

News/What to Watch For:

Watch for fire blight infections and prune out in dry weather.
Watch for powdery mildew lesions on apple, cherry, and peach leaves.
Watch for “cottony” colonies of woolly apple aphid in the next few weeks
Spray timing (codling moth and peach twig borer), pages 5-6
Spray materials, pages 7-8

Insect and Disease Activity/Info

APPLES/PEARS

Codling Moth



Many remember last spring as cool and wet, and this spring is even cooler and wetter. We are behind last spring by about 1.5 weeks or more in insect development, which may mean a drawn out first generation for codling moth, and possibly reduced numbers of moths that fly and mate. They usually only fly when temperatures are above 50-60 degrees at dusk. So when it is too cool for them to fly, they are not mating. Trap catches have been moderate.

Most areas are approaching the time period when egg hatch increases at a rapid rate. During this narrow window of time, about 70% of all the eggs laid for the first generation will be hatching. At the same time, fruit is actively expanding. So pay careful attention to your spray intervals and make sure fruit is protected at this time (see table on page 5).

Powdery Mildew

-Adapted from Michigan State University's Fruit Crop Advisory Team Alert, June 8, by George Sundin and Amy Irish-Brown



Heavy infections of apple powdery mildew (*Podosphaera leucotricha*) can result in loss of vigor and potential effects on return bloom and yield of bearing trees and stunted growth of nonbearing trees. In addition, powdery mildew infection of fruit can cause russetting if the disease is not controlled before fruit are present. Powdery mildew can thrive in Utah's dry climate because it does not need lots of moisture to spread, just humidity that can build naturally within a thick tree canopy.

Because the fungus overwinters on twigs, initial infections occur just after petal fall, when leaves are actively expanding. Only new, unfolding leaves are susceptible to infection, so future infections will only occur when the tree is actively growing. Infection risk ends when the trees set terminal buds. Young trees are most vulnerable to infection.

Insect and Disease Information, continued from previous page

According to Oregon State University research, very susceptible apple cultivars include 'Braeburn', 'Jonathan', 'Rome', 'Newtown', 'Granny Smith', and 'Gravenstein'. Fruits of 'Jonathan' and 'Rome' also may be severely affected. Moderately susceptible: 'Winesap'. Less susceptible: 'Golden Delicious', 'Red Delicious', and 'Delicious' strains. 'Pristine' and 'Enterprise' have powdery mildew resistance.

Michigan State University recommends the following options:

- Sulfur: On nonbearing trees, apply at 10 lbs per acre every two weeks to prevent further infections. A reduced amount of sulfur could be used on bearing trees to avoid scorching the fruit. This would be the cheapest option to arrest further mildew infection.
- Sterol inhibitor (Rally, Topguard, Bayleton): On young trees, it may be worth the investment to help limit the inoculum carryover to next year. Topguard was recently registered, and is an excellent mildewcide.
- Strobilurins (Flint and Sovran): Flint is very effective for powdery mildew control.
- Topsin M or Pristine are also effective fungicides for powdery mildew control.
- EBDC's (mancozeb, maneb, dithane), captan, and chlorothalonil are NOT effective, and may kill other fungi that can inhibit powdery mildew somewhat, making the problem worse.

The powdery mildew fungus overwinters in infected buds. Thus, the more mildew can be controlled now; the less chance there is for extensive inoculum to be present next year.

STONE FRUITS

Peach Twig Borer

We have caught peach twig borer moths in most northern Utah locations except Cache County. The spray timing dates are posted on page 6. Residential growers that have not historically seen much damage from peach twig borer could get away with one spray per generation, applied on the date under the column heading for "small population."

Areas where fruit is nailed with "worms" should start applying sprays at the "large population" start date, and maintain insecticide residual through the end of egg hatch.

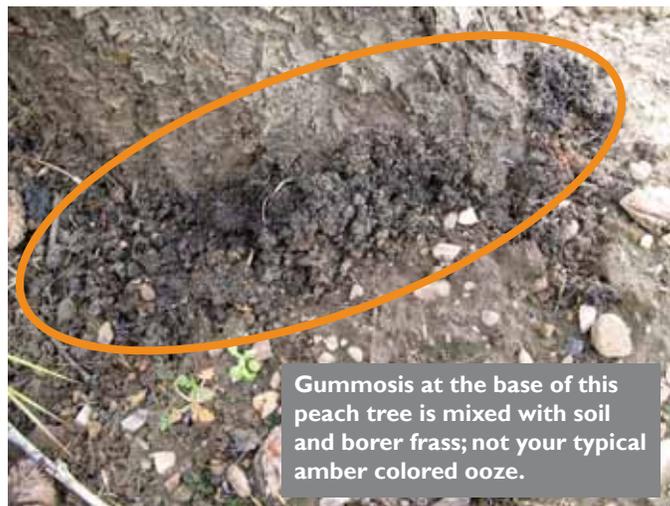
Note that at this time of year, peach twig borer adults lay eggs on the succulent shoot tips of trees, where larvae will bore to



the pith to feed. Twigs are their preferred feeding sites, hence the name of the pest.

Later in the summer, when tree growth has stopped and terminal shoots have hardened off, adults will lay eggs on the developing fruit.

Greater Peachtree Borer



If you break off a chunk of the gummosis, you can see the frass mixture.



We have not yet trapped greater peachtree borer in any locations in northern Utah. Sprays do not need to be applied until we have detected this moth. We predict that adults will be emerging in the last week of June or first week of July.

Insect and Disease Information, continued from previous page

Greater peachtree borer is a clearwing moth. It spends the winter as a larva inside peach or nectarine trees. We have not found that it attacks cherry trees in Utah. Adults will lay eggs on the bark, and 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. Eggs are only laid on the lower bark (12-18" from soil line) or on upper exposed roots.

Trees that have peachtree borer larvae will ooze gum at the entrance hole. But often, the gum is mixed with frass (sawdust-like excrement). So when you see oozing gummosis on the lower part of your peach tree, and it is clear or amber, it may not be greater peachtree borer (see pictures).

Western Cherry Fruit Fly



Western cherry fruit fly is the primary pest of cherries, and they cause damage when the young maggots feed inside the fruits. Adults spend the winter as pupae in the soil, and emerge when the weather warms. Adult flies were recently detected in Kaysville.

The adult must penetrate the cherry skin to lay eggs inside the fruit. They CANNOT penetrate the skin and lay eggs in green fruit. Therefore, the recommendation is that materials should be applied only after the first few fruits have developed a salmon blush color over the yellow. The fruits at the top of the tree, where they are exposed to the most sun, will be the first to develop color.

Many commercial orchards have lost all or a portion of the sweet cherry crop. If you are not planning on harvesting your cherries, we recommend that you still apply at least one treatment (dimethoate, for example) to prevent the population from building up. The adult flies lay most of their eggs on cherry fruit at the time period between two weeks before and two weeks after harvest, when fruit is softest.

RAINFASTNESS OF PESTICIDES

-repeated from a 2009 advisory

With codling moth sprays in the works and peach twig borer starting up, it is good to know about rainfastness of pesticides. Rainfastness of a product is the point at which it has dried long enough after application, or has absorbed into the plant tissue, so that rains cannot wash it off. Unfortunately, very few insecticides include information on rainfastness on their labels. Most products differ in how well they withstand rain. Some materials may come pre-mixed with a spray adjuvant that will improve rainfastness.

In doing a Google search of pesticide rainfastness, there were lots of research projects, and not a lot of information on the specific products that we are recommending.

In general:

- do not spray when rainfall may occur within 2 hours
- make sure plants are dry before spraying
- if the material is allowed 4 hours to dry after spraying, then depending on the material, it will usually be rainfast to light rains and reapplication earlier than label recommendation is not necessary
- if a heavy rain (1+ inches) falls, then the residual amount of some materials may decrease by half; for example if a material lasts 14 days and heavy rains fall a few days after application, it should be re-applied after 7 days.

NOTE: this does not apply to systemic materials (acephate, imidacloprid, guthion, etc.)

- for residual control of insects, the factor that causes the greatest residual breakdown is UV exposure rather than water; materials break down faster in direct sunlight than under cloudy conditions

Materials that are not rainfast:

Surround (kaolin clay)
neem
spinosad, GF-120
sulfur
Mancozeb
copper

Degree Day Accumulations and Insect Development

Upcoming Monitoring/Insect Activity

Pest	Host(s)	DD/Monitoring Action
Cherry powdery mildew	cherry	Look for small white lesions on new foliage near the base and interior of the tree
White apple leafhopper	apple	Look for nymph and adult activity on undersides of leaves
Codling moth	apple, pear	Egg-hatch continues through late June/early July
Western cherry fruit fly	cherry	First flies appear on yellow sticky traps in early June; treat when fruit develops salmon blush color
Peach twig borer	peach, nectarine	First flight early to mid June
Flatheaded appletree borer	apple, pear (uncommon)	Adults start emerging early June
San Jose scale	apple mostly	Crawlers hatch early June; treat in late June

Degree Day Accumulations and Insect Phenology

March 1 - Friday, June 11

County	Location	Codling Moth, 1st Gen.			Peach Twig Borer, 1st Gen.		
		DD (post biofix)	% Moth Flight	% Egg Hatch	DD (post biofix)	% Moth Flight	% Egg Hatch
Box Elder	Perry	285	54	4	134	17	0
	Tremonton	122	19	0	-	-	-
Cache	North Logan	149	27	0	-	-	-
	Providence	219	45	1	-	-	-
	Smithfield	110	16	0	-	-	-
Carbon	Price	380	73	25	-	-	-
Davis	Kaysville	295	59	6	159	26	0
Grand	Castle Valley	678	99	85	525	99	70
Juab	Tintic	228	51	3	48	-	-
Salt Lake	Holladay	335	61	7	237	57	1
	West Valley City	371	71	22	240	57	1
Sevier	Richfield	339	67	12	268	66	2
Tooele	Erda	157	29	0	157	26	0
	Tooele	274	53	4	143	20	0
Uintah	Vernal	336	67	12	182	34	0
Utah	Alpine	263	52	3	50	3	0
	American Fork	353	68	17	181	34	0
	Genola	357	70	20	180	34	0
	Lincoln Point	310	61	7	146	23	0
	Orem	370	72	22	168	60	0
	Payson	316	63	9	174	32	0
	Provo	374	72	24	191	38	0
	Santaquin	322	63	9	146	24	0
West Mountain	322	63	9	161	26	0	
Weber	Pleasant View	317	63	9	82	7	0
Wasatch	Heber City	125	19	0	-	-	-
Wayne	Capitol Reef	551	94	64	376	92	21

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 Generation

Most residential growers should start sprays at the “standard start date,” unless you choose to use horticultural oil at 200 DD. The period of greatest egg hatch occurs from 340 DD - 640 DD.

County	Location	<i>If using oil for early ovicide</i>		Standard Start Date (1% egg hatch)	Period of Greatest Egg Hatch (340-640 DD)
		Apply Oil (200 DD)	Apply delayed 1st cover (350 DD)		
Box Elder	Perry	past	past	past	June 15 - July 1
	Tremonton	June 16	June 24	June 17	June 24 - July 8
Cache	N. Logan	June 15	June 25	June 16	June 24 - July 10
	Providence	June 10	June 20	June 11	June 20 - July 7
	Smithfield	June 17	June 26	June 18	June 25 - July 10
Carbon	Price	past	past	past	June 8 - June 30
Davis	Kaysville	past	past	past	June 14 - June 28
Grand	Castle Valley	past	past	past	May 29 - June 9
Juab	Tintic	past	past	June 10	June 18 - July 5
Salt Lake	Holladay	past	past	past	June 10 - June 24
	West Valley City	past	past	past	June 9 - June 24
Sevier	Richfield	past	past	past	June 11 - June 29
Tooele	Erda	June 13	June 21	June 14	June 21 - July 4
	Tooele	past	past	past	June 15 - June 29
Uintah	Vernal	past	past	past	June 11 - June 29
	Alpine	past	past	past	June 16 - July 2
Utah	American Fork	past	past	past	June 10 - June 26
	Genola	past	past	past	June 10 - June 27
	Lincoln Point	past	past	past	June 13 - June 29
	Orem	past	past	past	June 9 - June 24
	Payson	past	past	past	June 12 - June 27
	Provo	past	past	past	June 9 - June 24
	Santaquin	past	past	past	June 12 - June 28
	West Mountain	past	past	past	June 12 - June 27
Weber	Pleasant View	past	past	past	June 12 - June 27
Wasatch	Heber City	June 17	June 28	June 19	June 27 - July 15
Wayne	Capitol Reef	past	past	past	June 3 - June 15

Spray Timing - Peach Twig Borer

Peach Twig Borer, First 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 300 and 360 degree days after biofix, or 5% and 16% egg hatch. End of egg hatch, where you should “keep fruit protected up to” is at 800 degree days.

County	Location	Start Date (large population)	Start Date (small population)	Keep Fruit Protected Up To:
Box Elder	Perry	June 21	June 24	July 15
	Tremonton	-	-	-
Cache	N. Logan	-	-	-
	Providence	-	-	-
	Smithfield	-	-	-
Carbon	Price	-	-	-
Davis	Kaysville	June 19	June 22	July 11
Grand	Castle Valley	past	past	June 23
Juab	Tintic	June 27	June 30	July 21
Salt Lake	Holladay	June 14	June 17	July 5
	West Valley City	June 14	June 17	July 7
Sevier	Richfield	June 13	June 17	July 11
Tooele	Erda	June 19	June 22	July 10
	Tooele	June 19	June 22	July 11
Uintah	Vernal	June 18	June 22	July 14
	Alpine	June 26	June 29	July 19
	American Fork	June 18	June 21	July 11
	Genola	June 18	June 22	July 11
	Lincoln Point	June 20	June 23	July 13
Utah	Orem	June 18	June 20	July 9
	Payson	June 18	June 21	July 10
	Provo	June 17	June 20	July 8
	Santaquin	June 20	June 23	July 13
	West Mountain	June 18	June 21	July 11
Weber	Pleasant View	June 22	June 25	July 13
Wasatch	Heber City	-	-	-
Wayne	Capitol Reef	past	past	June 29

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	hort. oil acetamiprid deltamethrin methoxyfenozide phosmet spinetoram thiacloprid rynaxypyr codling moth virus	variety Assail Battalion Intrepid Imidan Delegate Calypso Altacor Virosoft, etc	see label 3.4 oz 7-14 oz 16 oz 5.33 lbs 6-7 oz 4-8 oz 3.5-4.5 ---	12 h 12 h 4 h 5 d 4 h 12 h ---	<ul style="list-style-type: none"> 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
Powdery mildew	apple	potassium bicarbonate myclobutanil trifloxystrobin triflumizole fenarimol boscalid/pyraclostrobin	Kaligreen Rally (3) Flint (11) Procure (3) Rubigan (3) Pristine (7+11)	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	rotate among chemical classes to prevent resistance
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	<p>begin sprays according to spray timing table on previous page; maintain residual through end of egg hatch</p> <p>Delegate, Altacor: apply at 14 day intervals</p>
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 4-8 oz 10.5-14.5 oz see label		
Pacific flatheaded appletree borer	all fruit trees	esfenvalerate pyrethrin	Asana Pyganic	see label see label	4 h	<p>sprays usually not necessary in commercial orchards</p> <p>Pyganic: OMRI organic</p>

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 malathion gamma-cyhalothrin bifenthrin <i>Soft/organic</i> hort. oil (1%) spinosad codling moth virus	Ortho Max Flower, Fruit, and Veg., Sevin, Bonide Fruit Tree Spray, etc. Malathion Spectracide Triazicide Ortho Max Lawn and Garden Many products Green Light Lawn and Garden Spinosad; Gardens Alive Bull's Eye; Ferti-Lome Borer, Bagworm, Leafminer & Tent Caterpillar; Monterey Garden Insect Spray; Natural Guard Virosoft, Cyd-X	acetamiprid: every 14 days carbaryl: every 14 - 21 days malathion: every 7 days gamma-cyhalothrin: every 14 days bifenthrin: every 14 days hort. oil: lasts 5-7 days for killing eggs; use at beginning of each generation; apply at 1% rate only when temperatures are below 80; follow up with a different product spinosad: every 7 days codling moth virus can only be purchased online
White apple leafhopper	apple	imidacloprid acetamiprid	Ortho Max Tree and Shrub Ortho Max Flower, Fruit and Veg.	one application when nymphs are first noticed in spring
Powdery mildew	apple	<i>Conventional</i> bayleton propiconazole <i>Soft/organic</i> lime sulfur neem oil potassium bicarbonate	Lilly Miller Ferti-Lome Bonide Garden Safe Kaligreen	do not apply lime sulfur when temperature is over 75 degrees F
Peach twig borer	peach, nectarine	<i>Conventional</i> acetamiprid carbaryl malathion permethrin <i>Soft/organic</i> 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
Pacific flatheaded borer	all fruit trees	<i>Conventional</i> carbaryl imidacloprid permethrin	Sevin Bayer Advanced Tree & Shrub Spectracide	carbaryl and permethrin: apply 1 to 3 applications at 2-4 weeks apart, depending on severity imidacloprid: only on apples; apply once as a drench in spring

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.

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