

2023



EXTENSION AND ADVISORY TEAM

SPRAY GUIDE FOR RHUBARB

Nova Scotia Vegetable Crop Spray Guide 2023
[RHU1-23]



SPRAY GUIDE FOR RHUBARB

Nova Scotia Vegetable Crop Spray Guide 2023
[RHU1-23]

Updated March 10, 2023, by
Dustin MacLean, Field Plant Pathologist, Perennia
Jenna Bekkers, Research Associate, Perennia

LIABILITY STATEMENT

Recommendations in this guide are given for general information only and do not give the user the right to use a product in a manner not in accordance with the pesticide label or Pest Control Products Act. Perennia, by funding and printing this publication, and the editors/authors, do not offer any warranty or guarantee and do not assume any liability for crop loss, animal loss, health, safety, or environmental hazard caused by the use of any pesticide, advice, or recommendation in this schedule. Pesticides used in this schedule are products labeled for the target and crop. This information was retrieved from the Pest Management Regulatory online of Registered Products Database. The list of products presented in this schedule is intended to be complete, based on products known to be available in the region, but in no way is guaranteed to be complete. Some of the products listed may not be available. Trade names are given as a convenience to producers and are neither an endorsement of the product nor a suggestion that similar products are not available or effective.

CONTENTS

LIABILITY STATEMENT.....	1
PESTICIDE EMERGENCY CONTACT INFORMATION	3
ABBREVIATIONS AND CONVERSIONS	3
GUIDE TO WEED MANAGEMENT.....	4
GUIDE TO INSECT MANAGEMENT	6
GUIDE TO DISEASE MANAGEMENT	13

PESTICIDE EMERGENCY CONTACT INFORMATION

Poison Control Centres		
Nova Scotia	800.565.8161 or 902.470.8161	IWK, Halifax, NS
New Brunswick	911	Ask for Poison Information
Prince Edward Island	800.565.8161 or 902.470.8161	IWK, Halifax, NS
Newfoundland	709.722.1110	Dr. Charles A. Janeway Child Health Care Centre, St. John's, NF

Environmental Emergencies (Pesticide Spills)	
Transport Canada Regional Operations Centre (24 hours)	
Nova Scotia	800.565.1633
New Brunswick	800.565.1633
Prince Edward Island	800.565.1633
Newfoundland	800.563.9089

ABBREVIATIONS & CONVERSIONS

Formulation and Measurement Abbreviations			
FORMULATIONS		MEASUREMENTS	
DF	Dry flowable	mL	millilitre
EC, E	Emulsifiable concentrate	kPa	kilopascal
L	Liquid	kg	kilogram
Sn / Su	Suspension	g	gram
WP/W	Wettable powder	L	litre
		BIU	Billions of International Units
		ppm	parts per million (1000 ppb)
		ppb	parts per billion (1/1000 ppm)

Helpful Conversions ¹	
kPa X 0.14 = pounds per square inch (psi)	millilitres X 0.035 = fluid ounces
hectares X 2.47 = acres	litres X 35 = fluid ounces
kilograms X 2.2 = pounds	litres X 0.22 = imperial gallons
kilograms per hectare X 0.89 = pounds per acre	litres per hectare X 14.17 = fluid ounces per acre
kilograms per hectare X 0.40 = kilograms per acre	litres per hectare X 0.40 = litres per acre
	degree-days C X 1.8 = degree-days F

¹ Pesticide Units of Measurement

It is not recommended to convert label rates to imperial units because there is a high probability of mathematical and rounding errors. Present day pesticides are formulated to be more effective in smaller amounts. Therefore, even small conversion errors can lead to the use of incorrect rates (either too high or too low). Use metric – you will be glad you did!

Pest	Group	Active Ingredient	Pesticide Product Name	Rate	Restricted Entry Interval (REI)	Pre-harvest Interval (days)	Remarks
WEEDS:							
Preplant <i>Perennial weeds including quackgrass</i>	9	glyphosate	Roundup WeatherMAX	1.67-4.67 L/ha	12 hours	7	Apply in the fall or spring prior to planting. Annual weed control programs will be necessary to control weeds germinating after planting. For quackgrass control, apply it to actively growing quackgrass when at least 4 new leaves are present. Lower rates will provide a minimum of one season control, while higher rates will provide longer term control. A lower rate of Roundup should be applied in 50 to 100 L/ha water. If higher water volumes are used, add a suitable surfactant. Wait 72 hours before plowing under. Best control of quackgrass is obtained when these herbicides are applied in the fall.
			Touchdown Total	1.6-5.0 L/ha	12 hours	7	
	14	carfentrazone-ethyl	Aim EC	36.5-117 mL/ha	12 hours	1	Apply in minimum spray volume of 100 L/ha. Refer to label for target weeds, buffer zones and rates. Use high flow rate nozzles to apply the highest spray volume.
Postemergence <i>Inter-row shielded</i>	1	fluazifop-p-butyl and S-isomer	Venture L	2.0 L/ha	12 hours	14	Do not make more than two applications per season with a minimum re-treatment interval of 14 days. Apply in sufficient water volume for thorough coverage.
	14	carfentrazone-ethyl	Aim EC	36.5-117 mL/ha	12 hours	1	Apply in minimum spray volume of 100 L/ha. Refer to label for target weeds, buffer zones and rates. Use high flow rate nozzles to apply the highest spray volume.
	22	diquat	Dessicant, Dessicash	2.3-4.6 L/ha	24 hours	-	Avoid spraying crop as damage may occur.

Pest	Group	Active Ingredient	Pesticide Product Name	Rate	Restricted Entry Interval (REI)	Pre-harvest Interval (days)	Remarks
Postemergence <i>Grasses and Broadleaves</i>	-	Acetic Acid	Serene NEW 2023	179-219.5 L/ha	When residue is dry	-	Apply as a uniform band or spot application directed at weeds on the ground between the crops. Use hooded or shielded application equipment. Do not spray the crop directly. Do not apply it when plants are under stress. Retreatment is required for regrowth of weeds.
Established <i>Pre-emergent to crop, pre-emergent up to 2-leaf stage of weeds</i>	27	mesotrione	Callisto 480SC or Mester 480 SC	0.3 L/ha	12 hours	42	Make only one application per year. Apply in 200 L/ha water at 206-300 kPa. CAUTION: Apply to dormant (prior to spring greenup) rhubarb. Applications to rhubarb that is not dormant will result in crop injury. Rainfall or irrigation after application may increase the risk of injury to emerging rhubarb. Repeated use of CALLISTO 480SC Herbicide in low pH soils may cause injury to rhubarb plants. Wait at least 18 months after the last CALLISTO 480SC Herbicide application in rhubarb before replanting rhubarb.
Broadcast application to dormant rhubarb <i>Broadleaf weeds & nutsedge</i>	2	Halosulfuron	Sandea WG	35-70 g/ha	12 hours	60	The timing of the application should be just prior to the breaking of rhubarb dormancy. Application may cause significant crop stunting. It is recommended that the user begin with the lower rate to determine potential sensitivity to its use along with speed and degree of recovery. Use a nonionic surfactant (NIS) if labeled weeds are emerged.

Pest	Group	Active Ingredient	Pesticide Product Name	Rate	Restricted Entry Interval (REI)	Pre-harvest Interval (days)	Remarks
INSECTS:							
Aphids	4	acetamiprid	Assail 70 WP Aceta 70 WP	56-86 g/ha	12 hours	7	Max. 5 applications/yr. Thorough coverage is important to obtain optimum control. Use the high rate under heavy pest pressure.
		imidacloprid	Admire 240	6 mL/100 m row	24 hours	45	Apply specified dosage in one of the following methods: <ul style="list-style-type: none"> • In 2000 L/ha of water as a narrow (5 cm or less) surface band over seed line during planting. Application should be made with sufficient water to ensure incorporation into the root zone. • Subsurface side-dress on both sides of each row of seedlings or established transplants; apply in 200 L/ha of water. Admire must be incorporated into root-zone. • Post-seeding drench, transplant-water drench, or hill drench; use higher water volumes - sufficient to thoroughly wet the soil. Do not apply more than once per season.
		thiamethoxam	Actara 25 WG	105 g/ha	12 hours	7	Apply before aphids reach damaging levels. Max. 2 applications per year, at least 7 days apart. This product is highly toxic to bees, do not apply to blooming crops and wait at least 5 days before placing beehives in a treated field.

Pest	Group	Active Ingredient	Pesticide Product Name	Rate	Restricted Entry Interval (REI)	Pre-harvest Interval (days)	Remarks
Aphids (cont.)	4A, 28	Thiamethoxam, cyantraniliprole	Minecto Duo 40 WG	750 g/ha	12 hours	-	In-furrow application at the seeding or transplant depth, or a narrow surface band above the seedline during planting. Apply in sufficient water volume to ensure uniform application and incorporation at least 5 cm (2 in) into the soil. Apply only one application per season. Do not use a foliar application of a product containing Group 4 or 28 pesticides following in-furrow or soil application of Minecto Duo.
	4C	Sulfoxaflor	Closer SC	100-150 ml/ha	12 hours	3	Max. 2 applications/growing season at least 7 days apart. Do not apply during crop flowering period or when flowering weeds are present.
	28	Cyantraniliprole	Exirel	500-1500 ml/ha	12 hours	1	Begin applications when treatment thresholds have been reached. Thorough coverage is important to obtain optimum control. For optimum control apply Hasten NT Spray Adjuvant* at an application rate of 0.25% v/v or MSO Concentrate with Leci-Tech* at an application rate of 0.5% v/v. Do not make more than 4 applications per season.
	-	Mineral Oil	SuffOil-X® NEW 2023	13L/100L H ₂ O	12 hours	0	Deter feeding. Begin applications when pests appear. Apply at 7-14-day intervals. Do not apply more than 8 applications per year.

Pest	Group	Active Ingredient	Pesticide Product Name	Rate	Restricted Entry Interval (REI)	Pre-harvest Interval (days)	Remarks
Aphids and Whiteflies	4D	Flupyradifurone	BYI 02960 200SL	Aphids: 500 – 750 mL/ha Whiteflies: 750 – 1000 mL/ha	12 hours	1	Apply as a directed foliar spray ensuring thorough coverage. Minimum interval between applications = 7 days. Minimum application volumes = 100 L/ha (Ground) Maximum amount allowed per crop season = 2000 mL/ha.
	9D	Afidopyropen	Versys	0.1-0.5 L/ha	12 hours	0	Allow a minimum of 7 days between applications. Monitor pest population and reapply if necessary once thresholds are reached. Max. 4 applications per year.
	9D	Afidopyropen	Sefina	Aphid: 0.2 L/ha Whitefly: 0.7-1.0 L/ha	12 hours	-	Green peach aphid, Potato aphid, Lettuce aphid, sweet potato whitefly, Silverleaf whitefly. Allow a minimum of 7 days between applications. Apply a minimum spray volume of 100-200 L/ha. Don't apply more than 4 applications per year.
	23	spirotetramat	Movento 240 SC	220-365 ml/ha	12 hours	3	Minimum 7-day interval between applications. Max. 730 ml/ha of product applied/season. This product is TOXIC to bees through direct contamination of pollen and nectar. DO NOT apply during crop flowering period or when flowering weeds are present in the field.
			Movento 150 OD	347-585 ml/ha	12 hours	3	Minimum 7-day interval between applications. Max 1.17 L/ha of product applied per season. This product is TOXIC to bees through direct contamination of pollen and nectar. DO NOT apply during crop flowering period or when flowering weeds are present in the field.
Whitefly	-	Beauveria bassiana strain R444	BASSIDOR NEW 2023	0.5-1.0 g in 1L of water	4 hours	0	Apply every 3-7 days depending on pest pressure. Ensure to use enough water to sufficiently cover the crop. Use within 6 hours of mixing.

Pest	Group	Active Ingredient	Pesticide Product Name	Rate	Restricted Entry Interval (REI)	Pre-harvest Interval (days)	Remarks
Cabbage looper, Imported cabbage worm, & Diamondback moth	4A, 28	Thiamethoxam, cyantraniliprole	Minecto Duo 40WG	750 g/ha	12 hours	-	Cabbage looper. In-furrow application at the seeding or transplant depth, or a narrow surface band above the seedline during planting. Apply in sufficient water volume to ensure uniform application and incorporation at least 5 cm (2 in) into the soil. One application per season. DO NOT use a foliar application of a product containing a Group 4 or 28 insecticide following in-furrow or soil application of MINECTO DUO 40WG.
	5	spinetoram	Delegate WG	140-200 g/ha	12 hours	1	Time application for Cabbage Looper with peak egg hatch or small larvae. Repeat applications based on insect monitoring. Use higher rate for higher infestations or advanced growth stages. Max 3 applications per year. Allow at least 5 days between applications.
		spinosad	Success 480 SC	0.182 L/ha	When dry	1	Max. 3 applications/yr. Allow 7-10 days between applications. <i>Also controls potato stem borer. See label.</i>
			Entrust 80	109 g/ha			Max. 3 applications/yr. Allow 7-10 days between applications
			Entrust	364 ml/ha			
	6, 28	Abamectin, cyantraniliprole	Minecto Pro	370 mL/ha	12 hours	7	Cabbage looper. Early season control. Begin applications when treatment thresholds have been reached. Thorough coverage is important to obtain optimum control.
	11	<i>Bacillus thuringiensis</i> , subsp. <i>aizawai</i> , (Strain ABTS-1857 fermentation solids, spores, and insecticidal toxins)	XenTari WG	500-1000 g/ha	4 hours	0	Cabbage Looper. Apply sufficient spray volume to ensure uniform deposition on all plant surfaces.

Pest	Group	Active Ingredient	Pesticide Product Name	Rate	Restricted Entry Interval (REI)	Pre-harvest Interval (days)	Remarks
Cabbage looper, Imported cabbage worm, & Diamondback moth <i>(cont.)</i>	18	Methoxyfenozide	Intrepid	0.3 – 0.6 L/ha	12 hours	1	Cabbage looper: Apply at the first sign of feeding damage or when insect monitoring indicates threshold has been reached. Repeat applications after 7-14 days if required based on further monitoring. Use higher rate for heavy infestations, advanced growth stages of the target pest or larger crop canopies.
	28	chlorantraniliprole	Coragen	250 ml/ha	12 hours	1	Cabbage Looper. Begin applications when treatment thresholds have been reached. Max. 4 applications per season. Do not apply more than once every 3 days. Do not exceed 1 L /ha/season. Apply in a finished spray volume of 100L/ha.
		Cyantraniliprole	Exirel	250-500 ml/ha	12 hours	1	Cabbage Looper. Begin applications when treatment thresholds have been reached. Thorough coverage is important to obtain optimum control. Do not make more than 4 applications per season.
Tarnished Plant Bug	4	thiamethoxam	Actara 25 WG	210 g/ha	12 hours	7	Apply before aphids reach damaging levels. Max. 1 application per year. This product is highly toxic to bees, do not apply to blooming crops and wait at least 5 days before placing beehives in a treated field.
	29	Flonicamid	Beleaf 50SG	0.20 - 0.30 Kg/ha	12 hours	0	Suppression. Apply when tarnished plant bugs first appear in the field and before populations reach high levels. Beleaf will stop tarnished plant bugs feeding rapidly but it may take several days to see a reduction in tarnished plant bug numbers. Reapply when new insects are detected. Allow a minimum of 7 days between applications. Max. 3 applications per year (lower rate), do not apply more than 0.6 kg/ha per season.

Pest	Group	Active Ingredient	Pesticide Product Name	Rate	Restricted Entry Interval (REI)	Pre-harvest Interval (days)	Remarks
Onion thrips	5	Spinetoram	Delegate WG	200-336 g product/ha	12 hours	1	Max 3 applications/year. Apply when onion thrips first appear, targeting egg hatch and small nymphs. Repeat in 7-10 days if needed.
	23	Spirotetramat	Movento 240 SC	365 ml/ha	12 hours	3 days	Minimum 7-day interval between applications. Maximum allowed per crop season: 730 mL/ha. Apply when thrips are first identified. Use during the first half of the season when adult populations are relatively low or building. Reduction in numbers of thrips larvae may take 3-4 days after application.
Armyworm, Beet Armyworm, Fall Armyworm	11	<i>Bacillus thuringiensis</i> , subsp. <i>aizawai</i> , (Strain ABTS-1857 fermentation solids, spores, and insecticidal toxins)	XenTari WG	500-1000 g/ha	4 hours	0	Beet Armyworm. Apply sufficient spray volume to ensure uniform deposition on all plant surfaces.
	28	Cyantraniliprole	Exirel	500 ml/ha	12 hours	1	Begin applications when treatment thresholds have been reached. Thorough coverage is important to obtain optimum control. For optimal control, apply to smaller plants or when lower portions of plant can receive adequate coverage. Do not make more than 4 applications per season.
Cutworms	28	Cyantraniliprole	Exirel	500-750 ml/ha	12 hours	1	Begin applications when treatment thresholds have been reached. Thorough coverage is important to obtain optimum control. For early season cutworm control, apply to foliage when rain is not expected in the next 24 hours. For optimal control, apply to smaller plants or when lower portions of plant can receive adequate coverage. Do not make more than 4 applications per season.

Pest	Group	Active Ingredient	Pesticide Product Name	Rate	Restricted Entry Interval (REI)	Pre-harvest Interval (days)	Remarks
Corn earworm	28	Cyantraniliprole	Exirel	750 ml/ha	12 hours	1	Begin applications when treatment thresholds have been reached. Thorough coverage is important to obtain optimum control. For optimal control, apply to smaller plants or when lower portions of plant can receive adequate coverage. Do not make more than 4 applications/season.
Dipteran leafminers (larvae)	4	Acetamiprid	Assail 70 WP	86 g/ha	12 hours	7	Pea leafminer. Begin applications when insect populations reach recognized economic threshold. Thorough coverage is important to obtain optimum control. Do not make more than 5 applications per season. Do not apply more than once every 7 days.
			Aceta 70 WP				
	28	Cyantraniliprole	Exirel	1000-1500 ml/ha	12 hours	1	Begin applications when treatment thresholds have been reached. Thorough coverage is important to obtain optimum control. For optimal control, apply to smaller plants or when lower portions of plant can receive adequate coverage. Do not make more than 4 applications/season.
Flea Beetles	28	Cyantraniliprole	Exirel	500-1000 ml/ha	12 hours	1	Begin applications when treatment thresholds have been reached. Thorough coverage is important to obtain optimum control. Re-application interval: 5 days. Max. 4 applications/season.
Spider Mites	-	Mineral Oil	SuffOil-X® NEW 2023	13L/100L H ₂ O	12 hours	0	Suppression only. Begin applications when pests appear. Apply at 7-14-day intervals. Do not apply more than 8 applications per year.

Pest	Group	Active Ingredient	Pesticide Product Name	Rate	Restricted Entry Interval (REI)	Pre-harvest Interval (days)	Remarks
DISEASES:							
Botrytis leaf rot	M4	captan	Captan 80 DF	1.25-2.0 kg/ha	48 hours	2	For use in forcing sheds only. Spray at weekly intervals in 1000L of water.
Gray Mold	7	penthioapyrad	Fontelis	1.25-1.75 L/ha	12 hours	3	Begin applications prior to disease development, continue a 7–10-day interval. Use higher rate and shorter intervals when disease pressure is high. Max seasonal rate is 5.25 L/ha. Max. 2 sequential applications before switching to another mode of action.
Sclerotinia White Mould, Leaf Drop (<i>Sclerotinia spp.</i>)	7	penthioapyrad	Fontelis	1.25-1.75 L/ha	12 hours	3	Begin applications prior to disease development, continue a 7–10-day interval. Use higher rate and shorter intervals when disease pressure is high. Max seasonal rate is 5.25 L/ha. Max. 2 sequential applications before switching to another mode of action.
	7-11	boscalid, pyraclostrobin	Pristine WG	1.0 – 1.3 Kg/ha	24 hours general, 9 days hand work	0	For suppression of white mold. Apply once per season before disease develops.
		Pyraclostrobin, Fluxapyroxad	Merivon	0.3 – 0.4 L/ha	12 hours. 1 day thinning, pruning, and turning. 9 days thinning	1 mechanical harvesting. 9 days hand harvesting	Suppression. Begin applications prior to onset of disease development. Apply subsequent applications every 7 – 14 days if disease persists or weather conditions are favourable for disease development. Use the shorter interval and/or the higher rate when disease pressure is high. Max. 3 applications per year.

Pest	Group	Active Ingredient	Pesticide Product Name	Rate	Restricted Entry Interval (REI)	Pre-harvest Interval (days)	Remarks
<i>Phytophthora spp.</i> , <i>Fusarium spp.</i> , <i>Pythium spp.</i> , and <i>Thielaviopsis spp.</i>	-	Chloropicrin	Chloropicrin 100 Liquid Soil Fumigant NEW 2023	93 L/ha	-	-	Apply as broadcast or banded. Must determine the buffer zone distance required by calculating the broadcast equivalent application rate. After application Leave the soil undisturbed for 10 to 14 days. At the end of the exposure period, aerate the soil by plowing or deep cultivation. Aerate for at least 5 days after opening row.
Downy Mildew (<i>Peronospora spp.</i> , <i>Bremia Latucae</i>)	U15	Oxathiapiprolin	Zorvec Enicade	0.175-0.35 L/ha	12 hours	0	Begin applications prior to disease development and continue a 5-14- day interval. Use higher rate and shorter interval when disease pressure is high.
Root Lesion and root knot nematodes.	-	Chloropicrin	Chloropicrin 100 Liquid Soil Fumigant NEW 2023	93 L/ha	-	-	Apply as broadcast or banded. Must determine the buffer zone distance required by calculating the broadcast equivalent application rate. After application Leave the soil undisturbed for 10 to 14 days. At the end of the exposure period, aerate the soil by plowing or deep cultivation. Aerate for at least 5 days after opening row.

Use the following web link to search for any pesticide label mentioned in this guide, or any other pesticide registered in Canada: <http://pr-rp.hc-sc.gc.ca/lr-re/index-eng.php>