

## Grape Pest Management Options for Colorado - 2006<sup>1</sup>

Pest or Disease	Materials	Rate per acre <sup>2</sup>	Remarks
Powdery Mildew	Sulfur products:		To minimize risk of disease resistance, rotate categories of controls, not products within categories. Avoid using sulfurs on Muscat cultivars and when temperatures will exceed 90°F. Avoid use of sulfurs on Concord or <i>V. lambrusca</i> type grapes after bloom.  Do not use strobilurin materials for last spray of the season.
	● Flowable Sulfur (6F)	3 - 6 qts.	
	● Microthiol Disperss 80DF	3-10 lbs.	
	● Thiolux 80DF	2 - 5 lbs.	
	● Wettable sulfurs (90W, etc.)	5 - 10 lbs.	
	□ Lime-Sulfur (liquid)	4-10 gal (dormant) 0.5 - 2 qt (foliage) 10 - 20 gal (post-harvest)	
	DMI fungicides:		
	● Bayleton 50DF	4 - 6 oz.	
	● Nova 40W	3 - 5 oz.	
	● Rubigan 1E	2 - 6 fl. oz.	
	○ Elite 45DF	4 oz.	
	Strobilurin fungicides:		Quinolines (Quintec) have no curative properties, they are protectants only.  Apply Erase at 50 - 200 gal / acre.
	● Flint 50WDG	2 oz.	
	● Sovran 50W	4 oz.	
	○ Abound 2.08F	11 - 15 fl. oz.	
	Carboximide fungicides:		
	○ Endura 70WDG	4 oz.	
	Combination fungicides:		
● Pristine 38WDG	8 - 10.5 oz.		
Quinolines:			
○ Quintec	3 - 6.6 fl. oz.		
Oils:			
■ Stylet-Oil	1.5 gal. / 100 gal.		
■ Erase	1 - 2 qts. / 50 - 200 gal.		
Potassium Bicarbonate materials:			
■ Kaligreen 82W	2.5 - 5 lbs.		
Biocontrol products:			
■ AQ10	0.5 - 1.0 oz.		
□ Serenade 10W	4 - 8 lbs.		
□ Sonata Biofungicide	2 - 4 qt.		

<sup>1</sup> Prepared by H. J. Larsen, Western Colorado Research Center, Grand Junction, CO.

<sup>2</sup> Always check the label as changes in labeled rates can occur without extensive notice.

● Product demonstrated to be effective under Colorado conditions.

○ No documented experience under Colorado conditions, but found to be effective elsewhere.

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Pest or Disease	Materials	Rate per acre <sup>1</sup>	Remarks
Bunch Rot	<ul style="list-style-type: none"> <li>○ Dithane F-45 4F</li> <li>○ Rovral 4L</li> <li>□ Serenade 10W</li> <li>□ Serenade Max 0.14</li> </ul>	<ul style="list-style-type: none"> <li>1.2-2.0 qts.</li> <li>1.5 - 2 pts.</li> <li>4 - 8 lbs</li> <li>1 - 3 lbs</li> </ul>	Apply Rovral at early to mid-bloom, prior to bunch closing, or at beginning of fruit ripening.
Cutworms	<ul style="list-style-type: none"> <li>carbaryl (Sevin) <ul style="list-style-type: none"> <li>○ Sevin (carbaryl) 4L, 4F, XLR-Plus</li> <li>○ Sevin (carbaryl) 80 SP, WSP</li> </ul> </li> <li>○ Imidan 70W</li> <li>● Lorsban 4E</li> <li>pyrethrum products: <ul style="list-style-type: none"> <li>□ Diatect V</li> <li>□ PyGanic EC1.4</li> <li>□ PyGanic EC5.0</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>2 - 4 pts.</li> <li>1.25 - 2.5 lb.</li> <li>1.33 - 2.13 lb.</li> <li>1 - 2 qt.</li> <li>1 - 6 lbs.</li> <li>1 - 4 pt.</li> <li>4.8 - 18 fl oz.</li> </ul>	Infestations often are localized to clusters of vines or panels of vines. Spot treatments may be sufficient in such cases.
Flea beetle	<ul style="list-style-type: none"> <li>● carbaryl (Sevin) <ul style="list-style-type: none"> <li>● Sevin (carbaryl) 4L, 4F, XLR-Plus</li> <li>● Sevin (carbaryl) 80 SP, WSP</li> </ul> </li> <li>○ Danitol 2.4 EC</li> <li>○ Imidan 70W</li> <li>pyrethrum products: <ul style="list-style-type: none"> <li>□ Diatect V</li> <li>□ PyGanic EC1.4</li> <li>□ PyGanic EC5.0</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>2 - 4 pts.</li> <li>1.25 - 2.5 lb.</li> <li>5.33 - 10.66 fl oz.</li> <li>1.33 - 2.13 lb.</li> <li>1 - 6 lbs.</li> <li>1 - 4 pt.</li> <li>4.8 - 18 fl oz.</li> </ul>	
Grape Berry Moth	<ul style="list-style-type: none"> <li>○ Lannate 90SP</li> <li>○ Lannate 2.4LV</li> <li>○ Venom Insecticide (70W)</li> </ul>	<ul style="list-style-type: none"> <li>0.5 - 1.0 lb.</li> <li>1.5 - 3.0 pts.</li> <li>1 - 3 oz. (Foliar)</li> <li>5 - 6 oz. (Soil)</li> </ul>	
Leafhoppers ( <i>E. variabilis</i> , <i>E. ziczac</i> )	<ul style="list-style-type: none"> <li>● Applaud 70WP</li> <li>● Dimethoate 4E (Microflo)</li> <li>● Malathion 8EC</li> <li>● Malathion 5EC</li> <li>● Provado 75WSP</li> <li>● Sevin 50WP</li> <li>● Sevin XLR (4E)</li> <li>○ Admire 2F</li> <li>○ Fujimite 5EC</li> <li>○ Lannate 90SP</li> <li>○ Lannate 2.4LV</li> <li>○ Nexter 75WSP</li> <li>○ Pyramite 60WSP</li> <li>○ Venom Insecticide (70W)</li> <li>■ M-Pede</li> <li>■ Stylet-Oil</li> </ul>	<ul style="list-style-type: none"> <li>12 oz.</li> <li>0.5 - 1.0 pt./100 gal</li> <li>2.0 - 2.5 pt.</li> <li>1.5 pt.</li> <li>0.75 - 1.0 oz.</li> <li>2 - 4 lb.</li> <li>1 -2 qts.</li> <li>16 - 32 fl. oz.</li> <li>1 - 2 pts.</li> <li>0.5 - 1.0 lb.</li> <li>1.5 - 3.0 pts.</li> <li>10.67 oz.</li> <li>13.2 oz.</li> <li>1 - 3 oz. (Foliar)</li> <li>5 - 6 oz. (Soil)</li> <li>2 gal / 100 gal water</li> <li>1 gal. / 100 gal.</li> </ul>	Nexter & Pyramite also control spider mites. Fujimite also controls mealybug and spidermites.

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Mealybug	● Applaud 70WP	12 oz.	Lorsban: Min. Spray 50 gal./acre. Fujimite also controls spidermites and leafhoppers. Lime-sulfur: dormant application can reduce mealybug and powdery mildew carryover. Foliar sprays starting at 4 - 6" shoot growth can do the same. Risk of plant burn increases greatly after 5 am or when daytime high temperatures will exceed 85 °F. See label!
	● Dimethoate 4E (Microflo)	0.5 - 1.0 pt./100 gal.	
	● Lorsban 4E	1 - 2 qt.	
	○ Admire 2F	16 - 32 fl. oz.	
	○ Fujimite 5EC	2 pts.	
	○ Malathion 8EC	2.0 - 2.5 pt.	
	○ Malathion 5EC	1.5 pt.	
	○ Provado 75WSP	0.75 - 1.0 oz.	
	○ Venom Insecticide (70W)	1 - 3 oz. (Foliar) 5 - 6 oz. (Soil)	
	<input type="checkbox"/> Lime-sulfur (liquid)	4 - 10 gal (dormant) 0.5 - 2 qts (foliage)	
Sphinx Moth (Achemon and White-lined)	Bt materials: ■ Dipel 2X	0.5 - 1.0 lb.	
Spider mites (Two-Spot, McDaniel)	Miticides:		Fujimite, Nexter, & Pyramite also give some control of grape leafhopper  Avoid use of sulfurs on Concord or <i>V. lambrusca</i> type grapes after bloom.
	● Vendex 50W	1 - 2.5 lb.	
	○ Abba 0.15EC	8 - 16 fl. oz.	
	○ Acramite 50WSB	0.75 - 1.0 lb.	
	○ Envidor 2SC Miticide	16 - 18 fl. oz.	
	○ Fujimite 5EC	1 - 2 pts.	
	○ Nexter 75WSP	10.67 oz.	
	○ Pyramite 60WSP	13.2 oz.	
	○ Zeal Miticide	2 - 3 oz.	
	Sulfur products:		
	■ Flowable sulfurs (6F)	3 - 6 qts.	
	■ Microthiol Disperss 80DF	3-10 lbs.	
	■ Thiolux 80DF	2 - 5 lbs.	
	■ Wettable powders (90W)	5 - 10 lbs.	
	Oils:		
■ Stylet-Oil	1 gal. / 100 gal.		
Thrips	○ Dimethoate 4E (Microflo)	0.5 - 1.0 pt./ 100 gal.	Certain varieties are very sensitive to damage from endosulfan – see label).
	○ endosulfan		
	Thiodan, Thionex 50W	2 - 3 lbs.	
	Thiodan, Thionex 3EC	1 1/3 - 2 qts.	
	○ Lannate 90SP	0.5 - 1.0 lb.	
	○ Lannate 2.4LV	1.5 - 3.0 pts.	
	○ Venom Insecticide (70W)	1 - 3 oz. (Foliar) 5 - 6 oz. (Soil)	
Wasps	● carbaryl (Sevin)		Look for wasps collecting wood fibers on the posts. It may be possible to treat just the posts (especially if they are cedar posts) and obtain satisfactory control.
	● Sevin (carbaryl) 50W	2-4 lbs.	
	● Sevin (carbaryl) 4L, 4F, XLR-Plus	2 - 4 pts.	
	pyrethrum products:		
	■ PyGanic EC1.4	1 - 4 pt.	
	<input type="checkbox"/> Diatect V	1 - 6 lbs.	
<input type="checkbox"/> PyGanic EC5.0	4.8 - 18 fl oz.		

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## Grape Pest Management Options for Colorado -2006

Pest or Disease	Materials	Rate per acre <sup>1</sup>	Remarks
Western Grape Leaf Skeletonizer	<ul style="list-style-type: none"> <li>○ Abba 0.15EC</li> <li>○ Danitol 2.4EC</li> <li>○ Imidan 70W</li> <li>pyrethrum products:               <ul style="list-style-type: none"> <li><input type="checkbox"/> PyGanic EC1.4</li> <li><input type="checkbox"/> PyGanic EC5.0</li> </ul> </li> <li>Bt materials               <ul style="list-style-type: none"> <li><input type="checkbox"/> Dipel 2X</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>8 -16 fl. oz.</li> <li>5.33-10.33 fl.oz.</li> <li>1.33 lb.</li> <li>1 - 4 pt.</li> <li>4.8 - 18 fl oz.</li> <li>0.5 - 1.0 lb.</li> </ul>	PyGanic products list caterpillars on label for controlled pests; they should also provide quick knock-down of skeletonizer larvae, but have a short effective period before breakdown.
Phylloxera	<ul style="list-style-type: none"> <li>○ Admire 2F</li> </ul>	16 - 32 fl oz.	Phylloxera is not reported from western Colorado vineyards at this time. This is one available option should it be found here in the near future.

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## Product Information Summary

Product	Active Ingredient	REI	PHI	Season Limit (per acre / yr)
Abba	abamectin	12 hrs	28 days	32 oz.
Abound	azoxystrobin	4 hrs	14 days	4 applic's.; 1.92 qt.
Acramite	bifenazate	5 days	14 days	1 applic.
Admire	imidacloprid	12 hrs	30 days	32 fl. oz.
Applaud	buprofezin	12 hrs	14 days	2 applic's.
AQ10	<i>Ampelomyces quisqualis</i>	4 hrs	0 days	
Bayleton	triadimefon	12 hrs	14 days	18 oz.
Carbaryl (Sevin)	carbaryl	12 hrs	7 days	
Danitol	fenpropathrin	24 hrs	21 days	42.67 fl. oz.
Diatect	silicon dioxide + pyrethrins	12 hrs	0 days	
Dimethoate	dimethoate	48 hrs	28 days	
Dipel	<i>Bacillus thuringiensis</i>	4 hrs	0 days	
Dithane	mancozeb	24 hrs	66 days	6 qts. / 7.5 lbs
Elite	tebuconazole	12 hrs	14 days	2 lbs.
Endura	boscalid	12 hrs	14 days	5 applic's.; 25 oz.
Envidor	spirodiclofen	12 hrs	14 days	1 applic.
Erase	jojoba oil	4 hrs	0 days	
Flint	trifloxystrobin	12 hrs	14 days	4 applic's.; 8 oz.
Fujimite	fenpyroximate	12 hrs	14 days	2 applic's.; 2 pts.
Imidan	phosmet	24 hrs	14 days	
Kaligreen	potassium bicarbonate	4 hrs	1 day	
Lannate	methomyl	7 days	28 days	5 applic's.; 5 lbs
Lime-Sulfur	lime-sulfur	48 hrs	2 days	
Lorsban	chlorpyrifos	24 hrs	90 days	2 applic's.; 2 qts.
Malathion	malathion	12 hrs	3 days	
Microthiol Disperss	micronized sulfur	24 hrs	1 day	
Mpede	potassium salts of fatty acids	4 hrs	0 days	
Nexter	chloropyridazin	12 hrs	7 days	2 applic's.; 10.67 oz.
Nova	myclobutanil	24 hrs	14 days	1.5 lbs
Pristine	pyraclostrobin	24 hrs	14 days	6 applic's.; 69 oz.
Provado	imidacloprid	12 hrs	0 days	
PyGanic	pyrethrins	12 hrs	12 hrs	

## Product Information Summary (cont'd.)

Product	Active Ingredient	REI	PHI	Season Limit (per acre / yr)
Pyramite	chloropyridazin	12 hrs	7 days	26.4 oz.
Quintec	quinoxifen	12 hrs	14 days	5 applic's.; 33 fl. oz.
Rovral	iprodione	48 hrs	7 days	4 applic's.
Rubigan	fenarimol	12 hrs	30 days	19 fl. oz.
Serenade	Bacillus subtilis	4 hrs	0 days	
Sevin	carbaryl	12 hrs	7 days	
Sonata Biofungicide	Bacillus pumillis	4 hrs	0 days	
Sovran	kresoxim-methyl	12 hrs	14 days	25.6 oz.
Stylet-Oil	paraffinic oil	4 hrs	0 days	
Sulfur (wetable, flowable)	sulfur	24 hrs	1 day	
Thiolux	micronized sulfur	24 hrs	1 day	
Thiodan / Thionex	endosulfan	24 hrs	7 days	3 applic's.; 4 qts. (6 lbs)
Vendex	fenbutatin-oxide	48 hrs	28 days	4 lbs.
Venom Insecticide	dinetofuran	12 hrs	1 day	6 oz. (or 1 soil applic.)
Zeal Miticide	etoxazole	12 hrs	14 days	1 applic.

**Application Cost Approximation Summary for Grapes - 2006**

Pesticide Application Cost List for Grapes - 2006 data				Application rates			Approx. cost / applic. (assume 100 gal. spray / acre)		
Product	Package size	2006 Cost	per Unit	Application Rate Low	Application Rate High	units/ acre	Low rate	High rate	
Abba 0.15E	1 gal	\$695.00	gal.	8	16	fl oz	\$43.00	\$87.00	
Abound 2.08F				*	11	15	fl oz		
Acramite 50WSB	1 lb.	\$72.00	lb.	0.75	1	lb	\$54.00	\$72.00	
Admire 2F	1 gal	\$664.00	gal	16	32	fl oz	\$83.00	\$166.00	
Applaud 70WP	1.08 lb	\$35.50	1.08 lb	9	12	oz	\$20.00	\$27.00	
AQ10 (58W), individual pkt.	1/2 oz	\$17.50	oz	0.5	1.0	oz	\$9.00	\$18.00	
AQ10 (58W), bulk pkt.	2 oz	\$22.50	oz	*NA	0.5	1.0	oz	\$11.00	\$23.00
Bayleton 50DF	1 lb.	\$63.00	lb.	*	4.0	6.0	oz	\$16.00	\$24.00
Danitol 2.4EC				*	5.33	10.33	fl oz		
Diatect V (organic)	20 lb	\$8.50	lb		1	6	lbs	\$9.00	\$51.00
						pt / 100 gal			
Dimethoate 400 (4E)	2.5 gal.	\$36.00	gal	0.5	1	gal	\$18.00	\$36.00	
Dipel 2X	5 lb.	\$14.00	lb	0.5	1	lb	\$7.00	\$14.00	
Dithane F-45 4F	2.5 gal	\$15.25	gal	1.2	2	qt	\$5.00	\$8.00	
Endosulfan (Thionex) 3EC	2.5 gal	\$29.00	gal.	1.33	2	qt	\$10.00	\$15.00	
Endosulfan (Thionex) 50W	5 lb.	\$9.00	lb	2	3	lb	\$18.00	\$27.00	
Endura 70WDG	4 x 6 lb	\$100.00	lb.	4	4	oz	\$25.00	\$25.00	
Envidor 2SC Miticide				*					
Erase (97.5% ai)	1 qt.	\$22.50	qt.	*	1	2	qt	\$23.00	\$45.00
Flint 50WDG	8 oz.	\$15.00	oz	2.0	2.0	oz	\$30.00	\$30.00	
Imidan 70W	4 lb.	\$7.25	lb.	1	2.13	lb	\$7.00	\$15.00	
Kaligreen 82W	1 lb.	\$6.00	lb.	2.5	5.0	lbs	\$15.00	\$30.00	
Lannate 90SP	2 lb.	\$22.00	lb.	0.5	1.0	lb	\$11.00	\$22.00	
Lannate 2.4LV	2.5 gal.	\$62.00	gal.	1.5	3.0	pt	\$12.00	\$23.00	
Latron B-1956	1 gal	\$32.00	gal	*NA					
Lime-Sulfur, liquid (growing season, foliage)	30 gal	\$7.70	gal	0.5	2	qt	\$1.00	\$4.00	
Lime-Sulfur, liquid (dormant, post-harvest)	30 gal	\$7.70	gal	4	20	gal	\$31.00	\$154.00	
Lorsban 4E	2.5 gal.	\$38.00	gal.	1	2.0	qt	\$10.00	\$19.00	
Malathion 57EC (5E)	2.5 gal.	\$29.00	gal.	2	2.5	pt	\$7.00	\$9.00	
Malathion 5EC	1.0 gal.	\$30.00	gal.	1.5		pt	\$6.00		
Microthiol Dispers 80DF (Micronized Wettable Sulfur )	30 lb.	\$0.85	lb.	3	10	lb	\$3.00	\$9.00	
M-Pede	2.5 gal.	\$23.00	gal	2		%	\$46.00	\$0.00	
Nexter 75WDG	4 x 2.7 lb.	\$129.00	lb.	10.67	10.67	oz	\$86.00	\$86.00	
Nova 40W	20 oz	\$4.00	oz.	3	5	oz	\$12.00	\$20.00	
Pristine 38WDG	6.25 lb.	\$37.50	lb.	8	10.5	oz	\$19.00	\$25.00	
Provado 75WSP	8 oz	\$40.00	oz.	0.5	1	oz	\$20.00	\$40.00	
PyGanic EC1.4	1.0 gal.	\$178.50	gal.	1	4	pt	\$22.00	\$89.00	
PyGanic EC5.0				*	4.8	18	fl oz		
Rovral 4L	2.5 gal.	\$190.00	gal.	1.5	2	pt	\$36.00	\$48.00	
Rubigan 1E	1 qt	\$78.25	qt	2	6	fl oz	\$5.00	\$15.00	
Serenade 10W	12 lb	\$8.25	lb.	4	8	lbs	\$33.00	\$66.00	
Serenade Max 0.14	18 lb	\$9.00	lb	1	3	lbs	\$9.00	\$27.00	
Sevin XLR (4E)	2.5 gal.	\$33.50	gal.	1	2	qt	\$8.00	\$17.00	
Sonata biofungicide				*	2	4	qt		
Sovran 50WDG	1 lb.	\$103.00	lb.	4.0	4.0	oz	\$26.00	\$26.00	
Stylet-Oil (organic formulation)	2.5 gal	\$14.50	gal	1.0	1.5	%	\$15.00	\$22.00	
Stylet-Oil (organic formulation)	30 gal	\$14.00	gal.	1.0	1.5	%	\$14.00	\$21.00	
Sulfur 6F	2.5 gal.	\$5.00	gal.	3	6	qt	\$4.00	\$8.00	
Sulfur 99W, Wilbur-Ellis	50 lb	\$0.32	lb	5	10	lbs	\$2.00	\$3.00	
Sulfur, Thiolux 80DF	50 lb	\$0.85	lb	2	5	lbs	\$2.00	\$4.00	
Vendex 50W	1 lb.	\$30.00	lb.	1	2.5	lbs	\$30.00	\$75.00	
Venom Insecticide (70W) - foliar applic.				*	1	3	oz		
Venom Insecticide (70W) - soil applic.				*	5	6	oz		
Zeal Miticide				*	2	3	oz		
* Not handled by local agchemical suppliers									