

## Grape Pest Management Options for Colorado - 2009<sup>1</sup>

Pest or Disease	Materials	Rate per acre <sup>2</sup>	Remarks
Powdery Mildew	<p><i>Sulfur products:</i></p> <ul style="list-style-type: none"> <li>● Flowable Sulfur (6F)</li> <li>● Microthiol Disperss 80DF</li> <li>● Thiolux 80DF</li> <li>● Wettable sulfurs (90W, etc.)</li> <li>□ Lime-Sulfur (liquid)</li> </ul> <p><i>DMI fungicides:</i></p> <ul style="list-style-type: none"> <li>● Bayleton 50DF</li> <li>● Nova 40W</li> <li>● Rubigan 1E</li> <li>○ Elite 45DF</li> </ul> <p><i>Strobilurin fungicides:</i></p> <ul style="list-style-type: none"> <li>● Flint 50WDG</li> <li>● Sovran 50W</li> <li>○ Abound 2.08F</li> </ul> <p><i>Carboximide fungicides:</i></p> <ul style="list-style-type: none"> <li>○ Endura 70WDG</li> </ul> <p><i>Combination fungicides:</i></p> <ul style="list-style-type: none"> <li>● Pristine 38WDG</li> </ul> <p><i>Quinolines:</i></p> <ul style="list-style-type: none"> <li>○ Quintec</li> </ul> <p><i>Oils:</i></p> <ul style="list-style-type: none"> <li>■ Stylet-Oil</li> <li>■ Erase</li> </ul> <p><i>Potassium Bicarbonate materials:</i></p> <ul style="list-style-type: none"> <li>■ Kaligreen 82W</li> </ul> <p><i>Biocontrol products:</i></p> <ul style="list-style-type: none"> <li>■ AQ10</li> <li>□ Serenade 10W</li> <li>□ Sonata Biofungicide</li> </ul>	<p>3 - 6 qts.</p> <p>3-10 lbs.</p> <p>2 - 5 lbs.</p> <p>5 - 10 lbs.</p> <p>4-10 gal (dormant) 0.5 - 2 qt (foliage) 10 - 20 gal (post-harvest)</p> <p>4 - 6 oz.</p> <p>3 - 5 oz.</p> <p>2 - 6 fl. oz.</p> <p>4 oz.</p> <p>2 oz.</p> <p>4 oz.</p> <p>11 - 15 fl. oz.</p> <p>4 oz.</p> <p>8 - 10.5 oz.</p> <p>3 - 6.6 fl. oz.</p> <p>1.5 gal. / 100 gal. 1 - 2 qts. / 50 - 200 gal.</p> <p>2.5 - 5 lbs.</p> <p>0.5 - 1.0 oz. 4 - 8 lbs. 2 - 4 qt.</p>	<p>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.</p> <p>Do not use strobilurin materials for last spray of the season.</p> <p>Pristine is a combination of strobilurin and carboximide fungicides. Do Not rotate with other fungicides in either category. Also, do not use it on Concord, Worden, Fredonia, Niagara or related grape varieties.</p> <p>Quinolines (Quintec) have no curative properties, they are protectants only.</p> <p>Apply Erase at 50 - 200 gal / acre.</p> <p>Manufacturer of AQ10 is no longer in business. Existing stocks may be used until exhausted.</p>

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

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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>○ Altacor 35WDG 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>2.0 - 4.5 oz.</li> <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>	
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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Grape Berry Moth	<ul style="list-style-type: none"> <li>○ Altacor 35 WDG</li> <li>○ Lannate 90SP</li> <li>○ Lannate 2.4LV</li> <li>○ Venom Insecticide (70W)</li> </ul>	<ul style="list-style-type: none"> <li>2.0 - 4.5 oz.</li> <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>	
Mealybug	<ul style="list-style-type: none"> <li>● Applaud 70WP</li> <li>● Dimethoate 4E (Microflo)</li> <li>● Lorsban 4E</li> <li>○ Admire 2F</li> <li>○ Fujimite 5EC</li> <li>○ Malathion 8EC</li> <li>○ Malathion 5EC</li> <li>○ Provado 75WSP</li> <li>○ Venom Insecticide (70W)</li> <li>□ Lime-sulfur (liquid)</li> </ul>	<ul style="list-style-type: none"> <li>12 oz.</li> <li>0.5 - 1.0 pt./100 gal.</li> <li>1 - 2 qt.</li> <li>16 - 32 fl. oz.</li> <li>2 pts.</li> <li>2.0 - 2.5 pt.</li> <li>1.5 pt.</li> <li>0.75 - 1.0 oz.</li> <li>1 - 3 oz. (Foliar)</li> <li>5 - 6 oz. (Soil)</li> <li>4 - 10 gal (dormant)</li> <li>0.5 - 2 qts (foliage)</li> </ul>	<p>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!</p>
Sphinx Moth (Achemon and White-lined)	<p>Bt materials:</p> <ul style="list-style-type: none"> <li>■ Dipel 2X</li> </ul>	<ul style="list-style-type: none"> <li>0.5 - 1.0 lb.</li> </ul>	
Spider mites (Two-Spot, McDaniel)	<p>Miticides:</p> <ul style="list-style-type: none"> <li>● Vendex 50W</li> <li>○ Abba 0.15EC</li> <li>○ Acramite 50WSB</li> <li>○ Envirdor 2SC Miticide</li> <li>○ Fujimite 5EC</li> <li>○ Nexter 75WSP</li> <li>○ Pyramite 60WSP</li> <li>○ Zeal Miticide</li> </ul> <p>Sulfur products:</p> <ul style="list-style-type: none"> <li>■ Flowable sulfurs (6F)</li> <li>■ Microthiol Disperss 80DF</li> <li>■ Thiolux 80DF</li> <li>■ Wettable powders (90W)</li> </ul> <p>Oils:</p> <ul style="list-style-type: none"> <li>■ Stylet-Oil</li> </ul>	<ul style="list-style-type: none"> <li>1 - 2.5 lb.</li> <li>8 - 16 fl. oz.</li> <li>0.75 - 1.0 lb.</li> <li>16 - 18 fl. oz.</li> <li>1 - 2 pts.</li> <li>10.67 oz.</li> <li>13.2 oz.</li> <li>2 - 3 oz.</li> <li>3 - 6 qts.</li> <li>3-10 lbs.</li> <li>2 - 5 lbs.</li> <li>5 - 10 lbs.</li> <li>1 gal. / 100 gal.</li> </ul>	<p>Fujimite, Nexter, &amp; Pyramite also give some control of grape leafhopper</p> <p>Avoid use of sulfurs on Concord or <i>V. lambrusca</i> type grapes after bloom.</p>
Thrips	<ul style="list-style-type: none"> <li>○ Dimethoate 4E (Microflo)</li> <li>○ endosulfan</li> <li>Thiodan, Thionex 50W</li> <li>Thiodan, Thionex 3EC</li> <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 pt./ 100 gal.</li> <li>2 - 3 lbs.</li> <li>1 1/3 - 2 qts.</li> <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>	<p>Certain varieties are very sensitive to damage from endosulfan – see label).</p>

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Wasps	<ul style="list-style-type: none"> <li>● carbaryl (Sevin)               <ul style="list-style-type: none"> <li>● Sevin (carbaryl) 50W</li> <li>● Sevin (carbaryl) 4L, 4F, XLR-Plus</li> </ul> </li> <li>pyrethrum products:               <ul style="list-style-type: none"> <li>■ PyGanic EC1.4</li> <li>□ Diatect V</li> <li>□ PyGanic EC5.0</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>2-4 lbs.</li> <li>2 - 4 pts.</li> <li>1 - 4 pt.</li> <li>1 - 6 lbs.</li> <li>4.8 - 18 fl oz.</li> </ul>	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.
Western Grape Leaf Skeletonizer	<ul style="list-style-type: none"> <li>○ Abba 0.15EC</li> <li>○ Altacor 35WDG</li> <li>○ Danitol 2.4EC</li> <li>○ Imidan 70W</li> <li>pyrethrum products:               <ul style="list-style-type: none"> <li>□ PyGanic EC1.4</li> <li>□ PyGanic EC5.0</li> </ul> </li> <li>Bt materials               <ul style="list-style-type: none"> <li>□ Dipel 2X</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>8 -16 fl. oz.</li> <li>3.0 - 4.5.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.
Altacor	ranaxypyr	4 hrs	14 days	9 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 thuringensis</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	

## Product Information Summary (cont'd.)

Product	Active Ingredient	REI	PHI	Season Limit (per acre / yr)
PyGanic	pyrethrins	12 hrs	12 hrs	
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	dinotofuran	12 hrs	1 day	6 oz. (or 1 soil applic.)
Zeal Miticide	etoxazole	12 hrs	14 days	1 applic.