

## News/What to Watch For:

Examine apples and pears for frass, indicating entry by codling moth larvae; monitor spider mite activity; watch for cat-facing injury by lygus bugs

Spray timing dates for codling moth and peach twig borer, page 4

Spray information, pages 5-6

## Insect and Disease Activity/Info

### APPLE AND PEAR

#### Codling Moth



Look now for injury from first generation larvae. Pay close attention to fruit high up in the tree where sprays may not have reached. Frass will be present at successful entries, while unsuccessful entries (called stings) will look like a small brown spot. Most first generation entries are through the calyx end because, while fruit is still firm, it is easier for the larvae to enter at that location. Although not as common, side entries can also be found now, usually where two fruit touch or where leaves touch the fruit. If you are finding a lot of damage, re-evaluate your management program and look at alternative materials, spraying methods, or length of time between treatments.

If you cut into the fruit to look for the larva inside, you can sometimes tell when the entry occurred. If larvae are large or have already exited, then the entry occurred approximately 4-6 weeks prior (at the beginning of egg-hatch). Medium-sized larvae (1/3-2/3-inch long) indicates that entry

occurred at the early to mid egg-hatch period (early June), and if the larvae are small, they entered in late June.

For second generation control, be sure to select a material in a different chemical class than what you used in 1st generation control. By changing the pesticide's mode of action (how the insect is killed), we are reducing the chances of pesticide resistance. For **homeowner** sprays listed on page 6, esfenvalerate, permethrin, and pyrethrin are all in the same class (pyrethroids) while the remaining materials are each in a different class. For **commercial** sprays listed on page 5, acetamiprid and thiacloprid are in the same class (neonicotinyls) while the remaining are in individual classes. (Remember that these lists are not complete.)

### ALL FRUITS

#### Spider Mites

Mite numbers are increasing but not a problem in most sites. Continue to monitor because when the population grows to cause severe damage, mites can be hard to control. Severe infestations that cause leaf drop can adversely affect the following year's return bloom.



## Insect and Disease Activity, continued

### Lygus Bug (tarnished plant bug)



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#### early-season damage to peaches



Keep an eye out for lygus bug activity as the summer progresses, especially if your orchard is near alfalfa or uncultivated land, or if there are tall weeds between rows. Late season damage from their feeding appears as water-soaked lesions or single spots with gumming. (Early feeding shows up as deep, depressed, calloused tissue.)



late-season  
damage to  
peach

To manage lygus, remove weed hosts and replace with grasses, if possible. Early season control (pre-bloom) will prevent early injury. Later in the season, treatments may need to be applied to outside orchard rows.

## STONE FRUITS

### California Prionus

The larvae of this insect bore within the roots of stone fruits, in particular sweet cherry. The adult is a very large (1-2-inch) beetle that is emerging from pupation now 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



larvae of  
various age  
groups

Shawn Steffan, USU Extension



adult male

Shawn Steffan, USU Extension

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 tree 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.

There are very little control options. Recently, the female sex pheromone has been identified and research is being conducted on monitoring. 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.

## Degree Day Accumulations and Insect Development

### Upcoming Monitoring/Insect Activity

By Insect (in alphabetical order)		By Host (see abbrev. at left)	
Cherry powdery mildew (CPM)	Look for small white lesions on new foliage near the base and interior of the tree	Apple	CM, FB, SM, WALH
Codling moth (CM)	2nd gen. egg-hatch begins at 1100 DD (after biofix)		
Obliquebanded leafroller (OBLR)	First flight ends at approx. 1300 DD (base 50)	Cherry	CPM
Fire blight (FB)	Prune out strikes in July 18-24" down	Peach	PTB, SM
Peach twig borer (PTB)	2nd gen. egg-hatch begins at 1200 DD after biofix	Pear	FB
Spider mite (SM)	Look for damage on leaves closest to ground first		
White apple leafhopper (WALH)	Look for nymph and adult activity		

## Degree Day (DD) Accumulations and Insect Phenology

([click here](#) for more information on degree days)

March 1 - Tuesday, July 8

County	Location	*GDD50	Codling Moth - 1st/2nd Gen.			Peach Twig Borer - 1st/2nd gen.		
			DD (post biofix)	% Egg Hatch	% Moth Flight	DD (post biofix)	% Egg Hatch	% Moth Flight
Box Elder	Perry	100	972	99	3 (2nd)	724	98	100
Cache	North Logan	881	703	87	99	387	25	93
	Providence	904	749	91	100	392	28	94
	Smithfield	884	716	89	99	424	34	96
Carbon	Price	1024	810	96	100	524	69	99
Davis	Kaysville	1086	884	98	1 (2nd)	702	97	100
Grand	Castle Valley	1643	1252	6 (2nd)	35 (2nd)	1179	4 (2nd)	41(2nd)
Salt Lake	SLC	1198	1034	100	5 (2nd)	765	99	100
	West Valley City	1281	1106	1 (2nd)	13 (2nd)	849	100	100
Tooele	Erda	1369	1064	100	9 (2nd)	---	---	---
	Grantsville	1383	1383	18 (2nd)	56 (2nd)	---	---	---
	Tooele	1308	1061	100	9 (2nd)	873	1 (2nd)	0 (2nd)
Utah	Alpine	992	774	94	100	504	63	99
	Genola	1123	945	99	2 (2nd)	680	96	100
	Lincoln Point	1025	852	97	1 (2nd)	628	92	100
	Orem	1068	956	99	3 (2nd)	682	96	100
	Payson	1161	987	99	4 (2nd)	765	99	100
	Provo	1151	962	99	3 (2nd)	707	97	100
	Santaquin	1072	924	99	2 (2nd)	688	96	100
	West Mountain	1082	912	98	1 (2nd)	659	95	100
Weber	Pleasant View	1191	1049	100	8 (2nd)	771	99	100

\*GDD50 (growing degree days base 50) are degree days since March 1, calculated using 50 F as the lower threshold value. This number is used for insects that develop at temperatures above 50 F only.

## Spray Timing

Please check this chart each week for updated dates. These dates are forecasted using the average temperature for each site.

### Codling Moth, First Generation (end first generation at 1020 DD; begin 2nd at 1100)

County	Location	End Protection (1st Generation)	Begin Protection (2nd Generation)
Box Elder	Perry	July 10	July 14
Cache	North Logan	July 22	July 27
	Providence	July 21	July 26
	Smithfield	July 24	July 28
Carbon	Price	July 16	July 20
Davis	Kaysville	July 13	July 16
Grand	Castle Valley	July 2	July 4
Salt Lake	SLC	July 7	July 11
	West Valley City	July 6	July 9
Tooele	Erda	July 6	July 10
	Tooele	July 9	July 13
Utah	Alpine	July 17	July 21
	Genola	July 10	July 14
	Lincoln Point	July 13	July 17
	Orem	July 10	July 14
	Payson	July 10	July 14
	Provo	July 18	July 22
	Santaquin	July 12	July 16
	West Mountain	July 12	July 15
Weber	Pleasant View	July 7	July 11

**Peach Twig Borer** (Ending protection (egg hatch) date corresponds to 800 DD. For 2nd generation, if you had moderate to severe PTB damage last year, use the earlier spray date; if you had very little PTB damage last year, use the later date to start sprays. These two dates correspond to 1200 and 1360 degree days after biofix, or 5% and 28% egg hatch.

County	Location	End Protection (1st gen.)	Start Protection (large pop.-2nd gen.)	Start Protection (small pop.-2nd gen.)
Box Elder	Perry	July 11	July 27	August 3
Cache	All locations	July 27	August 15	August 23
Carbon	Price	July 20	August 5	August 12
Davis	Kaysville	July 11	July 25	July 31
Grand	Castle Valley	June 25	July 9	July 15
Salt Lake	Salt Lake City	July 9	July 23	July 29
	West Valley City	July 8	July 23	July 28
Tooele	Tooele	July 8	July 24	July 30
Utah	Alpine	July 20	August 5	August 12
	Genola	July 13	July 28	August 3
	Lincoln Point	July 13	July 28	August 4
	Orem	July 12	July 28	August 3
	Payson	July 10	July 26	August 2
	Provo	July 14	August 1	August 8
	Santaquin	July 13	July 29	August 5
	West Mountain	July 13	July 29	August 4
Weber	Pleasant View	July 10	July 26	August 1

## Spray Materials - Commercial Applicators

Target Pest	Host	Chemical	Example Brands	Amount per acre	REI	Comments
Apple aphids	apple, peach, cherry	imidacloprid acetamiprid	Provado Assail	4-8 oz 1.7 oz	12 h 12 h	
Codling moth	apple, pear	acetamiprid deltamethrin methoxyfenozide phosmet spinetoram thiacloprid codling moth virus	Assail Battalion Intrepid Imidan Delegate Calypso Virosoft, etc	3.4 oz 7-14 oz 16 oz 5.33 lbs 6-7 oz 4-8 oz ---	12 h 12 h 4 h 5 d 4 h 12 h ---	<ul style="list-style-type: none"> <li>• see table on page 4 for timing</li> <li>• ensure good coverage for effective control</li> <li>• virus must be applied every 7 days</li> </ul>
Powdery mildew	apple	potassium bicarbonate myclobutanil trifloxystrobin triflumizole fenarimol boscalid/pyraclostrobin	Kaligreen Rally Flint Procure Rubigan Pristine	2.5-3 lb 5 oz 2-2.5 oz 8-16 oz 12 oz 14.5-18 oz	4 h 24 h 12 h 12 h 12 h 12 h	
San Jose scale	apple, others	acetamiprid pyrproxyfen	Assail Esteem	3.4 oz 4-5 oz	12 h 12 h	treat crawlers at 600-700 dd after codling moth biofix
Spider mites	apple, peach	abamectin bifenazate difocol fenpyroximate spiroticlofen	Agrimek Acramite Kelthane Fujimite Envidor	10-20 oz .75-1 lb 4 lb 32 oz 16-18 oz	12 h   12 h 4 h	
Woolly apple aphid	apple	endosulfan diazinon	Thionex Diazinon	3-4 lbs 4 lbs	24 h 4 d	
Western cherry fruit fly	cherry	carbaryl malathion imidacloprid spinosad spinosad	Sevin Malathion Provado Success, Entrust GF-120	1 pint 12 oz 2 oz see label see label	12 h 12 h 12 h 4 h 4 h	GF-120, when applied every 7 days, can provide 100% control.
Greater peachtree borer	peach, nectarine, apricot	chlorpyrifos endosulfan esfenvalerate	Lorsban 4EC Thionex Asana	see label see label see label	4 d 24 h 12 h	use Lorsban only once/year; keep trees protected until mid-Sept.
Green peach aphid	peach	imidacloprid	Provado	2 oz	12 h	
Peach twig borer	peach, nectarine, apricot	Bt methoxyfenozide phosmet spinosad spinetoram tebufenozide	Dipel Intrepid Imidan Entrust Delegate Confirm	see label 2 pints 4 lbs 4-8 oz 4.5-7 oz 16-30 oz	4 h 4 h 5 d 4 h 4 h 4 h	
Lygus bug	apple, peach, nectarine	endosulfan esfenvalerate lambda-cyhalothrin	Thionex Asana Warrior	4-5 lb 5-12 oz 2.5-5 pz	24 h 12 h 24 h	use no more than 2x/year restricted-use pesticide

## Spray Materials - Residential Applicators

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

Target Pest	Host	Chemical	Example Brands	How Often	Comments
Aphids	apple, pear, peach, plum, cherry	azadiractin hort. oil imidacloprid insecticidal soap malathion	Azatin variety Bayer Advanced Safer, M-Pede Malathion	once as necessary	
Codling moth	apple, pear	azadiractin carbaryl esfenvalerate malathion permethrin pyrethrin spinosad	Azatin Sevin, Bonide Fruit Tree Spray Ortho Bug-B-Gone Malathion Bayer Advanced Dust Concern Multi-Purpose, Green Light	Most are applied every 7 days, but read the label. Continue through harvest or until Sept. 15.	<ul style="list-style-type: none"> <li>• Rotate among chemical classes to prevent resistance.</li> <li>• to reduce number of sprays, time them so that none are applied in between generations</li> </ul>
Flat-headed appletree borer	apple	carbaryl esfenvalerate imidacloprid permethrin	Sevin Ortho Bug-B-Gone Bayer Advanced Spectracide	1 to 3 applications 2 weeks apart, depending on severity	imidacloprid is applied as soil drench; others to trunk and scaffolding
Powdery mildew	apple	bayleton propiconazole neem oil potassium bicarbonate	Bonide Ferti-Lome Garden Safe Kaligreen	repeat every 7-10 days as necessary until new growth stops	
Spider mites	most trees	hard spray of water fenbutatin-oxide horticultural oil insecticidal soap	Vendex variety variety	repeat only as necessary	
Woolly apple aphid	apple	carbaryl hort. oil malathion	Sevin variety Malathion		
Western cherry fruit fly	cherry	carbaryl esfenvalerate malathion pyrethrin spinosad spinodad	Sevin Ortho Bug-B-Gone Malathion Concern Multi-Purpose Ferti-Lome, Green Light, etc. GF-120	Most are every 7 days. Continue until harvest.	
Greater peachtree borer	peach, nectarine	esfenvalerate	Ortho Bug-b-Gone		treat lower trunk only until mid-Sept.
Peach twig borer	peach, nectarine	Bt carbaryl esfenvalerate malathion pyrethrin pyrethrum spinosad	Dipel Sevin Ortho Bug-B-Gone Malathion variety Pyganic Entrust	Most are every 7 days. Continue until harvest.	<ul style="list-style-type: none"> <li>• Rotate among chemical classes.</li> <li>• to reduce number of sprays, time them so that none are applied in between generations</li> </ul>

**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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