

News/What to Watch For:

Check codling moth traps daily (if you are using them for monitoring) to get biofix (first moth flight)
Examine apple leaves for bright white powdery spores of powdery mildew
Examine apple, peach, and cherry leaves for new colonies of aphids forming
Images of bud stages, page 4
Spray information, pages 5-6

Bud Stages

A threat of frost is in the cards for tonight, but after that, evening temperatures seem to be on the rise.

Davis, Box Elder, Salt Lake, Weber counties:

Apples: king bloom - full bloom
Cherries (tart): full bloom
Cherries (sweet): petal fall
Pears: bloom - petal fall

Cache County:

Apples: open cluster - pink
Cherries: first white
Peaches: bloom
Pears: first bloom

Utah County:

Apples: king bloom - full bloom
Cherries (tart): full bloom
Pears: bloom - petal fall

Insect and Disease Activity/Info

APPLES/PEARS

Fire Blight

Remember: antibiotics for fire blight infections only work on open blossoms

Risk for fire blight is LOW in most areas through May 7. By May 9 in the Utah County area, blight risk changes to HIGH due to warmer temperatures. Remember that in a HIGH risk, infection is possible on wetted flowers. "Wetting" means 2+ hours of rain, irrigation water, heavy dew, or other moisture. If wetting occurs on May 9 or soon afterward, apply antibiotic within 24 hours before or after the infection (wetting) event.

An alternative option for backyard growers is to not spray, but monitor trees closely in the next several weeks after bloom. Look for new infections, and prune them out immediately (on a dry day). You do not need to disinfect pruners between cuts. Cut 10" below visible infection.

The following pictures will help to determine what fire blight infections look like.

With warm weather in spring, existing fire blight cankers will start to ooze.



After an infection, symptoms will show up about 2 weeks later.



Insect and Disease Information, continued from previous page



On new infections, look for darkened fruit pedicels, and droplets of bacterial ooze.



Also look for darkened areas at the base of leaves near flower/fruit clusters.



On less susceptible apple varieties, fire blight will kill the clusters, and the bacteria will not spread further.



Fire blight was named for the symptoms on pear, in which fruit and leaves turn black.

You can look up fire blight risk in one of 10 locations on Utah Climate Center's TRAPs site: climate.usu.edu/pest.php. Simply click on a location on the map, then select "fire blight" from the drop down menu, and hit "submit." You can tailor the results to the fire blight history in your area.

Note that the risk levels provided in the table on page 5 are for areas that had fire blight in the trees last year. The risk level goes down if your own trees did not have fire blight (even if there is a chance of spread from neighborhood trees).

Green peach aphid

Scattered green peach aphid colonies are forming now, and populations will continue to increase with warmer weather and expanding foliage.

Early feeding on nectarines can cause damage similar to that caused by thrips (scarring, gummosis). Look for small, green insects on the new foliage and treat if necessary. Backyard growers can use insecticidal soap.



Rosy apple aphid

Rosy apple aphids are hatching now, and will build populations as the weather warms. Adults are all females, and give birth to live young. At this time of year, they are tucked away at the bases of blossom clusters, feeding on newly expanding leaves. As they feed, their saliva causes the developing fruit to become distorted.

If you have not made an application and know that this aphid is a problem in your trees, make an inspection for activity. Shake a limb over a cloth tray to look for dislodged, rosy-colored aphids, and look for damage (curled leaves) on at least 10 terminals per tree, especially toward the center of the tree. If you find one colony per tree, make an application at petal fall.

continued on next page

Insect and Disease Information, continued from previous page

Codling Moth

The only places codling moth has been detected are in Grand County (Castle Valley) and Wayne County (Capitol Reef). Spray information for these locations is found on page 4.

No moths have been detected in northern Utah. They typically start emerging at full bloom of Red Delicious, and need a warm (above 50 F) night to fly. We predict that moths will be caught by this weekend or early next week. We will then be able to calculate the first spray date, which is typically about 10 days later; however, the exact timing is temperature dependent. Stay tuned!

Materials for Codling Moth Control

COMMERCIAL GROWERS:

The following list is not all-inclusive, but includes some of the newer products for codling moth control. As commercial growers must shift away from Guthion and pyrethroids (to avoid mite outbreaks), it is important to understand the alternative options.

Altacor (rynaxypyr): Altacor has been shown to have excellent control of both first and second generation codling moth. Washington State University (WSU) research has shown that it also kills eggs. It should be applied at 220 DD after biofix. It lasts 14 days.

Assail (acetamiprid): In WSU studies, Assail performed similarly to Imidan (and almost as well as Guthion). Assail is primarily a larvicide, but WSU found that Assail is also highly toxic to codling moth eggs. Assail lasts approximately 14 days and has a PHI of 12 hr, and 7-day PHI. Good coverage is essential. Michigan State University (MSU) reports that the higher rate on the label is most effective, especially for the second generation. This is a fairly broad spectrum product (neonicotinoid).

Belt (flubendiamide): Belt has the same mode of action as Altacor, but is not as effective.

Calypso (thiacloprid): Calypso is similar to Assail in mode of action, efficacy against codling moth, and mammalian toxicity, but has a 30 day PHI. The application rate at the high end works best. This is a fairly broad spectrum product (neonicotinoid).

Clutch (clothianidin): WSU field trials found that Clutch, which works against newly hatched larvae, is not a highly effective material for codling moth.

Delegate (spinetoram): Like Altacor, Delegate is very lethal to codling moth larvae. Field testing at WSU and MSU

showed that Delegate has provides excellent control of first and second generation larvae. The larvae must consume the material to die, so Delegate should be applied at the start of egg hatch (220 DD after biofix). It lasts 14-21 days depending on codling moth density and rate. A program rotating Delegate and Altacor has shown to be as effective as Guthion.

Esteem (pyriproxyfen): Esteem is an insect growth regulator and it has activity primarily against the eggs. WSU found that in order for it to be effective, the insecticide must be present BEFORE eggs are laid. Therefore, Esteem should be applied at the petal fall stage. This may not be a good product for locations with high populations, but could be a good supplement to mating disruption.

Intrepid (methoxyfenozide): Intrepid is also an insect growth regulator. WSU studies found that in some cases Intrepid might not kill the larva but the subsequent adult will not be able to reproduce, which is considered a sublethal effect. Intrepid must be ingested by larvae to have a toxic effect. Intrepid has strong ovicidal activity whether applied after eggs are laid, or if eggs are laid on residues. Intrepid lasts about 14 days, but is not a good alternative to Guthion, but could be used as an early application (petal fall) to kill eggs, delaying the second cover spray.

BACKYARD GROWERS

The following list includes the chemical name of the active ingredient (carbaryl, for example). Brand names (Sevin, for example) are not used because there are many different brands that carry the same active ingredient, and individual suppliers do not all carry the same brands, but most should have products with the same active ingredients. Look at the small print on the front of the label for "active ingredient."

Acetamiprid: This active ingredient was made available in 2009 and is a good option for backyard growers. It lasts approximately 14 days and is very effective against codling moth larvae and eggs. Spectracide and Ortho have acetamiprid products.

Spinosad: Spinosad is a low toxicity product that is soft on beneficials. It must be applied every 10 days, and is moderately effective.

Carbaryl: Carbaryl is a broad spectrum insecticide with good efficacy against codling moth and many other pests. It lasts 14 days for heavy populations, and possibly up to 21 days in areas of light infestations. It is a fruit thinner, so using carbaryl 4-6 weeks after petal fall will cause fruit drop. It is toxic to natural enemies and honeybees, and can cause spider mite outbreaks.

Insect and Disease Information, continued from previous page

Malathion: Malathion is a broad spectrum insecticide that has good efficacy against codling moth, but must be applied every 7 days. Not all malathion products are the same, so be sure to read the label for application information.

Horticultural oil: Oil at the 1% rate can be used during the egg laying stage at the beginning of each generation (for example, 7-10 days after full bloom for first generation) to kill eggs. It has no residual activity, so another material should be used 7-14 days later.

Azadirachtin: These products are softer on beneficial insects and mammals, but not as effective on codling moth.

Bt (*Bacillus thuringiensis*), Pyrethrum, insecticidal soap, and pyrethrin/rotenone are not effective against codling moth.

Two backyard growers, one in Utah County, and one in Cache County, reported using banana bait in 2009. They filled milk gallon jugs with a mixture of 1 cup apple cider vinegar, 1 cup sugar, 1 banana peel, and water to full, and hung 1 jug in each tree. The Utah County grower reported trapping thousands of moths in her jugs and ending up with about 15% injury (but it was a bumper crop, anyway). She did not apply any supplemental sprays. The Cache County grower did not trap as many codling moths with this method, and had more severe injury.

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 Generation:

“Start sprays” occurs at 220 DD. The period of greatest egg hatch occurs from 340 DD - 640 DD. “Last spray” is two weeks *prior* to the end of egg hatch. Materials that last 2 weeks, should be applied on this date.

County	Location	Start Sprays (1% egg hatch)	Period of greatest egg hatch	Last Spray Date
Grand	Castle Valley	May 19	May 27 - June 12	June 12
Wayne	Capitol Reef	May 23	May 31 - June 15	June 14

Degree Day Accumulations and Insect Development

Upcoming Monitoring/Insect Activity

Pest (in order of appearance)	Host	Appearance/Management Action
Cherry powdery mildew	cherry	Look for small white lesions on new foliage near the base and interior of the tree
Apple powdery mildew	apple	Look for small white lesions on new foliage
Green peach aphid	peach, nectarine	Look for colonies on peach and nectarine
Black cherry aphid	cherry	Watch terminals for leaf-curling and feeding
White apple leafhopper	apple	Look for nymph activity
Codling moth	apple fruit	First flight approximately Red Delicious full bloom
San Jose scale	apple mostly	Crawler emergence in mid spring Treat in mid to late June

Degree Day Accumulations

March 1 - Tuesday, May 4

County	Location	GDD (50)	Fire Blight Warning
Box Elder	Perry	149	May 5-9: LOW
	Tremonton	115	May 5-9: LOW
Cache	North Logan	108	No Blight
	Providence	133	No Blight
	Smithfield	97	No Blight
Carbon	Price	146	No Blight
Davis	Kaysville	147	May 5-9 - LOW
Grand	Castle Valley	64 (after CM biofix)	---
Juab	Tintic	95	May 5-6: EXTREME; May 7 - HIGH, May 8-9: EXTREME
Salt Lake	Holladay	188	May 5-6: LOW, May 7-8: CAUTION, May 9: HIGH
	West Valley City	192	May 5-6: LOW, May 7-8: CAUTION, May 9: HIGH
Tooele	Erda	160	May 5-6: LOW, May 7-8: CAUTION, May 9: HIGH
	Tooele	148	May 5-6: LOW, May 7-8: CAUTION, May 9: HIGH
Uintah	Vernal	138	May 5-9: LOW
Utah	Alpine	138	May 5-9: LOW
	American Fork	158	May 5-7: LOW; May 8: CAUTION, May 9: HIGH
	Genola	185	May 5-6: LOW, May 7-8: CAUTION, May 9: HIGH
	Lincoln Point	-	May 5-6: LOW, May 7-8: CAUTION, May 9: HIGH
	Payson	165	May 5-6: LOW, May 7-8: CAUTION, May 9: HIGH
	Provo	188	May 5-6: LOW, May 7-8: CAUTION, May 9: HIGH
	Santaquin	144	May 5-6: LOW, May 7-8: CAUTION, May 9: HIGH
West Mountain	163	May 5-7: LOW, May 8-9: CAUTION	
Weber	Pleasant View	153	May 5-9: LOW
Wasatch	Heber City	98	No Blight
Wayne	Capitol Reef	227	---

Bud Phenological Stages

Apple

Open cluster



Pear

Bloom



Peach

Petal fall



King bloom



Cherry

First bloom



Bloom



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 legal to use “softer” materials such as Bt or spinosad during bloom, we still recommend either: waiting until the petal fall stage or apply at dawn or dusk when pollinators are not active.

Target Pest	Host	Chemical	Example Brands	Amount per acre	REI	Comments
Campylocoma	apple	acetamiprid	Assail	1.7-3.4 oz	12 h	
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"> works on eggs only ensure good coverage for effective control virus must be applied every 7 days has shown to have good efficacy
Rosy apple aphid	apple	acetamiprid clothianidin flonicamid imidacloprid thiacloprid	Assail Clutch Beleaf Provado Calypso	1.7 oz 2-3 oz 2-2.8 oz 4-8 oz 2-4 oz	12 h 12 h 12 h 12 h 12 h	apply post bloom
Thrips	light-skinned apples, nectarines	endosulfan spinosad	Thionex Success	4 lb 4-8 oz	24 h 4 h	<ul style="list-style-type: none"> apply just before bloom or during bloom at dusk or dawn Thionex will also control lygus and campylocoma; toxic to bees
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	apply starting at open cluster stage
Fire blight	apple, pear	streptomycin oxytetracycline	Agri-mycin Mycoshield	check label check label		apply within 24 h of a wetting event only if fire blight was present last year
Green peach aphid	peach, nectarine	acetamiprid imidacloprid	Assail Provado	8 oz 4-8 oz	12 h 12 h	
Lygus bug	peaches	azadirachtin beta-cyfluthrin cyfluthrin pyrethrin	Aza-Direct Baythroid Tombstone Pyganic	1-2 pints 2-2.4 oz 2-2.4 oz 4..-18	4 h 12 h 12 h 4 h	OMRI certified organic restricted use product restricted use product OMRI certified organic

Spray Materials - Residential Applicators

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

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

Target Pest	Host	Chemical	Example Brands	Comments
Codling moth	apple, pear	acetamiprid azadirachtin carbaryl malathion pyrethrin spinosad	Spectracide, Ortho Azatin Sevin, Bonide Fruit Tree Spray Malathion Concern Multi-Purpose Green Light	<ul style="list-style-type: none"> • Rotate among chemical classes to prevent resistance. • Most are applied every 7 days, but read the label. • See spray timing below
Rosy apple aphid	apple	carbaryl bifenthrin malathion neem oil permethrin	Bayer Advanced Ortho Bug-B-Gone Bonide, Malathion Green Light Lilly Miller	start with a single application
Powdery mildew	apple	bayleton lime sulfur propiconazole neem oil potassium bicarbonate	Bonide Lilly Miller Ferti-Lome Garden Safe Kaligreen	do not apply lime sulfur when temperature is over 75 degrees F
Fire blight	apple, pear	biological streptomycin oxytetracycline	Blightban, Bloomtime Ferti-Lome Mycoshield	<ul style="list-style-type: none"> • Biologicals should be applied at 15-20% bloom and again at full bloom • Do not use antibiotic unless necessary; apply within 24 h of a wetting event only if fire blight was present last year
Green peach aphid	peach, nectarine	malathion pyrethrin	Bonide, Malathion Pyganic	start with a single application

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
is published weekly by Utah State University Extension

Editor: Marion Murray, marion.murray@usu.edu
[click here](#) for archived advisories