

## What to Look for/Do Now:

Watch for coryneum; spray trees at shuck split with fungicide (Pristine, captan, etc.)

Powdery mildew may become an issue with the higher humidity; watch leaves as the temperatures warm.

Check table below for fire blight risk.

## Insect and Disease Activity/Info

### APPLES/PEARS

#### Codling Moth

There have only been two additional locations that have reported codling moth trap catches, so the information for locations from last week remains almost unchanged:

Location	Date to Start Sprays	
	Option A	Option B
Castle Valley: (May 2 biofix)	Oil on May 17 First spray on May 28	May 19
Capitol Reef National Park: (biofix on May 7)	Oil on May 25 First spray on June 3	May 27
Orem: (biofix on May 7)	Oil on May 26 First spray on June 5	May 27
Genola: (biofix on May 7)	Oil on May 29 First spray on June 10	June 3

The table above shows two options for the first spray of the first generation. Option A is a recommendation out of Washington State University. It is a little more complicated, but may result in a slight cost savings and possibly improved control. We usually recommend to start sprays at egg hatch (Option B, 220 degree days after biofix), targeting the newly hatched larvae before they enter the fruit. But with Option A, you are killing the eggs instead by applying horticultural oil (1% rate) just before they hatch (at 200 degree days). Then, the first traditional insecticide spray would be applied about 7-12 days later (at 350 degree days). The later application of the traditional insecticide is close to the timing of "peak egg hatch",

when about 50-75% of eggs hatch in a 1-2 week window of time. Good residue (insecticide) coverage is important at this timing.

After the first insecticide spray has been applied, continue to apply your chosen material(s) at the interval provided on the label.

#### Using codling moth virus as organic alternative:

Commercial or residential apple/pear growers looking for an organic option to codling moth control should consider the codling moth granulosis virus. Used alone, this biocontrol option will not give great control (anywhere from 60% to 80% control depending on location), but in organic orchards, could be used alternatively with oil or Entrust (spinosad) and/or with mating disruption, or in conventional orchards to reduce chemical inputs. Cyd-X and Carpovirusine are available to Utah growers. Cyd-X is available online for homeowners.

- Cyd-x: (4 oz/acre, \$300 for 1 quart; Grand Mesa discount in Eckert, CO, 970-234-3424) or homeowner formulation (1 tsp/5 gallons, \$40 for 1.5 oz; groworganic.com)
- Carpovirusine: (6.8-13.5 oz/acre)

The codling moth virus is specific to codling moth only. It is a naturally occurring virus that is very toxic to larvae (does not kill adults), i.e., it must be ingested to work (like spinosad). Once inside a larva, the virus multiplies and it takes a few days for feeding to stop and for the larva to die. Larvae killed by the virus "melt" in place, and are capable of spreading the virus to the surface of the fruit, potentially causing new infections in newly hatched larvae.

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Some points to remember when using codling moth virus:

- thorough coverage is very important because codling moth larvae are on the surface of the fruit for a very short amount of time
- use the highest rate on the first application; afterward, use a lower rate at shorter intervals (every 7 days)
- apply in late afternoon or on a cloudy day to prevent quick breakdown of the product by the sun
- you may see some feeding damage (stings) because the larvae are not killed immediately; if feeding damage is unacceptable, you may choose to use granulosis virus for the first generation only
- store the product in a refrigerator to reduce degradation of the virus
- can be used up to the day of harvest; 4-hour re-entry interval
- can be mixed with most other pesticides, except for Bt or antibiotics
- resistance to the virus has been reported, so growers should not overuse this product

**Fire Blight**

Apples are still in bloom, but fire blight risk is low. Even with the moisture, there has not been enough warmth for infections to occur.

In the forecasting shown below, the “warnings” are for a generic orchard that has a history of fire blight. If you did not have fire blight in your orchard last year, your warning level would be reduced. Again, the levels are:

**Low:** low risk of infection, only treat areas adjacent to active cankers if a wetting event occurs

**Caution:** Wetting at this point is not likely to lead to infection, except within a few yards of an actively oozing canker.

**High:** If unprotected flowers are wetted, infection is possible. You may choose to apply antibiotic within 24 hours before or after the infection (wetting) event.

**Extreme:** Outbreak may occur if blossoms are wetted, no matter the blight history of your orchard. Apply antibiotic within 24 hours before or after the wetting event.

Note that the risk levels provided in the table below for areas that had fire blight in the trees last year, AND have oozing cankers now. The risk level goes down if your own trees did not have fire blight (even if there is a chance of spread from neighborhood trees).

County	Location	Fire Blight Risk Potential
Box Elder	Perry	May 19-23: LOW
Cache	North Logan	May 19-23: LOW
Davis	Kaysville	May 19-23: LOW
Utah	Alpine	May 19-23: LOW
	American Fork	May 19-22: LOW; May 23: CAUTION
	Genola	May 19-22: LOW; May 23: CAUTION
	Lindon	May 19-22: LOW; May 23: CAUTION
	Lincoln Point	May 19-22: LOW; May 23: CAUTION
	Payson	May 19-22: LOW; May 23: CAUTION
	Santaquin	May 19-22: LOW; May 23: CAUTION
	West Mountain	May 19-22: LOW; May 23: CAUTION
Weber	Pleasant View	May 19-23: LOW

**If Using Ultor, It Is Time to Treat Woolly Apple Aphid**

Soon, woolly apple aphids (WAA) will start to be visible in apple trees. This is an insect that is usually not obvious in trees until the end of June or early July, when large cottony colonies form on succulent shoots or on pruning cuts. Their feeding on twigs (and roots) causes galls.

Growers can apply Ultor at petal fall to prevent colonies from forming.

The reason that these aphids show up “late” is that most overwinter on the roots, and they crawl up the tree to feed after new growth has expanded. (A large population also stays on the apple roots year-round). Some aphids do overwinter as adults within the tree canopy, and will be visible as small cottony colonies only after they start reproducing.

When WAA populations have increased to large colonies, they are very difficult to treat. Commercial growers with WAA problems should consider an application of spirotetramat (Ultor) at apple petal fall. Research at USU has shown

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that a single application of Ultor at the higher rate (12-14 oz) is very effective at reducing the population of WAA on the roots and in the tree canopy for the entire season. No other registered insecticides affect root populations.

Other available materials are contact sprays and should be applied when the WAA colonies are visible in the tree, but before they become too large. They should be applied with a high volume to penetrate the waxy coverings. These products will be listed in a later advisory when we have detected colonies forming.

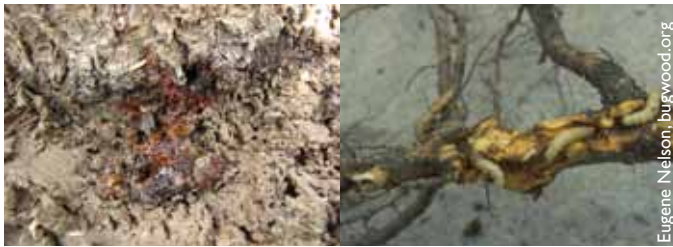
The Malling-Merton (MM.106 and MM.111, for example) are mostly resistant to root feeding, as is the Robusta 5 root stock.

## ALL FRUIT TREES

### Borers and Root Feeders

We have had a few questions about fruit tree borers and root feeders, so I thought I would run through some of the most common culprits.

### Greater Peachtree Borer



Eugene Nelson, bugwood.org

Greater peachtree borer is a clearwing moth. It spends the winter as a larva inside peach or nectarine trees (chokecherries are also susceptible). We have not found that it attacks cherry trees in Utah, and plums are rarely attacked. Adults start emerging from trees in late spring/early summer, and females lay eggs on the lower bark (12-18" from soil line) or upper roots. When the egg hatches, the larva crawls around for a short period of time, and then bores through the bark of the tree and into the cambium.

Trees that have peachtree borer larvae will ooze gum from the entrance hole. Dried gum will be crumbly because it is mixed with frass (sawdust-like excrement). Oozing gummosis on the lower part of your peach tree that is clear or amber may not be greater peachtree borer.

At this time of year, there is nothing to do in peachtree borer treatments. We have traps set up to detect the first moths, and we will announce when sprays should begin in northern Utah. (In general, permethrin is the best available option,

sprayed at the lower trunk and exposed roots every 14-21 days through September.)

As an alternative to spraying, growers with at least one acre of peaches can successfully control peachtree borer with mating disruption. This technology prevents males from finding females. When no mating occurs, no eggs are laid. The mating disruption dispensers can be purchased locally from IFA or Steve Regan stores, or online from Great Lakes IPM, Michigan. If you are interested in learning more about using mating disruption for peachtree borer, contact me or see the USU greater peachtree borer fact sheet.

### Prionus Root Borer

The larvae of this insect bore within the roots of stone fruits,



in particular sweet cherry. You would only notice the larvae at this time of year, and only if you are digging up an infested tree. The adult is a very large (1-2-inch) beetle that emerges from pupation in June through the end of July. They fly only at night during their 10-20 day life span. They do not feed; their only objective is to mate. After mating, the female lays 150-200 eggs just below the soil surface and near the trunk of trees. Larvae seek out roots for feeding. They begin at the smallest diameter roots and eventually move to larger diameter roots toward the crown of the tree. This process can take 3-5 years. Mature larvae are up to 3 inches long.

A minor infestation will cause foliar wilting and possibly yellowing of leaves due to lack of water and nutrient uptake. A heavy infestation will kill trees. The problem tends to be more severe in sandy soils. Gamble oak is also susceptible, and stone fruit trees planted in gamble oak soil should be monitored for health.

There are very little control options. USU will be testing mating disruption (or is it mass trapping??) in orchards in the Box Elder County area as well as using lures to determine first emergence. If the proper timing can be identified, spray materials (carbaryl, synthetic pyrethroids) could be used to target the adults and prevent egg-laying. (There are no controls to kill larvae already in the roots.)

The best options are to keep trees healthy, completely remove infested trees, and avoid planting in infested sites.

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### Flatheaded Borers

In Utah, we have two flatheaded borer species that may attack fruit trees: flatheaded appletree borer and pacific flatheaded borer. They are more common in landscape settings on stressed trees rather than in orchard settings. They can attack all species of fruit trees. If you see an exit hole in the tree that is long and oval, this is a flatheaded borer.

On larger trees, damage includes dieback back of large limbs, and loose bark at feeding sites. Younger trees can be killed.



In northern Utah, adults of the Pacific flatheaded borer begin emerging from their pupation sites within infested trees in mid to late May (typically after apple bloom) and continue for about a month. Eggs hatch from early June to late July. Emergence timing and egg-laying is similar for the flatheaded appletree borer.

Adults seek out trees that are stressed, dying, are newly transplanted, or that have large bark wounds (from sunscald, for example). They lay eggs on the lower bark surface, and larvae tunnel through the bark and then meander through the phloem and outer xylem tissue until mature. If a healthy tree is attacked, the borer will likely be killed by a vigorous flow of sap.

The key for borer management is prevention:

- keeping trees at optimal health
- remove infested trees
- protect trunks from winter sunscald with paint or wrap
- keep weeds and grass away from the base of the trunk

Trees at risk such as young fruit trees near infested trees, trees stressed by drought, and trees with wounded bark, may require preventive insecticide sprays. The spray is applied to the bark to kill hatching larvae. Spray the trunk up to the lower limbs about June 1 and again on July 1. Products that contain permethrin will work best, but carbaryl (Sevin) is another option.

### Tenlined June Beetle

We recently had a report of ten-lined June beetle infesting the soil where new trees were to be planted.

The larvae feed on the roots of all species of fruit trees. Heavy feeding reduces the amount of roots, resulting in reduced tree vigor. The adults are most active at night so are



rarely seen. Ten-lined June beetles thrive in sandy soils, and don't survive well in heavy, clay soils. Soils near sagebrush or converted from sagebrush may have high populations. Keeping trees as healthy as possible and reducing stress through proper fertilization and irrigation are important to keep trees vigorously growing.

When an orchard is replanted without at least a 1-2 year fallow period, soil fumigation or other practices to reduce root borer populations should be considered. Replant problems are generally most severe when the same species of tree is replanted without a fallow period.



### Root Weevils



You may be familiar with the half-moon notch-type feeding by root weevil adults on the edges of leaves. The larvae, however, cause the most damage by feeding on fine feeder roots. Young trees with small root systems are especially prone to decline caused by root weevils.

Treatment for root weevils would target the adults; they are active starting in early summer, and continue through late summer. If heavy leaf notching is observed, consider an insecticide applied to the lower canopy. Several years of treatment may be necessary to get the population down.

Recommended insecticides for commercial growers include Lorsban, Actara, Provado, Calypso, Guthion, and Diazinon.



# Degree Day Accumulations and Insect Development

## Upcoming Monitoring/Insect Activity

Pest	Host(s)	DD/Monitoring Action
Apple powdery mildew	apple	Look for small white lesions on new foliage
Codling moth	apple fruit	First flight approximately Red Delicious full bloom; egg-hatch
San Jose scale	apple mostly	Crawler emergence in mid spring
White apple leafhopper	apple	Look for nymph activity on the undersides of leaves
Green peach aphid	peach, nectarine	Look for colonies on peach and nectarine
Peach twig borer	peach, nectarine, apricot	Moths typically start flying in June; treatment is 1-2 weeks later
Black cherry aphid	cherry	Watch terminals for leaf-curling and feeding

## Spray Materials - Commercial Applicators

Target Pest	Host	Chemical	Example Brands (Classification)	Amount per acre	REI	Comments
Campylocoma	apple	acetamiprid	Assail (4)	1.7-3.4 oz	12 h	
Rosy apple aphid	apple	acetamiprid	Assail	1.7 oz	12 h	apply post bloom only if scouting shows that this pest is present
		clothianidin	Clutch	2-3 oz	12 h	
		flonicamid	Beleaf	2-2.8 oz	12 h	
		imidacloprid	Provado	4-8 oz	12 h	
		thiacloprid	Calypso	2-4 oz	12 h	
Thrips	light-skinned apples, nectarines	spinosad	Success	4-8 oz	4 h	scout by shaking flower clusters into a paper cup
Pear psylla	pear	acetamiprid	Assail	1.7-3.4 oz	12 h	oil alone is also effective, or add oil to one of these products
		buprofezin	Centaur WDG	34.5-45 oz	12 h	
		spinetoram	Delegate	4-7 oz	4 h	
Powdery mildew	apple	potassium bicarbonate	Kaligreen	2.5-3 lb	4 h	apply starting at open cluster stage and repeat every 7-14 days if necessary
		trifloxystrobin	Flint	2-2.5 oz	12 h	
		myclobutanil	Rally (3)	5 oz	24 h	
		triflumizole	Procure	8-16 oz	12 h	
		pyraclostrobin + boscalid	Pristine (7+11)	14.5-18 oz	12 h	
		fenarimol	Rubigan	12 oz	12 h	
Fire blight	apple, pear	streptomycin	Agri-mycin	check label		apply within 24 h of a wetting event only if fire blight was present last year
		oxytetracycline	Mycroshield	check label		
Green peach aphid	peach, nectarine	acetamiprid	Assail	8 oz	12 h	could use 1 cover spray of Dimethoate post-harvest if any fruit is left in the orchard.
		imidacloprid	Provado	4-8 oz	12 h	
Lygus bug	peachers	azadirachtin	Aza-Direct	1-2 pints	4 h	OMRI certified organic
		beta-cyfluthrin	Baythroid	2-2.4 oz	12 h	restricted use product
		cyfluthrin	Tombstone	2-2.4 oz	12 h	restricted use product
		pyrethrin	Pyganic	4.5-18 oz	4 h	OMRI certified organic

## Spray Materials - Residential Applicators

Note that these treatments are only recommended if you know you have the particular pest in your trees.

If your trees are in bloom, we do not recommend applying any pesticides unless you are controlling fire blight with antibiotics. Although it is accepted to use "softer" materials such as Bt or spinosad during bloom, we still recommend either: waiting until the petal fall stage or apply at dawn or dusk when pollinators are not active.

Target Pest	Host	Chemical	Example Brands	Comments/Insecticide Mode of Action Group (group)
Rosy apple aphid	apple	carbaryl	Bayer Advanced	start with a single application
		bifenthrin	Ortho Bug-B-Gone	
		malathion	Bonide, Malathion	
		neem oil	Green Light	
		permethrin	Lilly Miller	
Powdery mildew	apple	bayleton	Bonide	do not apply lime sulfur when temperature is over 75 degrees F
		lime sulfur	Lilly Miller	
		propiconazole	Ferti-Lome	
		neem oil	Garden Safe	
		potassium bicarbonate	Kaligreen	
Fire blight	apple, pear	biological	Blightban, Bloomtime	Biologicals should be applied at 15-20% bloom and again at full bloom
		streptomycin	Ferti-Lome	
		oxytetracycline	oxytetracycline	
Pear psylla	pear	oil	horticultural (petroleum) oil	When using oil on trees with leaves, do not use more than 1% preparation, and apply on days under 85 degrees F
Green peach aphid	peach, nectarine	malathion	Bonide, Malathion	start with a single application
		pyrethrin	Pyganic	

**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

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