

Pest Control Products Recommended for Use on Grapes in British Columbia

Table 1. INSECTICIDES and MITICIDES

February 2020

Read the *Best Practices Guide for Grapes* section on Insects and Mites for additional control information on these and other pests. See explanatory notes on page 13 of this document.

READ THE PRODUCT LABEL BEFORE MIXING AND APPLYING ANY PESTICIDE.

Insect or Mite	Recommended Product Choices	Grp ¹	Oral Toxicity	Max. Applics/Season	Amount per		REI ²	PHI ³ (days)	Precautions and Notes
					Ha	Acre			
Virginia Creeper Leafhopper (VCL) and/or Western Grape Leafhopper (WGL)	Malathion 85E (malathion)	1B	S	1	880 mL/1000 L of water		12 h-5 days	3	Will suppress most beneficials except predatory mites. Not effective against the WGL. Toxic to bees.
	Admire 240 F (imidacloprid)	4A	S	2	200 mL	80 mL	24 h	0	Toxic to bees. Do not apply during bloom or when bees are actively foraging. Target Assail sprays to small nymphs. Avoid using Group 4 products more than twice/year to prevent mite problems. Use the higher rate of Clutch when insect pressure is high.
	Assail 70 WP (acetamiprid)	4A	S	2	80 g	32 g	12 h-13 days	5	
	Clutch (clothianidin)	4A	S	2	100-140 g	40-57 g	12 h	1	
	Closer SC (sulfoxaflor)	4C	S	2	200-400 mL	80-160 mL	12 h	7	Closer is registered for suppression of leafhoppers.
	Sivanto Prime (flupyradifurone)	4D	S	2-4	500-750 mL	200-300 mL	12-24 h	0	May be harmful to some beneficial insects. Do not apply when bees are foraging. Maximum amount per season: 2L/ha.
	Surround WP (kaolin)	NC	S		25-50 kg	10-20 kg	24 h*	0	Suppression of leafhoppers. Do not apply post-bloom on table grapes. May be harmful to beneficials.
	Ambush 500EC (permethrin)	3A	S	1	140 mL	56 mL	when dry	7	Harmful to all beneficial arthropods. Toxic to bees.
	Pounce 384EC (permethrin)	3A	S	2	175 mL	71 mL	when dry	21	
	Pyganic (pyrethrins)	3A	S	8	2.32- 4.65 L	0.94-1.9 L	12 h	0	For use on organic grapes. Harmful to all beneficial arthropods. Toxic to bees.
<p>Additional Notes: Monitor (see page 5-31) and target wingless immature stages of leafhoppers as adults are more difficult to control. Some insecticides registered for the control of leafhoppers are ineffective against the Western grape leafhopper therefore it is important to determine if this species is present in your vineyard.</p> <p>Consider applying insecticides only to areas where leafhoppers have exceeded the threshold level to help preserve beneficials.</p>									

¹Group number for resistance management (see p. 7-6, *Best Practices Guide for Grapes*)

²Re-entry interval on the label (see p. 7-2). Re-entry intervals for grapes usually vary widely by activity. See label for details where a range of re-entry times are shown. An asterisk(*) indicates that no re-entry is shown on the label, but the WorkSafe BC re-entry interval may apply and is shown.

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Climbing Cutworms	Altacor (chlorantraniliprole)	28	S	3	215-285 g	87-115 g	12 h	14	Direct sprays to the developing buds.
	Pounce 384EC (permethrin)	3A	S	2	180-360 mL	70-145 mL	when dry	21	Harmful to all beneficial arthropods. Toxic to bees. Apply at the first sign of cutworm damage in spring, to the trunk and soil surface near trunk base. Use higher rate for larger cutworms.
	Intrepid (methoxyfenozide)	18	S	2	600 mL	243 mL	12 h	30	Apply at first sign of cutworm damage in the spring, to the trunk, cordons, unopened buds and tender shoots.
	Additional Notes: To help reduce cutworm damage, do not control broadleaf weeds until shoots have elongated and the first leaves have expanded.								
Snailcase Bagworm	Dipel 2X DF (<i>Bacillus thuringiensis</i>)	11	S	4	125-250 g/ 400L water		24 h*	0	Apply in late summer when larvae are feeding.
	Bioprotec CAF (<i>Bacillus thuringiensis</i>)	11	S	1	2.8 L	1.1 L	24 h*	0	
Grape Mealybug	Vegol Crop Oil (canola oil)	NC	S	2 dormant 4 summer	2% solution (1L per 50 L water)		24 h*	0-wine 14-table	Dormant and summer application. Begin when pests appear; repeat every 7 to 14 days as needed.
	Insecticidal Soap	NC	S		1% spray (1L/100 L)		24 h*	0-5	Target sprays to the crawler stage in the spring. Do not apply with sulphur or within 3 days of sulphur spray. Also suppresses leafhoppers.
	Movento 240 SC (spirotetramat)	23	S	2	365-585 mL	148-236 mL	12 h	7	Movento has good systemic activity. DO NOT apply to table grapes. Toxic to bees.
	Malathion 85E (malathion)	1B	S	1	880 mL/1000 L of water		12 h-5 days	3	Target sprays to the crawler stage in the spring. Will suppress most beneficials except predatory mites.
	Clutch (clothianidin)	4A	S	2	140-210 g	57-85 g	12 h	1	Toxic to bees. Avoid using Group 4 products more than twice/season to prevent mite problems. Use the higher rate when insect pressure is high.
	Additional Notes: It is important to monitor for and control mealybugs if you have or suspect leafroll virus in your vineyard.								
Grape Phylloxera	Movento 240 SC (spirotetramat)	23	S	2	365-585 mL	148-236 mL	12 h	7	Movento has good systemic activity. DO NOT apply to table grapes. Toxic to bees.
	Clutch (clothianidin)	4A	S	2	140-210 g	57-85 g	12 h	1	Toxic to bees. Avoid using Group 4 products more than twice/season to prevent mite problems. Use the higher rate when insect pressure is high.
	Additional Notes: Resistant rootstocks provide an effective means of combating phylloxera.								

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Scale Insects	Vegol Crop Oil (canola oil)	NC	S	2 dormant 4 summer	2% solution (1L per 50 L water)		24 h*	0-wine 14-table	Dormant and summer application. Begin when pests appear; repeat every 7 to 14 days as needed.
	Insecticidal Soap	NC	S		1% spray (1L/100 L)		24 h*	0-5	Target sprays to the crawler stage in the summer. Do not apply with sulphur or within 3 days of sulphur spray. Also suppresses leafhoppers.
	Movento 240 SC (spirotetramat)	23	S	2	365-585 mL	148-236 mL	12 h	7	DO NOT apply to table grapes. Toxic to bees.
	Malathion 85E (malathion)	1B	S	1	880 mL/1000 L of water		12 h-5 days	3	Target sprays to the crawler stage in the summer. Will suppress most beneficials except predatory mites.
Additional Notes: It is important to monitor for and control scale insects if you have or suspect leafroll virus in your vineyard.									
Thrips	Entrust (spinosad)	5	S	3	364 mL	147 mL	dry-15 days	7	For suppression of thrips.
	Success 480 SC (spinosad)	5	S	3	182 mL	74 mL	dry-15 days	7	For suppression of thrips.
	Clutch (clothianidin)	4A	S	2	140 g	57 g	12 h	1	Toxic to bees. Avoid using Group 4 products more than twice/season to prevent mite problems. Use the higher rate when insect pressure is high.
	Harvanta 50SL (cyclaniliprole)	28	S	3	1.2-1.6 L	486-648 mL	12 h	7	For suppression of Western flower thrips. Toxic to bees. Avoid application during blooming period or apply in the evening when bees are not foraging.
Additional Notes: Thrips are not normally an economic concern for wine grapes. Inspect table grapes for the presence of thrips in spring from around 75% bloom to the end of fruit set and apply insecticides as required. Avoid mowing cover crops during bloom and fruit set.									
Two-Spotted Spider Mites and European Red Mites	Vegol Crop Oil (canola oil)	NC	S	2 dormant 4 summer	2% solution (1L per 50 L water)		24 h*	0-wine 14-table	Dormant and summer application. Begin when pests appear; repeat every 7 to 14 days as needed.
	SuffOil-X (mineral oil)	NC	S	8	1.3% solution (1.29L/100 L water)		12 h	0-wine 14-table	Summer oil for suppression of mites. Begin applications when mites appear; repeat 10-14 days as needed. Do not apply 14 days before or after a captan spray.
	Insecticidal Soap	NC	S		1% solution (1L/100 L)		24 h*	0-5	Do not apply with sulphur or within 3 days of sulphur spray. Also suppresses leafhoppers.
	Malathion 85E (malathion)	1B	S	1	880 mL/1000 L of water		12 h-5 days	3	Will suppress most beneficial insects except predatory mites. Toxic to bees.
	Agri-mek SC ♂ (abamectin)	6	V	2	130-265 mL	52-107 mL	12 h-21 days	28	Use higher rate for severe infestations. Applicator's Certificate needed.
	Nexter (pyridaben)	21	S	1	300-600 g	120-243 g	24 h-54 days	25	Toxic to bees. High rates are harmful to predatory mites.

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Two-Spotted Spider Mites and European Red Mites	Envidor 240 SC (spirodiclofen)	23	S	1	0.75 L	300 mL	12 h-2 days	14	Toxic to predatory mites. Post-bloom application only.
	Acramite 50 WS (bifenazate)	25	S	1	568 g (spider mite) 851 g (Eur.redmite)	230 g (spider mite) 345 g (Eur. redmite)	12 h-5 days	14	May harm beneficial insects and predatory mites. Rates are equivalent to 2-3 pouches per 2 acres.
	Nealta (cyflumetofen)	25	S	2	1 L	405 mL	12 h	14	Effective on all life stages. Safe on beneficial insects.
	PureSpray Green Spray Oil 13E (mineral oil)	NC	S	8	10 L	4 L	12 h	0-wine 14-table	Summer oil for suppression of mites. Do not apply within 14 days of a sulphur or captan spray.
Additional Notes: To preserve and enhance beneficial species that help to control mites, apply pesticides only when necessary and only to parts of the vineyard where pest populations are sufficiently high to warrant control. Rotate materials from different chemical groups to help prevent development of mite resistance.									
Grape Erineum Mite	Kumulus DF or Cosavet DF Edge (sulphur)	M	S	8	3.4 kg	1.3 kg	24 h	21-wine 14-table	Apply at pre-bloom at first sign of gall formation on leaves. May cause injury during hot weather See label for sensitive varieties.
	PureSpray Green Spray oil 13E (mineral oil)	NC	S	8	10 L	4 L	12 h	0-wine 14-table	Summer oil for suppression of mites. Do not apply within 14 days of a sulphur or captan spray.
	Vegol Crop Oil (canola oil)	NC	S	2 dormant 4 summer	2% solution (1L per 50 L water)		24 h*	0-wine 14-table	Dormant and summer application. Begin when pests appear; repeat every 7 to 14 days as needed.
	SuffOil-X (mineral oil)	NC	S	8	1.3% solution (1.29L/100 L water)		12 h	0-wine 14-table	Summer oil for suppression of mites. Begin applications when mites appear; repeat 10-14 days as needed. Do not apply 14 days before or after a captan spray.
	Insecticidal Soap	NC	S		1% solution (1L/100 L water)		24 h*	0	Do not apply with sulphur or within 3 days of sulphur spray. Do not use on table grapes once they become 6-7 mm in diameter (removes waxy bloom). Also suppresses leafhoppers.
Additional Notes: Erineum mite is seldom a problem in vineyards where sulphur is applied routinely for powdery mildew control. Applications of sulphur are most effective early in the season when galls are first being formed on new leaves.									
Grape Leaf Rust Mite	There are no miticides currently registered specifically for the control of grape leaf rust mite. Sulphur (Kumulus, Cosavet) applied for grape erineum mite will also help to control grape leaf rust mite. Apply in high volume sprays during bud swell to woolly bud stage.								
Yellow Jacket Wasps	Mako (cypermethrin)	3	S	2	150 mL	60 mL	24 h*	2-mechanical 7-hand	Do not use on table grapes. PHI is 7 days for hand harvest or 2 days for mechanical harvest. Toxic to bees.
Spotted Wing Drosophila	Imidan 70 WP (phosmet)	1B	M	3	2.2 kg	0.9 kg	14	14	Toxic to bees and most beneficial insects.
	Harvanta (cyclanilprole)	28	S	3	1.2-1.6 L	486-648 mL	12 h	7	Toxic to bees. Use the higher rate when insect pressure is high.

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Spotted Wing Drosophila	Delegate (spinetoram)	5	S	3	350 g	142 g	12 h	7	Toxic to bees.

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Table 2. FUNGICIDES

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 Read the *Best Practices Guide for Grapes* section on Diseases for additional information on disease management. See explanatory notes on page 13 of this document.

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Disease	Recommended Product Choices	Grp ¹	Risk of Resistance	Max. Applies/Season	Amount per		REI ²	PHI ³ (days)	Precautions and Notes
					Ha	Acre			
Powdery Mildew	Kumulus DF or Cosavet DF (sulphur 80%)	M2	low	8	4.2 kg	1.7 kg	24 h	21-wine 14-table	Repeated applications may harm beneficial mites. Apply at 10-day intervals. May cause injury during hot weather (> 27 °C) and on sensitive varieties.
	PureSpray Green Spray Oil 13E (mineral oil)	NC	low	8	10 L	4 L	12 h	0-wine 14-table	Summer oil for suppression of powdery mildew. Apply on a 10-21 day interval. Do not apply within 14 days of a sulphur or captan spray.
	SuffOil-X	NC	low	8	1.3% solution (1.29L/100 L water)		12 h	0-wine 14-table	Summer oil for suppression of powdery mildew. Apply pre-bloom on a 10-21 day interval. Use shorter interval for high disease pressure. Do not apply 14 days before or after a captan spray.
	Vegol Crop Oil (canola oil)	NC	low	4	2% solution (1L per 50 L water)		24 h*	0-wine 14-table	Summer application for suppression of powdery mildew. Apply on a 7 to 14 day interval.
	Vivando (metrafenone 300g/L)	U8	medium	3	750 ml	304 mL	12 h to 4 days	14	Apply at 14-21 day intervals; use shorter interval for high disease pressure.
	Property 300 SC (pyriofenone)	U8	medium	3	300-366 mL	121-148 mL	12 h to 16 days	0	Apply preventatively at 14 day intervals.
	Priwen 500EC (spiromamine)	5	low to medium	2-3	400-600 mL	162-243 mL	12 h to 24 days	35	Wine grapes only. Do not use on table grapes. Use on a preventative schedule at 14 day intervals.
	Nova (myclobutanil 40%)	3	medium	2	200 g	81 g	12 h to 14 days	14	Apply at 21-day intervals. Limit group 3 fungicides to 2 sprays per season for resistance management.
	Mettle (tetraconazole)	3	medium	2	219-365 mL	89-148 mL	12 h to 23 days	15	Apply at 14-21 day intervals. Limit group 3 fungicides to 2 sprays per season for resistance management.
	Fullback (flutriafol)	3	medium	2	585-731 mL	237-296 mL	12 h to 15 days	14	Apply at 14-21 day intervals. Limit group 3 fungicides to 2 sprays per season for resistance management.
	Cevya (mefentrifluconazole)	3	medium	2	190-250 mL	77-101 mL	12 h to 35 days	14	Apply preventatively at 14 day intervals. Limit group 3 fungicides to 2 sprays per season for resistance management.
	Inspire Super (difenoconazole + cyprodinil)	3+9	medium	2	836 mL	338 mL	7 to 15 days	14	Apply at 15-21 day intervals. Note higher rate needed for botrytis control. Alternate with fungicides from different groups.
	Aprovia (benzovindiflupyr)	7	medium to high	3	500-750 mL	202-303 mL	12 h to 4 days	21	Apply beginning at bud break on a 7-21 day interval. Alternate with fungicides from different groups.
	Aprovia Top (benzovindiflupyr + difenoconazole)	7+3	medium to high	6	643 mL	260 mL	2 to 10 days	21	Apply beginning at bud break on a 11-21 day interval. Alternate with fungicides from different groups.
Sercadis fungicide (fluxapyroxad)	7	medium to high	6	250 mL	101 mL	12 h	14	Apply beginning at bud break or prior to onset of disease on a 7 to 14 day interval.	

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Powdery Mildew	Cantus WDG (boscalid 70%)	7	medium to high	3	315 g	128 g	12 h	14	Apply on a 10-14 day schedule. Use the shorter interval when disease pressure is high.
	Luna Tranquility (fluopyram + pyrimethanil)	7+9	medium to high	3	600 mL	243 mL	12-24 h	7	Wine grapes only. Apply preventatively and continue as needed on a 7-14 day interval.
	Pristine WG (boscalid + pyraclostrobin)	7+11	medium to high	3	420-735 g	170-300 g	dry to 21 days	14	See label for details on rates and spray intervals. Also suppresses botrytis. Do not use on table grapes.
	Flint (trifloxystrobin 50%)	11	high	2	105-140 g	43-57 g	12 h to 12 days	14	Apply preventively and continue as needed on a 14-21 day interval. Limit group 11 fungicides to 1 or 2 sprays per season for resistance management.
	Sovran WG (kresoxim-methyl 50%)	11	high	2	240-300 g	100-122 g	48 h	14	
	Quintec (quinoxifen)	13	medium	3	300 ml	121 mL	12 h	14	Apply at 14 day intervals.
	Diplomat 5SC (polyoxin D zinc salt)	19	medium		259-926 mL	105-375 mL	dry	0	Apply preventatively at a 7-14 day interval. Use higher rate and shorter intervals when disease pressure is high. Maximum 3 applications at full rate.
	Milstop or Sirocco (potassium bicarbonate)	NC	low		2.8-5.6 kg	1.1-2.3 kg	4 h	0	Apply at 7-14 day intervals. Use higher rate under high disease pressure.
	Serifel (<i>Bacillus amyloliquefaciens</i>)	44	low		250-500 g	100-200 g	4 h	0	Biofungicide. Disease suppression only. Apply preventatively at 5-10 day intervals.
	Serenade Opti (<i>Bacillus subtilis</i>)	44	low		1.7-3.3 kg	688 g-1.33 kg	24 h*	0	Biofungicide. Disease suppression only. Do not tank mix with other products or fertilizers.
	Double Nickel (<i>Bacillus amyloliquefaciens</i>)	44	low		2.5-10 L	1-4 L	dry	0	Biofungicide. Disease suppression only. Apply at 3-10 day intervals. Use higher rate and closer timings under high disease pressure.
	Timorex Gold (tea tree oil)	46	low		1.5-2.0 L	0.6-0.81 L	4 h	2	Apply at 7-14 day intervals. Do not apply with sulphur or captan products. May also suppress botrytis.
	Regalia Maxx (<i>Reynoutria sachalinensis</i>)	P	low		0.125 - 0.25 % solution (1.25-2.5 L/1000 L water)		dry	0	Apply preventatively or when disease symptoms first appear. Biofungicide. Disease suppression only.
	Actinovate SP (<i>Streptomyces lydicus</i>)	NC	low		425-840 g	172-340 g	dry	0	Biofungicide. Disease suppression only.
	Buran (garlic powder)	NC	low		18 L	7.3 L	dry	0	Disease suppression only.
OxiDate ♂ (hydrogen peroxide + peroxyacetic acid)	NC	low		1% solution (100 mL/ 10 L water)		4 h	0	Partial disease suppression only. Apply preventatively or when disease symptoms first appear. Thorough and even spray coverage is required.	

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Powdery Mildew	Fracture (BLAD polypeptide)	M12	low	5	1.5-3.3 L	0.6-1.3 L	24 h*	0	Biofungicide. Diseases suppression. Use higher rate for high disease pressure. Apply at 7-10 day intervals.
	Lime Sulphur (sulphide sulphur 30%)	M2	low	1	73 L / 1000 L of water		48 h	120	Apply 500L of spray mixture/ha during dormant stage in late fall or early spring prior to bud swell.
	Cueva (copper octanoate)	M1	low		0.5% to 2% solution (0.5-2 L/100 L water) Apply at 470-940 L per hectare		4 h	1	Apply at the start of flowering and continue every 7 to 10 days. Do not mix with lime.
	Parasol WG ♂ (copper hydroxide)	M1	low		2.24-6.72 kg	0.9-1.5 kg	48 h	2	Apply at bud break and continue every 3 days. Use 400- 600 L water/ha. May cause injury to foliage of copper-sensitive varieties such as Concord.
Good early season control is critical to prevent berry damage. Protect green tissue from bud break to 3-4 weeks after cap fall (most susceptible period for primary infection and fruit infection). Continue cover sprays through the summer to protect foliage health and prevent build-up of mildew inoculum for the next season. Use shorter application intervals and/or higher label rates under high disease pressure.									
Botrytis Bunch Rot	Rovral (iprodione 50%)	2	medium to high	2	1.5 kg	600 g	12 h	7	Apply beginning at mid to late bloom. Protect fruit before complete bunch closure.
	Elevate (fenhexamid 50%)	17	low to medium	3	1.12 kg	450 g	4 h	7	Do not apply more than 2 consecutive sprays
	Scala (pyrimethanil 400 g/L)	9	medium	3	2.0 L	810 mL	12-24 h	7	Apply at 7 day intervals. Thorough coverage of bunches is essential.
	Switch 62.5 WG (cyprodinil + fludioxonil)	9+12	low to medium	2	775-975 g	314-395 g	12 h to 7 days	7	21 day application interval. Thorough coverage of bunches is essential.
	Inspire Super (difenoconazole + cyprodinil)	3+9	medium	2	1033-1475 mL	418-597mL	7 to 15 days	14	Apply at 15-21 day intervals. Also controls powdery mildew. Alternate with fungicides from different groups.
	Kenja 400 SC (isofetamid)	7	medium to high	3	1.46-1.61 L	591-652 mL	12 h	14	Apply at critical timings on a 14 day interval. Thorough coverage of bunches is essential.
	Luna Tranquility (fluopyram + pyrimethanil)	7+9	medium to high	2	1.2 L	485 mL	12-24 h	7	Wine grapes only. Thorough coverage of bunches is essential.
	Pristine WG (boscalid + pyraclostrobin)	7+11	medium to high	3	420-735 g	170-300 g	dry to 21 days	14	Suppression only for botrytis. See label for details on rates and spray intervals. Do not use on table grapes.
	Miravis Prime (pydiflumetofen + fludioxonil)	7 + 12	medium to high	2	800-1000 mL	324-405 mL	12 h	14	21 day application interval. Begin applications at early bloom. Use higher rate and shorter intervals when disease pressure is high.
	Diplomat 5SC (polyoxin D zinc salt)	19	medium		463-926 mL	187-375 mL	dry	0	Suppression only. Apply preventatively. Use higher rate & shorter intervals when disease pressure is high. Maximum 3 applications at full rate.

¹Group number for resistance management (see p. 7-6, *Best Practices Guide for Grapes*)

²Re-entry interval on the label (see p. 7-2). Re-entry intervals for grapes usually vary widely by activity. See label for details where a range of re-entry times are shown.

An asterisk(*) indicates that no re-entry is shown on the label, but the WorkSafe BC re-entry interval may apply and is shown.

³Pre-harvest interval (see p. 7-13).

Table 2. FUNGICIDES

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Read the *Best Practices Guide for Grapes* section on Diseases for additional information on disease management. See explanatory notes on page 13 of this document.

READ THE PRODUCT LABEL BEFORE MIXING AND APPLYING ANY PESTICIDE

Disease	Recommended Product Choices	Grp ¹	Risk of Resistance	Max. Applics/Season	Amount per		REI ²	PHI ³ (days)	Precautions and Notes
					Ha	Acre			
Botrytis Bunch Rot	Sirocco (potassium bicarbonate)	NC	low		2.8 kg	1.1 kg	4 h	0	Suppression only. Apply at 7-14 day intervals.
	Serifel (<i>Bacillus amyloliquefaciens</i>)	44	low		250-500 g	100-200 g	4 h	0	Biofungicide. Disease suppression only. Apply preventatively at 5-10 day intervals.
	Serenade Opti (<i>Bacillus subtilis</i>)	44	low		1.7-3.3 kg	688 g-1.33 kg	24 h*	0	Biofungicide. Disease suppression only. Do not tank mix with other products. May also suppress sour rot.
	Double Nickel (<i>Bacillus amyloliquefaciens</i>)	44	low		3.0-25 L	1.2-10 L	dry	0	Biofungicide. Disease suppression only. Apply at bloom, pre-bunch closure, veraison, and pre-harvest. Use higher rates under high disease pressure.
	Regalia Maxx (<i>Reynoutria sachalinensis</i>)	P	low		0.25 % solution (2.5 L/1000 L water)		dry	0	Biofungicide. Disease suppression only.
	Fracture (BLAD polypeptide)	M12	low	5	1.5-3.3 L	0.6-1.3 L	24 h*	0	Biofungicide. Apply prior to onset of disease when conditions favor Botrytis development during early bloom, bunch preclosure, veraison and ripening
	Botector (<i>Aureobasidium pullulans</i>)	NC	low	4	400 g	162 g	dry	0	Biofungicide. Suppression only. Apply to the bunch zone. Sensitive to some fungicides – see label.
Key timings for Botrytis fungicide applications: bloom, just before bunch closing, veraison, and pre-harvest. Botrytis control becomes more difficult as the fruit matures because heavy canopy growth and bunch closing make it difficult to place the fungicide where it is needed, and grapes become increasingly susceptible. Use shorter application intervals and/or higher label rates under high disease pressure.									
Sour Rot	Serenade Opti (<i>Bacillus subtilis</i>)	44	low		1.7-3.3 kg	688 g-1.33 kg	24 h*	0	Biofungicide. Disease suppression only. Do not tank mix with other products or fertilizers.
	Reduce fruit damage by controlling mildew, bunch rot, and feeding injury from wasps and birds.								

¹Group number for resistance management (see p. 7-6, *Best Practices Guide for Grapes*)

²Re-entry interval on the label (see p. 7-2). Re-entry intervals for grapes usually vary widely by activity. See label for details where a range of re-entry times are shown.

An asterisk(*) indicates that no re-entry is shown on the label, but the WorkSafe BC re-entry interval may apply and is shown.

³Pre-harvest interval (see p. 7-13).

Table 3. HERBICIDES

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 See Table 4 for more information on product efficacy against target weeds. Read the *Best Practices Guide for Grapes* sections on Weeds and Vineyard Floor Management for additional information on cover crops and using herbicide effectively. See explanatory notes on page 13 of this document. **READ THE PRODUCT LABEL BEFORE MIXING AND APPLYING ANY PESTICIDE.**

Herbicide	General Characteristics, Rates and Restrictions											Comments
	Product name (active ingredient)	Chemical Group ¹	Dermal Toxicity	Oral Toxicity	Applicator Certificate	Optimum pH	Maximum Amount or Applications/Season	Pre-Harvest Interval (days) ³	Re-entry Interval ²	Target Weed Growth Stage (Application Timing)	Water Volume/ha	
Aim EC (carfentrazone)	14	S	S	N		1	3	12 h	Growing weeds (≤ 10cm)	Minimum 100 L/ha	37-117mL /ha (15-47 ml/acre)	Use a hooded sprayer
						2	30	12 h	Sucker management	200 L/ha	150 mL /ha (61 ml/acre)	Apply with an adjuvant. See label.
Alion (indaziflam)	29	S	S	N		1	14	12 h	Pre-emergent	Minimum 93 L/ha	375 mL/ha (152 mL/acre)	Use only in vineyards established 5 years or longer. See label for additional precautions.
Authority 480 (sulfentrazone)	14	S	S	N	5-9	1	3	12 h	Pre-emergent	Minimum 100 L/ha	219 -292 mL/ha (89-118 mL/acre)	Do not use on coarse soils with less than 1% organic matter. Protect green bark and foliage.
Casoron G4 (dichlobenil)	20	S	S	N				24 h	Pre-emergent	Apply to moist soils	110-175 kg/ha (44-70 kg/acre)	Treat only dormant vines established for 2 or more years
Chateau WDG (flumioxazin)	14	S	S	N		2	60	12 h	Pre-emergent	Apply to moist soils	280-420 g/ha (113-170 g/acre)	For use in established vineyards. Rates vary by soil type; see label
Chikara (flazasulfuron)	2	S	S	N		1	75	12 h	Pre or Post-emergent	150 to 450 L/ha	150-200 g/ha (61-81 g/acre)	Apply only to 3 rd year planted vines or older. For post-emergent application add non-ionic surfactant at 0.25%
Devrinol 50 DF (napropamide)	15	S	S	N	5.5-7	1		12 h	Pre-emergent	Apply to moist soils	9 kg/ha (3.6 kg/acre)	For use in established vineyards Do not apply from bloom to harvest
Frontier Max (dimethenamid)	15	S	S	N		1	30	24 h	Pre-emergent	Minimum 170 L/ha	963 mL/ha (390 mL/acre)	For bearing and non-bearing grapes
Gramoxone Ⓜ (paraquat)	22	M	M	Y	<7		7	24 h	Actively Growing weeds	1100 L/ha	5.5 L/ha (2.2 L/acre)	No longer available to purchase. May be used until December 31, 2018.
Ignite SN (glufosinate ammonium)	10	S	S	N	5.5	6.7 L	40	12 h	Young actively growing weeds	330-1100 L/ha	2.7-5.0 L/ha (1.1-2.0 L/acre)	For use in established vineyards.
Karmex DF (diuron)	7	S	S	N				12 h	Pre-emergent	250-400 L/ha	2.25-3.25 kg/ha (0.9-1.3 kg/acre)	For use in established vineyards. Rates vary by soil type; see label
Poast Ultra (sethoxydim)	1	S	S	N		1	30	12 h	Actively Growing weeds (2-5 leaf)	50-200 L/ha	0.32-1.1 L/ha (130-445 mL/acre)	Adjust rate for banded application. Use with Merge adjuvant, see label.

Table 3. HERBICIDES

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See Table 4 for more information on product efficacy against target weeds. Read the *Best Practices Guide for Grapes* sections on Weeds and Vineyard Floor Management for additional information on cover crops and using herbicide effectively. See explanatory notes on page 13 of this document. **READ THE PRODUCT LABEL BEFORE MIXING AND APPLYING ANY PESTICIDE.**

Herbicide	General Characteristics, Rates and Restrictions											Comments
Product name (active ingredient)	Chemical Group ¹	Dermal Toxicity	Oral Toxicity	Applicator Certificate	Optimum pH	Maximum Amount or Applications/Season	Pre-Harvest Interval (days) ³	Re-entry Interval ²	Target Weed Growth Stage (Application Timing)	Water Volume/ha	Application Rate(s)	
Roundup, Credit, Crush'R-Plus, Glyphos, Vantage, Touchdown (glyphosate)	9	S	S	N	5-7.5	3	14	12 h	Actively Growing weeds	50-300 L/ha	See label	For use in established vineyards. Rates vary by product; see label
Venture L (fluazifop-P)	1	S	S	N		1	30	12 h	Actively Growing weeds (2-5 leaf)	50-200 L/ha	2 L/ha (800 mL/acre)	For bearing and non-bearing grapes

Table 4. Weeds Controlled by Herbicides Registered for Use on Grapes (includes only weeds listed on product labels)

Weeds controlled by Herbicides registered for the use on grapes																																						
Trade Name	Active Ingredient	Group	Broadleaf Weeds															Grassy Weeds																				
			Canada fleabane	Cleavers	Common chickweed	Common groundsel	Common purslane	Dandelion	Field Bindweed	Field Horsetail	Kochia	Lamb's-quarters	Mallow	Morning Glory	Nightshade, Eastern Black	Nightshade, Hairy	Prickly lettuce	Redroot pigweed	Shepherd's-purse	Sowthistle, annual	Stinkweed	Stork's-bill	Vetch	Waterhemp, Tall	Wild Buckwheat	Yellow woodsorrel	Barnyard Grass	Bluegrass, annual	Crabgrass	Cheat	Downy brome	Foxtail barley	Green foxtail	Long-spine Sandbur	Witch grass	Yellow foxtail		
Authority	sulfentrazone	14		X		X	X				X	X			X		X						X	X														
Aim	carfentrazone	14					X				X	X	X	X		X		X	X				X	X														
Alion	Indaziflam	29				X			X		X	X			X	X	X			X					X		X		X	X	X		X	X				
Casoron G-4	dichlobenil	20			X	X		X	X	X	X	X					X	X	X			X		X			X									X		
Chateau WDG	flumioxazin	14	X					X			X	X			X	X																	X					
Chikara	flazasulfuron	2	X	X	X	X	X	X				X	X			X	X	X		X								X	X		X	X	S		X			
Devrinol 50-DF	napropamide	15				X	X								X	X		X		X						X	X	X				X			X			
Frontier Max	dimethenamid-P	15											X			X										X					X		X	X				
Ignite SN	glufosinate	10			X			X		S		X				X			X												X							
Karmex DF	diuron	7										X				X																X						
Poast Ultra	sethoxydim	1																														S	X		X	X		
	glyphosate	9	X	X	X	X	X	X	X		X	X		X	X	X	X	X	X	X					X		X	X	X	X	X					X		
Venture L	fluazifop-P-butyl	1																														X		X	X			
Gramoxone	paraquat	22	Label states it is a non-residual herbicide for the control of many grasses and broadleaf weeds																																			
	Legend																																					
	X=control																																					
	S=suppression																																					

Explanatory Notes / Legend:

- This publication is a companion document to the **Best Practices Guide for Grapes for British Columbia Growers**. Page number references point to more detailed information in the Best Practices Guide - <http://www.bcwgcc.org/best-practices-guide>.
- **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 in the *Best Practices Guide for Grapes* 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.
- **Risk of Resistance (fungicides):** Ratings based on FRAC guidelines (<http://www.frac.info/>) indicate level of risk for development of fungicide resistance by the pathogen.
- **Toxicity, oral:** S (slightly toxic), M (moderately toxic), V (very toxic) – see page 7-2 of the *Best Practices Guide for Grapes* for more information. Note, all fungicides listed in this guide are rated as S (slightly toxic).
- **Re-entry Intervals (REI):** Do not enter or allow workers to enter the vineyard until the re-entry time has passed following a pesticide application. Note: REIs for grapes often vary widely by activity. See label for details where a range of re-entry times are shown. Typically the longest REI is required for girdling and cane turning. Tying/training, leaf pulling and hand harvesting usually also require relatively long REIs. An asterisk (*) indicates that no REI is shown on the label, but the WorkSafe BC re-entry interval may apply and is shown.
- **Pests/Diseases/Weeds Controlled:** list includes only pests, diseases and weeds against which a pesticide is registered and recommended for use in the B.C. Interior.
- **Maximum Applications/Season:** product labels often indicate the maximum number of times a product can be used per season. In some cases we have recommended fewer applications for resistance management purposes.
- **Notes on impacts to 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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