UtahState University COOPERATIVE EXTENSION

Tree Fruit IPM Advisory

UTAH PESTS

Weekly Orchard Pest Update, Utah State University Extension, **May 20, 2009**

News/What to Watch For:

Hang western cherry fruit fly traps everywhere except Cache County
Hang peach twig borer traps everywhere except Cache County
Examine leaves for leafhopper, spider mites, caterpillars (fruitworm, leafrollers, cankerworm)
Thinning information for residential growers, page 3, Worker Protection Standards Information for commercial growers, page 4
Spray timing (codling moth), page 6
Spray materials, pages 7-8

Insect and Disease Activity/Info

APPLES/PEARS

Codling Moth

Additional biofixes recorded:

Kaysville: May 12
Lincoln Point: May 12
Price: May 13
Providence: May 17
Smithfield: May 18
Spring Glen: May 18
Tremonton: May 19
Vernal: May 11

A note to commercial fruit growers: Entomologist Diane Alston reports that her research codling moth traps located in mating disruption orchards are catching high numbers of first generation adults. Some traps have caught as many as 40 moths in one week. She suspects that most of these are males, but there is no doubt that a small number are females (possibly already mated). Growers using mating disruption should all be monitoring the codling moth numbers in your apple blocks. Apple trees are loaded with fruit this year, and a large first generation that is left uncontrolled will lead to greater problems down the road.

USU recommends using the CM/DA lure ('combo' lure, Trece) in monitoring traps. From three years of data, Alston has developed threshold levels for the combo lure, provided below. This season, she is validating those numbers with treatments applied when the threshold is reached.

Codling moth treatment threshold levels in mating disrupted orchards using the combo lure; threshold level is a cumulative moth catch, within each generation.

% Injury	Threshold
0.5	10 moths
1.0	20 moths
5.0	100 moths

Other lure options that are commonly used are the "mega-lure" and "10x" lures. Alston's research has found that trap catch with these lures is much LOWER than the combo lure. Also, moth catch is inconsistent, so results are not a reliable indicator of population density, nor is there a clear relationship between trap catch and fruit injury. Growers that feel most comfortable using these types of lures should continue, but consider adding an additional trap with a combo lure for comparison. It may take time getting used to trapping higher numbers of moths. Be sure to also watch fruit for injury, and treat when you have historically felt the need.

For residential growers, check the spray timing chart on page 6. Most of you should choose the "traditional start date" for spraying, which is 1% egg hatch. I know that people are getting "antsy" about treating for codling moth now with the warm weather and fruit development. Keep in mind that if you treat early, you will not have enough residue on the fruit when the egg hatch starts speeding up. Note that the materials have been slightly altered in the "spray material" table on page 8. We have made an attempt to order products by "conventional" and "soft/organic" and the products listed first are the most efficacious.

Spider Mites

Very low numbers of spider mites were found in apples in Box Elder County, and in peaches in Utah County this week. It is not time to treat now, but monitor all trees in your

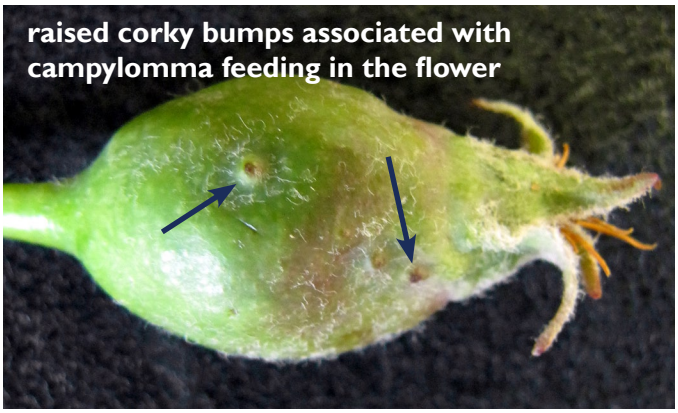
continued on next page

Insect and Disease Information, continued from previous page

orchard, starting with the lowest, interior leaves first. Spider mites overwinter in groundcover, and move up the tree when populations increase, or when the groundcover dries or is cut. Moderate populations will be regulated by predatory spider mites. These mites are slightly larger, and move very quickly through the mite colony.

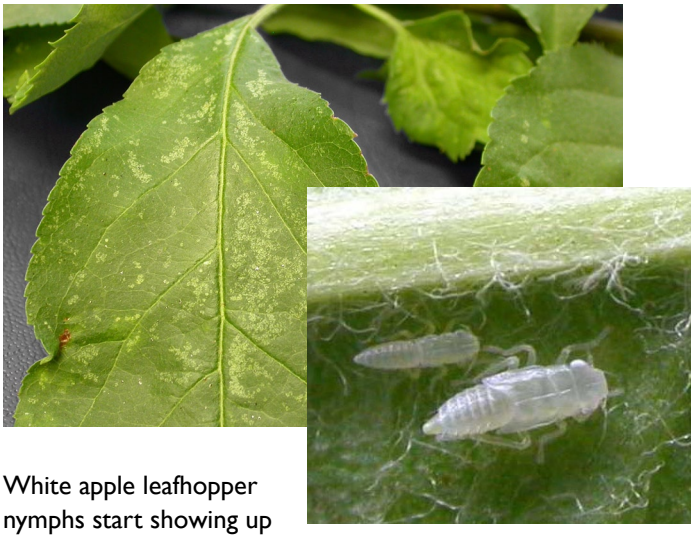
To determine a treatment threshold, collect 5 random leaves from one branch at eye level. An average of 10 mites/leaf would require a treatment. Begin monitoring in July, and continue every 1-3 weeks until temperatures cool.

Campylomma bug


raised corky bumps associated with campylomma feeding in the flower

A few apple fruitlets damaged by campylomma bug (mullein plant bug) were found in orchards in Utah County. As mentioned in earlier advisories, campylomma nymphs are normally predatory insects, however; if there is not enough food, they may feed on flowers and developing fruit. Plenty of campylomma still remain in the orchards, and will help to regulate other pest populations, such as mites, aphids, and pear psylla.

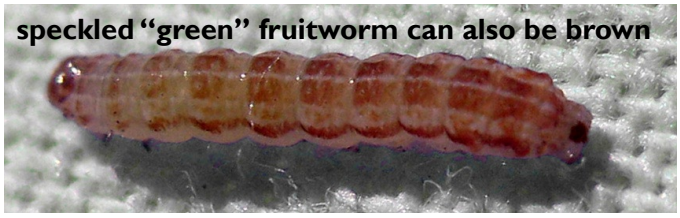
White apple leafhopper

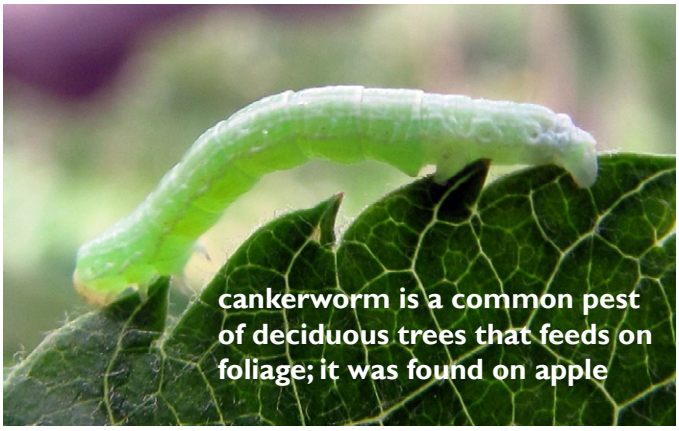


White apple leafhopper nymphs start showing up around petal fall. None have been found yet in high numbers, but growers that have had a problem with this pest in the past should be monitoring now. One or more per leaf causes stippling damage. This in itself will not harm the tree, but the problem is that untreated early generations lead to a nuisance situation for apple pickers at harvest.

Using Sevin XLR for fruit thinning will provide sufficient control. For commercial growers, entomologists from Cornell suggest using Provado, Actara, or Assail for leafhopper, as these products also provide control for leafminer (a minor pest in UT) and rosy apple aphid.

Speckled Green Fruitworm


speckled "green" fruitworm can also be brown


cankerworm is a common pest of deciduous trees that feeds on foliage; it was found on apple

There are several species of fruitworms, but past monitoring has shown that the speckled green fruitworm is the most common. They feed on leaves and fruit of all tree fruits. The main damage is early fruit feeding that causes scarring. They overwinter as pupae, emerge in early spring, and lay eggs as the foliage is expanding. They are still very small and difficult to see among the foliage, so monitoring should be done by banging branches over a cloth tray.

We do not have a threshold set for Utah, but the UC-Davis IPM Program recommends treatment for one caterpillar/50 beat tray samples, or one caterpillar/100 fruit clusters. For residential growers, this would equate to one larva/tree.

Fire Blight

Where trees are in bloom (including Cache County and trees that have "rat-tail" blooms), there is still a HIGH to EXTREME risk of fire blight infection due to the warm weather. If there is a 2+ hour wetting event, consider keeping trees protected. As you see new infections, prune them out up to 14" below the diseased tissue.

Production Information

Residential Growers: Thinning the Home Orchard

By Dr. Brent Black, Extension Fruit Specialist

Fruit trees must like their job, because when left to their own devices they often produce more fruit than they can handle. Then, home gardeners are left wondering why their fruit aren't as big or as sweet as those found in Utah's farm stands and farmers markets. The solution to this problem is in proper pruning and thinning to keep a balance between fruit growth and tree health.

Why thin – The objective of thinning is to balance supply with demand (leaves per fruit) and in the case of apples and pears, to prevent or at least reduce biennial bearing. The goal is to have fewer fruit in favor of larger size, sweeter flavor, and a crop every year.

Supply and demand - For fruits to grow large and sweet, they require lots of energy in the form of carbohydrates. Maintaining a healthy root system and producing adequate new shoots and leaves also requires carbohydrate energy. This energy all comes from photosynthesis in the existing leaves. Too many developing fruits competing for the carbohydrates supply of a limited number of leaves result in lower fruit quality (smaller size, less sugar), weak shoot and root growth, and declining tree health. In the case of apples and pears, this energy drain in combination with plant hormones coming from the developing fruit, signal the plant to produce less flower buds for the following year.

Alternate cropping – Flower buds in temperate fruit trees begin their development the season before they open. For apple and pear, this starts 3 to 6 weeks after bloom. Peach flower buds begin to form 2 months after bloom. The presence of developing apple and pear fruitlets will prevent the short side-shoots known as spurs from initiating flower buds for the next year. If too many spurs set fruit in a given season, then there will be few or no blossoms the following year. This situation is known as alternate cropping or biennial bearing.

When to thin – Most fruit trees will partially thin themselves through natural fruit drop. However, this comes after a lot of energy is wasted on the extra fruit, and after the chance for improving return bloom has past. For best results, apples should be thinned when the largest fruits are between ½ and ¾ of an inch in diameter. Thinning late will help fruit size, but return bloom will be compromised. Peaches and other stone fruits should be thinned when fruits are ¾ to 1 inch in diameter. Stone fruits do not typically suffer from biennial bearing, but waiting too long wastes the plant's energy and the opportunity to get the largest, sweetest fruit possible.

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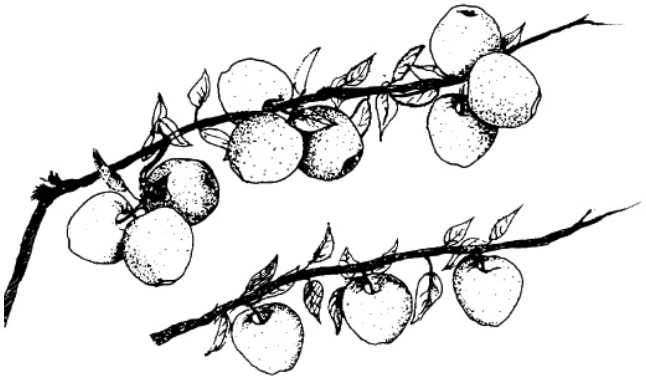
Your hand can guide you in spacing peaches, nectarines, apricots, and prunes, 3-5 inches apart.



NC State University Extension

Each apple cluster should be thinned to the largest fruitlet, and individual clusters spaced 6-8 inches apart.

How to thin – When thinning, pick off the smallest fruits as well as any that are misshaped or damaged. Then adequately space the remaining fruits. Peaches, nectarines and other stone fruits should be spaced out 3 to 5 inches along a shoot. If the trees have not been properly pruned to reduce the amount of fruiting wood, additional thinning may be required to prevent a heavy crop from breaking limbs. To achieve the large sweet peaches that we all enjoy, a moderate-sized peach tree should only produce 100 to 150 fruits on the entire tree. Apple blossoms come in clusters of five or six and, when pollination conditions are right, may try to produce three or more fruits on each cluster. For best results, apple clusters should be thinned to one fruit, and fruiting clusters spaced 6 to 8 inches apart.

continued on next page

Production Information, continued

Residential Orchards: Pruning Mature Fruit Trees, continued from previous page

No more fruit – Some homeowners enjoy the appearance of a flowering tree, but would prefer not to deal with all of the nuisance fruit. For pome fruits such as apples, crabapples, and flowering pears, there is a chemical alternative to avoid the nuisance. When applied to plants, the chemical ethephon releases a natural plant hormone. This hormone signals a stress response which will cause flowers to abort and drop from the tree. For best results, the material should be applied as a foliar spray at bloom. Avoid using the material in hot weather (>90°F), as this will result in excessive stress and may cause leaf drop or other harmful side effects. Ethephon is not recommended for use in stone fruits (peach, nectarine, apricot, cherry) as leaf drop and other side effects will be excessive. Ethephon is available in a homeowner formulation known as FLOREL. As with any chemical, read and follow the label carefully.

Chemical thinning? – There are some chemicals such as ethephon that are used to thin large commercial orchards. However, these are typically not recommended for the home owner or hobbyist, because response is extremely variable and there is a high risk of undesirable side effects, due to a very narrow acceptable dose range. A relatively slight overdose can result in complete fruit removal and leaf drop. An inadequate dose wastes time, money, and the opportunity to maximize fruit growth and return bloom.

Hand thinning will take time and effort, but the improved fruit quality and consistent cropping will be worth the effort.

Commercial Orchards: EPA Enforcement of Worker Protection Standards

By Dr. Howard Deer Extension Pesticide Specialist

The Worker Protection Standard for Agricultural Pesticides was established in 1992 by the Environmental Protection Agency to protect agricultural handlers and agricultural workers against the potential hazards that agricultural pesticides might present to them. It applies only to farms, greenhouses, nurseries, and forests producing agricultural products. If it is not one of these sites, then the standard does not apply. The standard is printed on the label in a box called "Agricultural Use Requirements", that is located in the section of the label called "Directions For Use". You must do what is in that box if you are on a farm, in a greenhouse, nursery, or a forest producing agricultural products. Otherwise, you would only need to comply with the regular label.

The EPA has had this standard on the books now for 17 years and they have said that they are done training and will now do enforcement from this point forward. One of our sites at Utah State University has been visited and found to be out of compliance.

Also, the question has come up as to whether or not a volunteer would have to receive the worker protection training and the other components of the standard. The EPA said they don't think there are many true volunteers. Just about everybody is being compensated in some way (maybe not with money, but with privileges, free produce, or other things). So they must be treated as workers.

Here is the link to a factsheet on the Worker Protection Standard for Agricultural Pesticides available on the Extension Integrated Pest Management Web site: "Worker Protection Standard for Agricultural Pesticides".

If you have questions about these requirements, you should contact Drew Matthews with the Utah Department of Agriculture and Food, 801-538-4925 or email, dmatthews@utah.gov.

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
Apple powdery mildew	apple	Look for small white lesions on new foliage
White apple leafhopper	apple	Look for nymph activity
Codling moth	apple, pear	Egg-hatch begins at 220 DD (after biofix)
Western cherry fruit fly	cherry	Hang traps at 700-750 DD (base 41); first flies at 900-950
Peach twig borer	peach, nectarine	Hang traps at 300 DD; first moths at 400-450 DD
San Jose scale	apple mostly	Crawler emergence at 300-400 DD after biofix Treat at 600-700 DD

Degree Day Accumulations

March 1 - Wednesday, May 20

County	Location	GDD 50	Codling Moth			San Jose Scale (base 51)	Western Cherry Fruit Fly (base 41)
			DD (post biofix)	% Moth Flight	% Egg Hatch		
Box Elder	Perry	336	108	15	0	101	710
	Tremonton	299	9	1	0	8	682
Cache	North Logan	214	23	2	0	21	521
	Providence	228	42	4	0	40	537
	Smithfield	198	22	2	0	21	460
Carbon	Price	352	92	15	0	86	720
	Spring Glen	371	21	2	0	20	721
Davis	Kaysville	325	88	11	0	82	700
Grand	Castle Valley	676	382	73	25	350	1180
Salt Lake	Holladay	368	99	15	0	86	756
	West Valley City	367	98	15	0	88	775
Tooele	Erda	335	104	15	0	97	697
	Grantsville	484	172	32	0	161	925
	Tooele	340	107	15	0	100	745
Uintah	Vernal	345	107	15	0	101	699
Utah	Alpine	336	84	10	0	83	702
	Genola	403	150	27	0	137	793
	Lincoln Point	332	69	8	0	64	692
	Orem	341	147	27	0	137	733
	Payson	366	141	24	0	130	712
	Provo	476	117	19	0	104	868
	Santaquin	358	137	24	0	128	733
Weber	Pleasant View	312	98	15	0	87	681

"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

Please check this chart each week for updated dates. These dates are forecasted using the average temperature for each site. Most residential growers should start sprays at the "traditional start date," unless you choose to use horticultural oil at 200 DD. Fruit should remain protected through each generation according to interval provided on pesticide label.

Codling Moth, First Generation

		If using early ovicide option				
County	**Location**	***Apply early ovicide* (50-150 DD)***	**OR**	***Apply Oil (200 DD)***	***Apply delayed 1st cover (350 DD)***	**Traditional Start Date (1% egg hatch)**
Box Elder	Perry	May 17 - May 24		May 29	June 8	May 31
	Tremonton	May 25 - June 2		June 6	June 16	June 8
Cache	N. Logan	May 23 - June 3		June 7	June 18	June 9
	Providence	May 21 - June 1		June 6	June 17	June 9
	Smithfield	May 23 - June 3		June 7	June 19	June 9
Carbon	Price	May 17 - May 29		June 4	June 17	June 6
	Spring Glen	May 25 - June 6		June 11	June 22	June 13
Davis	Kaysville	May 18 - May 26		May 30	June 9	May 31
Grand	Castle Valley	----		---	---	May 13
Salt Lake	Holladay	May 18 - May 26		May 26	June 7	May 29
	West Valley City	May 17 - May 24		May 26	June 6	May 30
Tooele	Erda	May 17 - May 25		May 28	June 8	May 30
	Grantsville	---		May 23	June 3	May 25
	Tooele	May 16 - May 23		May 26	June 7	May 30
Uintah	Vernal	May 15 - May 24		May 29	June 9	May 30
Utah	Alpine	May 18 - May 28		June 1	June 12	June 1
	Genola	May 12 - May 22		May 26	June 6	May 27
	Lincoln Point	May 18 - May 28		June 1	June 11	June 2
	Orem	May 13 - May 21		May 23	June 1	May 25
	Payson	May 13 - May 24		May 27	June7	May 26
	Provo	May 17 - May 25		May 26	June 5	May 28
	Santaquin	May 13 - May 23		May 26	June 7	May 28
Weber	Pleasant View	May 16 - May 23		May 29	June 8	May 30

*Ovicides include: Altacor, Intrepid, Rimon, and Esteem (for commercial growers only)

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	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 lable 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 ---	• 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
Powdery mildew	apple	potassium bicarbonate myclobutanil trifloxystropin 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..5-18	4 h 12 h 12 h 4 h	OMRI certified organic restricted use product restricted use product OMRI certifiec organic
Brown mite	all fruit trees	abamectin acequinocyl bifenazate etoxazole fenpyroximate pyridaben spirodiclofen	Agri-Mek Kanemite Acramite Zeal Fujimite Nexter Envidor	10-20 oz 21-31 oz .75-1 lb 2-3 oz 32 oz 3.5-10 oz 16-18 oz	12 h 12 h 12 h 12 h 12 h 12 h 12 h	best used before mid-June only one application/season two applications/season one application/season

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	*Conventional* carbaryl malathion gamma-cyhalothrin bifenthrin acetamiprid *Soft/orgainc* spinosad codling moth virus	 Sevin, Bonide Fruit Tree Spray, etc. Malathion Spectracide Ortho Bug-B-Gone Ortho Max Flower, Fruit, and Veg. Green Light, Gardens Alive Bull's Eye Virosoft, Cyd-X	• Rotate among chemical classes to prevent resistance. • Most are applied every 7-14 days, but read the label. • codling moth virus is an organic option, but can only be purchased online.
Powdery mildew	apple	*Conventional* bayleton propiconazole *Soft/orgainc* 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
Fire blight	apple, pear	streptomycin oxytetracycline	Ferti-Lome Mycoshield	• 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	*Conventional* malathion *Soft/orgainc* pyrethrin	Bonide, Malathion Pyganic	start with a single application

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