



Current Report

Oklahoma Cooperative Extension Fact Sheets are also available on our website at:
<http://osufacts.okstate.edu>

Commercial Apple Insect and Disease Control — 2008

Phil Mulder
 Extension Entomologist

Read and follow all label directions

In the following tables, the quantity of materials to mix to apply to apples is the amount of spray volume needed to cover one acre of well pruned, standard size trees. In Oklahoma, application rates will vary from 25-200 gallons per acre. Effectiveness of spray volumes will be determined by several factors including: tree sizes, tree densities, canopy density, and nozzle type. Irrespective of the amount of liquid per acre

applied, use the amount of chemical per acre listed below as a guide for mixing. Numerous insecticides are labeled for use and are effective against insect and mite pests on apples. See the list of labeled insecticides for materials we have been able to determine are labeled for current use. However, registrations and use patterns are constantly changing and all recommendations should be offered with the advice to **READ THE LABEL** of any and all pesticides to be used on any crop.

Application and Timing	Pests Involved	Amount of Materials Needed		Comments	
		Material ¹ (MOA Group)*	Per Acre		
DORMANT: Apply when trees are dormant and temperature is above 40°F.	San Jose Scale	Superior Summer Oil ² (**)	See label	For scale insect control apply a minimum of 150 gallons of liquid per acre.	
	Forbes Scale				
	European red mite	Microthiol Special (M) (Mites only)	10-20 lbs	Delayed dormant application. Suppression of aphids. Aphids only.	
	Apple aphid	Apollo SC (10)	4-8 oz		
		Battalion 0.2EC ¹ (3)	14.1 oz		
		Beleaf 50SG (9C)	2.0-2.8 oz		
		Lorsban 4E (1B)	1.5 pts		
GREEN TIP:	Scab	Bayleton 50DF (3)	2-8 oz		
		Flint (11)	2-3 oz		
		Nova 40W (3)	5-8 oz		
		Rubigan EC (3)	8-12 oz		
		Sovran (11)	4-6.4 oz		
		Topsin-M 70W (1)	1-1.5 lb		
		Ziram 76DF (M4)	6-8 lb		
	Powdery Mildew	Bayleton 50DF (3)	2-8 oz		
		Nova 40W (3)	5-8 oz		
		Rubigan EC (3)	8-12 oz		
		Topsin-M 70W (1)	1-1.5 lb		
		Ziram 76DF (M4)	6-8 lb		
	Cedar Apple Rust	Bayleton 50DF (3)	2-8 oz		
		Nova 40W (3)	5-8 oz		
		Rubigan EC (3)	8-12 oz		
		Ziram 76DF (M4)	6-8 lb		
	Scale or Mites	Battalion 0.2EC ¹ (3)	7.0-14.1 oz		Scale only. If application is delayed until tight cluster to pink, reduce oil to 1/2 -1 gal per 100 gal.
		Superior Oil or highly refined summer oil (**)	See label		
		Pasada 1.6F (4A)	8 oz		
		Provado 1.6 F (4A)	8 oz		

<i>Application and Timing</i>	<i>Pests Involved</i>	<i>Amount of Materials Needed</i>		<i>Comments</i>
		<i>Material¹ (Group)*</i>	<i>Per Acre</i>	
GREEN TIP: (cont'd)		Danitol 2.4EC ^r (3) (mites only)	16.0-21.33 oz	Superior Oil, Pasada, Provado, and Danitol kill overwintering eggs of mites.
		Zeal (10B)	2-3 oz	
		Apollo SC (mites only) (10)	4 oz	
		Savey 50WP (10A) (mites only)	3 oz	
		Acramite 50WS (25) (mites only)	0.75-1.0 lb	
PREBLOOM: When flower buds first show pink.	Scab	Same as Green Tip		
	Powdery Mildew	Same as Green Tip		
	Cedar Apple Rust	Same as Green Tip		
	Cankerworm	Asana XL (3)	4.8-14.5 oz	
	Aphids	Assail 70WP (4A)	1.1-1.7 lbs	
		Ambush 2EC ^r (3)	6.4-25.6 oz	Aphids only.
		Battalion 0.2EC ^r (3)	7.0-14.1 oz	Aphids only.
		Beleaf 50SG (9C)	2.0-2.8 oz	
		Danitol 2.4EC ⁴ (3)	10.66-21.33 oz	
		Dimethoate 4EC (1B)	2-4 pt	
		Lannate LV ^r (1A)	2 pt	
		Lorsban 4E ^r (1B) (No preharvest interval, because labeled use is prior to fruiting.)	1.5 pt	
		Mustang-Max ^r (3)	1.28-4.0 oz	
		Pasada 1.6F (4A)	8 oz	
BLOOM STAGE: When the first blossoms open. To protect bees do not use insecticides during the bloom stage.	Fireblight	Agri-Strep	See label	
	Scab, Powdery Mildew, Cedar Apple Rust	Same as Green Tip		
	Codling moth	Do not apply insecticides.		See Footnote 3
		Isomate CT or Checkmate CM	400 200	
PETAL FALL: When most of the petals have fallen. Sevin should not be applied until 30 days after full bloom to avoid thinning of fruit.	Scab, Powdery Mildew, Cedar Apple Rust	Same as Green Tip		
	Codling Moth, Plum Curculio	Ambush 25W ^r (3) Asana XL ^r (3) Assail 70WP (4A) Battalion 0.2EC ^r (3) Calypso 4F (4A) Danitol 2.4EC ^r (3) Dimethoate 4EC (1B) (codling moth) Entrust (5) Guthion 50WP ^r (1B) Imidan 70WP ⁶ (1B) Intrepid 2F (1B) Javelin (11B2) Lannate LV ^r (1A) Mustang-MAX ^r (3) Pounce 3.2EC ^r (3) Rimon 0.83EC (15) Warrior ^r (3)	6.4-25.6 oz 4.8-14.5 fl oz 1.7-3.4 lbs 7.0-14.1 oz 4.8 oz 16.0-21.33 oz 1 pt 2-3 oz 2-3 lb 2.13-5.33 lb 10 -16 oz 0.5-4.0 lb 2 pt 1.28-4.0 oz 4-8 oz 30-50 oz 2.56-5.12 oz	Javelin, Intrepid, and Entrust are for codling moth and other caterpillar pests only.

<i>Application and Timing</i>	<i>Pests Involved</i>	<i>Amount of Materials Needed</i>		<i>Comments</i>
		<i>Material¹ (Group)*</i>	<i>Per Acre</i>	
FIRST COVER: Two weeks after petal fall.	Scab, Cedar Apple Rust, Powdery Mildew	Same as Green Tip		
	Codling Moth	Assail 70WP (4A) Asana XL ¹ (3) Battalion 0.2EC ¹ (3) Calypso 1.4F (4A) Danitol 2.4EC ¹ (3) Dimethoate 4EC (1B) Guthion 50WP ¹ (1B) Imidan 70WP ⁶ (1B) Intrepid 2F (18) Javelin (11B2) Lannate LV ¹ (1A) Mustang-Max ¹ (3) Rimon 0.83EC (15) Seize 35 WP (7D) Thiodan 3EC (2A)	1.7-3.4 lbs 4.8-14.5 fl oz/A 7.0-14.1 oz 4-8 oz 16.0-21.33 oz 1 pt 3 lb 2.13-5.33 lb 12-16 oz 0.5-4.0 lb 2 pt 1.28-4.0 oz 20-50 oz 4-5 oz 6 pt	Rimon is effective for leafrollers. See label for specific rates.
	Aphids Scale	Asana XL (3) Beleaf 50SG (9C) Danitol 2.4EC ¹ (3) (aphids only) Dimethoate 4EC (1B) Mustang-Max ¹ (3) Pasada 1.6 F (4A) Provado 1.6F (4A) Seize 35WP (7D)	4.8-14.5 oz 2.0-2.8 oz 10.66-21.33 oz 2 pt 1.28-4.0 oz 8 oz 8 oz 3-5 oz	
SECOND COVER: Ten days after first cover.	Black Rot (Frog Eye Leaf Spot), Sooty Blotch, Bitter Rot, Flyspeck	Benlate 50WP (1) Captan 50WP (M4) Flint (11) Sovran (11) Topsin-M 70W (1) Ziram 76DF (M4)	6-12 oz 4-8 lb 2-3 oz 4-6.4 oz 1-1.5 lb 6-8 lb	
	Codling Moth Aphids	Same as First Cover.		
THIRD COVER: Ten days after second cover.	Sooty Blotch, Scab, Bitter Rot Codling Moth	Same as Second Cover.		
		Same as First Cover plus Sevin ⁴	1 lb	
FOURTH COVER: Ten days after third cover. About June 1.	Bitter Rot	Same as Second Cover.		
	Codling Moth	Same as First Cover plus Sevin. ⁴	1 lb	
	Mites	Abacus ⁷ (6) Acramite 50WS (25) Agri-Mek ⁵ 0.15 EC (6) Carzol SP (1A) Dicofol 4E (20) Kelthane 35W (20) Onager 1 EC (10A) Pyramite 60 WP (21) Summer oil (**) Wettable Sulfur (M) Vendex 50WP ¹ (12B) Zeal (10B)	10-20 oz 0.75-1.0 lb 10-20 oz 1-1.5 lb 4 pt 4-8 lb 12-24 oz 4.4-13.2 oz 1/2-1% solution 5-15 lb 1-2 lb 2-3 oz	For best results, use Abacus ⁷ with horticultural spray oil, not a dormant oil. Limited to a period extending from petal fall through six weeks following petal fall.
FIFTH AND LATER COVERS: At 10 day intervals until 2 weeks before harvest.	Codling Moth	Same as First Cover plus Sevin. ⁴	1 lb	
	Mites	Same as Fourth Cover Sprays.		

* Chemical Group Classifications can be found at the following Web sites:

Herbicides: <http://www.plantprotection.org/hrac/>; **Insecticides:** <http://www.irac-online.org/>; **Fungicides:** <http://www.frac.info/>.

** Horticultural oils are physical toxicants which act as suffocant and entrapment insecticides.

† Restricted use pesticide.

¹ Check Table 1 for date of last application prior to harvest.

² Scale insects may not be a problem if trees were regularly sprayed in cover applications with Guthion in the previous year. Horticultural oils act as a suffocant and entrapment insecticide.

³ Mating disruption dispensers are only recommended in orchards with low codling moth populations and not in blocks of less than 5 acres. Isomate CT releases pheromone for a minimum of 100 days, but Checkmate CM dispensers release pheromone for only 75 days. Two applications of Checkmate CM per season should be made.

⁴ Avoid use of Sevin from bloom to 30 days after full bloom, unless fruit thinning is desired, then follow directions on the label. Avoid use of Sevin in areas exhibiting heavy mite infestation.

⁵ Do not exceed 20 fl. oz. per acre per application or 40 fl. oz. per acre in a growing season. Do not make more than 2 applications per growing season. Do not apply in less than 40 gal. of water per acre. If second application is needed, do not re-treat within 21 days. See label for additional precautions about certain varieties.

⁶ Imidan is very sensitive to alkaline hydrolysis; therefore, check the pH of the tank mix and add a buffering agent if necessary, to adjust the pH to 6.0 or lower. Do not attempt to acidify solutions containing copper compounds.

Table 1. Limitations. NUMBER OF DAYS BEFORE HARVEST

DAYS FROM LAST APPLICATION TO HARVEST			
CHEMICALS*	DAYS	CHEMICALS*	DAYS
Abacus [†]	28	Lorsban 50W [†]	28
Acramite 50WS	7	Mustang-Max [†]	14
Agri-Mek	28	Nova	14
Agri-Strep	50	Omite	7
Ambush [†]	Do not apply after petal fall.	Onager	28
Apollo SC	45	Pasada	7
Asana XL [†]	21	Pounce [†]	Do not apply after petal fall.
Battalion [†]	21	Provado	7
Bayleton	45	Pyramite 60WP	25
Beleaf	21	Rimon	14
Calypso	30	Rubigan EC	30
Captan	0	Savey WP	Do not apply after pink stage.
Carzol SP	7	Seize	35
Danitol 2.4EC	14	Sevin	3
Dimethoate 4EC	28	Sovran	30
Dicofol	7	Summer Oil	0
Flint	30	Thionex	21
Guthion 50W [†]	14	Topsin-M 70W	0
Imidan	7	Vendex [†]	14
Javelin	0	Wettable Sulfur	7
Kelthane	7	Zeal	28
Lannate LV	14	Ziram	14
Lorsban 4E [†]	14		

* See labels for other limitations.

† = Restricted use pesticide.

MITES. The most important mites of this region are red mites and twospotted mites. Red mites pass the winter as somewhat spherical eggs of a bright red to orange color on twigs and smaller branches of the tree. Twospotted mites generally overwinter as orange, hibernating females in protected locations of cover crops or other debris. They then migrate to the foliage of the trees in the spring and summer. Mites overwintering on the tree may be controlled by delayed dormant oil sprays. In the event control is not satisfactory, one should rotate between Kelthane, Omite, or Guthion sprays.

WOOLY APPLE APHID. The winter is spent as eggs and young nymphs on elm trees. After two spring generations on elm, they migrate to apples, usually in late June or early

July. Several generations are produced on apples during the remainder of the summer. These aphids are purplish and characteristically covered with white, waxy secretion. Their presence can be detected by visual observations of the scaffold limbs. They are usually found where there are wounds from pruning or at the base of water sprouts. Chemicals, such as Guthion, applied to control other aphids usually suppress populations of this pest as well.

For detailed information on using pesticides safely, see OSU Extension Fact Sheets EPP-7451, "Agricultural Pesticide Storage"; EPP-7454, "Check Your Pesticide Labels"; and EPP-7457, "Toxicity of Pesticides."

Oklahoma State University, in compliance with Title VI and VII of the Civil Rights Act of 1964, Executive Order 11246 as amended, Title IX of the Education Amendments of 1972, Americans with Disabilities Act of 1990, and other federal laws and regulations, does not discriminate on the basis of race, color, national origin, gender, age, religion, disability, or status as a veteran in any of its policies, practices, or procedures. This includes but is not limited to admissions, employment, financial aid, and educational services.

Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Robert E. Whitson, Director of Cooperative Extension Service, Oklahoma State University, Stillwater, Oklahoma. This publication is printed and issued by Oklahoma State University as authorized by the Vice President, Dean, and Director of the Division of Agricultural Sciences and Natural Resources and has been prepared and distributed at a cost of 20 cents per copy. 0308 GH Revised.