

## News/What to Watch For:

After tart cherry harvest, do not let cherry powdery mildew spread. Apply a spray of 1 to 1.5% oil in mid to late August to reduce powdery mildew spores.

Now is a good time to collect foliage for nutrient analysis by the USU Analytical Lab ([www.usual.usu.edu](http://www.usual.usu.edu))

Updated Codling Moth and Peach Twig Borer dates, pages 7-8.

## JUST THE BASICS: Current Treatments

### APPLE & PEAR

- Continue protecting fruit from *codling moth*.

### WALNUT

- Continue protecting walnuts from *walnut husk fly*.

### PEACH/NECTARINE, APRICOT

- May need to apply an additional lower trunk spray to prevent *greater peachtree borer*.

## Insect and Disease Information

 : information for residential settings

 : information for commercial orchards

### APPLE & PEAR

#### Pear Psylla

Hosts: pear

Pear psylla is a pest that occurs sporadically in Utah. Where present, its feeding causes scorching of the foliage and it produces large amounts of honeydew. These symptoms and signs would be clearly evident now. If left unchecked, pear psylla can build to damaging levels and be difficult to manage.

This insect pest is around all season, from April to October. At this time of year, a variety of life stages can be found, including the flying black adults, eggs, newly-hatched nymphs, and older nymphs. The nymphs are cream colored to brownish-red, and typically feed on the undersides of leaves, sucking sap and excreting honeydew.

**Treatment Options:** The best timing for treatment is in spring, but if necessary, there are some options to use now.



Commercial growers can use products listed by [clicking here](#).

Backyard growers can use acetamiprid (Ortho Fruit and Vegetable Insect Control) or 1% oil (applied in the evenings when temperatures are below 85°F).

*Pear psylla* is continued on next page

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### Pear psylla, continued

If the problem is severe, apply lime sulfur after harvest to reduce overwintering psylla.

### White Apple Leafhopper

**Hosts:** apple, cherry



Leafhopper nymphs and adults feed on the undersides of leaves.

Where present, feeding damage from the second generation of leafhoppers can now be seen on the foliage. The nymphs are active on the undersides of leaves. If your trees had a high population of the first generation, now would be a good time to treat. Nymphs are easier to manage than the adults because they are less mobile. Adult activity will become very noticeable by late August.

Note that feeding on the foliage will not affect apple yield or tree health. The biggest concern is that this pest can become a nuisance to pickers during apple harvest.

## PEACH/NECTARINE, APRICOT, CHERRY

### Greater Peachtree Borer

**Hosts:** peach/nectarine, plum



We are still catching high numbers of peachtree borer in all areas of northern Utah. Continue to maintain protection

of the lower trunk of peach/nectarine and apricot (where necessary) with your last treatment around September 15. When you spray, be sure to move mulch or weeds away from the trunk (or even excess soil) because sometimes eggs are laid below grade.

This fall, determine the success of your treatment program by inspecting a random selection of trees. Remove dirt from around the base of the tree down to about 4 inches. Look for oozing gum mixed with frass. If you find any symptoms, you will know that you need to improve your control program for next year.

There's not much you can do about successful entries that you find, unless you want to carefully search for the larva under the bark. Cut a small amount of bark away (vertically) to find the larva, or insert a strong but thin wire into the borer hole. Take care in using these methods so that you do not damage the tree more than a single borer would.

### Peach Silver Mite

**Host:** nectarine



The top leaf is silvery in color due to feeding by 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.

**Treatment Options:** 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 2% oil.

Keep in mind that the mites are serving as an important food source for predatory mites and for the important predator, Stethorus lady beetle, both of which also feed on spider mites.

## Insect and Disease Information, continued from previous page

### ALL FRUIT TREES

#### Apple Maggot Update



Hosts: all fruit trees



Apple maggot larva emerging from a plum.



A yellow sticky trap filled with apple maggot flies.

Apple maggot is related to the cherry fruit fly and walnut husk fly. In 2013, we had several reports from the Salt Lake City area of apple maggot in plums and possible maggots in apples. We could not confirm the presence of maggots in the apples, so this season, we set up several backyard traps in the reported areas. We have seen very high numbers of flies on the traps, starting in mid June (in one location, as many as 200 flies in a 7 day period!).

We are also conducting weekly monitoring of damage on the fruits around the traps. Although we have seen infested plums, we have not seen any apples yet with maggots inside.

The Utah Department of Agriculture and Food first detected apple maggot in 1985 on traps in abandoned and non-commercial cherry orchards in Utah County. They then initiated a trapping program in commercial orchards

every year since. In 2013, traps were placed in 16 orchards throughout northern Utah, and no flies were detected. UDAF also helps growers by coordinating the removal of abandoned trees. In 2013, over 1,000 trees were removed.

Apple maggot is a serious pest to commercial growers in the eastern U.S., but thankfully, it has not been a problem in Utah's commercial orchards. Most western states have a quarantine enacted for both cherry fruit fly and apple maggot. That means that any fruit exported to another state must be 100% free of both pests.

Like cherry fruit fly, apple maggot overwinters in the soil. It emerges from late June through August, laying eggs in host fruit, which include apple, cherry, plum, crabapple, peach, chokecherry, and hawthorn. Any infested fruit is rendered inedible.

We invite any backyard grower who suspects apple maggot in apple fruit to report any findings to the Utah IPM Program, at [marion.murray@usu.edu](mailto:marion.murray@usu.edu), or 435-797-0776. We would need to see the fruit, or at the very least, high quality images.

#### Crown Gall



Hosts: all fruit trees



Trees infected with crown gall have knobby galls at the crown, roots or trunk.

Crown gall is a disease of many fruit trees (most commonly on apple), and is caused by a bacterium. Infected trees have galls (large swollen areas) at the base of the tree, on scaffold limbs, or on roots. These galls interfere with water and nutrient flow. This



*Crown gall* is continued on next page

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### Crown gall, continued

disease does not kill trees, but those with many galls may become weakened, stunted, and unproductive.

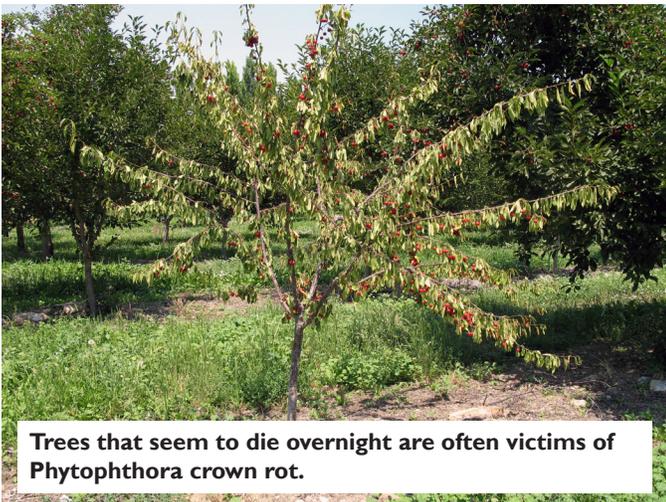
The crown gall bacterium is soil-borne and persists for long periods of time in the soil in plant debris. It requires a fresh wound (such as freeze injury or equipment damage) in order to infect trees. The development of galls can occur in a few weeks or a few years, depending on various environmental factors (temperature) and host affected.

The most susceptible apple rootstock to crown gall is M.7 followed by M.9 and M.26. Trees growing in poorly drained soil seem to be more susceptible to the disease.

**Treatment Options:** Infected trees are still productive, but if possible, remove the tree. New trees planted into the site should be “inoculated” against crown gall. Roots are dipped into a suspension of a biocontrol agent comprised of a related bacterium (*Agrobacterium radiobacter* strain 84). The antagonistic bacteria act to protect the new trees from future infection by the crown gall bacterium.

### Phytophthora Crown Rot

**Hosts:** all fruit trees



Trees that seem to die overnight are often victims of Phytophthora crown rot.

Large trees that die suddenly at this time of year (in the high heat and drought of the summer) may have been living with phytophthora infections much of the season. Crown rot is a disease

**Phytophthora can be diagnosed by scraping the outer bark away from the base of the tree to look for the cinnamon colored, diseased cambium.**



that girdles the tree at the crown level by killing the cambium, preventing the flow of water and nutrients. An infected tree exposed to the stress of heat, drought, and bearing fruit can result in a quick death. Trees that have only a small portion of the crown or roots infected will live longer, but have symptoms such as small, chlorotic leaves and fruit, poor growth, early fall color, and late spring leaf emergence.

Phytophthora is a fungus-like, soil-borne pathogen that kills root and crown tissue. It is present in almost all soils, but infection only occurs with the combination of saturated soils (for at least 6 hours) and a susceptible host. Trees planted too deeply in clay soils are at greatest risk. The following shows the susceptibility of various trees:

- Peach and apricot: susceptible
- 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
- Cherry: susceptible to very susceptible;
  - Mahaleb is the most susceptible cherry rootstock;
  - Mazzard, Morello, and Colt are somewhat resistant.

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 grade, and prevent water from puddling around the root collar.

For trees that are infected, there is no “cure”. Trees that show moderate symptoms may recover with a soil application of Ridomil Gold, which should be made in spring (on non-bearing trees only). 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 infection.

### Spotted Wing Drosophila Update

**Hosts:** all fruit trees (and most small fruits)

Dr. Lori Spears, Utah CAPS Co-Coordinator has a fantastic website that provides updates to many of the invasive pests that her team traps for, including spotted wing drosophila, found here: [utahpests.usu.edu/caps/html/most-unwanted-invaders](http://utahpests.usu.edu/caps/html/most-unwanted-invaders). (CAPS=Cooperative Agriculture Pest Survey)

Spotted wing drosophila (SWD) is an invasive pest from Southeast Asia that has become established on the West Coast and many additional states since its first detection in California in 2008. SWD attacks a large variety of fruit, including cherries, peaches, raspberries, and strawberries.

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## Insect and Disease Information, continued from previous page

### Spotted wing, continued



SWD larvae that emerged from a container of infested raspberries. (Image not taken in Utah!)

This pest is of particular concern because females' serrated ovipositors allow them to attack fruit earlier than other *Drosophila* species, often before the fruit ripens.

### Cat-facing Injury



Hosts: all fruit trees



Cat-facing injury is a generic term used to describe a symptom caused by early-summer feeding of true bugs (lygus and stink bugs) on young fruit. Although these insects are considered minor pests, most commercial and residential orchards will see a certain level of damage each year.

Red-shouldered stink bugs on a peach.



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 (lygus or stink bug) 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 usually 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.

Severely dimpled fruit indicates that feeding occurred early 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.

Stink bugs will continue to move into orchards for the next month, feeding up until harvest.

**Treatment Options** (commercial growers): Danitol is one option, but keep in mind that it will kill beneficial mites. Beleaf (flonicamid) is another option, but it has a PHI of 21 days. An organic option is Pyganic or Pyrellin (pyrethrin).

### Earwigs



Hosts: all fruit trees

Harvest of early peach varieties is just getting underway in northern Utah, and damage by earwigs has been seen in many locations. Earwigs do not like dry conditions, so they are concentrated in areas that are irrigated and have moist, cool places to hide during the day (such as orchards). They feed

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### Earwigs, continued



mostly at night. (Earwigs are omnivores, and also feed on detritus as well as other insects.)

Earwigs will enter fruit at the stem end that is affected by split pit, and feed on the flesh. They may exit through the stem end or through a new exit hole. They also create shallow to deep, circular gouges on the fruit surface. The riper the fruit, the more appealing it is to feeding. They may not be seen, but they leave behind their tale-tell frass (black droppings).

In an emergency, Sevin can be used to kill earwigs in trees that are causing economic damage to fruit.

To manage earwigs over the long term, 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, and 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 (Success, Entrust) 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



**Hosts:** all fruit trees

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 Utah's high pH soils, 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. Iron is a nutrient necessary for the formation of chlorophyll. Iron-deficient leaves have interveinal chlorosis (yellowing between veins). 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.

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. Now is a good time to test foliage for deficiencies (that can then be corrected next spring.)

## 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 Generations

Apply treatments (the number of times depends on prior infestation), spaced 7-21 days apart (depending on material) to protect fruit up to the end of the second generation egg hatch. Time the last treatment to be 10-25 days (depending on the material) before the "End" date.

In general, starting with the 2nd generation, the fruit should be protected continuously until September 15, or just before harvest (whichever is earliest). Because of the hotter temperatures occurring during 2nd and 3rd generations, there is a very short "break" (about 3 days), and egg hatch occurs almost nonstop. In sites with lower populations or very little outside pressure, just apply a treatment during the period of greatest egg hatch.

Any cells with " --- " mean that we do not yet know these dates (too far into the future).

County	Location	Period of Greatest Egg Hatch	End 2nd Gen. Egg Hatch	Start Spray, 3rd Gen.	Keep Fruit Protected Up To:
<b>Box Elder</b>	Perry	July 21 - August 2	August 20	August 22	Sept. 15
	Tremonton	July 24 - August 5	August 21	August 23	Sept. 15
<b>Cache</b>	River Heights	August 1 - 14	September 1	September 4	Sept. 15
	Richmond	August 8 - 21	---	---	Sept. 15
<b>Carbon</b>	Price	July 24 - August 7	August 24	August 27	Sept. 15
<b>Davis</b>	Kaysville	passed	August 13	August 16	Sept. 15
<b>Grand</b>	Castle Valley	passed	passed	passed	Sept. 15
<b>Juab</b>	Tintic	August 2 - 15	September 4	---	Sept. 15
<b>Salt Lake</b>	North Holladay	passed	August 5	August 8	Sept. 15
	Taylorville	passed	August 9	August 11	Sept. 15
<b>Sevier</b>	Monroe	passed	August 16	August 19	Sept. 15
<b>Tooele</b>	Erda	passed	August 14	August 17	Sept. 15
	Grantsville	passed	August 9	August 11	Sept. 15
<b>Uintah</b>	Vernal Airport	July 25 - August 7	August 25	August 28	Sept. 15
<b>Utah</b>	Alpine	July 30 - August 13	August 30	September 2	Sept. 15
	American Fork	July 22 - August 3	August 18	August 21	Sept. 15
	Genola	passed	August 13	August 16	Sept. 15
	Lincoln Point	July 22 - August 3	August 18	August 21	Sept. 15
	Orem (Lindon)	July 23 - August 3	August 18	August 20	Sept. 15
	Payson	July 22 - August 3	August 18	August 20	Sept. 15
	Provo Airport	passed	August 15	August 18	Sept. 15
	Provo Canyon	July 27 - August 9	August 23	August 26	Sept. 15
	Santaquin	July 22 - August 3	August 17	August 20	Sept. 15
	Tickville	July 21 - August 2	August 21	August 25	Sept. 15
West Mountain	July 26 - August 8	August 23	August 25	Sept. 15	
<b>Weber</b>	Ogden Airport	passed	August 11	August 13	Sept. 15
	Pleasant View	passed	August 9	August 12	Sept. 15
<b>Wasatch</b>	Heber City	August 13 - 28	---	---	Sept. 15
<b>Washington</b>	New Harmony	passed	August 10	August 13	Sept. 15
<b>Wayne</b>	Torrey	passed	August 6	August 9	Sept. 15

## Spray Timing - Peach Twig Borer

### Peach Twig Borer, Second and Third Generations

The table below shows a range of dates for “apply spray” for each generation. Choose the earlier date if you have high pest pressure in your area (lots of damage last year), and choose the later date if you have low pest pressure (very little damage).

In general, one to two sprays per generation should suffice.

Any cells with “ --- “ mean that the we do not yet know these dates (too far into the future).

County	Location	Apply Spray, 2nd Gen.	Keep Fruit Protected Up To:	Apply Spray, 3rd Gen.	Keep Fruit Protected Up To:
<b>Box Elder</b>	Perry	passed	August 20	September 2 - 4	Sept. 15
	Tremonton	passed	August 25	---	Sept. 15
<b>Cache</b>	All Locations	August 1 - 6	---	---	Sept. 15
<b>Carbon</b>	Price	passed	August 28	---	Sept. 15
<b>Davis</b>	Kaysville	passed	August 16	August 27 - Sept. 1	Sept. 15
<b>Grand</b>	Castle Valley	passed	passed	August 4 - 7	Sept. 15
<b>Iron</b>	Cedar City	passed	August 31	---	Sept. 15
<b>Juab</b>	Tintic	July 31 - Aug 4	---	---	Sept. 15
<b>Salt Lake</b>	North Holladay	passed	August 7	August 16 - 20	Sept. 15
	Taylorville	passed	August 8	August 17 - 22	Sept. 15
<b>Sevier</b>	Monroe	passed	August 19	September 2 - 4	Sept. 15
<b>Tooele</b>	Erda	passed	August 12	August 20 - 24	Sept. 15
	Grantsville	passed	August 7	August 22 - 27	Sept. 15
<b>Utah</b>	Alpine	August 3 - 8	---	---	Sept. 15
	American Fork	passed	August 17	August 27 - Sept. 1	Sept. 15
	Genola	passed	August 12	August 22 - 27	Sept. 15
	Lincoln Point	passed	August 14	August 25 - 30	Sept. 15
	Orem (Lindon)	passed	August 19	August 30 - 4	Sept. 15
	Payson	passed	August 15	August 25 - 30	Sept. 15
	Provo Airport	passed	August 14	August 24 - 28	Sept. 15
	Provo Canyon	passed	August 21	August 31 - Sept. 4	Sept. 15
	Santaquin	passed	August 14	August 25 - 30	Sept. 15
	Tickville	passed	August 22	---	Sept. 15
West Mountain	passed	August 20	August 31 - Sept. 4	Sept. 15	
<b>Weber</b>	Pleasant View	passed	August 9	August 19 - 23	Sept. 15
<b>Wayne</b>	Torrey	passed	August 7	August 17 - 22	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	<i>Conventional</i> acetamiprid carbaryl gamma-cyhalothrin malathion  <i>Soft/organic</i> spinosad  codling moth virus	Ortho Fruit and Veg. Sevin, Bonide Fruit Tree Spray, etc. Spectracide Triazicide Malathion  Green Light, Gardens Alive Bull's Eye, Monterey Cyd-X	<b>acetamiprid:</b> every 14 days <b>carbaryl:</b> every 14 - 21 days <b>gamma-cyhalothrin:</b> every 14 days <b>malathion:</b> every 7 days <b>spinosad:</b> every 7 days <b>codling moth virus</b> can only be purchased online
Spider mites	all	<i>Soft/organic</i> oil (1%) insecticidal soap	Many products, EcoSmart Safer's, Bayer Natria, Bonide	<b>oil and soap:</b> allow 4 hours-time for application to dry before temps reach 85 or above.
Coryneum blight	peach, apricot	<i>Conventional</i> myclobutanil captan	Spectracide Immunox Captan	Use as a preventive before a rain.
Peach twig borer	peach, nectarine	<i>Conventional</i> acetamiprid carbaryl malathion permethrin  <i>Soft/organic</i> 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  <b>permethrin:</b> every 14 days; this ingredient is becoming less available in stores and may cause spider mite outbreaks  <b>Surround:</b> every 3-5 days; works to repel, not kill insects; only moderate control; must purchase online
Walnut husk fly	walnut peach apricot	<i>Conventional</i> acetamiprid carbaryl malathion  <i>Soft/organic</i> pyrethrin spinosad	Ortho Fruit & Veg. Sevin Malathion  Concern Multi-Purpose see above	start applications when fruit in sunniest locations develops a salmon blush  <b>spinosad:</b> every 7 days

**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.

### Tree Fruit IPM Advisory

is published weekly by Utah State University Extension

Editor: Marion Murray, [marion.murray@usu.edu](mailto:marion.murray@usu.edu)

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