Tree Fruit IPM Advisory

Weekly Orchard Pest Update, Utah State University Extension, **July 21, 2010**

News/What to Watch For:

Spider mite activity has been low but may be increasing with the heat and dry, dusty conditions
Monitor tree water needs carefully; trees with ripening fruit demand more water; a soil probe helps to determine soil moisture
Collect leaf samples soon for foliar nutrition analysis by USU Analytical Lab (if necessary)
Spray timing (codling moth and peach twig borer), pages 5-6
Spray materials, pages 7-8

Insect and Disease Activity/Info

APPLES/PEARS

Woolly apple aphid

Woolly apple aphid colonies are growing in size in the tree canopy. They are best controlled early when the colonies are small. Their cottony coatings are waxy and water-resistant, so getting insecticide to penetrate through to the aphids is difficult. But the colonies will continue to enlarge, so treating now is better than later. Diazinon (restricted use) is one option, as are Assail and Beleaf. Residential growers can use a hard spray of summer-weight (1%) horticultural oil, applying to dripping.

STONE FRUITS

Catfacing Injury

Catfacing injury is a generic term used to describe feeding by true bugs, including lygus bug and various species of stink bugs.

stink bugs hatching;

most nymphs move to groundcover, while adults cause the fruit damage

Although these are considered minor pests, most commercial and residential orchards will see a certain level of damage each year. True bugs feed by inserting their proboscus 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 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 orchard.

Types of Injury

1. ***Cat-facing (dimpling)***: This is the most common and recognized injury, and is represented by deformed fruit with deep pits. Healthy plant tissue continues expanding while the tissue at the feeding wound is dead. Green peaches that are deformed like this will have been fed upon between petal fall and when fruit is 0.5-inch in diameter.

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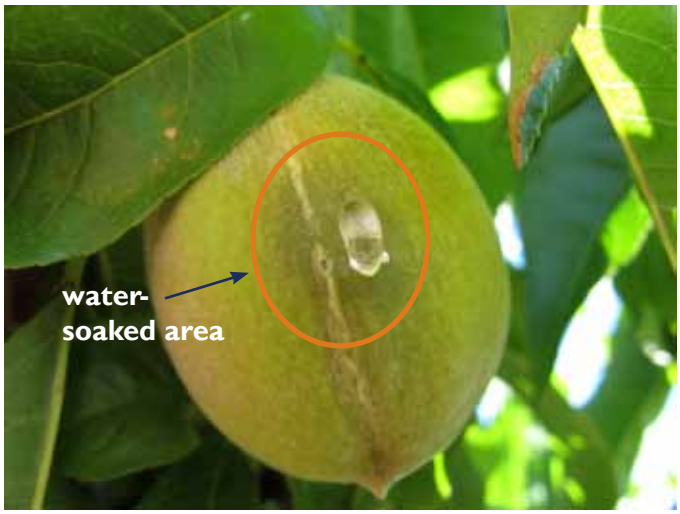
Insect and Disease Information, continued from previous page

2. ***Early fruit drop***: When lygus bug feeds on flowers, ovary, or young fruit, fruits usually drop.

3. ***Gummosis injury***. This type of injury occurs when fruit is fed upon at the time period when fruit is 0.75-inch to 2 inches in diameter. Usually there is no surface blemish other than clear, oozing gum. Keep in mind that many other factors can cause peaches to ooze, such as coryneum, hail damage, or other wounding.

4. ***Water-soaked injury***. This type of injury is most commonly seen this time of year, and is often associated with large gobs of ooze. It occurs when cat-facing bugs feed on fruit that is between 1 to 2 inches in diameter.



5. ***Ripe fruit injury***: This type of injury occurs when stink bug feeding on fruits causes small dimples.

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Most cat-facing bugs enter the orchard as adults to feed while they breed in other habitats (primarily weeds, field crops or wooded areas). If possible, remove weed hosts in the orchard (mullien, ironweed, horse-weed) or keep them mown within and on orchard edges. Lygus bugs are commonly found in alfalfa, and when alfalfa is cut, bugs move into the orchard. They are also common in the orchard at the pink to petal-fall stage, which causes the fruit drop or deep dimpling injury.

The newer products for peach twig borer control (Intrepid, Delegate, Altacor, Belt) are not as effective on cat-facing bugs. Unfortunately, the broad spectrum insecticides (carbaryl and pyrethroids) are the most effective on the adults. You just need to balance cost of injury versus cost of spray versus cost of killing beneficial insects.

Earwigs

European earwigs are becoming more and more of a problem for Utah fruit (and vegetable) growers. We have had moist springs for almost three years in a row; ideal conditions for earwigs. They do not like dry conditions, so they are concentrated in areas that are irrigated and have moist, cool places to hide during the day. They feed mostly at night, leaving behind trails of black frass. (They are also beneficial in that they feed on insects such as aphids and insect eggs.)

We are starting to see fruit damage where earwigs are entering apricots through the stem end, and feeding around the pit. They may exit through the stem end or through a new exit hole. You may also see shallow gouges on the fruit surface or a single deep hole. The riper the fruit, the more appealing it is to feeding.

To manage earwigs, 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, 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.

Degree Day Accumulations and Insect Development

Degree Day Accumulations and Insect Phenology

March 1 - Tuesday, July 20

County	Location	Codling Moth, 2nd Gen.			Peach Twig Borer, 2nd Gen.		
		DD (post biofix)	% Moth Flight	% Egg Hatch	DD (post biofix)	% Moth Flight	% Egg Hatch
Box Elder	Perry	1100	13	1	948	3	0
	Tremonton	816	0	96 (1st)	739	0	99 (1st)
Cache	North Logan	784	100 (1st)	94 (1st)	509	99 (1st)	63 (1st)
	Providence	906	1	98 (1st)	549	100 (1st)	75 (1st)
	Smithfield	767	100 (1st)	92 (1st)	537	100 (1st)	75 (1st)
Carbon	Price	1202	26	3	991	8	0
Davis	Kaysville	1074	11	0	938	3	0
Grand	Castle Valley	1821	98	83	1668	100	88 (1st)
Juab	Tintic	887	1	98 (1st)	707	0	97 (1st)
Salt Lake	Holladay	1172	23	3	1054	16	0
	West Valley City	1266	36	7	1135	32	2
Sevier	Richfield	1172	23	3	1101	23	1
Tooele	Erda	982	4	99 (1st)	982	6	0
	Tooele	1129	15	1	999	8	0
Uintah	Vernal	1092	13	1	938	3	0
Utah	Alpine	972	4	99 (1st)	758	0	99 (1st)
	American Fork	1131	18	2	958	4	0
	Genola	1140	18	2	963	4	0
	Lincoln Point	1069	9	0	905	2	0
	Orem	1220	29	4	1018	10	0
	Payson	1077	11	0	935	3	0
	Provo	1199	26	3	1016	10	0
	Santaquin	1033	7	0	858	1	0
	West Mountain	1020	6	100 (1st)	860	1	0
Weber	Pleasant View	1121	15	1	885	1	0
Wasatch	Heber City	693	99 (1st)	87 (1st)	454	98 (1st)	49 (1st)
Wayne	Capitol Reef	1531	79	43	1357	81	28

Spray Timing - Codling Moth

Please check these chart each week for updated dates. These dates are forecasted using the average temperature for each site. Fruit should remain protected through each generation according to interval provided on pesticide label.

Codling Moth, First and Second Generations

For codling moth generation one, egg hatch ends at 920 DD. Egg hatch of the second generation starts at 1100 degree days, and the period of greatest egg hatch occurs at 1320-1720 DD. The time between the end of the first and beginning of the second generation egg hatch is longer than normal because of the cooler weather earlier in the season. You do not need to have the fruit protected in this lag period.

		FIRST GENERATION	SECOND GENERATION	
County	**Location**	**Egg Hatch Ends**	**Begin protecting fruit (egg hatch begins again)**	**Period of Greatest Egg Hatch**
Box Elder	Perry	past	July 20	July 29 - August 16
	Tremonton	July 24	July 31	August 9 - August 27
Cache	N. Logan	July 26	August 3	August 13 - September 4
	Providence	July 21	July 29	August 8 - August 29
	Smithfield	July 26	August 3	August 12 - August 31
Carbon	Price	past	past	July 26 - August 16
Davis	Kaysville	past	July 21	July 30 - August 14
Grand	Castle Valley	past	past	July 4 - July 17
Juab	Tintic	July 21	July 29	August 8 - August 28
Salt Lake	Holladay	past	past	July 25 - August 8
	West Valley City	past	past	July 22 - August 5
Sevier	Richfield	past	past	July 27 - August 16
Tooele	Erda	past	July 24	August 2 - August 17
	Tooele	past	July 19	July 27 - August 11
Uintah	Vernal	past	July 20	July 30 - August 19
Utah	Alpine	past	July 25	August 4 - August 21
	American Fork	past	July 19	July 27 - August 13
	Genola	past	past	July 27 - August 12
	Lincoln Point	past	July 21	July 30 - August 15
	Orem	past	past	July 24 - August 8
	Payson	past	July 21	July 29 - August 14
	Provo	past	past	July 25 - August 9
	Santaquin	past	July 23	July 31 - August 17
	West Mountain	past	July 23	August 1 - August 17
Weber	Pleasant View	past	July 19	July 27 - August 11
Wasatch	Heber City	August 1	August 11	August 24 - September 26
Wayne	Capitol Reef	past	past	July 13 - July 27

Spray Timing - Peach Twig Borer

Peach Twig Borer, First and Second Generations: End of first generation egg hatch, where you should "keep fruit protected up to" is at 800 degree days. Treatment for second generation egg hatch starts at 5% hatch, which is 1200 DD.

		FIRST GENERATION	SECOND GENERATION	
County	**Location**	**Keep Fruit Protected Through This Date**	**Begin protecting fruit**	**Keep Fruit Protected Up Through this Date**
Box Elder	Perry	past	July 31	September 1
	Tremonton	July 22	August 7	September 9
Cache	All Locations	August 1	August 19	September 15
Carbon	Price	past	July 30	September 10
Davis	Kaysville	past	July 30	August 28
Grand	Castle Valley	past	past	July 28
Juab	Tintic	July 24	August 11	September 15
Salt Lake	Holladay	past	July 25	August 18
	West Valley City	past	July 22	August 16
Sevier	Richfield	past	July 25	August 29
Tooele	Erda	past	July 28	August 24
	Tooele	past	July 27	August 23
Uintah	Vernal	past	August 1	September 6
Utah	Alpine	July 22	August 8	September 11
	American Fork	past	July 30	August 27
	Genola	past	July 29	August 27
	Lincoln Point	past	August 1	August 30
	Orem	past	July 27	August 22
	Payson	past	July 30	August 27
	Provo	past	July 27	August 23
	Santaquin	past	August 2	September 1
	West Mountain	past	August 2	August 31
Weber	Pleasant View	past	August 1	August 28
Wasatch	Heber City	August 8	September 1	September 15
Wayne	Capitol Reef	past	past	August 8

Spray Materials - Commercial Applicators

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

Target Pest	Host	Chemical	Example Brands (Classification)	Amount per acre	REI	Comments
Codling moth	apple, pear	acetamiprid methoxyfenozide phosmet spinetoram thiacloprid rynaxypyr codling moth virus	Assail (4) Intrepid (18) Imidan (1) Delegate (5) Calypso (4) Altacor (28) Virosoft, etc	3.4 oz 16 oz 5.33 lbs 6-7 oz 4-8 oz 3.5-4.5 ---	12 h 4 h 5 d 4 h 12 h 4 h	• for all products, ensure good coverage for effective control • **hort. oil** works on eggs only • **codling moth virus** must be applied every 7 days • **Altacor** and **Delegate** have shown to have good efficacy, and target eggs and larvae
Woolly apple aphid	apple	acetamiprid carbaryl diazinon endosulfan flonicamid imidacloprid	Assail Sevin Diazinon Thionex Beleaf Admire	1.7 oz 1.5-3 qt 4 lb 3-4 lb 2-2.8 oz 7-10.5 oz	 12 h 4 d 4 d 12 h 12 h	**Beleaf:** 21 day PHI **Admire**: soil application only; 21-day PHI
Greater peachtree borer	peach, nectarine, apricot	chlorpyrifos endosulfan esfenvalerate pemethrin	Lorsban Thionex Asana Pounce	see label see label see label 4-8 oz	4 d 4 d 12 h 12 h	**Lorsban**: max once/season; do not allow spray to touch foliage/ fruit **Thionex**: max twice/season
Peach twig borer	peach, nectarine	Bt chlorantraniliprole spinetoram spinosad methoxyfenozide endosulfan phosmet	Dipel, Foray Altacor Delegate Success, Entrust Intrepid Thionex Imidan	see label 3-4.5 oz 4.5-7 oz see label 8-16 oz 4 lb 4 lb	4 h 4 h 4 h 4 h 4 h 4 d 4 d	begin sprays according to spray timing table on previous page; maintain residual through end of egg hatch **Delegate, Altacor**: apply at 14 day intervals
Powdery mildew	peach	azoxystrobin myclobutanil potassium bicarbonate pyraclostrobin + boscalid sulfur products	Abound (11) Rally (3) Kaligreen Pristine (7+11) variety (M)	11-15 oz 2.5-6 oz 2.5-3 lb 14.5-15.5 oz see label	4 h 24 h 4 h 12 h 24 h	
Powdery mildew	cherry	fenarimol myclobutanil propiconazole thiophanate-methyl triflumizole	Rubigan (3) Rally (3) Orbit (3) Topsin M (1) Procure (3)	6-12 oz 5 oz 10-16 oz 1-1.5 lb 10-16 oz	12 h 24 h 12 h 2 d 12 h	All products listed have curative properties. Rubigan: 0 day PHI Rally: 0 day PHI Orbit: 0 day PHI Procure: 1 day PHI
Western cherry fruit fly	cherry	acetamiprid carbaryl malathion imidacloprid spinetoram spinosad spinosad + bait	Assail Sevin Malathion Provado Delegate Success, Entrust GF-120	2.5-3.4 oz 1 pint 12 oz 6-8 oz 4-4.5 oz see label see label	12 h 12 h 12 h 12 h 4 h 4 h 4 h	could use 1 cover spray of Dimethoate post-harvest if any fruit is left in the orchard.

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/Insecticide Mode of Action Group (group)
Codling moth	apple, pear	*Conventional* acetamiprid carbaryl malathion gamma-cyhalothrin bifenthrin *Soft/organic* spinosad codling moth virus	 Ortho Max Flower, Fruit, and Veg. Sevin, Bonide Fruit Tree Spray, etc. Malathion Spectracide Triazicide Ortho Max Lawn and Garden Green Light Lawn and Garden Spinosad; Gardens Alive Bull's Eye; Ferti-Lome Borer, Bagworm, Leafminer & Tent Caterpillar; Monterey Garden Insect Spray Virosoft, Cyd-X	**acetamiprid**: every 14 days; group 4 **carbaryl**: every 14 - 21 days; group 1 **malathion**: every 7 days; group 1 **gamma-cyhalothrin**: every 14 days; group 3 **bifenthrin**: every 14 days; group 3 **spinosad**: every 7 days; group 5 **codling moth virus** can only be purchased online
Greater peachtree borer	peach, nectarine, apricot	permethrin, bifenthrin carbaryl	Bonide Eight, Ortho Bug-b-Gone, Green Light Borer Killer, Bonide Borer-Miner Killer, Enforcer Outdoor Insect Killer, Hi-Yield Broad Use Including Gardens; Lilly Miller Multi-Purpose Insect Spray, Spectracide Bug Stop Sevin, Bonide Fruit Tree Spray	**permethrin**: apply every 14-21 days until mid-September in highly infested areas; apply twice (now and one month later) in low infestations **carbaryl**: must be applied every 7 days
Peach twig borer	peach, nectarine	*Conventional* acetamiprid carbaryl malathion permethrin *Soft/orgainc* spinosad kaolin clay	 Ortho Max Flower, Fruit & Veg Sevin, Bonide Fruit Tree Spray, etc. Malathion Basic Solutions Yard & Garden, Bonide Eight see 'codling moth' above Surround	see comments under Codling Moth **permethrin**: every 14 days; this ingredient is becoming less available in stores **Surround**: every 3-5 days; works to repel, not kill insects; only moderate control; must purchase online
Western cherry fruit fly	cherry	carbaryl malathion pyrethrin spinosad *(Soft/Organic)*	Sevin Malathion Concern Multi-Purpose see above	start applications when fruit in sunniest locations develop a salmon blush **spinosad**: every 7 days
Walnut husk fly	walnut	carbaryl malathion pyrethrin spinosad *(Soft/Organic)*	Sevin Malathion Concern Multi-Purpose see above	start applications now (as of July 14) and repeat every 7-14 days until 1 month before harvest. mixing molasses with the Sevin or spinosad will be more effective

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