

News/What to Watch For:

Examine trees for off-color foliage, wilting, leaf drop (these could be caused by a variety of factors: poor nutrition, root rot, prionus root borer, over- or under-irrigation); plan to collect leaf samples early Aug. for foliar nutrition analysis if necessary
Spray timing (codling moth and peach twig borer), pages 4-5
Spray material options, pages 6-7

Insect and Disease Activity/Info

POME FRUITS

Codling Moth

Second generation codling moth egg hatch is well under way in most locations. Be mindful of the time period of maximum egg hatch, which has begun for many areas of the Wasatch Front (see page 4). It will continue through approximately August 11. Make sure that the material you are using for control has active (rather than waning) residue on the fruit during this time period. (For Cache and Price counties, the period of maximum egg hatch is approximately early August - August 29.)

STONE FRUITS

Western Cherry Fruit Fly

Harvest is about finished for sweet cherries, and in progress for tart cherries. If a "last minute" treatment for cherry fruit fly is necessary, there are a few products to use: GF-120 (PHI: 4 hours), Sevin (3 days), and malathion (1-3 days). Note that the other brands of spinosad (Success, Entrust) have a 7-day pre-harvest interval.



Thrips on Nectarines

Adult and nymph thrips are actively feeding on a variety of host plants, and can sometimes be an issue on nectarines as they start to ripen. They can feed on the surface of the flesh, causing a silvery pattern. This does not damage the flesh, and is primarily an aesthetic issue.



Success (spinosad) is very effective on thrips, and the similar product, Delegate (spinetoram), also provides quick knock-down. Both materials have a 1 day PHI for nectarine (14 for peach). When spraying for thrips, complete coverage is essential since they usually feed in protected areas.

Iron Deficiency

Iron deficiency is a common sight in Utah orchards, and something growers have to deal with every year. Iron deficiency is not caused by a lack of iron in the soil, but rather the soil pH (which ranges from 7.5 to 8.5). In high pH, iron is insoluble, and therefore not available for root absorption. Because irrigation water is also very alkaline, trying to manage iron deficiency by reducing soil pH is impossible.

Iron deficiency is exacerbated by frequent springtime irrigation or prolonged soil wetness.

Insect and Disease Information, continued from previous page



Iron is a nutrient necessary for the formation of chlorophyll. Lack of chlorophyll means reduced photosynthesis, and reduced tree vigor. Iron-deficient leaves have interveinal chlorosis (yellowing between veins). In severe symptoms, leaves may show blackened scorching, curling, or premature drop. Some trees are genetically more susceptible to nutrient deficiencies than others.

To prevent or treat iron deficiency, chelated iron can be applied to the soil or foliage, but results are temporary. (Chelated products are readily available for absorption, and are not affected by soil pH.) Soil applications should be made in the spring, and worked into the root zone. For minor deficiencies, one application will last all season. Foliar sprays (0.1%) with a spreader-sticker provide quick results but must be reapplied at approximately 10- to 21-day intervals. The drawback of foliar sprays is that staining of fruit can occur.

To be sure of the correct nutrient deficiency, the USU Analytical Lab (435-797-2217) can test foliar and soil samples. Iron chlorosis symptoms usually show up later in the season, but research has shown that nutrient analysis of peach flowers in spring can be used for predicting iron deficiency.

New Pest Found in California Sweet Cherries

A new vinegar fly pest was discovered feeding on California cherries this summer. After much observation, it was identified as *Drosophila suzukii*, and called the spotted wing drosophila (SWD). It has since been found in raspberries, blackberries, strawberries, and blueberries in 21 counties in southern California. This insect is one of only two of the 3000 species of *Drosophila* (vinegar flies) that is a plant pest. Normally they feed on rotting fruit.



ucanr.org/blogs/strawberries_caneberries/index

Traps in infested areas have shown very high population sizes. Because SWD became widely established so quickly (apparently in one season), no eradication measures will be put into place. In addition, no other states have plans to survey for SWD at this time. California farmers have been using weekly applications of GF-120 or Entrust.

The female penetrates the skin of the fruit, laying 2-3 eggs per fruit. A single female can lay up to 350 eggs. The larvae develop inside the fruit, and it is still unclear whether they pupate within the fruit, or drop to the ground.

In the warm California climate, the SWD is predicted to have 3 generations during the cherry season. They are most active at 68° F, and least active at temperatures above 86° F. Above 86° F, males become sterile.

Whether this pest could become established in Utah is unknown. The eggs, larvae, and adults cannot survive below freezing, but the survivorship of pupae has yet to be determined. SWD is established on the island of Hokkaido in Japan, where in winter, snowfall is heavy and temperatures average 14° F. The dry climate of Utah may prove advantageous in preventing establishment because vinegar flies are sensitive to desiccation, and die within 24 hours in the absence of water.

Degree Day Accumulations and Insect Development

Upcoming Monitoring/Insect Activity

Pest	Host(s)	DD/Monitoring Action
Western cherry fruit fly	cherry	Adults continue emerging through late summer (beyond harvest)
Fire blight	apple, pear	Prune out strikes in July 18" down
San Jose scale	apple mostly	Treat at 1900 DD for 2nd generation crawlers
Codling moth	apple, pear	Second generation egg-hatch begins at 1100 DD (after biofix)
Peach twig borer	peach, nectarine	2nd gen. egg-hatch begins at 1200 DD after biofix
Obliquebanded leafroller	most fruits	2nd gen. flight begins at approx. 1500 DD (base 50)
Spider mite	all	Look for stippled leaves closest to ground first; populations build in the heat

Degree Day Accumulations

March 1 - Wednesday, July 22

County	Location	GDD (50)	Codling Moth, 2nd Gen.			Peach Twig Borer, 2nd Gen.			San Jose Scale (base 51)
			DD (post biofix)	% Moth Flight	% Egg Hatch	DD (post biofix)	% Moth Flight	% Egg Hatch	
Box Elder	Perry	1486	1258	35	6	1032	12	0	1080
	Tremonton	1370	1080	11	0	819	0	0	954
Cache	North Logan	1107	916	2	99 (1st)	619	0	90 (1st)	829
	Providence	1259	1073	10	0	721	0	98 (1st)	956
	Smithfield	1092	916	2	99 (1st)	634	0	92 (1st)	837
Carbon	Price	1419	1159	19	2	941	3	0	1035
	Spring Glen	1246	1022	6	100 (1st)	797	0	100 (1st)	945
Davis	Kaysville	1425	1188	24	3	1027	11	0	1020
Grand	Castle Valley	2137	1843	98	85	1682	0 (3rd)	91	1455
Salt Lake	Holladay	1545	1275	38	7	1089	21	1	1067
	West Valley City	1593	1325	47	12	1136	31	2	1121
Tooele	Erda	1576	1344	51	14	1122	28	1	1172
	Grantsville	1855	1543	79	43	1194	44	4	1203
	Tooele	1579	1346	51	15	1117	26	1	1179
Uintah	Vernal	1389	1152	19	2	941	3	0	1005
Utah	Alpine	1305	1057	8	0	768	0	99 (1st)	960
	Genola	1488	1238	32	5	980	6	0	1034
	Lincoln Point	1365	1112	13	1	933	2	0	967
	Orem	1517	1323	47	12	1065	16	0	1128
	Payson	1451	1227	31	4	985	6	0	1031
	Provo	1643	1284	40	9	1071	18	0	1107
	Santaquin	1424	1210	27	3	970	5	0	1060
Weber	Pleasant View	1475	1261	36	7	976	5	0	1057

“Base 41,” “base 50,” and “base 51” refer to the lower temperature threshold at which certain insects develop. For example, codling moth does not start developing in spring until temperatures reach 50 degrees or more.

Spray Timing - Codling Moth

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

Codling Moth, First and Second Generations

Second generation egg hatch begins at 1100 DD (the date to "start sprays". Second generation egg hatch ends at 2100 DD.

Do not apply any materials between your last spray for the first generation and the "start spray" date for second generation.

County	Location	FIRST GENERATION	SECOND GENERATION		
		Keep Fruit Protected To This Date	Start Sprays	Period of Greatest Egg Hatch	Keep Fruit Protected To This Date
Box Elder	Perry	---	July 16	July 25 - August 11	August 30
	Tremonton	---	July 23	August 1 - August 17	September 5
Cache	N. Logan	July 26	July 30	August 9 - August 29	September 15
	Providence	---	July 23	August 3 - August 22	September 15
	Smithfield	July 25	July 29	August 7 - August 25	September 15
Carbon	Price	---	July 24	July 30 - August 20	September 15
	Spring Glen	July 21	July 26	August 6 - August 29	September 15
Davis	Kaysville	---	July 19	July 27 - August 12	August 28
Grand	Castle Valley	---	June 26	July 5 - July 18	July 31
Salt Lake	Holladay	---	July 15	July 24 - August 6	August 20
	West Valley City	---	July 14	July 22 - August 6	August 20
Tooele	Erda	---	July 13	July 21 - August 5	August 20
	Grantsville	---	July 5	July 14 - July 29	August 12
	Tooele	---	July 13	July 21 - August 5	August 20
Uintah	Vernal	---	July 20	July 30 - August 18	September 10
Utah	Alpine	---	July 24	August 2 - August 19	September 9
	Genola	---	July 16	July 25 - August 10	August 26
	Lincoln Point	---	July 21	July 30 - August 15	September 2
	Orem	---	July 13	July 22 - August 6	August 21
	Payson	---	July 17	July 26 - August 10	August 26
	Provo	---	July 14	July 23 - August 8	August 23
	Santaquin	---	July 17	July 26 - August 11	August 28
Weber	Pleasant View	---	July 16	July 24 - August 8	August 23

Spray Timing - Peach Twig Borer

Peach Twig Borer, First and Second Generations: The “start spray date” for second generation corresponds to 1200 DD, and ends at 1880 DD.

County	Location	FIRST GENERATION	SECOND GENERATION	
		Keep Fruit Protected Through This Date	Start Date (2nd Gen.)	Keep Fruit Protected Through This Date
Box Elder	Perry	---	July 29	August 30
	Tremonton	July 22	August 6	September 8
Cache	All Locations	July 30	August 17	harvest
Carbon	Price	---	August 4	September 19
	Spring Glen	July 23	August 6	harvest
Davis	Kaysville	---	July 29	August 25
Grand	Castle Valley	---	---	July 29
Salt Lake	Holladay	---	July 26	August 19
	West Valley City	---	July 24	August 19
Tooele	Erda	---	July 25	August 20
	Grantsville	---	July 22	August 17
	Tooele	---	July 25	August 20
Uintah	Vernal	---	August 3	September 9
Utah	Alpine	July 23	August 9	September 14
	Genola	---	July 30	August 28
	Lincoln Point	---	August 2	August 31
	Orem	---	July 27	August 23
	Payson	---	July 30	August 27
	Provo	---	July 27	August 23
	Santaquin	---	July 31	August 29
Weber	Pleasant View	---	July 30	August 26

Spray Material Options - Commercial Applicators

Target Pest	Host	Chemical	Example Brands	Amount per acre	REI	PHI	Comments
Spider mites	all	bifenazate	Acramite	0.75- 1 lb	12 h	3-7 d	
		hexythiazox	Savey	3-6 oz	12 h	28 d	
		clofentezine	Apollo	4-8 oz	12 h	21-45 d	
		fenbutatin-oxide	Vendex	1-2 lb	48 h	14 d	
		abamectin	Agri-Mek	10-20 oz	12 h	28 d	
		spirodiclofen	Envidor	16-18 oz	12 h	7 d	
Codling moth	apple, pear	acetamiprid	Assail	3.4 oz	12 h	7 d	• for all products, ensure good coverage for effective control
		deltamethrin	Battalion	7-14 oz	12 h	21 d	
		methoxyfenozide	Intrepid	16 oz	4 h	14 d	• codling moth virus must be applied every 7 days
		phosmet	Imidan	5.33 lbs	5 d	7 d	
		spinetoram	Delegate	6-7 oz	4 h	7 d	
		thiacloprid	Calypso	4-8 oz	12 h	30 d	• Altacor and Delegate have shown to have good efficacy
		rynaxypyr	Altacor	3.5-4.5		14 d	
		codling moth virus	Virosoft, etc	---	---	---	
Woolly apple aphid	apple	diazinon	Diazinon 50W	4 lb	4 d	21 d	
		endosulfan	Thionex	3-4 lb	4 d	21 d	
		flonicamid	Beleaf	2-2.8 oz	12 h	21 d	
		thiamethoxam	Actara	4.5-5.5 oz	12 h	35 d	
Earwigs	peach, nectarine	carbaryl	Sevin	2.5-3.75 lb	12 h	3 d	no more than three applications/season; residual only lasts 1-2 days
Peach twig borer	peach, nectarine	Bt	Dipel	see label	4 h	---	begin sprays according to spray timing table on previous page and keep fruit protected
		spinetoram	Delegate	4.5-7 oz	4 h	14 d	
		spinosad	Success, Entrust	see label	4 h	14 d	
		methoxyfenozide	Intrepid	8-16 oz	4 h	14 d	Delegate: apply 7 day intervals; 1-day PHI on nectarine
		endosulfan	Thionex	4 lb	4 d	30 d	
		phosmet	Imidan	4 lb	4 d	14 d	
Greater peachtree borer	peach, nectarine, apricot	chlorpyrifos	Lorsban	see label	4 d	14 d	Lorsban: max once/season; do not allow spray to touch foliage/fruit
		endosulfan	Thionex	see label	4 d	21 d	
		esfenvalerate	Asana	see label	12 h	14 d	Thionex: max twice/season
		permethrin	Pounce	4-8 oz	12 h	14 d	
Lygus bug	peach, nectarine	endosulfan	Thionex	see label	4 d	21 d	
		esfenvalerate	Asana	5-12 oz	12 h	14 d	
		lambda-cyhalothrin	Warrior	1.3-2.5 oz	24 h	14 d	
Western cherry fruit fly	cherry	carbaryl	Sevin	1 pint	12 h	3 d	
		malathion	Malathion	12 oz	12 h	3 d	
		imidacloprid	Provado	2 oz	12 h	7 d	
		spinosad	Success, Entrust	see label	4 h	7 d	
		spinosad + bait	GF-120	see label	4 h	4 h	
Walnut husk fly	walnuts	cyfluthrin	Baythroid	2.4-2.8 oz	12 h		
		phosmet	Imidan	4.33-8.5 lb.	5 d		
		spinosad	GF-120	20 oz	4 h		
		spinetoram	Delegate	3-7 oz	4 h		
		permethrin	Ambush	16-24 oz	12 h		

Spray Material Options - 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
Spider mites	all	horticultural oil insecticidal soap	variety variety	use no higher than 1% oil, and do not apply over 85 F
Codling moth	apple, pear	<i>Conventional</i> carbaryl malathion gamma-cyhalothrin acetamiprid <i>Soft/orgainc</i> hort. oil spinosad	Sevin, Bonide Fruit Tree Spray, etc. Malathion Spectracide Triazide Ortho Max Flower, Fruit, and Vegetable many options Green Light Lawn and Garden Spinosad, Gardens Alive Bull's Eye, Ferti-Lome Borer, Bagworm, Leafminer & Tent Caterpillar Spray, Monterey Garden Insect Spray, Natural Guard	Carbaryl: every 7 days Malathion: every 7 days Acetamiprid: every 14 days hort. oil: lasts 7 days; use at beginning of each generation; apply at 1% rate ONLY when temperatures are below 80 spinosad: every 7 days
Woolly apple aphid	apple	<i>Conventional</i> carbaryl	Sevin	apply only as needed; thorough coverage essential
Earwigs	peach, nectarine	<i>Conventional</i> carbaryl	Sevin	apply only if needed; cover bark and adjacent soil 1-2 times
Peach twig borer	peach, nectarine	<i>Conventional</i> carbaryl malathion permethrin <i>Soft/orgainc</i> spinosad kaolin clay	Sevin, Bonide Fruit Tree Spray, etc. Malathion Adams Yard Spray, Ortho Basic Solutions Yard and Garden, Bonide Eight RTU, Hi Yield Permethrin Concentrate see 'codling moth' above Surround	see comments under Codling Moth Surround: every 3-5 days; works to repel, not kill insects; only moderate control; must purchase 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 Indoor/Outdoor Broad Use Including Gardens; Hi-Yield Pemethrin, Lilly Miller Multi-Purpose Insect Spray, Spectracide Bug Stop Garden 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
Western cherry fruit fly	cherry	carbaryl esfenvalerate malathion pyrethrin spinosad (<i>Soft/Organic</i>)	Sevin Ortho Bug-B-Gone Malathion Concern Multi-Purpose Ferti-Lome, Green Light, Natural Guard, GF-120	start applications only when fruit in sunniest locations develops a salmon blush spinosad: every 7 days
Walnut husk fly	walnuts	spinosad malathion permethrin	GF-120, Gardens Alive Bullseye malathion Bayer Advanced Dust	Most are every 7 days. Continue until harvest.

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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