	Genola	passed	August 12	August 13
	Lincoln Point	passed	August 12	August 14
	Orem	passed	August 14	August 16
	Payson	passed	August 16	August 18
	Santaquin	passed	August 15	August 17
Weber	Pleasant View	passed	August 11	August 12
Wasatch	Heber City	July 25	after August 22	after August 22

Spray Timing - Peach Twig Borer

Peach Twig Borer, Second and Third Generations

End of second generation egg hatch, where you should “keep fruit protected up to” is at 1900 degree days. Third generation egg hatch, which will be occurring only on fruit, begins a few weeks after the second generation ends. Like prior generations, if you had moderate to severe PTB damage last year, use the earlier spray date to start again. If you had very little PTB damage last year, use the later date to start sprays. These two dates correspond to 2140 and 2250 degree days after biofix, or 5% and 16% egg hatch.

County	Location	Start Protecting Fruit 2nd Gen.	Keep Fruit Protected Up To (2nd Gen.):	Start Protecting Fruit 3rd Gen.
Box Elder	Perry	passed	August 9	August 20-24
	Tremonton	July 24 - 27	after August 22	after August 22
Cache	River Heights	July 27 - 31	after August 22	after August 22
	Smithfield	July 28 - August 1	after August 22	after August 22
Carbon	Price	July 24 - 27	after August 22	after August 22
Davis	Kaysville	passed	August 8	August 17-21
Iron	Cedar City	July 20	August 15	after August 22
Salt Lake	All Regions	passed	August 12	August 10-14
Tooele	Tooele	passed	August 4	August 13-17
Uintah	Vernal	passed	August 12	after August 22
Utah	Alpine	July 22 - 23	August 22	after August 22
	American Fork	passed	August 11	August 21 - 25
	Genola	passed	August 9	August 19-22
	Lincoln Point	July 20	August 12	August 22 - 27
	Orem	July 20 - 23	August 15	after August 22
	Payson	passed	August 11	August 23
	Santaquin	July 20	August 12	August 22 - 27
Weber	Pleasant View	July 20	August 11	August 21 - 26
Wasatch	Heber City	August 5 - 9	after August 22	after August 22

Spray Materials - Commercial Applicators

Please look up spray material options in the **2012 Utah-Colorado Tree Fruit Production Guide**. If you do not have a copy and would like one, contact marion.murray@usu.edu. You may also access spray options at the guide's companion website at intermountainfruit.org.

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. Products are listed by *Conventional* (usually broad-spectrum pesticides that are effective, but harmful to beneficial insects), or *Soft/Organic* (not as effective, but safer for the environment and humans). Products are listed in order of efficacy.

Target Pest	Host	Chemical	Example Brands	Comments
Both codling moth AND peach twig borer (except Cyd-X)	apple, pear	<i>Conventional</i> carbaryl acetamiprid malathion gamma-cyhalothrin <i>Soft/organic</i> hort. oil (1%) spinosad codling moth virus	Sevin, Bonide Fruit Tree Spray, etc. Ortho Max Flower, Fruit, and Veg., Malathion Spectracide Triazicide Many products Green Light, Gardens Alive Bull's Eye, Monterey Cyd-X	acetamiprid: every 14 days carbaryl: every 14 - 21 days malathion: every 7 days gamma-cyhalothrin: every 14 days hort. oil (codling moth only): lasts 5-7 days for killing eggs; use at beginning of each generation; apply at 1% rate only when temperatures are below 80 F; follow up with a different product spinosad: every 7 days codling moth virus (codling moth only) can only be purchased online
Coryneum blight	peach, apricot	captan	Captan	use as a preventive before a rain

Precautionary Statement: Utah State University Extension and its employees are not responsible for the use, misuse, or damage caused by application or misapplication of products or information mentioned in this document. All pesticides are labeled with ingredients, instructions, and risks. The pesticide applicator is legally responsible for proper use. USU makes no endorsement of the products listed herein.

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