

## News/What to Watch For:

Avoid pruning trees; new shoots that may be stimulated to grow will not be cold hardy

Keep peach and apple protected from internal caterpillars through harvest or until Sept. 15, whichever is earlier

When monitoring for pests (aphids or mites, especially), look for presence of beneficial predators that may make treatment unnecessary

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## Insect and Disease Activity/Info

### APPLES/PEARS

#### Codling Moth

Most of the warmer northern Utah locations are within the period of maximum egg hatch for the second generation (the time span at which the majority of eggs hatch in the shortest period of time). It is essential to keep the fruit well protected at this time.

Many of you will be picking apples well into October, and you may be wondering if the codling moth activity will ever end. The general rule of thumb for our area is that fruit should be protected until approximately September 15. Even though the second generation egg hatch is scheduled to end in some areas before this date, eggs of the third generation will start hatching soon afterward, ending close to the middle of Sept.

The reason that egg hatch ceases after approximately September 15 has to do with the shorter day length. Each life stage receives environmental "signals" that determine its outcome. Eggs, for example, need a certain amount of heat and daylight to signal hatching, and egg hatch starts to slow in late August. And earlier in the summer, mature larvae that exited fruit either entered a resting stage for overwintering, or pupated to become a moth for the subsequent generation.

#### Western Tentiform Leafminer

Sometimes you may notice a few mines in apple leaves here and there, and these are caused by larvae of the moth, western tentiform leafminer. This pest is rarely a problem in northern Utah as it is controlled by natural enemies and cold winters. Trees can tolerate a large number of mines (up to 5 mines per leaf late in the season) before any treatment is necessary. Larvae only feed on foliage, not on fruit.

mines in an apple leaf (top) and an exposed larva (bottom, with frass stuck to body)



This insect overwinters as a pupa, and adult moths emerge in early spring to lay eggs on unfolding leaves. Larvae feed between the upper and lower leaf layers, creating mines. Mines of the second generation larvae are showing up now, and adults of the third generation are emerging. There are about 3 generations per year in northern Utah.

### STONE FRUITS

#### Redhumped Caterpillar

The redhumped caterpillar is another minor pest of fruit trees that may be found in small, localized areas. The larvae feed as a group, and can defoliate trees if the population size is large.

## Insect and Disease Information, continued from previous page



This species overwinters as a mature larva in the ground, and does not emerge as a moth until July. Females lay clusters of eggs on the undersurface of leaves, and the mass of caterpillars march along together, eating leaf after leaf as they go. They do not feed on fruit.

Caterpillars can be found now, in stages ranging from early instars to mature larvae, depending on location. Young larvae are a dull yellow with a black head and black spot on the tail end. Older larvae have a bright red head, and the fourth abdominal segment is red and enlarged. There is just one generation in northern Utah. If you have found this insect, you can easily hand pick them off, or use spinosad.

### Pear Sawfly



The pear sawfly is also called the pear slug because the larva is slug-shaped, and covered with a slimy green ooze. There are two generations per year of this pest, and larvae of the second generation are feeding now and into early September.

This is another pest that is not common, but is sometimes found on the upper surface of pear, cherry, peach, or plum leaves. They typically only feed on the surface of the leaf, leaving the veins intact, skeletonizing the leaves. They generally do not cause economic harm, and do not need treatment. We have, however, seen large populations in localized areas. Larvae are very susceptible to most insecticides, and overwintering pupae can be killed in high numbers in cold winters.

### Cherry Powdery Mildew



If you had heavy cherry powdery mildew toward harvest, you might consider a post-harvest fungicide application to reduce inoculum (overwintering fruiting bodies) for the following year. Oil, at a 1% rate, applied now, is a good option; make sure you get good coverage. Sulforix, applied later in the season, is another option.

# Degree Day Accumulations and Insect Development

## Degree Day Accumulations and Insect Phenology

March 1 - Tuesday, August 3

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	1490	77	36	1339	78	23
	Tremonton	1219	29	4	1142	32	2
Cache	North Logan	1117	15	1	841	0	100 (1st)
	Providence	1264	36	7	907	2	0
	Smithfield	1118	15	1	889	1	0
Carbon	Price	1558	81	46	1347	78	23
Davis	Kaysville	1455	69	30	1318	74	20
Grand	Castle Valley	2253	26 (3rd gen)	5 (3rd)	2100	29	3 (3rd)
Juab	Tintic	1208	26	3	1027	10	0
Salt Lake	Holladay	1563	81	46	1445	92	46
	West Valley City	1671	91	66	1540	98	69
Sevier	Richfield	1539	79	43	1468	94	51
Tooele	Erda	1376	56	18	1376	84	32
	Tooele	1538	79	43	1407	88	37
Uintah	Vernal	1450	69	30	1296	70	16
Utah	Alpine	1323	46	11	1109	23	1
	American Fork	1504	77	36	1332	78	23
	Genola	1504	77	36	1327	74	20
	Lincoln Point	1463	69	30	1300	70	16
	Orem	1587	83	50	1385	84	32
	Payson	1431	66	27	1289	66	13
	Provo	1597	85	53	1414	89	41
	Santaquin	1394	60	21	1218	51	6
West Mountain	1349	50	14	1188	41	4	
Weber	Pleasant View	1515	77	40	1280	66	13
Wasatch	Heber City	1034	7	0	795	0	100 (1st)
Wayne	Capitol Reef	1915	1 (3rd Gen)	91	1741	0	95

## 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, Second Generation

Egg hatch of the second generation starts at 1100 degree days, and the period of greatest egg hatch occurs at 1320-1720 DD. End of egg hatch is at 2100 DD. Fruit in all areas should remain protected through approximately Sept. 15.

County	Location	Begin protecting fruit (egg hatch begins)	Period of Greatest Egg Hatch	Egg Hatch Ends
<b>Box Elder</b>	Perry	past	July 28 - August 13	September 1
	Tremonton	past	August 7 - August 24	September 15
<b>Cache</b>	N. Logan	August 2	August 12 - September 3	September 15
	Providence	past	August 6 - August 26	September 15
	Smithfield	August 2	August 11 - August 30	September 15
<b>Carbon</b>	Price	past	July 25 - August 11	September 4
<b>Davis</b>	Kaysville	past	July 29 - August 14	August 30
<b>Grand</b>	Castle Valley	past	past	Aug. 30 (3rd gen)
<b>Juab</b>	Tintic	past	August 8 - August 28	September 15
<b>Salt Lake</b>	Holladay	past	July 25 - August 8	August 22
	West Valley City	past	July 22 - August 5	August 19
<b>Sevier</b>	Richfield	past	July 26 - August 12	September 3
<b>Tooele</b>	Erda	past	August 1 - August 16	September 2
	Tooele	past	July 27 - August 10	August 25
<b>Uintah</b>	Vernal	past	July 29 - August 16	September 7
	Alpine	past	August 3 - August 20	September 11
	American Fork	past	July 27 - August 12	August 29
	Genola	past	July 27 - August 12	August 29
	Lincoln Point	past	July 29 - August 13	August 31
	Orem	past	July 24 - August 8	August 23
	Payson	past	July 30 - August 15	August 31
	Provo	past	July 24 - August 8	August 23
	Santaquin	past	July 31 - August 16	September 4
<b>Utah</b>	West Mountain	past	August 2 - August 18	September 5
<b>Weber</b>	Pleasant View	past	July 27 - August 11	August 26
<b>Wasatch</b>	Heber City	August 6	August 19 - September 15	September 15
<b>Wayne</b>	Capitol Reef	past	past	September 15 (3rd gen)

## Spray Materials - Commercial Applicators

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 4 h	<ul style="list-style-type: none"> <li>for all products, ensure good coverage for effective control</li> <li><b>codling moth virus</b> must be applied every 7 days</li> <li><b>Altacor</b> and <b>Delegate</b> have shown to have good efficacy, and target eggs and larvae</li> </ul>
Woolly apple aphid	apple	acetamiprid carbaryl diazinon endosulfan flonicamid	Assail Sevin Diazinon Thionex Beleaf	1.7 oz 1.5-3 qt 4 lb 3-4 lb 2-2.8 oz	12 h 4 d 4 d 12 h	<b>Beleaf:</b> 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	<p><b>Lorsban:</b> max once/season; do not allow spray to touch foliage/fruit</p> <p><b>Thionex:</b> max twice/season</p>
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>maintain residual through Sept. 15</p> <p><b>Delegate, Altacor:</b> apply at 14 day intervals</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/Insecticide Mode of Action Group (group)
Codling moth	apple, pear	<i>Conventional</i> acetamiprid carbaryl malathion gamma-cyhalothrin bifenthrin  <i>Soft/organic</i> 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	maintain protection through Sept. 15  <b>acetamiprid:</b> every 14 days; group 4 <b>carbaryl:</b> every 14 - 21 days; group 1 <b>malathion:</b> every 7 days; group 1 <b>gamma-cyhalothrin:</b> every 14 days; group 3 <b>bifenthrin:</b> every 14 days; group 3 <b>spinosad:</b> every 7 days; group 5 <b>codling moth virus</b> 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	<b>permethrin:</b> apply every 14-21 days until mid-September in highly infested areas; apply twice (now and one month later) in low infestations  <b>carbaryl:</b> must be applied every 7 days
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	maintain protection through Sept. 15  <b>permethrin:</b> every 14 days; this ingredient is becoming less available in stores  <b>Surround:</b> every 3-5 days; works to repel, not kill insects; only moderate control; must purchase online
Walnut husk fly	walnut	carbaryl malathion pyrethrin spinosad ( <i>Soft/Organic</i> )	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

**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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