EXTENSION
UtahStateUniversity

Tree Fruit IPM Advisory

UTAH PESTS

Weekly Orchard Pest Update, Utah State University Extension, **August 24, 2015**

News/What to Watch For:

There is still time to collect foliage for nutrient analysis by the USU Analytical Lab (www.usual.usu.edu).

Spider mites will continue to be active through the end of the month, and then will begin migrating to ground cover for overwintering

Protect peaches from late season coryneum blight and brown rot infection if rainfall (at least 4 hours) is predicted; only for sites that already have these diseases:

- Backyard growers, apply fungicide before rain; use Captan or Spectracide Immunox
- Commercial growers can find a list in the July 29, 2015 advisory, page 4

JUST THE BASICS: Current Treatments

APPLE & PEAR

- Continue protecting fruit from *codling moth* through Sept. 15.

PEACH/NECTARINE

- Continue protecting fruit from *peach twig borer* through Sept. 15.
- Continue protecting lower trunk from *greater peachtree borer* through early October.

Insect and Disease Information

: *information for residential settings* : *information for commercial orchards*

ALL FRUIT TREES

Phytophthora Crown and Collar Rot

Large trees that die suddenly at this time of year have probably been living with infections by the pathogen, Phytophthora (fye-TOP-thora), for much of the season. An infected tree has a limited ability to transport water and nutrients because the pathogen kills the conductive tissue at the base of the tree, essential girdling it. The stress of heat, drought, and ripening fruit is too much for the tree, and can result in a quick death (see images, next page).

Phytophthora is a fungus-like, soil-borne pathogen that feeds on live cambium in the roots and crown. It is present in almost all soils, but it requires saturated soils (for a period of about 6-10 hours) and a susceptible host to cause infection. Light infection can also occur, and it may take up to 3 years for the tree to die. In that time period, the tree will have small, chlorotic (yellow) leaves and fruit, poor growth, late spring leaf emergence, and early fall color.

The following shows the susceptibility of various fruits:

Apples:

- M-9, M-2, and M-4 are relatively resistant;
- M-7 (and M-7a), M-26, and MM-111 are moderately susceptible;
- MM-106 and MM-104 are highly susceptible

Plums and Pears:

- relatively resistant

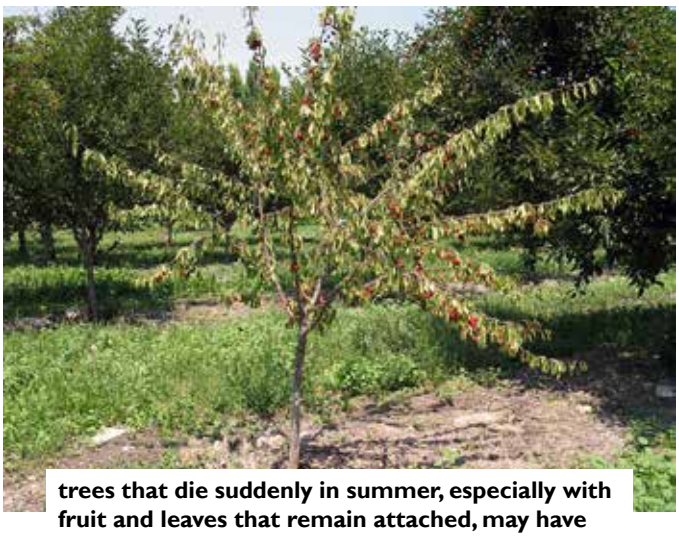
Peach and apricot:

- susceptible, but not commonly seen in Utah

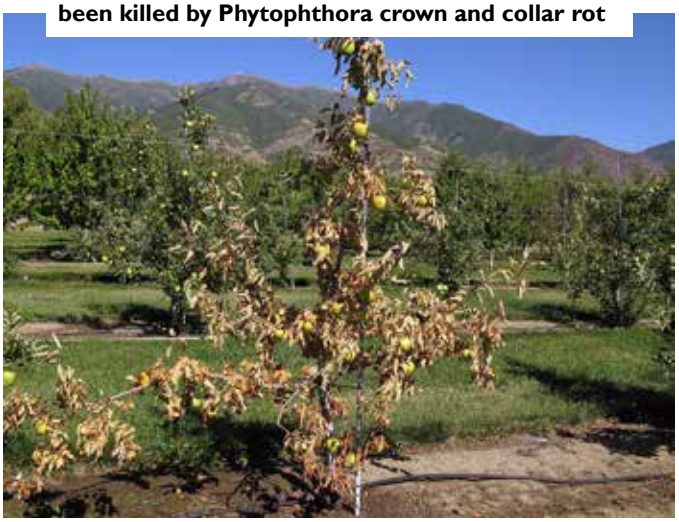
Cherry:

- Mahaleb is the most susceptible cherry rootstock;
- Mazzard, Morello, and Colt are somewhat more resistant

Insect and Disease Activity, continued



trees that die suddenly in summer, especially with fruit and leaves that remain attached, may have been killed by Phytophthora crown and collar rot



one way to diagnose the disease is to scrape the bark off the base of the tree; cinnamon-brown tissue indicates death by Phytophthora

To prevent infection, avoid planting trees in low spots or in poorly drained soils. Plant new trees slightly high so that they do not settle lower than the normal soil height, and prevent water from puddling around the root collar.

Unfortunately, there is no "cure" for infected trees. Trees that show moderate symptoms may recover with a soil application of Ridomil Gold, which should be applied in spring (on non-bearing trees only).

Removal of infected trees and sanitation is important. If possible, do not spread soil or infested debris from one area to another. Do not replant in an infested site without drenching the soil with fosetyl-Al (Aliette) as a preventive. Try to improve soil drainage, monitor soil moisture, and fix any irrigation leaks.

Asymptomatic trees growing adjacent to phytophthora-killed trees should be given a foliar treatment with phosphorus acid (Agri-Fos, Fosphite, others), which will help the tree(s) develop tolerance to future infection.

Stink Bugs

Hosts: apple, pear, peach, nectarine

green stinkbug on peach, top; stink bug feeding injury to apple, below

Stink bugs will continue to move into orchards for the next month, feeding up until harvest, where they are present. Activity will escalate through the end of August and into early September. In Utah, we have several species of stink bugs (green and brown). The invasive brown marmorated stink bug has not yet been found damaging fruit in Utah.

Insect and Disease Activity, continued

Late season stink bug damage appears as slightly sunken spots on the fruit skin. On apple, the flesh underneath the injury is corky and light colored. On peach, the lesions are water-soaked. When you slice into the flesh, the damaged area forms a conical shape, with the widest area near the skin. Damage mostly occurs near the top third of the apple, and on fruits near the orchard borders or near natural areas.

Insecticides for late season stink bug management in commercial orchards include Baythroid, Danitol, and Leverage. Surround (organic, kaolin clay) may provide some repellent activity. Start with treatment of the border rows only, and be mindful of the label's pre-harvest interval. Avoid using a pyrethroid if you have spider mites, as this could make the problem worse.

Spider Mites

Spider mites (two-spotted and McDaniel) are peaking now in tart cherry, peach, and apple orchards now due to the prolonged hot, dry weather. Use of broad-spectrum pesticides early in the season (pyrethroids, carbaryl) contributes to spider mite activity because they kill predatory mites.

Starting in early September, the mites will develop into their overwintering forms, which are adult females that take on an orange color. In mid to late September, they will migrate in droves down the trunks of trees to groundcover.

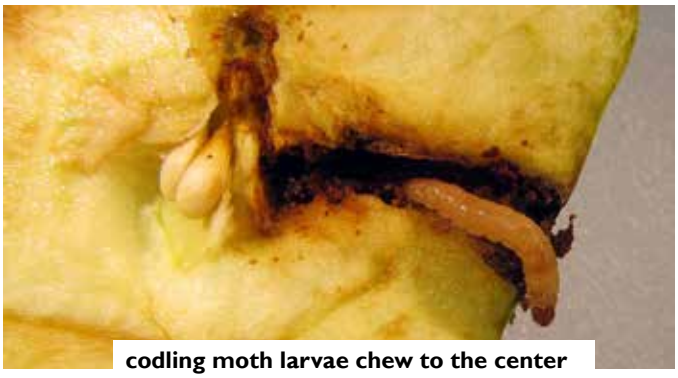
In general, a late-season treatment threshold for most fruits would be an average of 10-30 mites per leaf (or when severe symptoms are seen on outer leaves). Pear leaves infested with mites will turn black, and newer foliage may become distorted. View the undersides of leaves with a hand lens to determine if a treatment is necessary.

The best option for treatment is 1% horticultural oil, sprayed to dripping. A second application 10-14 days later may be required for heavy infestations. Apply before mid-September, as the overwintering forms are resistant to oil.

APPLE and PEAR

Codling Moth

Hosts: apple, pear



codling moth larvae chew to the center of the apple to feed on the seeds

Third generation egg hatch is underway in most areas of northern Utah. We are still trapping codling moth, with numbers varying from location to location.

Keep fruit protected up until September 15, when eggs stop hatching due to cooler weather and shorter days. Most orchards not using mating disruption will need one last treatment to maintain protection for these last 3 weeks.

Commercial growers can find options in the Intermountain Tree Fruit Guide on page 73 of the pdf. Be mindful of PHI values. Options such as Imidan, Leverage, Sevin, Altacor, Assail, Cyd-X, Delegate, Entrust, Exirel, Javelin, and Entrust all have a PHI of 7 days or less.

White Apple Leafhopper

Hosts: apple

leafhoppers molt as they grow; their shed skins on the undersides of leaves give them away

White apple leafhopper summer generation nymphs are continuing to build in numbers. Activity will peak in mid-September, around the start of apple harvest. This is when

Insect and Disease Activity, continued

the leafhopper is considered a true pest, as they fly into the face and eyes of pickers.

Normally, control should target first generation nymphs in the spring, but if necessary, a treatment now will also work. Do not wait much longer because once they mature to adults, they are more difficult to kill. See the Intermountain Tree Fruit Guide, page 78, for options.

Appleleaf and Pearleaf Blister Mites

Hosts: apple

Leaves affected by blister mites will be the first to turn color and drop in the fall; treat them before this time

Blister mites are microscopic mites in a group called eriophyid mites. Eriophyid mites are mostly a problem on backyard trees rather than in large, commercial orchards. Feeding by these mites causes blisters to form on leaves. In spring, the blisters are barely visible, but by late summer, they become raised, necrotic (dead) spots. Inside each blister are hundreds of mites.

Blister mites overwinter in the host trees' bud scales. Before leaf fall, they will migrate to buds for the winter. This is the time to take advantage of their exposure and apply a treatment. Options include Sevin, horticultural oil (1.5%), or insecticidal soap.

PEACH/NECTARINE

Peach Twig Borer

Hosts: peach/nectarine

Egg hatch of the 3rd generation of larvae has just started in some areas, and will start in late August/early September in most others. (Cooler areas of Utah will not have a 3rd generation.) Many peaches have been harvested, but the remaining peaches still need protection up to September 15, especially in areas not using mating disruption, or with a history of injury.

peach twig borer larvae feed on the flesh of ripening peaches

If harvest has begun, select a material that has a shorter pre-harvest interval, such as Assail (or Ortho Fruit, Flower and Vegetable), Belt, Intrepid (all can be applied up to 7 days before harvest), or Entrust (or backyard spinosad products) (1 day PHI).

Boxelder Bugs

Hosts: peach

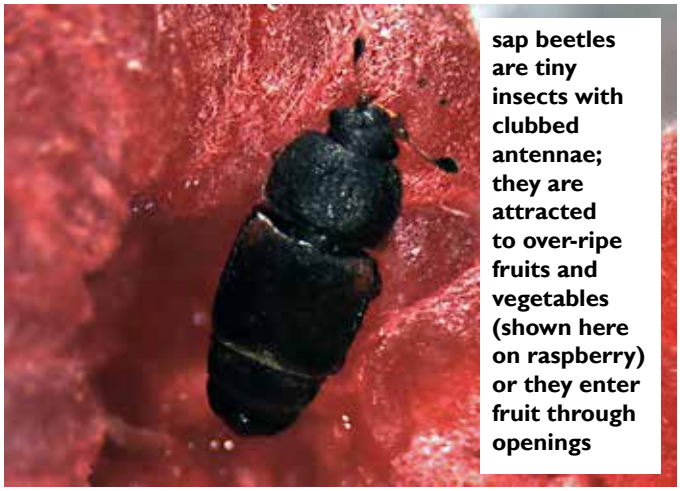
Almost every year, boxelder bugs are a problem on late peaches. They form large aggregations, especially in orchards in Box Elder and Davis counties.

Adults prefer feeding on fruit that is ready to harvest, which makes control difficult. Only products with a very short pre-harvest interval can be used. Options include Sevin (carbaryl, PHI: 3 days) or pyrethrin (Pyganic E.C., Pyronyl, Pyrellin E.C., Pyrola, Pyrenone Crop Spray; PHI: 0).

Insect and Disease Activity, continued

Sap Beetles and Comb-Clawed Beetles

Hosts: peach



sap beetles are tiny insects with clubbed antennae; they are attracted to over-ripe fruits and vegetables (shown here on raspberry) or they enter fruit through openings

Sap and comb-clawed beetles are opportunistic insects that can enter peaches through tiny openings, primarily caused by split pits or soft sutures. The smallest openings (which would occur at the stem end in the case of split pits) or overripe fruit are all the invitation that is needed. When the fruit is handled, the beetles will scurry out.

Sap beetles are tiny, brown to black beetles that feed on over-ripe fruit. Comb-clawed beetles are small and glossy black. They normally feed on organic matter, but they also invade ripening fruit. During harvest, baskets and totes can become infested with beetles, moving from one fruit to another.

As these insects travel in and out of fruit, they introduce saprophytic fungi into the fruit, causing it to decay. Nothing is worse than a customer biting into a fruit that is a mushy mess on the inside.

Controlling adults can be difficult due to these insects' limited exposure to surface applied insecticides. Because these beetles are around ripe fruit, one of the only options is pyrethrin, because it can be applied up to the day of harvest (Pyganic E.C., Pyronyl, Pyrellin E.C., Pyrola, Pyrenone Crop Spray).

The best control measure for sap beetles and other opportunistic insects is good sanitation. Any damaged, splitting, or overripe fruit should be pulled from the tree and dropped to the ground immediately to encourage decomposition. On smaller farms or where possible, remove the fruits from the orchard.

Earwigs

Hosts: primarily peach; all fruit can be affected

The wet May has resulted in very high populations of earwigs throughout northern Utah. While the fruit is still hard, earwigs feed on leaves or other insects, and many have been observed in peach trees in Utah and Box Elder counties.

Once the fruit softens, they will enter not only through existing openings, but will chew their own holes, leaving deep pits. Earwig damage is usually easy to diagnose because they leave behind black dots of excrement on the fruit surface.

Controlling adults can be difficult due to their limited exposure to surface applied insecticides. Carbaryl or spinosad have both shown good control for earwigs. Either product should be applied just before the peach fruits start to soften.

Coryneum Blight and Brown Rot

Hosts: peach/nectarine

left: coryneum blight
right: brown rot infection spreading between fruits

Do not forget to protect ripening fruit against late season infections of coryneum blight and brown rot, where they are known to occur. At least 4 hours of rainfall at 70 F to 80°F are optimal conditions for infections. To prevent brown rot from becoming a problem in storage, a fungicide application should be made about 10 days before picking, and repeated on the day before or between pickings.

Many fungicides have a 0 or 1-day PHI and a re-entry interval of 12-24 hours, making this timing possible. See the table in the July 29, 2015 advisory, page 4, for a list of options. It is important to rotate between pesticide classes to prevent resistance.

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. Many more locations can be viewed on the Utah Climate Center TRAPs website (select location; select codling moth).

Codling Moth, Second and Third Generation

There is very little gap between 2nd and 3rd generations, so keep fruit protected until Sept. 15.

County	Location	2nd Gen. End of Egg Hatch	3rd Gen. Start of Egg Hatch	Keep Protected Up To:
Box Elder	Perry	passed	passed	Sept 15
	Tremonton	passed	passed	Sept 15
Cache	Logan Airport	Sept 11	none	Sept 15
	River Heights	Aug 28	Sept 2	Sept 15
Carbon	Price Airport	Aug 24	Aug 25	Sept 15
Davis	Kaysville	passed	passed	Sept 15
Grand	Moab	passed	passed	Sept 15
Iron	Cedar City Airport	passed	Sept 1	Sept 15
Salt Lake	Benches/Cooler sites	passed	passed	Sept 15
	Most areas	passed	passed	Sept 15
Sevier	Monroe	passed	passed	Sept 15
Tooele	Erda Airport	passed	passed	Sept 15
	Grantsville	passed	passed	Sept 15
Uintah	Vernal Airport	Aug 28	Sept 1	Sept 15
Utah	Alpine	Aug 26	Aug 29	Sept 15
	American Fork	passed	passed	Sept 15
	Genola (CHF)	passed	passed	Sept 15
	Lincoln Point	passed	passed	Sept 15
	Orem (Lindon)	passed	passed	Sept 15
	Payson	passed	passed	Sept 15
	Provo Airport	passed	passed	Sept 15
	Provo Canyon	Aug 22	Aug 24	Sept 15
	Santaquin (South Ridge)	passed	passed	Sept 15
	Tickville (Oak Springs)	Aug 30	Aug 29	Sept 15
	West Mountain (Wall)	passed	passed	Sept 15
Weber	Ogden Airport	passed	passed	Sept 15
	Pleasant View	passed	passed	Sept 15
Wasatch	Heber City	after Sept 15	none	Sept 15
Washington	New Harmony	passed	passed	Sept 15
Wayne	Torrey	passed	passed	Sept 15

Spray Timing - Peach Twig Borer

Peach Twig Borer, Second and Third Generations

Apply at least one application per generation, or two in high population areas. For areas that will have a third generation hatch, apply one treatment to protect fruit to harvest. Use the earlier spray date if you had PTB damage last year and the later date if you had very little damage.

County	Location	Keep Fruit Protected Up To:	3rd Gen. Treatment Start Date Range	Keep Protected Up To:
Box Elder	Perry	passed	Aug 23 -28	Sept 15
	Tremonton	passed	Aug 26 - Sept 1	Sept 15
Cache	All Locations	Aug 28	none	Sept 15
Carbon	Price Airport	Aug 28	none	Sept 15
Davis	Kaysville	passed	Aug 20 - 25	Sept 15
Grand	Moab	passed	passed	Sept 15
Iron	Cedar City Airport	Aug 28	none	Sept 15
Salt Lake	Benches/Cooler sites	passed	Aug 25 - 30	Sept 15
	Most areas	passed	passed	Sept 15
Sevier	Monroe	passed	Aug 24 - 30	Sept 15
Tooele	Erda Airport	passed	Aug 20 - 25	Sept 15
	Grantsville	passed	passed	Sept 15
Uintah	Vernal Airport	Aug 27	none	Sept 15
Utah	Alpine	Aug 26	none	Sept 15
	American Fork	passed	Aug 24 - 29	Sept 15
	Genola (CHF)	passed	Aug 20 - 25	Sept 15
	Lincoln Point	passed	Aug 26 - 31	Sept 15
	Orem (Lindon)	passed	Aug 23 - 28	Sept 15
	Payson	passed	Aug 23 - 28	Sept 15
	Provo Airport	passed	Aug 22 - 27	Sept 15
	Provo Canyon	passed	Aug 31 - Sept 3	Sept 15
	Santaquin	passed	Aug 26 - 31	Sept 15
	Tickville (Oak Springs)	Aug 26	none	Sept 15
	West Mountain	passed	Aug 27 - 31	Sept 15
Washington	New Harmony	passed	Aug 28 - 31	Sept 15
Weber	Pleasant View	passed	passed	Sept 15
Wayne	Torrey	Aug 22	Sept 3 - 6	Sept 15

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 gamma-cyhalothrin malathion *Soft/organic* codling moth virus spinosad	 Ortho Max Flower, Fruit, and Veg. Sevin, Bonide Fruit Tree Spray, etc. Spectracide Triazicide Bonide products, Malathion Cyd-X Green Light, Gardens Alive Bull's Eye, Monterey	**acetamiprid**: every 14 days **carbaryl**: every 14 - 21 days **malathion**: every 7 days; check label carefully as some brands do not apple or pear **gamma-cyhalothrin**: every 14 days **spinosad**: every 7 days **codling moth virus** can only be purchased online
Coryneum blight	peach, apricot	*Conventional* captan myclobutanil	 Captan Spectracide Immunox	**captan**: use as a preventive before a rain **Immunox**: may be applied after a rain
Peach twig borer	peach, nectarine	*Conventional* acetamiprid carbaryl gamma-cyhalothrin malathion permethrin *Soft/organic* kaolin clay spinosad	 Ortho Max Flower, Fruit, and Veg. Sevin, Bonide Fruit Tree Spray, etc. Spectracide Triazicide Bonide products, Malathion Hi-Yield Lawn, Garden, and Livestock Insect Control Surround see 'codling moth' above	see comments under Codling Moth **permethrin**: peaches only; 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
Walnut husk fly	walnut, peach (rarely), apricot (rarely)	*Conventional* acetamiprid carbaryl gamma-cyhalothrin malathion *Soft/organic* pyrethrin spinosad	 Ortho Max Flower, Fruit, and Veg. Sevin, Bonide Fruit Tree Spray, etc. Spectracide Triazicide Bonide products, Malathion Concern Multi-Purpose see above	start applications when fruit in sunniest locations develops a salmon blush **spinosad**: every 7 days **malathion**: check label carefully as some brands do not list cherry
Earwigs	all, especially peach	*Conventional* carbaryl *Soft/organic* spinosad	 Sevin, Bonide Fruit Tree Spray, etc. see 'codling moth' above	one to two treatments when fruit starts to soften
Spider mites	all	*Soft/organic* oil (1%) insecticidal soap	 Many products, EcoSmart Safer's, Bayer Natria, Bonide	**oil and soap**: allow 4 hours-time for application to dry before temps reach 85F or above.

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Editor: Marion Murray, marion.murray@usu.edu

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