Tree Fruit IPM Advisory

Weekly Orchard Pest Update, Utah State University Extension, **July 3 , 2013**

News/What to Watch For:

The hot weather encourages spider mites; they are easier to control when treated at low populations. Monitor for them starting with the lowest foliage closest to the trunk.

Trees with iron chlorosis will be under more stress in the hot, dry conditions and prone to scorch; apply a foliar application if necessary.

Updated spray timing dates for codling moth and peach twig borer, pages 5-6

JUST THE BASICS

APPLE & PEAR

- *Codling moth* treatment will take a slight "break" between generations 1 and 2. See table on page 5.
- Continue to prune out *fire blight* strikes to prevent further spread.

PEACH/NECTARINE, APRICOT, PLUM

- *Peach twig borer* treatments will take a longer "break" between generations 1 and 2. See table on page 6.
- Protect trunks from *greater peachtree borer* now.

EXPANDED COVERAGE - Insect and Disease Information

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

APPLE & PEAR

Codling Moth

Egg hatch of the second generation will begin between July 5 through July 12 for most areas of the Wasatch Front, and close to July 18 for the cooler areas of northern and central Utah.

To prevent resistance to pesticides, we recommend rotating to a different chemical class for the second generation treatment. This generation will last about 5-6 weeks. High population areas (most backyard or urban settings) will require at least 2 sprays for this generation. Keep in mind, though, that a third hatching of eggs will begin just a few days after the 2nd generation is complete. In essence, fruit should be protected up to September 15.

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)

White Apple Leafhopper

White apple leafhopper has two generations. The second generation adults that fly during harvest can be a nuisance. Trees can tolerate a high population, but for pickers, bugs flying in eyes and ears is not fun. Leafhoppers are best treated early as nymphs, which will be in the next few weeks.

If you used Sevin for a thinning agent, or treated first generation nymphs soon after petal fall, then you shouldn't have too big of a second generation. Monitor your apple trees by checking the undersides of foliage for the white-colored, wingless nymphs. Plan a treatment, if necessary, soon after hatching.

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STONE FRUIT

Peach Twig Borer

many times, twig borer larvae gain access into green fruit through the stem end

Egg hatch of the first generation is ending for most areas along the Wasatch Front. About 2 weeks later, eggs hatch for the second generation begins. It is this generation that causes damage to fruit as the larvae feeds on the flesh of peaches, nectarines, and apricots.

Like the first generation, the table on page 6 provides two start dates for applying a treatment. We recommend the earlier date if you had peach twig borer injury last year, and the later date if you had very little damage last year. Treatment materials are the same as for codling moth.

Greater Peachtree Borer

All locations of northern Utah should start treatment for greater peachtree borer. Adult peachtree borer moths lay eggs on the lower 12" of the tree trunk or on nearby soil, so only that portion of the tree trunk should be saturated with the pesticide spray to prevent injury.

Continue spraying the trunks at intervals (14 days for younger trees, 21-30 days for more mature trees), with your last treatment around September 15.

Commercial treatment (and days between sprays):
a few options are Lorsban (one spray only; do not touch foliage), Asana (21); products containing permethrin (21-30 days) Isomate-P mating disruption (all season); for more information, see the Intermountain Tree Fruit Production Guide

Residential treatment options (14-30 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

Most sweet cherries (where they survived the spring frost) have been harvested, while tart cherry harvest is just around the corner. If a cherry fruit fly treatment is needed close to harvest, select a product with a short pre-harvest interval, such as Sevin or Malathion (both 3 days), or GF-120 (1 day). You may choose to use Provado/Admire Pro for your last spray (7 days) because it penetrates into the fruit slightly to target any larvae inside. Keep in mind, though, that Provado can encourage spider mites.

Earwigs

Earwig feeding makes leaves look ragged and torn in irregular patterns.

Earwig populations are increasing in peach orchards. While the fruit is still hard, earwigs feed on leaves or other insects. They become more of a problem on ripe or overripe fruit, or on split peaches. Earwigs are active at night, and so may not be seen when pest scouting during the day.

Utah State University PhD candidate, Andrew Tebeau, has been studying earwig biology and is working on developing a degree day model to predict the optimal time to treat. According to Tebeau, the timing coincides with the greatest abundance of nymphs and adults in peach orchards, rather than fruit ripeness or injury level. Preliminary results have shown that this timing is around 1800 degree days after January 1.

For Utah County commercial peach orchards, this is between July 21 and 24. Sevin and Success have shown to be good options.

Stinkbugs

We observed injury due to lygus bugs (tarnished plant bug) on Box Elder county peaches several weeks ago. This injury most likely occurred soon after petal fall, when lygus bugs were looking for food. Now, we are seeing stink bug adults and egg hatch. Stink bugs can be just as injurious as lygus bugs, causing "cat-facing" injury to fruits. As the bugs feed,

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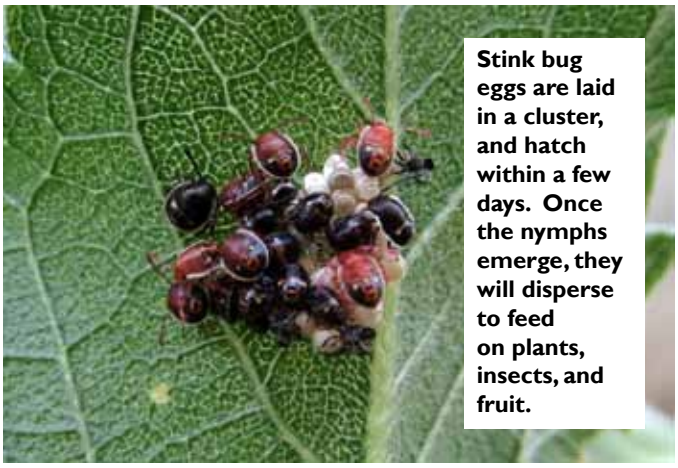

Stink bug eggs are laid in a cluster, and hatch within a few days. Once the nymphs emerge, they will disperse to feed on plants, insects, and fruit.

toxins in their saliva kill cells, and as the fruit grows, the original feeding site becomes sunken, and the fruit, deformed.

We cannot provide a timing recommendation for stink bugs because they are very mobile and their population depends on the local environment. Most orchards do not need to worry about this pest, but we have heard reports in the past of high populations where orchards neighbor rangeland or forage crops.

Growers with a history of cat-facing injury to peaches should monitor twice a week for signs of new feeding. You will see small water-soaked lesions that will ooze clear gum. Fruit that has distorted growth (cat-facing injury), or healed corky bumps, will have been damaged during early fruit development, so do not count that in your current injury assessment. Often, cover sprays for peach twig borer will help to control stink bugs, but if you see more than 2% of your fruit with current injuries, a control may be warranted.

Kaolin clay has shown to be an effective deterrent to stink bugs. It must be applied every 10 days to maintain coverage. Border treatments should suppress hot-spots.

Leafrollers on Tart Cherries: Utah County

The end of the first generation egg hatch falls within July 23-28; however, larvae take several weeks to feed and develop. Therefore, larval feeding could continue until August 10. The second summer generation egg hatch will not begin until well after cherry harvest, in late September.

Walnut Husk Fly

Walnut husk flies will start to emerge throughout the Wasatch Front toward mid to late July, and in cooler areas in early August. Just like cherry fruit fly, the husk fly overwinters as pupae in the soil, emerging in mid summer to lay eggs. The peak fly emergence will occur in early to mid August.

Black, Japanese, and English walnuts are all hosts for the husk fly. (Peach and apricot fruit are also sometimes attacked.) Although the maggots do not damage walnut meat directly, their feeding on the husk causes indirect damage by making hull removal difficult, and causing black staining of the nutshell.

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Female husk flies lays eggs just below the surface of the walnut husk. Maggots feed on the husk for 3 to 5 weeks and then drop to the soil to pupate. There is a single generation per year.

Like cherry fruit fly, populations of walnut husk fly can be reduced by placing landscape fabric under the tree canopy in late summer to prevent larvae from entering the soil. Also, remove all nuts that fall to the ground. To make husk removal easier, store infested nuts in a damp burlap bag for 2-3 days.

Monitoring Program for Invasive Pests

The Cooperative Agricultural Pest Survey (CAPS) Program will be monitoring for several invasive pests in 2013, two of which have previously been reported in Utah: the spotted wing drosophila (*Drosophila suzukii*) and the brown marmorated stink bug (*Halyomorpha halys*).

The spotted wing drosophila (SWD) is a pest of soft fruit such as raspberry, cherry, strawberry and peach, and was first discovered in Davis County in 2010 and again in 2011 and 2012. Currently, SWD has not been found in other Utah counties. Male SWD can be identified as having 1 spot per wing. SWD females have saw-like ovipositors which enable them to lay eggs in ripe and ripening fruit. The larvae feed inside the fruit, causing the fruit to become soft and unmarketable. This year, the Utah CAPS team will place 15 SWD traps in fruit orchards, berry patches, and backyard gardens in Davis County, and traps will be monitored weekly. A few traps will also be placed in Salt Lake and Utah County.

The brown marmorated stink bug (BMSB) feeds on a wide variety of host plants, including apples, peaches, corn, and tomatoes. The BMSB also poses a problem for residences when it searches for protected, overwintering sites indoors. BMSB is shield-shaped with light bands on the antennae and distinct white triangles on the rear of the front pair of wings. In the fall of 2012, two BMSBs were found in Salt Lake County. This year, as part of a collaborative effort between Utah State University and Utah Department of Agriculture and Food, approximately 25 BMSB traps will be placed in fruit orchards and backyard gardens in Box Elder, Davis, Salt Lake, and Utah counties. Traps will be monitored every 2 weeks.

If you find one of these pests, please contact Lori Spears, USU CAPS Coordinator (lori.spears@usu.edu). Suspect samples may be sent to: Lori Spears, Department of Biology, Utah State University, 5305 Old Main Hill, Logan, UT 84322.

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 and Second Generations

Continue keeping fruit protected up to the end of the first generation egg hatch (925 degree days after biofix). The start of second generation egg hatch (1120-1150 degree days) is when the next cycle of treatments should begin. If you have been diligent during the first generation, the population of moths should be smaller for the second generation. During the "period of greatest egg hatch" (from 1400-1700 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. Egg hatch ends at 2100 DD.

		FIRST GEN.	SECOND GENERATION		
County	Location	End of egg hatch	Start of egg hatch	Period of greatest egg hatch	Keep fruit protect up to this date
Box Elder	Perry	July 1	July 5	July 21 - August 3	August 21
	Tremonton	July 11	July 18	July 29 - August 10	August 28
Cache	River Heights	July 11	July 21	July 2 - August 15	September 8
	Smithfield	July 12	July 16	July 31 - August 13	September 1
Carbon	Price	July 3	July 14	July 28 - August 12	September 7
Davis	Kaysville	July 4	July 12	July 23 - August 4	August 19
Grand	Castle Valley	passed	passed	June 26 - July 6	July 20
Iron	Cedar City	July 2	July 11	July 23 - August 4	August 22
Juab	Tintic	July 12	July 22	August 3 - 17	September 9
Salt Lake	Holladay	June 26	July 5	July 21 - August 3	August 21
	Taylorsville	June 27	July 5	July 21 - August 3	August 21
Sevier	Monroe	June 28	July 6	July 19 - August 2	August 18
Tooele	Erda	July 3	July 10	July 22 - August 5	August 17
	Grantsville	June 29	July 6	July 17 - July 28	August 12
Uintah	Vernal Airport	July 5	July 15	July 27 - August 10	August 21
Utah	Alpine	July 9	July 18	July 30 - August 12	August 31
	American Fork	July 4	July 12	July 23 - August 4	August 21
	Genola	July 1	July 9	July 21 - August 2	August 18
	Lincoln Point	July 2	July 10	July 21 - August 2	August 19
	Orem	July 1	July 9	July 21 - August 1	August 17
	Payson	July 4	July 11	July 23 - August 3	August 14
	Provo	June 30	July 8	July 19 - August 1	August 15
	Santaquin	July 3	July 11	July 22 - August 3	August 20
	Tickville	July 8	July 18	August 1 - 14	September 2
	West Mountain	July 5	July 12	July 24 - August 5	August 21
Weber	Pleasant View	July 1	July 8	July 19 - 30	August 14
Wasatch	Heber City	July 19	July 30	August 14 - Sept. 1	September 15
Wayne	Torrey	June 23	July 3	July 9 -21	August 7

Spray Timing - Peach Twig Borer

Peach Twig Borer, First Generation

The end of egg hatch for the first generation, where you should "keep fruit protected up to" is at 800 degree days. For the start of second generation egg hatch, select the date that best reflects the injury level you had last year (earlier for more injury, and later for less). These dates correspond to 1200 and 1300 degree days after biofix, or 5% and 16% egg hatch. The end of egg hatch for the second generation, where you should "keep fruit protected up to" is at 1900 degree days.

		FIRST GEN	SECOND GENERATION		
County	Location	Keep Fruit Protected Up To:	Start Date (high population)	Start Date (low population)	Keep Fruit Protected Up To:
Box Elder	Perry	July 3	July 20	July 25	August 20
	Tremonton	July 10	July 27	July 31	August 25
Cache	All Locations	July 21	August 7	August 11	September 11
Carbon	Price	July 9	July 29	August 3	September 9
Davis	Kaysville	July 4	July 20	July 24	August 17
Grand	Castle Valley	passed	passed	passed	July 19
Iron	Cedar City	July 6	July 23	July 27	August 21
Juab	Tintic	July 17	August 4	August 8	September 11
Salt Lake	Holladay	passed	July 14	July 18	August 7
	Taylorsville	passed	July 14	July 17	August 6
Sevier	Monroe	passed	July 18	July 22	August 13
Tooele	Erda	July 4	July 19	July 23	August 14
	Grantsville	passed	July 17	July 21	August 12
Uintah	Vernal	July 10	July 28	August 2	September 2
Utah	Alpine	July 13	July 30	August 3	August 31
	American Fork	July 4	July 20	July 24	August 18
	Genola	July 3	July 19	July 21	August 17
	Lincoln Point	July 6	July 22	July 26	August 20
	Orem	July 7	July 22	July 26	August 18
	Payson	July 5	July 21	July 24	August 17
	Provo	July 4	July 18	July 24	August 14
	Santaquin	July 5	July 21	July 25	August 18
	Tickville	July 10	July 31	August 6	September 5
	West Mountain	July 7	July 23	July 26	August 19
Weber	Pleasant View	July 4	July 19	July 23	August 14
Wayne	Torrey	passed	July 6	July 10	August 3

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 and Walnut husk 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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