

Pest Control Products Recommended for Use on Grapes in British Columbia

Table 1. Herbicides recommended for control of weeds in vineyards, including general characteristics, application rates and effectiveness against perennial and annual broadleaved and grassy weeds. Read the *Best Practices Guide for Grapes* sections on Weeds and Vineyard Floor Management for additional information on cover crops and instructions for using herbicide effectively. See explanatory notes on page 4 of this document. **READ THE PRODUCT LABEL BEFORE MIXING AND APPLYING ANY PESTICIDE.**

Product	General Characteristics, Rates and Restrictions											Weeds Controlled (X = good-excellent control; x= poor control or top kill)				Comments
	Chemical Group	Dermal Toxicity	Oral Toxicity	Applicator Certificate	Optimum pH	Maximum Amount or Applications/Season	Pre-Harvest Interval (days)	Re-entry Interval	Target Weed Growth Stage	Water Volume/ha	Application Rate(s)	Annual Broadleaf	Annual Grasses	Perennial Broadleaf	Perennial Grasses	
Aim EC (carfentrazone)	14	S	S	N		1	3	24 h	Growing plants (≤ 10cm)	Minimum 100 L/ha	37-117mL /ha (15-47 ml/acre)	X		X		Use a hooded sprayer
Casoron G4 (dichlobenil)	20	S	S	N				24 h	Germinating seeds	Apply to moist soils	110-175 kg/ha (44-70 kg/acre)	X	X	X	X	Treat only dormant vines established for 2 or more years
Chateau WDG (flumioxazin)	14	S	S	N		2	60	24 h	Germinating seeds	Apply to moist soils	280-420 g/ha (113-170 g/acre)	X	X	x	x	For use in established vineyards. Rates vary by soil type; see label
Devrinol 50 DF (napropamide)	15	S	S	N		1		24 h	Germinating seeds	Apply to moist soils	9 kg/ha (3.6 kg/acre)	x	X			For use in established vineyards
Frontier (dimethenamid)	15	S	S	N		1	1-2 years	24 h	Germinating seeds, seedlings	Minimum 170 L/ha	1.4 L/ha (566 mL/acre)	X	X			For 1 st or 2 nd year non-bearing grapes
Gramoxone (paraquat)	22	M	M	Y			7	48 h	Growing plants	1100 L/ha	5.5 L/ha (2.2 L/acre)	X	X	x	X	Apply in May to early June
Ignite SN (glufosinate ammonium)	10	S	S	N	5.5	6.7 L	40	24 h	Growing plants	330-1100 L/ha	2.7-5.0 L/ha (1.1-2.0 L/acre)	X	X	x	X	For use in established vineyards.
Karmex DF (diuron)	7	S	S	N				24 h	Germinating seeds, seedlings	250-400 L/ha	2.25-3.25 kg/ha (0.9-1.3 kg/acre)	X	X	x	X	For use in established vineyards. Rates vary by soil type; see label
Roundup, Laredo, Victor, Wrangler, Touchdown (glyphosate)	9	S	S	N	> 8	3	14	24 h	Growing plants	90 – 330 L/ha	See label	X	X	X	X	For use in established vineyards. Rates vary by product; see label
Venture L (fluzifop-P)	1	S	S	N		1	30	24 h	Growing plants	50-200 L/ha	2 L/ha (800 mL/acre)		X		X	For bearing and non-bearing grapes

Table 2. Fungicides recommended for control of grape bunch rot and powdery mildew, including general characteristics, application rates, and impact on beneficial arthropods. Read the *Best Practices Guide for Grapes* section on Diseases for additional control information. See explanatory notes/legend on page 4 of this document. **READ THE PRODUCT LABEL BEFORE MIXING AND APPLYING ANY PESTICIDE.**

Product	General Characteristics and Restrictions							Target Diseases & Product Rates		Comments / Impact on Common Beneficial Insects and Mites
	Chemical Group	Dermal Toxicity	Oral Toxicity	Applicator Certificate	Maximum Applications/Season	Pre-Harvest Interval (days)	Re-entry Interval	Botrytis Bunch Rot	Powdery Mildew	
										Fungicides listed in this table are generally harmless to beneficial insects and mites, unless indicated otherwise. Alternate your fungicides for resistance management!
Bordeaux mixture (copper oxychloride 50%)	M	S	S	N		1	24 h		3 kg/1000 L of water	Toxic to bees. Add 6 Kg of hydrated lime per 1000 L.
Elevate (fenhexamid 50%)	17	S	S	N	3	7	24 h	1.12 kg/ha (450 g/acre)		Do not apply more than 2 consecutive sprays
Flint (trifloxystrobin 50% WG)	11	S	S	N	4	14	24 h – 12 days		105-140 g/ha (43-57 g/acre)	Apply preventively and continue as needed on a 14-21 day interval. Do not apply more than 2 sequential sprays.
Kumulus DF (sulphur 80%)	M	S	S	N		1 -table 21-wine	24 h		4.2 kg/ha (1.7 kg/acre)	Repeated applications can be harmful to beneficial mites. Apply at 10-day intervals. May cause injury during hot weather (> 27 °C) and on sensitive varieties.
Lance WDG (boscalid 70%)	7	S	S	N	5	14	24 h		315 g/ha (128 g/acre)	Apply on a 10-14 day schedule. Use the shorter interval when disease pressure is high. May also provide suppression of botrytis bunch rot.
Lime Sulphur (sulphide sulphur 22%)	M	S	S	N	1	120	24 h		100 L / 1000 L of water.	Apply 500L of spray mixture/ ha during dormant stage prior to bud swell. Spray to point of runoff.
Milstop (potassium bicarbonate)	NC	S	S	N		0	24 h		2.8-5.6 kg/ha (1.1-2.3 kg/acre)	Apply at 7-14 day intervals.
Nova (myclobutanil 40%)	3	S	S	N	5	14	24 h		200 g/ha (81 g/acre)	Apply at 21-day intervals.
Rovral (iprodione 50%)	2	S	S	N	2	7	24 h	1.5 kg/ha (600 g/acre)		Apply beginning at mid to late bloom. Protect fruit before complete bunch closure.
Scala (pyrimethanil 400 g/L)	9	S	S	N	3	7	24 h	2.0 L/ha (810 mL/acre)		Apply at 7 day intervals. Thorough coverage of bunches is essential.
Sovran WG (kresoxim-methyl 50%)	11	S	S	N	4	14	48 h		240-300 g/ha (100-122 g/acre)	Apply at 14-21-day intervals. Do not apply more than 2 sequential sprays. Caution, drift may injure cherries.
Serenade MAX (<i>Bacillus subtilis</i>)	NC	S	S	N		0	24 h	3.0 – 6.0 kg/ha (1.2-2.4 kg/acre)	3.0 – 6.0 kg/ha (1.2-2.4 kg/acre)	Disease suppression only. May also suppress sour rot. Do not tank mix with other products or fertilizers.
Vanguard (cyprodinil 75%)	9	S	S	N	2	7	48 h	750 g/ha (300 g/acre)		Caution, drift may injure cherries.
Wettable sulphur (sulphur 92%)	M	S	S	N		1 - table 21- wine	24 h		4.5-6.0 kg/ha (1.8-2.4 kg/acre)	Use the higher rate when vines are in full leaf. Apply at 10-day intervals. Re-apply after rain. May harm beneficial mites. May cause injury during hot weather (> 27 °C) and on sensitive varieties.

Table 3. General characteristics, application rates, and impact on beneficial arthropods of **insecticides and miticides** recommended for control of grape pests. Read the *Best Practices Guide for Grapes* section on Insects for additional control information on these and other pests. See explanatory notes/legend on page 4 of this document. **READ THE PRODUCT LABEL BEFORE MIXING AND APPLYING ANY PESTICIDE.**

Product	General Characteristics and Restrictions								Pests Controlled								Product Rates	Comments / Impact on Common Beneficial Insects and Mites	
	Chemical Group	Dermal Toxicity	Oral Toxicity	Applicator Certificate	Optimum pH	Maximum Applications/season	Pre-Harvest Interval (days)	Re-entry Interval	Virginia Creeper Leafhopper	Western Grape Leafhopper	Spider Mites & European Red Mites	Grape Erineum Mite	Scale Insects	Grape Mealybug	Grape Phylloxera	Climbing Cutworms			Thrips
Acramite 50 WS (bifenazate)	25	S	S	N	-	1	14	24 h – 5 days			✓							567 g/ha (spider mites); 851 g/ha (Eur. red mite) (2-3 pouches/2 acres*)	Beneficial arthropods include European earwig, ladybugs, lacewings, predatory bugs, leafhopper parasitoids, spiders, predatory mites, and predatory thrips. Tolerance of beneficials will vary according to the history of pesticide use.
Altacor (chlorantraniliprole)	28	S	S	N		3	14	24 h								✓		215 - 285 g/ha (87-115 g/acre)	May be harmful to beneficial insects and predatory mites.
Ambush 500EC (permethrin)	3	S	S	N	6	1	7	24 h		✓								140 mL/ha (56 mL/acre)	Harmful to all beneficial arthropods. Toxic to bees.
Pounce 384EC (permethrin)	3	S	S	N	6	2	21	24 h		✓						✓		Leafhoppers: 175 mL/ha (71 mL/acre) Cutworms: 180-360 mL/ha (70-145 mL/acre)	Apply at the first sign of cutworm damage in the spring, to the trunk and soil surface near trunk base. Use higher rate for larger cutworms.
Assail 70 WP (acetamiprid)	4	S	S	N	-	2	7	24 h	✓	✓								80 g/ha (32 g/acre)	Can suppress some beneficial insects. Harmful to bees.
Diazinon 50WP (diazinon)	1B	S	M	Y	7	1+	16	48 h	✓	✓				✓				3.3 kg/ha (1.3 kg/acre), or 1 kg/1000 L	Will suppress beneficials except predatory mites.
Diazinon 500E (diazinon)	1B	S	M	Y	7	1+	16	48 h	✓	✓				✓				1 L/1000 L or 2.75-3.5 L/ha (1.1-1.4 L/acre)	
Envidor 240 SC (spirodiclofen)	23	S	S	N	-	1	14	24 h – 6 days			✓							0.75 L/ha (300 mL/acre)	Toxic to predatory mites. Post-bloom application only.
Guthion 50 WSB, Sniper (azinphos-methyl)	1B	V	V	Y	6	2	28	28 days	✓	✓								625g - 1.25 kg/ha (250-500 g/acre)	Harmful to beneficial insects. Will not be registered after Dec. 31, 2012.
Insecticidal Soap		S	S	N			0-5	24 h			✓	✓	✓	✓				1% Spray (1 L/100 L)	Do not apply with sulphur or within 3 days of sulphur application.
Kelthane 50W (dicofol)	3	S	S	N	5	1	7	24 h			✓							1.25 - 3.0 kg/ha (500 g - 1.2 kg/acre)	Safe for all beneficials.
Kumulus DF (sulphur)	M	S	S	N	-	1+	1-table 21-wine	24 h				✓						3.4 kg (1.3 kg/acre)	May cause injury during hot weather See label for sensitive varieties.

Table 3 con't	Chemical Group	Dermal Toxicity	Oral Toxicity	Applicator Certificate	Optimum pH	Maximum Applications/season	Pre-Harvest Interval (days)	Re-entry Interval	Virginia Creeper Leafhopper	Western Grape Leafhopper	Spider Mites & European Red Mite	Grape Erineum Mite	Scale Insects	Grape Mealybug	Grape Phylloxera	Climbing Cutworms	Thrips	Product Rate	Comments / Impact on Common Beneficial Insects and Mites
Malathion 500E (malathion)	1B	S	S	N	5	1+	3	24 h	✓	✓	✓		✓	✓				1.8 L/ha (728 mL/acre)	Will suppress most beneficials except predatory mites.
Malathion 85E	1B	S	S	N	5	1+	3	24 h	✓	✓	✓		✓	✓				880 mL/1000 L	
Movento 240 SC (spirotetramat)	23	S	S	N		2	7	24 h					✓	✓	✓			365-585 mL/ha (148-236 mL/acre)	For wine grapes only. DO NOT apply to table grapes. Toxic to bees.
Nexter (Pyramite) (pyridaben)	21	S	S	N	-	1	25	24 h			✓							300 - 600 g/ha (120-243 g/acre)	Safe for beneficial insects; high rates harmful to predatory mites.
Ripcord 400 EC (cypermethrin)	3	S	S	N		2	7	24 h										150 mL/ha (60 mL/acre)	For control of adult Multicoloured Asian Lady Beetle only
Sevin XLR (carbaryl)	1A	S	M	Y	7	1+	5	48 h	✓	✓								VCL*: 320–640 mL/ha (130-260 mL/acre) WGL*: 5.25-6.4 L/ha (2.1-2.6 L/acre)	Moderate to high impact on all beneficials. *VCL= Virginia creeper leafhopper; WGL = Western grape leafhopper
Success 480 SC (spinosad)	5	S	S	N	6-7	3	7	24 h-15 days									✓	182 mL/ha (74 mL/acre)	For suppression of thrips.
Surround WP (kaolin)		S	S	N			0	24 h	✓	✓								25-50 kg/ha (10-20 kg/acre)	Suppression of leafhoppers. Do not apply post-bloom on table grapes. May be harmful to beneficials
Thionex 50 WP (endosulfan)	2A	M	V	Y	6	1+	30	48 h	✓	✓								1 kg/ 1000L	Will suppress beneficials except predatory mites.

Legend:

- **Products:** This list includes pesticide products considered compatible with B.C. Interior vineyard pest management programs. Limited field performance information is available on Malathion and Surround. Refer to insect and diseases descriptions for other control options and best management practices
- **Chemical Group:** Do not repeat the use of pesticides with the same Chemical Group number as this practice will select for resistant individuals or strains within a population.
- **Toxicity:** S (slightly toxic), M (moderately toxic), V (very toxic) – see page 7-2 of the *Best Practices Guide for Grapes* for more information.
- **Applicator certificate:** N (no), Y (yes) according to WorkSafeBC (WCB) regulations.
- **Re-entry Intervals:** WorksafeBC regulations state that employees must follow the re-entry times listed here. Owner/operators may follow the re-entry times listed on the pesticide label. Refer to the *Occupational Health and Safety (OHS) Regulation* Part 6, Substance Specific Requirements, for more information.
Note: Re-entry interval may vary by activity – see label for details where a range of re-entry times are shown.
- **Pests/Diseases/Weeds Controlled:** list includes only pests, diseases and weeds against which a pesticide is registered and recommended for use in the BC Interior.
- **Impact on Common Beneficial Insects and Mites:** Comments reflect current understanding of toxicity of products to common beneficial insects and mites found in vineyards in the B.C. Interior. Toxicity can vary among vineyards according to the history of pesticide use.

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