

Grape Disease Management Schedule for Nova Scotia 2011/2012



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Sources of Information on Pesticides

Information Service of the Pest Management Regulatory Agency

Phone: 1-800-267-6315

Web Site: <http://www.hc-sc.gc.ca/cps-spc/pest/index-eng.php>

Pest Management Regulatory Agency –Electronic Labels: Search Tool

Web Site: <http://www.hc-sc.gc.ca/cps-spc/pest/registrant-titulaire/tools-outils/label-etiq-eng.php>

National Pesticide Information Centre

Web Site: <http://npic.orst.edu/>

Chemfinder WebsERVER

Web Site: <http://chembiofinderbeta.cambridgesoft.com/>

Environment Assistance

Pesticide and Chemical Spills

Phone: 1-800-565-1633

Organic Agricultural Centre of Canada

Web Site: <http://www.organicagcentre.ca/>

Emergency and First-Aid Procedure for Pesticide Poisoning

- Become familiar with the chemicals you are using. Keep a list of common names in case of accidents or emergencies. This information can be found on product labels cross-referenced in this publication.
- If a pesticide has come in contact with the skin or has been spilled on clothing, remove the clothing and wash the skin thoroughly with soap and warm water.
- If a person suspects poisoning from exposure to a pesticide by swallowing, inhalation or contact with skin or eyes, read the label of the pesticide container and carry out first-aid treatment as suggested.
- Immediately after first-aid treatment has been given, wrap the patient in a coat or blanket and rush him/her to the nearest hospital. Take the list of chemical common names with you and identify the one being used.
- If a person is unconscious or lapses into unconsciousness, call **911** immediately.
- Emergency advice on pesticide poisoning is available from the Poison Information Centre, Halifax, NS. Phone 1-800-565-8161 (NS & PEI).

Toxicity Table

LD ₅₀ (mg/kg)	Hazard Rating	Relative Toxicity Rating
Above 500	Very Low Hazard	1
101-500	Low Hazard	2
21-100	Moderate Hazard	3
11-20	Very High Hazard	4
10 and less	Extremely Hazardous	5

Pesticide Formulation Abbreviations

DF	dry flowable	SN	solution
DP	dispersible powder	SP	soluble powder
DU	dust	SU	suspension
EC or E	emulsifiable concentrate	SURF	surfactant
F or FLO	flowable solution	W or WP	wettable powder
GR or G	granular	WSP	water soluble pouch
SC	spray concentrate	WDG or DG	water dispersible granules
EG	water dispersible granule		

Warning

Please note that we make no warranty or guarantee of any kind, expressed or implied, concerning the use of products listed in this publication. The user assumes all risks, whether recommendations are followed or not. This publication is intended as a guide only.

For specific product information always refer to and follow directions on the label.

TABLE 1 PESTICIDES LISTED IN THIS SCHEDULE

This listing includes all the commercially registered fungicides detailed in the Grape Disease Management Schedule.

Chemical Name	Trade name	Fungicide Group	Re-entry Time (hrs)	Days to Harvest	Disease Controlled
bacillus subtilis	Serenade*	44		0	Powdery mildew, botrytis bunch rot
boscalid	Lance	7	12	14	Powdery mildew
Boscalid + pyraclostrobin	Pristine	7+11	21 days ¹	14	Powdery mildew, downy mildew, black rot and botrytis bunch rot
captan	Captan/Maestro	M	72	7	Black rot, downy mildew, Phomopsis cane and leaf spot
clothianidin	Clutch	4A	12	1	Phylloxera
copper oxychloride	Copper Spray*	M		1	Powdery and downy mildew
tri-basic copper sulphate	Copper 53W* Basicop	M		1	Black rot, downy mildew, Phomopsis cane and leaf spot
cyprodinil	Vanguard	9	48	7	Botrytis bunch rot
fenhexamid	Elevate	17	4	7	Botrytis bunch rot
ferbam	Ferbam	M		7	Black Rot
folpet	Folpan	M	24	1	Black rot, powdery and downy mildew, Phomopsis cane and leaf spot
iprodione	Rovral	2	12	Before bunch closure	Botrytis bunch rot
kresoxim-methyl	Sovran	11	48	14	Black rot, powdery and downy mildew
mancozeb + dinocap	Dikar	M	48	30	Powdery and downy mildew
mancozeb + zoxamide	Gavel	22+M	48	66	Downy mildew
mandipropamid	Revus	40	12	14	Downy mildew
metiram	Polyram	M		45	Black rot, downy mildew.
metalaxyl-M + mancozeb	Ridomil Gold MZ	4+M ²	24	66	Downy mildew
myclobutanil	Nova	3	When dry	14	Powdery mildew, black rot
potassium bicarbonate	Milstop*	M	4	0	Powdery mildew
pyrimethanil	Scala	9	24	7	Botrytis bunch rot
quinoxifen	Quintec	13	12	14	Powdery mildew
spirotetrament	Movento	23	12	7	Phylloxera
sulphur	Kumulus* Microscopic Sulphur	M	24	21	Powdery mildew, Erineum mite
trifloxystroblin	Flint	11	5 days ²	14	Powdery mildew, black rot

*Permitted substances for organic production but may have restrictions on their use. Check with your certifying body as to their permissible use.

¹For hand labour, otherwise when dry.

² For hand labour, otherwise 12 hrs.

Table 2 Effectiveness of Fungicides for Grape Disease Control						
	Group	Black rot	Downy Mildew	Powdery Mildew	Botrytis	Phomopsis Cane & Leaf Spot
Copper	M	++	++	++	0	+
Captan	M	++	+++	0	+	+++
Dikar	M	+++	+++	+++	0	+
Elevate	17	0	0	+	+++	0
Ferbam	M	+++	++	0	0	+
Flint	11	+++	+	+++	++	+
Folpan	M	++	+++	0	0	+++
Gavel	M,22	?	+++	0	?	?
Lance	7	0	0	+++	+	0
MilStop	NC	0	0	++	0	0
Polyram	M	+++	+++	0	0	?
Pristine	7,11	+++	+++	+++	++	+
Quintec	13	0	0	+++	0	0
Nova	3	+++	0	+++	0	0
Revus	40	0	+++	0	0	0
Ridomil	4	+	+++	0	0	+
Rovral	2	0	0	0	++	0
Scala	9	0	0	+	+++	?
Serenade	ASO	?	0	+	++	?
Sovran	11	+++	++	+++	++	+
Sulphur	M	0	0	+++	0	0
Vanguard	9	0	0	+	+++	+

Although a fungicide may control several diseases only use fungicides for diseases that are listed on the product label.
Ratings based upon information from OMFRA Pub. 360 and NY Pest Management Guide for Grapes.

0 = ineffective

+ = slightly effective/suppression, not recommended for very susceptible cultivars or at critical stages of infection

++ = moderately effective

+++ = very effective

Relative disease susceptibility and sensitivity to sulphur and copper

Cultivar	Susceptibility							Sensitivity	
	BR	DM	PM	Bot	Phom	Eu	CG	S	Cu
Baco noir	+++	+	++	++	+	++	+++	No	?
Cabernet Franc	+++	+++	+++	+	?	?	+++	No	?
Cabernet Sauvignon	+++	++	+++	+	+++	+++	+++	No	?
Canadice	+++	+	+	++	?	?	++	?	?
Chancellor	+	++	++	+	+++	+	+++	Yes	+++
Chardonnay	++	+++	+++	+++	+++	++	+++	No	+
Concord	+++	++	++	+	+++	+++	+	Yes	+
DeChaunac	+	+++	++	+	+++	+++	++	Yes	+
Einset Seedless	+++	+	+++	+	?	?	+	?	?
Frontenac	++	+++	++	++	+	?	?	No	?
Geurztraminer	+++	+	+++	+++	?	?	+++	No	+
Himrod	++	+++	++	+	?	?	?	No	?
L'Acadie	+	+	+	+	+	+	?	?	?
Leon Millot	+	+++	+++	+	+	+	?	Yes	?
Lucie Kuhlmann	++	+	++	++	++	++	?	?	?
Marechal Foch	++	+	++	+	++	++	?	Yes	?
NewYork Muscat	+	+	++	+	+	+	?	?	?
Pinot gris	+++	+++	+++	++	?	+++	+++	No	?
Pinot noir	+++	+++	+++	+++	?	?	+++	No	+
Reliance	+++	+++	++	+	++	?	?	No	+
Riesling	+++	+++	++	+	++	?	?	No	+
Sauvignon blanc	+++	++	+++	+++	?	?	+++	No	+
Seyval	++	+	+++	+++	++	+	++	No	+
Vidal	+	++	+++	+	+	+	++	No	?

Key **BR**= black rot; **DM** = downy mildew; **PM** = powdery mildew; **Bot** = Botrytis; **Phom** = Phomopsis; **Eu** = Eutypa; **CG** = crown gull; **S** = sulphur; **C** = copper

Key to ratings: = = slightly susceptible or sensitive; ++ = moderately susceptible or sensitive; +++ = highly susceptible or sensitive; No = not sensitive; Yes = sensitive; ? = relative susceptibility or sensitivity not established

Slight to moderate sulphur injury may occur even on tolerant cultivars when applied at temperatures of 29°C or higher, immediately prior to or after application.

Copper applied under cool, slow-dying conditions is likely to cause injury

Notes on Insects

Nova Scotia grape growers are very fortunate in that very few insect pests have reached population levels requiring control measures. The most commonly observed pests to date have been the grape erineum mite and phylloxera. The occurrences of these pests are still sporadic within Nova Scotia vineyards. Insecticide should only be applied once a pest has been identified and reached a population level that will have an impact on the crop and quality of grape produced.

Erineum Mite

In many North American grape growing regions the grape erineum mite is considered to be a minor pest causing little economic damage. The fact that Nova Scotia grape growers do not apply insecticides to control other pest may allow for the buildup of this pest. Severe infestations can reduce photosynthesis and cause early leaf drop. At first glance an infestation may be confused with phylloxera as both produce bumpy blistering and gall like formations on the upper surface of the leaf. Once the leaf is turned over the two are easily distinguished by white hairy erineum resulting from the feeding of the erineum mite.



Photos from OMFRA Factsheet

The only pesticides registered in Canada for erineum mite is sulphur. The timing of treatments is based upon when erineum mites are first observed which can occur in the prebloom period. Repeated applications may be required to control this mite. Microscopic Sulphur WP @ 3 kg/ha, Kumulus DF @ 3.4 kg/ha and Microthiol Disperss @ 3.4 kg/ha have registrations for erineum mite. The rate of sulphur to control erineum mite is only one quarter of the rate used to control powdery mildew. Certain cultivars exhibit phototoxicity symptoms to sulphur which further complicates the control of the pest. These three labels instruct not to apply to Concord, Foch, de Chaunac and van Buren varieties. It is important that when applying sulphur to control erineum mite that is applied with a sufficient water volume to obtain good coverage on the underside of the leaf.

Grape Phylloxera

There are two forms of this tiny aphid like insect, the root form which can be very destructive and the leaf form which many cultivars can withstand extensive galling. The leaf form is more commonly observed in Nova Scotia. The insect overwinters as an egg under the bark of the vine. The egg hatches in the spring with the nymph crawling onto the upper surface of a new leaf where it develops a gall. Once reaching maturity the female begins to lay eggs within the gall. Nymphs which hatch from these eggs will crawl out of the gall and move onto the upper surface of new leaves near the tip of the vine. The nymphs form new galls and start the process all over again. Several generations can occur during the growing season.



<http://www.ento.okstate.edu/ddd/insects/grapephylloxera.htm>

Control

There are several pesticides registered for the control of phylloxera in Canada with Movento 240 and Clutch being recommended as the better options for control. Movento 240 SC is systemic, moving to the roots and growing tips of the vines. It has the one drawback of being slow acting and therefore should be applied as soon as nymphs are observed and not waiting until a high number of galls are observed. Based upon past history and early observation it can be applied at the 20-25 cm shoot stage and later. The recommended rate is 88-140 mL/ha with the higher rate used for high pest pressure. The minimal interval between applications is 30 days with a maximum allowable annual application of 920 mL/ha. The preharvest interval is 7 days. Clutch 50 WDG was recently registered for phylloxera control on grapes. Apply at a rate of 140-210 g/ha prior to population reaching damaging levels. If pest pressure continues, apply a second application 14 days later. Do not apply more than 2 applications per growing season and do not exceed 420 g/ha per season. The preharvest interval is 1 day. The product is toxic to bees and should not be applied when bees are present or during bloom.

Additional information

<http://www.omafra.gov.on.ca/english/crops/facts/88-125.htm>

Grape Management Schedule for Nova Scotia 2011/2012

A guide to disease management in vineyards

- Pesticide rates are given on a per hectare basis, based on label information and vine canopy development. Water volumes range from 1700 L/ha at First Leaf to 2800 L/ha at Berry Pea-Sized.
- All rates are based on label rates. Please refer to specific notes or your agricultural advisor for details.
- Always read the label before using any pesticide. Where differences between the label and this schedule occur, label information prevails.

Disease	Products	Formulation	Rate per ha	Notes
First Leaf, 1.25-5.0 cm shoot length				
Fungicide rates are based on a dilute water volume of 1700 L/ha				
Phomopsis cane and leaf spot	Use one of the following listed fungicides.			
	▶ Maestro	80 DF	2.00 kg	Use sufficient volume of water to provide complete coverage. Apply to susceptible cultivars early where there is a history of Phomopsis and wet weather is anticipated. This fungus is active from bud break through pea-sized very stage but most infection take place between bud break and bloom. Rachises are quite susceptible when cluster first become visible.
	Supra Captan	80 WDG		
	▶ Folpan	50 WP	3.50 kg	
3-5 Leaves Unfolded 10-15 cm shoot length				
Fungicide rates are based on a dilute water volume of 1700 L/ha				
Phomopsis cane and leaf spot	Use one of the following listed fungicides.			
	▶ Maestro	80 DF	2.00 kg	Use sufficient volume of water to provide complete coverage. Apply to susceptible cultivars early where there is a history of Phomopsis and weather conditions are wet. This fungus is active from bud break through pea-sized very stage but most infection take place between bud break and bloom. Rachises are quite susceptible when cluster first become visible.
	Supra Captan	80 WDG		
	▶ Folpan	50 WP	3.50 kg	
Black Rot	Only treat at this period if the disease was serious the previous growing season. Fungicides may control more than one disease; select one that best fits the control program. Refer to Table 2 for options.			
	▶ Polyram	DF	3.50 kg	For resistance management do not apply more than 2 consecutive applications of Nova and use a maximum of 5 applications per season.
	▶ Ferbam	76 WDG	3.50 kg	
	▶ Nova	40 W	200 g	
Powdery Mildew	If mildew was a problem during the previous growing season select an appropriate fungicide listed below. Under extreme mildew pressure treatments can begin earlier.			
	▶ Nova	40 W	200 g	For resistance management do not apply more than 2 consecutive applications of Nova and use a maximum of 5 applications per season.
	▶ Flint	50 WG	140 g	Do not apply to Concord grapes or where spray drift may reach Concord grapes. For resistance management do not apply more than 2 consecutive applications of fungicides from the same class (group 11) in a season, and then alternate with 2 applications of a fungicide with a different mode of action. Do not apply more than 4 times per season.
	▶ Sovran	50 WG	240 -300 g	Use the 240 g rate for low to moderate pressure and 300 g rate for high to extreme pressure. For resistance management do not apply more than 2 consecutive applications of fungicides from the same class (group 11) in a season, and then alternate with 2 applications of a fungicide with a different mode of action. Do not apply more than 4 times per season
	▶ Pristine	WG	420-735 g	Use the high rate for spray intervals of up to 21days. Do not apply more than 6 applications per growing season. Do not apply to Concord Fredonia and like cultivars due to possible injury. 21 day re-entry interval for hand labour task.

See next page for additional selections

Disease	Products	Formulation	Rate per ha	Notes
Powdery Mildew ▶	Dikar	80 WP	5.50 kg	When applying to Foch use at least 600L of water per hectare as more concentrated sprays may cause injury. Do not apply under slow drying conditions or temperatures above 27°C.
	▶ Microscopic Sulphur	92 G	7.50 kg	Can be phytotoxic to certain grape cultivars. Do not use on Concord, Foch, de Chaunac, Van Buren or other sulphur sensitive cultivars. Sulphur sprays will suppress and may fully control Erineum mite.
	Kumulus	DF	7.10 kg	
	▶ Milstop	85 WP	2.80 -5.60 kg	Use the high rate and short spray intervals when conditions favor disease development. Complete coverage is required, use a minimum water volume of 500 L/ha. Do not mix with products that are not compatible with a mildly alkaline solution.
	▶ Serenade Max		3.00-6.00 kg	Use the high rate and short spray intervals when conditions favor disease development. Complete coverage is required, use a minimum water volume of 500 L/ha

Shoot Length, 20-25 cm

Fungicide rates are based on a dilute water volume of 1700 L/ha

Phomopsis cane and leaf spot	Use one of the following listed fungicides.			
▶ Maestro Supra Captan	80 DF 80 WDG	2.00 kg	Use sufficient volume of water to provide complete coverage. Apply to susceptible cultivars early where there is a history of Phomopsis and wet weather conditions	
▶ Folpan	50 WP	3.50 kg		
Black Rot	Fungicides may control more than one disease; select one that best fits the control program. Refer to Table 2 for options.			
▶ Polyram	DF	3.50 kg		
▶ Ferbam	76 WDG	3.50 kg		
▶ Nova	40 W	200 g	For resistance management do not apply more than 2 consecutive applications of Nova and use a maximum of 5 applications per season.	
▶ Flint	50 WG	140 g	Do not apply to Concord grapes or where spray drift may reach Concord grapes. For resistance management do not apply more than 2 consecutive applications of fungicides from the same class (group 11) in a season, and then alternate with 2 applications of a fungicide with a different mode of action. Do not apply more than 4 times per season.	
▶ Sovran	50 WG	240 g	For resistance management do not apply more than 2 consecutive applications of fungicides from the same class (group 11) in a season, and then alternate with 2 applications of a fungicide with a different mode of action. Do not apply more than 4 times per season.	
▶ Pristine	WG	735 g	Use the high rate for spray intervals of up to 21days. Do not apply more than 6 applications per growing season. Do not apply to Concord Fredonia and like cultivars due to possible injury. 21 day re-entry interval for hand labour task.	
Downy Mildew	Fungicides may control more than one disease; select one that best fits the control program. Refer to table for options.			
▶ Maestro Supra Captan	80 DF 80 WDG	2.00 kg		
▶ Dikar	80 WP	5.5 kg	When applying to Foch use at least 600L of water per hectare as more concentrated sprays may cause injury. Do not apply under slow drying conditions or temperatures above 27°C.	
▶ Polyram	DF	3.50 kg		
▶ Folpan	50 WP	3.50 kg		

See next page for additional selections

Disease and Insects	Products	Formulation	Rate per ha	Notes
Downy Mildew	▶ Gavel	75 DF	2.25 kg	Treated area must be posted prior to and post-treatment. Signs must remain in place for at least 20 days after application. See label.
	▶ Ridomil Gold MZ	68 WP	2.5 kg	Make only one application per year as a pre-bloom spray.
	▶ Copper Spray+ Lime		3.0 kg/1000L 6.0 kg/1000L	Do apply on Seibel cultivars (De Chaunac).
	▶ Pristine	WG	675-735 g	Do not apply more than 6 applications per growing season. Do not apply to Concord Fredonia and like cultivars due to possible injury. 21 day re-entry interval for hand labour task.
	▶ Revus	SC	500 mL	The use of a non-ionic adjuvant (0.125 v/v) is recommended. Apply prior to disease development. Do not apply more than 4 time per growing season.
	▶ Sovran	50 WG	240 -300g	Use the 240 g rate for low to moderate pressure and 300 g rate for high to extreme pressure. For resistance management do not apply more than 2 consecutive applications of fungicides from the same class (group 11) in a season, and then alternate with 2 applications of a fungicide with a different mode of action. Do not apply more than 4 times per season
Powdery Mildew	Fungicides may control more than one disease; select one that best fits the control program. Refer to table 2 for options.			
▶ Nova	40 W	200 g		For resistance management do not apply more than 2 consecutive applications of Nova and use a maximum of 5 applications per season.
▶ Flint	50 WG	105-140 g		Do not apply to Concord grapes or where spray drift may reach Concord grapes. For resistance management do not apply more than 2 consecutive applications of fungicides from the same class (group 11) in a season, and then alternate with 2 applications of a fungicide with a different mode of action. Do not apply more than 4 times per season.
▶ Sovran	50 WG	240 -300 g		Use the 240 g rate for low to moderate pressure and 300 g rate for high to extreme pressure. For resistance management do not apply more than 2 consecutive applications of fungicides from the same class (group 11) in a season, and then alternate with 2 applications of a fungicide with a different mode of action. Do not apply more than 4 times per season
▶ Lance	WDG	315 g		For resistance management do not apply more than 2 consecutive applications of fungicides from the same class (group 7) in a season, and then alternate with 2 applications of a fungicide with a different mode of action. Do not apply more than 5 times per season.
▶ Pristine	WG	420-735 g		Use the high rate for spray intervals of up to 21days. Do not apply more than 6 applications per growing season. Do not apply to Concord Fredonia and like cultivars due to possible injury. 21 day re-entry interval for hand labour task.
▶ Quintec	SC	300 mL		Use before symptoms appear, will not control established infections. Do not apply more than 5 times per season.
▶ Dikar	80 WP	5.50 kg		When applying to Foch use at least 600L of water per hectare as more concentrated sprays may cause injury. Do not apply under slow drying conditions or temperatures above 27°C.
▶ Microscopic Sulphur	92 G	7.50 kg		Can be phytotoxic to certain grape cultivars. Do not use on Concord, Foch, de Chaunac, Van Buren or other sulphur sensitive cultivars. Sulphur sprays will suppress and may fully control Erineum mite.
▶ Kumulus	DF	7.10 kg		
▶ Miistop	85 WP	2.80 -5.60 kg		Use the high rate and short spray intervals when conditions favor disease development. Complete coverage is required, use a minimum water volume of 500 L/ha. Do not mix with products that are not compatible with a mildly alkaline solution.
▶ Serenade Max		3.00-6.00 kg		Use the high rate and short spray intervals when conditions favor disease development. Complete coverage is required, use a minimum water volume of 500 L/ha

Disease and Insects	Products	Formulation	Rate per ha	Notes
Phylloxera (leaf form)		Only treat for when insect pressure threatens production		
▶	Movento	240 SC	365-585 mL	Only apply when galls become apparent. May take 2-3 weeks for control to become apparent. Movento will move to the young leaves as they development. Minimum interval between applications 30 days. Use the higher rate for high insect pressure.
▶	Clutch	50 EDG	140-210 g	Only apply when galls become apparent. Do apply when bees are present or during bloom. If pest pressure continues follow up with a second application 14 days later.
Erineum Mite	Only treat if populations were high the previous growing season and when new galls are observed. Check cultivar sensitivity to sulphur			
▶	Microscopic Sulphur	92 G	3.0 kg	Apply with a sufficient volume of water to wet both sides of the leaf. Can be phytotoxic to certain grape cultivars. Do not use on Concord, Foch, de Chaunac, Van Buren or other sulphur sensitive cultivars. If sulphur is being applied for powdery mildew control then it is not necessary to make additional applications of sulphur for erineum mite control.
	Kumulus	DF	3.4 kg	

Immediate Prebloom (flower clusters with floret separation)

Fungicide rates are based on a dilute water volume of 1700 L/ha

Black Rot	Fungicides may control more than one disease; select one that best fits the control program. Refer to Table 2 for options.			
▶	Polyram	DF	3.50 kg	
▶	Ferbam			
▶	Nova	40 W	200 g	For resistance management do not apply more than 2 consecutive applications of Nova and use a maximum of 5 applications per season.
▶	Flint	50 WG	140 g	Do not apply to Concord grapes or where spray drift may reach Concord grapes. For resistance management do not apply more than 2 consecutive applications of fungicides from the same class (group 11) in a season, and then alternate with 2 applications of a fungicide with a different mode of action. Do not apply more than 4 times per season.
▶	Sovran	50 WG	240 g	For resistance management do not apply more than 2 consecutive applications of fungicides from the same class (group 11) in a season, and then alternate with 2 applications of a fungicide with a different mode of action. Do not apply more than 4 times per season.
▶	Pristine	WG	735 g	Use the high rate when disease pressure is high. Do not apply more than 6 applications per growing season. Do not apply to Concord Fredonia and like cultivars due to possible injury. 21 day re-entry interval for hand labour task.
Downy Mildew	Fruit clusters are highly susceptible to downy mildew during the bloom to pea-sized berries stage of development. If bloom is delayed or if wet weather is expected repeat the application. Fungicides may control more than one disease; select one that best fits the control program. Refer to Table 2 for options.			
▶	Maestro Supra Captan	80 DF 80 WDG	2.00 kg	
▶	Dikar		5.50 kg	When applying to Foch use at least 600L of water per hectare as more concentrated sprays may cause injury. Do not apply under slow drying conditions or temperatures above 27°C.
▶	Polyram	DF	3.50 kg	
▶	Folpan	50 WP	3.50 kg	
▶	Gavel	75 DF	2.25 kg	Treated area must be posted prior to and post-treatment. Signs must remain in place for at least 20 days after application.
▶	Ridomil Gold MZ	68 WP	2.5 kg	Make only one application per year as a pre-bloom spray.

See next page for additional selections

Disease and Insects	Products	Formulation	Rate per ha	Notes
Downy Mildew	▶ Revus	SC	500 mL/ha	The use of a non-ionic adjuvant (0.125 v/v) is recommended. Apply prior to disease development. Do not apply more than 4 time per growing season.
	▶ Sovran	50 WG	240 -300 g	Use the 240 g rate for low to moderate pressure and 300 g rate for high to extreme pressure. For resistance management do not apply more than 2 consecutive applications of fungicides from the same class (group 11) in a season, and then alternate with 2 applications of a fungicide with a different mode of action. Do not apply more than 4 times per season
	▶ Pristine	WG	675-735 g	Use the high rate when disease pressure is high. Do not apply more than 6 applications per growing season. Do not apply to Concord Fredonia and like cultivars due to possible injury. 21 day re-entry interval for hand labour task.
Powdery Mildew	Fungicides may control more than one disease; select one that best fits the control program. Refer to table 2 for options.			
	▶ Nova	40 W	200 g	For resistance management do not apply more than 2 consecutive applications of Nova and use a maximum of 5 applications per season.
	▶ Flint	50 WG	105-140 g	Do not apply to Concord grapes or where spray drift may reach Concord grapes. For resistance management do not apply more than 2 consecutive applications of fungicides from the same class (group 11) in a season, and then alternate with 2 applications of a fungicide with a different mode of action. Do not apply more than 4 times per season.
	▶ Sovran	50 WG	240 -300g	Use the 240 g rate for low to moderate pressure and 300 g rate for high to extreme pressure. For resistance management do not apply more than 2 consecutive applications of fungicides from the same class (group 11) in a season, and then alternate with 2 applications of a fungicide with a different mode of action. Do not apply more than 4 times per season
	▶ Lance	WDG	315 g	For resistance management do not apply more than 2 consecutive applications of fungicides from the same class (group 7) in a season, and then alternate with 2 applications of a fungicide with a different mode of action. Do not apply more than 5 times per season.
	▶ Pristine	WG	420-735 g	Use the high rate for spray intervals of up to 21 days. Do not apply more than 6 applications per growing season. Do not apply to Concord Fredonia and like cultivars due to possible injury. 21 day re-entry interval for hand labour task.
	▶ Quintec	SC	300 mL	Use before symptoms appear, will not control established infections. Do not apply more than 5 times per season.
	▶ Dikar	80 WP	5.50 kg	When applying to Foch use at least 600L of water per hectare as more concentrated sprays may cause injury. Do not apply under slow drying conditions or temperatures above 27°C.
	▶ Milstop	85 WP	2.80 -5.60 kg	Use the high rate and short spray intervals when conditions favor disease development. Complete coverage is required, use a minimum water volume of 500 L/ha. Do not mix with products that are not compatible with a mildly alkaline solution.
	▶ Microscopic Sulphur	92 G	7.50 kg	Can be phytotoxic to certain grape cultivars. Do not use on Concord, Foch, de Chaunac, Van Buren or other sulphur sensitive cultivars. Sulphur sprays will suppress and may fully control Erineum mite.
	▶ Kumulus	DF	7.10 kg	
	▶ Serenade Max		3.00-6.00 kg	Use the high rate and short spray intervals when conditions favor disease development. Complete coverage is required, use a minimum water volume of 500 L/ha
Phylloxera (leaf form)	Only treat for when insect pressure threatens production			
	▶ Movento	240 SC	365-585 mL	Only apply when galls become apparent. May take 2-3 weeks for control to become apparent. Movento will move to the young leaves as they development. Minimum interval between applications 30 days. Use the higher rate for high insect pressure.
	▶ Clutch	50 EDG	140-210 g	Only apply when galls become apparent. Do apply when bees are present or during bloom. If pest pressure continues follow up with a second application 14 days later.

Disease and Insects	Products	Formulation	Rate per ha	Notes
Erineum Mite	Only treat if populations were high the previous growing season and when new galls are observed. Check cultivar sensitivity to sulphur			
	Microscopic	92 G	3.0 kg	Apply with a sufficient volume of water to wet both sides of the leaf. Can be phytotoxic to certain grape cultivars. Do not use on Concord, Foch, de Chaunac, Van Buren or other sulphur sensitive cultivars. If sulphur is being applied for powdery mildew control then it is not necessary to make additional applications of sulphur for erineum mite control.
▶	Sulphur			
	Kumulus	DF	3.4 kg	

End of Flowering to Early Fruit Set

Fungicide rates are based on a dilute water volume of 2200 L/ha

Disease and Insects	Products	Formulation	Rate per ha	Notes
Black Rot	Fungicides may control more than one disease; select one that best fits the control program. Refer to table 2 for options.			
▶	Polyram	DF	5.50 kg	For resistance management do not apply more than 2 consecutive applications of Nova and use a maximum of 5 applications per season.
▶	Ferbam	76 WDG	5.60 kg	
▶	Nova	40 W	200 g	
▶	Flint	50 WG	140 g	Do not apply to Concord grapes or where spray drift may reach Concord grapes. For resistance management do not apply more than 2 consecutive applications of fungicides from the same class (group 11) in a season, and then alternate with 2 applications of a fungicide with a different mode of action. Do not apply more than 4 times per season.
▶	Sovran	50 WG	240 g	For resistance management do not apply more than 2 consecutive applications of fungicides from the same class (group 11) in a season, and then alternate with 2 applications of a fungicide with a different mode of action. Do not apply more than 4 times per season
▶	Pristine	WG	735 g	Use the high rate when disease pressure is high. Do not apply more than 6 applications per growing season. Do not apply to Concord Fredonia and like cultivars due to possible injury. 21 day re-entry interval for hand labour task.
Downy Mildew	Fungicides may control more than one disease; select one that best fits the control program. Refer to table 2 for options.			
▶	Maestro Supra Captan	80 DF 80 WDG	2.75 kg	When applying to Foch use at least 600L of water per hectare as more concentrated sprays may cause injury. Do not apply under slow drying conditions or temperatures above 27°C.
▶	Dikar		5.50 kg	
▶	Polyram	DF	4.50 kg	
▶	Folpan	50 WP	4.50 kg	Use the 240 g rate for low to moderate pressure and 300 g rate for high to extreme pressure. For resistance management do not apply more than 2 consecutive applications of fungicides from the same class (group 11) in a season, and then alternate with 2 applications of a fungicide with a different mode of action. Do not apply more than 4 times per season.
▶	Sovran	50 WG	240 -300 g	
▶	Pristine	WG	675-735 g	
▶	Gavel	75 DF	2.25 kg	Treated area must be posted prior to and post-treatment. Signs must remain in place for at least 20 days after application.
▶	Revus	SC	500 mL	The use of a non-ionic adjuvant (0.125 v/v) is recommended. Apply prior to disease development. Do not apply more than 4 times per growing season.

Disease and Insects	Products	Formulation	Rate per ha	Notes
Powdery Mildew	Fungicides may control more than one disease; select one that best fits the control program. Refer to Table for 2 options.			
▶ Nova	40 W	200 g	For resistance management do not apply more than 2 consecutive applications of Nova and use a maximum of 5 applications per season.	
▶ Flint	50 WG	105-140 g	Do not apply to Concord grapes or where spray drift may reach Concord grapes. For resistance management do not apply more than 2 consecutive applications of fungicides from the same class (group 11) in a season, and then alternate with 2 applications of a fungicide with a different mode of action. Do not apply more than 4 times per season.	
▶ Sovran	50 WG	240 -300 g	Use the 240 g rate for low to moderate pressure and 300 g rate for high to extreme pressure. For resistance management do not apply more than 2 consecutive applications of fungicides from the same class (group 11) in a season, and then alternate with 2 applications of a fungicide with a different mode of action. Do not apply more than 4 times per season.	
▶ Lance	WDG	315 g	For resistance management do not apply more than 2 consecutive applications of fungicides from the same class (group 7) in a season, and then alternate with 2 applications of a fungicide with a different mode of action. Do not apply more than 5 times per season.	
▶ Pristine	WG	420-735 g	Use the high rate for spray intervals of up to 21days. Do not apply more than 6 applications per growing season. Do not apply to Concord Fredonia and like cultivars due to possible injury. 21 day re-entry interval for hand labour task.	
▶ Quintec	SC	300 mL	Use before symptoms appear, will not control established infections. Do not apply more than 5 times per season.	
▶ Dikar	80 WP	5.50 kg	When applying to Foch use at least 600L of water per hectare as more concentrated sprays may cause injury. Do not apply under slow drying conditions or temperatures above 27°C.	
▶ Microscopic Sulphur Kumulus	92 G DF	10.00 g 9.20 kg	Can be phytotoxic to certain grape cultivars. Do not use on Concord, Foch, de Chaunac, Van Buren or other sulphur sensitive cultivars. Sulphur sprays will suppress and may fully control Erineum mite.	
▶ Milstop	85 WP	2.80 -5.60 kg	Use the high rate and short spray intervals when conditions favor disease development. Complete coverage is required, use a minimum water volume of 500 L/ha. Do not mix with products that are not compatible with a mildly alkaline solution.	
▶ Serenade Max		3.00-6.00 kg	Use the high rate and short spray intervals when conditions favor disease development. Complete coverage is required, use a minimum water volume of 500 L/ha	
Phylloxera (leaf form)	Only treat for when insect pressure threatens production			
▶ Movento	240 SC	365-585 mL	Only apply when galls become apparent. May take 2-3 weeks for control to become apparent. Movento will move to the young leaves as they development. Minimum interval between applications 30 days. Use the higher rate for high insect pressure.	
▶ Clutch	50 EDG	140-210 g	Only apply when galls become apparent. Do apply when bees are present or during bloom. If pest pressure continues follow up with a second application 14 days later.	
Erineum Mite	Only treat if populations were high the previous growing season and when new galls are observed. Check cultivar sensitivity to sulphur			
▶ Microscopic Sulphur Kumulus	92 G DF	3.0 kg 3.4 kg	Apply with a sufficient volume of water to wet both sides of the leaf. Can be phytotoxic to certain grape cultivars. Do not use on Concord, Foch, de Chaunac, Van Buren or other sulphur sensitive cultivars. If sulphur is being applied for powdery mildew control then it is not necessary to make additional applications of sulphur for erineum mite control.	

Disease and Insects	Products	Formulation	Rate per ha	Notes
Berries Pea-Sized				
Fungicide rates are based on a dilute water volume of 2800 L/ha				
Black Rot	Fungicides may control more than one disease; select one that best fits the control program. Refer to Table 2 for options.			
	▶ Polyram	DF	5.50 kg	
	▶ Folpan	50 WP	5.50 kg	
	▶ Ferbam	76 WDG	5.60 kg	
	▶ Nova	40 W	200 g	For resistance management do not apply more than 2 consecutive applications of Nova and use a maximum of 5 applications per season.
	▶ Flint	50 WG	140 g	Do not apply to Concord grapes or where spray drift may reach Concord grapes. For resistance management do not apply more than 2 consecutive applications of fungicides from the same class (group 11) in a season, and then alternate with 2 applications of a fungicide with a different mode of action. Do not apply more than 4 times per season.
	▶ Sovran	50 WG	240 g	For resistance management do not apply more than 2 consecutive applications or fungicides from the same class (group 11) in a season, and then alternate with 2 applications of a fungicide with a different mode of action. Do not apply more than 4 times per season.
	▶ Pristine	WG	735 g	Use the high rate when disease pressure is high. Do not apply more than 6 applications per growing season. Do not apply to Concord Fredonia and like cultivars due to possible injury. 21 day re-entry interval for hand labour task.
Downy Mildew	Fungicides may control more than one disease; select one that best fits the control program. Refer to Table 2 for options.			
	▶ Maestro Supra Captan	80 DF 80 WDG	2.75 kg	
	▶ Dikar		5.50 kg	When applying to Foch use at least 600L of water per hectare as more concentrated sprays may cause injury. Do not apply under slow drying conditions or temperatures above 27°C.
	▶ Polyram	DF	4.50 kg	
	▶ Folpan	50 WP	4.50 kg	
	▶ Gavel	75 DF	2.25 kg	Treated area must be posted prior to and post-treatment. Signs must remain in place for at least 20 days after application.
	▶ Revus	SC	500 mL/ha	The use of a non-ionic adjuvant (0.125 v/v) is recommended. Apply prior to disease development. Do not apply more than 4 times per growing season.
	▶ Sovran	50 WG	240 -300g	Use the 240 g rate for low to moderate pressure and 300 g rate for high to extreme pressure. For resistance management do not apply more than 2 consecutive applications of fungicides from the same class (group 11) in a season, and then alternate with 2 applications of a fungicide with a different mode of action. Do not apply more than 4 times per season.
	▶ Pristine	WG	675-735 g	Use the high rate when disease pressure is high. Do not apply more than 6 applications per growing season. Do not apply to Concord Fredonia and like cultivars due to possible injury. 21 day re-entry interval for hand labour task.

Disease and Insects	Products	Formulation	Rate per ha	Notes
Powdery Mildew	Fungicides may control more than one disease; select one that best fits the control program. Refer to Table 2 for options.			
▶	Nova	40 W	200 g	For resistance management do not apply more than 2 consecutive applications of Nova and use a maximum of 5 applications per season.
▶	Flint	50 WG	105-140 g	Do not apply to Concord grapes or where spray drift may reach Concord grapes. For resistance management do not apply more than 2 consecutive applications of fungicides from the same class (group 11) in a season, and then alternate with 2 applications of a fungicide with a different mode of action. Do not apply more than 4 times per season.
▶	Sovran	50 WG	240 -300g	Use the 240 g rate for low to moderate pressure and 300 g rate for high to extreme pressure. For resistance management do not apply more than 2 consecutive applications of fungicides from the same class (group 11) in a season, and then alternate with 2 applications of a fungicide with a different mode of action. Do not apply more than 4 times per season.
▶	Lance	WDG	315 g	For resistance management do not apply more than 2 consecutive applications of fungicides from the same class (group 7) in a season, and then alternate with 2 applications of a fungicide with a different mode of action. Do not apply more than 5 times per season.
▶	Pristine	WG	420-735 g	Use the high rate for spray intervals of up to 21days. Do not apply more than 6 applications per growing season. Do not apply to Concord Fredonia and like cultivars due to possible injury. 21 day re-entry interval for hand labour task.
▶	Quintec	SC	300 mL	Use before symptoms appear, will not control established infections. Do not apply more than 5 times per season.
▶	Dikar	80 WP	5.50 kg	When applying to Foch use at least 600L of water per hectare as more concentrated sprays may cause injury. Do not apply under slow drying conditions or temperatures above 27°C.
▶	Microscopic Sulphur	92 G	12.60 kg	Can be phytotoxic to certain grape cultivars. Do not use on Concord, Foch, de Chaunac, Van Buren or other sulphur sensitive cultivars. Sulphur sprays will suppress and may fully control Erineum mite.
▶	Kumulus	DF	12.60 kg	
▶	Milstop	85 WP	2.80 -5.60 kg	Use the high rate and short spray intervals when conditions favor disease development. Complete coverage is required, use a minimum water volume of 500 L/ha. Do not mix with products that are not compatible with a mildly alkaline solution.
▶	Serenade Max		3.00-6.00 kg	Use the high rate and short spray intervals when conditions favor disease development. Complete coverage is required, use a minimum water volume of 500 L/ha
Phylloxera (leaf form)	Only treat for when insect pressure threatens production			
▶	Movento	240 SC	365-585 mL	Only apply when galls become apparent. May take 2-3 weeks for control to become apparent. Movento will move to the young leaves as they development. Minimum interval between applications 30 days. Use the higher rate for high insect pressure.
▶	Clutch	50 EDG	140-210 g	Only apply when galls become apparent. Do apply when bees are present or during bloom. If pest pressure continues follow up with a second application 14 days later.
Erineum Mite	Only treat if populations were high the previous growing season and when new galls are observed. Check cultivar sensitivity to sulphur			
▶	Microscopic Sulphur	92 G	3.0 kg	Apply with a sufficient volume of water to wet both sides of the leaf. Can be phytotoxic to certain grape cultivars. Do not use on Concord, Foch, de Chaunac, Van Buren or other sulphur sensitive cultivars. If sulphur is being applied for powdery mildew control then it is not necessary to make additional applications of sulphur for erineum mite control.
	Kumulus	DF	3.4 kg	

Disease and Insects	Products	Formulation	Rate per ha	Notes
Berry Touch to Cluster Closure				
Fungicide rates are based on a dilute water volume of 2800 L/ha				
Downy Mildew	Fungicides may control more than one disease; select one that best fits the control program. Refer to Table 2 for options.			
▶	Maestro Supra Captan	80 DF 80 WDG	2.75 kg	
▶	Dikar		5.50 kg	When applying to Foch use at least 600L of water per hectare as more concentrated sprays may cause injury. Do not apply under slow drying conditions or temperatures above 27°C.
▶	Polyram	DF	4.50 kg	
▶	Folpan	50 WP	4.50 kg	
▶	Gavel	75 DF	2.25 kg	Treated area must be posted prior to and post-treatment. Signs must remain in place for at least 20 days after application.
▶	Revus	SC	500 mL/ha	The use of a non-ionic adjuvant (0.125 v/v) is recommended. Apply prior to disease development. Do not apply more than 4 times per growing season.
▶	Sovran	50 WG	240 -300g	Use the 240 g rate for low to moderate pressure and 300 g rate for high to extreme pressure. For resistance management do not apply more than 2 consecutive applications of fungicides from the same class (group 11) in a season, and then alternate with 2 applications of a fungicide with a different mode of action. Do not apply more than 4 times per season.
▶	Pristine	WG	675-735 g	Use the high rate when disease pressure is high. Do not apply more than 6 applications per growing season. Do not apply to Concord Fredonia and like cultivars due to possible injury. 21 day re-entry interval for hand labour task.
Powdery Mildew	Fungicides may control more than one disease; select one that best fits the control program. Refer to Table 2 for options.			
▶	Nova	40 W	200 g	For resistance management do not apply more than 2 consecutive applications of Nova and use a maximum of 5 applications per season.
▶	Flint	50 WG	105-140 g	Do not apply to Concord grapes or where spray drift may reach Concord grapes. For resistance management do not apply more than 2 consecutive applications of fungicides from the same class (group 11) in a season, and then alternate with 2 applications of a fungicide with a different mode of action. Do not apply more than 4 times per season.
▶	Sovran	50 WG	240 -300 g	Use the 240 g rate for low to moderate pressure and 300 g rate for high to extreme pressure. For resistance management do not apply more than 2 consecutive applications of fungicides from the same class (group 11) in a season, and then alternate with 2 applications of a fungicide with a different mode of action. Do not apply more than 4 times per season.
▶	Lance	WDG	315 g	For resistance management do not apply more than 2 consecutive applications of fungicides from the same class (group 7) in a season, and then alternate with 2 applications of a fungicide with a different mode of action. Do not apply more than 5 times per season.
▶	Dikar	80 WP	5.50 kg	When applying to Foch use at least 600L of water per hectare as more concentrated sprays may cause injury. Do not apply under slow drying conditions or temperatures above 27°C.
▶	Microscopic Sulphur Kumulus	92 G DF	12.60 kg 11.80 kg	Can be phytotoxic to certain grape cultivars. Do not use on Concord, Foch, de Chaunac, Van Buren or other sulphur sensitive cultivars. Sulphur sprays will suppress and may fully control Erineum mite.
▶	Milstop	85 WP	2.80 -5.60 kg	Use the high rate and short spray intervals when conditions favor disease development. Complete coverage is required, use a minimum water volume of 500 L/ha. Do not mix with products that are not compatible with a mildly alkaline solution.

Disease and Insects	Products	Formulation	Rate per ha	Notes
Powdery Mildew ▶	Serenade Max		3.00-6.00 kg	Use the high rate and short spray intervals when conditions favor disease development. Complete coverage is required, use a minimum water volume of 500 L/ha
Botrytis Bunch Rot	Direct spray to the fruiting zone of the grape canopy, use at least 1000 L of water to provide good coverage. Susceptible cultivars, vinifera and vinifera hybrids may require more than 1 application during the bunch closing period.			
▶	Elevate	50 WDG	1.12 kg	Use Agral 90 at 200ml/1,000 L of water (0.02% v/v) with Elevate in the tank. Do not apply if rain is expected within 6 hrs after application.
▶	Rovral	50 WP	1.50 kg	Do not apply more than 2 times per year. Alternate with other fungicides.
▶	Scala	SC	2.00 l	Maximum of 3 applications per year. Alternate with other fungicides.
▶	Vangard	75 WDG	750 g	Do not apply within 30 m of lakes, stream, and ponds.
▶	Pristine	WG	420-735 g	Use the high rate when disease pressure is high. Do not apply more than 6 applications per growing season. Do not apply to Concord Fredonia and like cultivars due to possible injury. 21 day re-entry interval for hand labour task.
▶	Serenade Max		3.00-6.00 kg	Use the high rate and short spray intervals when conditions favor disease development. Complete coverage is required, use a minimum water volume of 500 L/ha

Beginning of Ripening (veraison period)

Fungicide rates are based on a dilute water volume of 2800 L/ha

Botrytis Bunch Rot	Direct spray to the fruiting zone of the grape canopy, use at least 1000 L of water to provide good coverage. Susceptible cultivars, vinifera and vinifera hybrids may require more than 1 application during the bunch closing period. If late summer and fall weather conditions are wet and humid, additional fungicide applications may be required to control botrytis during this period. This is especially important for vineyards with cultivars that are designated for late harvest or ice wine.			
▶	Elevate	50 WDG	1.12 kg	Use Agral 90 at 200ml/1,000 L of water (0.02% v/v) with Elevate in the tank. Do not apply if rain is expected within 6 hrs after application.
▶	Rovral	50 WP	1.50 kg	Do not apply more than 2 times per year. Alternate with other fungicides.
▶	Scala	SC	2.00 l	Maximum of 3 applications per year. Alternate with other fungicides.
▶	Vangard	75 WDG	750 g	Do not apply within 30 m of lakes, stream, and ponds.
▶	Pristine	WG	420-735 g	Use the high rate when disease pressure is high. Do not apply more than 6 applications per growing season. Do not apply to Concord Fredonia and like cultivars due to possible injury. 21 day re-entry interval for hand labour task.
▶	Serenade Max		3.00-6.00 kg	Use the high rate and short spray intervals when conditions favor disease development. Complete coverage is required, use a minimum water volume of 500 L/ha