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Commercial Apple Insect and Disease Control — 2007

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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* — *Material[1] (Group)**	*Per Acre*	*Comments*
DORMANT: Apply when trees are dormant and temperature is above 40°F.	San Jose Scale Forbes Scale	Superior Summer Oil[2] (*)	See label	For scale insect control apply a minimum of 150 gallons of liquid per acre.
	European red mite Apple aphid	Microthiol Special (M) (Mites only)	10-20 lbs	
		Apollo SC (10)	4-8 oz	Delayed dormant application.
		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	

Application and Timing	*Pests Involved*	*Amount of Materials Needed* *Material[†] (Group)**	*Per Acre*	*Comments*
GREEN TIP: (cont'd)	Scale or Mites	Superior Oil or highly refined summer oil (*)	See label	If application is delayed until tight cluster to pink, reduce oil to $^1/_2$ -1 gal per 100 gal.
		Pasada 1.6F (4A)	8 oz	
		Provado 1.6 F (4A)	8 oz	
		Danitol 2.4EC[r] (mites only) (3)	16.0-21.33 oz	
		Zeal (10B)	2-3 oz	
		Apollo SC (mites only) (10)	4 oz	Superior Oil, Pasada, Provado, and Danitol kill overwintering eggs of mites.
		Savey 50WP (mites only) (10A)	3 oz	
		Acramite 50WS (mites only) (25)	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 Aphids	Asana XL (3)	4.8-14.5 oz	
		Assail 70WP (4A)	1.1-1.7 lbs	
		Ambush 2EC[r] (3)	6.4-25.6 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	
		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	400	
		Checkmate CM	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)	6.4-25.6 oz	
		Asana XL[r] (3)	4.8-14.5 fl oz	
		Assail 70WP (4A)	1.7-3.4 lbs	
		Calyoso 4F (4A)	4.8 oz	
		Danitol 2.4EC[r] (3)	16.0-21.33 oz	
		Dimethoate 4EC (1B) (codling moth)	1 pt	
		Entrust (5)	2-3 oz	
		Guthion 50WP[r] (1B)	2-3 lb	
		Imidan 70WP[6] (1B)	2.13-5.33 lb	
		Intrepid 2F (1B)	12-16 oz	
		Javelin (11B2)	0.5-4.0 lb	Javelin, Intrepid, and Entrust are for codling moth and other caterpillar pests only.
		Lannate LV[r] (1A)	2 pt	
		Pounce 3.2EC[r] (3)	4-8 oz	
		Rimon 0.83EC (15)	20-50 oz	
		Warrior[r] (3)	2.56-5.12 oz	

Application and Timing	*Pests Involved*	*Amount of Materials Needed* *Material† (Group)**	*Per Acre*	*Comments*
FIRST COVER: Two weeks after petal fall.	Scab, Cedar Apple Rust, Powdery Mildew	Same as Green Tip		
	Codling Moth	Assail 70WP (4A)	1.7-3.4 lbs	
		Asana XL[r] (3)	4.8-14.5 fl oz/A	
		Calypso 1.4F (4A)	4-8 oz	
		Danitol 2.4EC[r] (3)	16.0-21.33 oz	
		Dimethoate 4EC (1B)	1 pt	
		Guthion 50WP[r] (1B)	3 lb	
		Imidan 70WP[6] (1B)	2.13-5.33 lb	
		Intrepid 2F (18)	12-16 oz	
		Javelin (11B2)	0.5-4.0 lb	
		Lannate LV[r] (1A)	2 pt	
		Rimon 0.83EC (15)	20-50 oz	Rimon is effective for leafrollers. See label for specific rates.
		Seize 35 WP (7D)	4-5 oz	
		Thiodan 3EC (2A)	6 pt	
	Aphids Scale	Asana XL (3)	4.8-14.5 oz	
		Danitol 2.4EC[r] (3) (aphids only)	10.66-21.33 oz	
		Dimethoate 4EC (1B)	2 pt	
		Pasada 1.6 F (4A)	8 oz	
		Provado 1.6F (4A)	8 oz	
		Seize WP35 (7D)	3-5 oz	
SECOND COVER: Ten days after first cover.	Black Rot (Frog Eye Leaf Spot), Sooty Blotch, Bitter Rot, Flyspeck	Benlate 50WP (1)	6-12 oz	
		Captan 50WP (M4)	4-8 lb	
		Flint (11)	2-3 oz	
		Sovran (11)	4-6.4 oz	
		Topsin-M 70W (1)	1-1.5 lb	
		Ziram 76DF (M4)	6-8 lb	
	Codling Moth Aphids	Same as First Cover.		
THIRD COVER: Ten days after second cover.	Sooty Blotch, Scab, Bitter Rot	Same as Second Cover.		
	Codling Moth	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[r] (6)	10-20 oz	
		Acramite 50WS (25)	0.75-1.0 lb	
		Agri-Mek[5] 0.15 EC (6)	10-20 oz	
		Carzol SP (1A)	1-1.5 lb	
		Dicofol 4E (20)	4 pt	
		Kelthane 35W (20)	4-8 lb	
		Onager 1 EC (10A)	12-24 oz	
		Pyramite 60 WP (21)	4.4-13.2 oz	
		Summer oil (*)	$^1/_2$-1% solution	
		Wettable Sulfur (M)	5-15 lb	
		Vendex 50WP[r] (12B)	1-2 lb	
		Zeal (10B)	2-3 oz	
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.		

* Horticultural oils are physical toxicants which act as suffocant and entrapment insecticides.
[r] 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.
[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.
* 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/.

Table 1. Limitations. NUMBER OF DAYS BEFORE HARVEST

DAYS FROM LAST APPLICATION TO HARVEST

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

* See labels for other limitations.
[r] = 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 F-7451, “Agricultural Pesticide Storage”; F-7454, “Check Your Pesticide Labels”; and F-7457, “Toxicity of Pesticides.”

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