

EXTENSION AND ADVISORY TEAM

GUIDE TO PEST MANAGEMENT IN RHUBARB

Nova Scotia Vegetable Crop Guide to Pest Management 2021
[RHU1-21]



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IMPORTANT

This publication was compiled by representatives from Perennia using information from the Pest Management Regulatory Agency of Health Canada, specific pesticide labels, previous Atlantic Provinces Vegetable Pest Guides, and manufacturer's information. **This information is continuously changing and therefore it can cease to be current and accurate. Pesticide labels are the best source of information and should always be consulted prior to using a product.** The label is the best source of information on registered crop uses, rates, days to harvest, compatibility with other pesticides, toxicity, and other special information on its effective and safe use.

By printing this publication, Perennia does not offer any warranty or guarantee, nor do they assume any liability for any crop loss, animal loss, health, safety, or environmental hazard caused by the use of a pesticide mentioned in this publication.

WARNINGS

This publication is meant to be used as a reference for possible pest control options. Where there are multiple brand names of a specific active ingredient registered in Canada, Perennia has only listed a couple for reference purposes and as such does not endorse one brand over another. If you have purchased a generic product not specifically in this guide but has your crop and pest on the label, always follow that product label.

If any information in this or any other publication conflicts with the information on the label, always use the label recommendation. You are legally responsible for the safe use of pesticides you purchase. This means the safe transport and storage of these materials, the label rates used on crops, and the safe disposal of container.

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	1.67-8.0 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 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	1.6-8.6 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>	22	paraquat	Gramoxone 200 SL	2.75-5.5 L/ha	24 hours	-	Avoid spraying crop as damage may occur.
		diquat	Reglone Dessicant, Dessicash	2.3-4.6 L/ha	24 hours	-	If grasses are present, use Gramoxone in place of Reglone Dessicant

Postemergence <i>Inter-row shielded</i>	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.
	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.
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.
	4	imidacloprid	Admire 240	6 mL/100 m row	12 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.
	29	Flonicamid	Beleaf 50SG	0.12-0.16 kg/ha	12 hours	0 days	Thorough spray coverage of plant foliage is essential. Minimum of 94 litres of water/ha. Max. 3 applications per season, at least 7 days apart. Avoid overnight storage of spray mixtures, do not use liquid fertilizer as a carrier and do not use adjuvants.

Aphids	4	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.
	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.
	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.

Aphids and Whiteflies	4D	Flupyradifurone	BYI 02960 200SL NEW 2021	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.
	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.
	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.

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	spinosad	Success 480 SC	0.182 L/ha	12 hours	1	Max. 3 applications/yr. Allow 7-10 days between applications. <i>Also controls potato stem borer. See label.</i>
			Entrust 80 W	109 g/ha	When dry	1	Max. 3 applications/yr. Allow 7-10 days between applications
			Entrust SC	364 ml/ha			
	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.
	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.

Cabbage looper, Imported cabbage worm, & Diamondback moth	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.
	18	Methoxyfenozide	Intrepid 240F	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	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.
	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.

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 NEW 2021	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.
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	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.
	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.
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.

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)	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.
	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				
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.

Pest	Group	Active Ingredient	Pesticide Product Name	Rate	Restricted Entry Interval (REI)	Pre-harvest Interval (days)	Remarks
DISEASES:							
Botrytis leaf rot	M	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	penthiopyrad	Fontelis	1.25-1.75 L/ha	12 hours	3	Begin applications prior to disease development, continue on a 7–10-day interval. Use higher rate and shorter interval 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>)	7-11	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.
	7-11	Pyraclostrobin, Fluxapyroxad	Merivon NEW 2021	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.

Sclerotinia White Mould, Leaf Drop (<i>Sclerotinia spp.</i>)	7	penthiopyrad	Fontelis	1.25-1.75 L/ha	12 hours	3	Begin applications prior to disease development, continue on a 7–10-day interval. Use higher rate and shorter interval when disease pressure is high. Max seasonal rate is 5.25 L/ha. Max. 2 sequential applications before switching to another mode of action.
Downy Mildew (<i>Peronospora spp, Bremia Latucae</i>)	U15	Oxathiapiprolin	Zorvec Enicade	0.175-0.35 L/ha	12 hours	0	Begin applications prior to disease development and continue on a 5-14-day interval. Use higher rate and shorter interval when disease pressure is high.

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>

PESTICIDE EMERGENCY CONTACT INFORMATION

Poison Control Centres		
Nova Scotia	800.565.8161 or 902.428.8161	IWK, Halifax, NS
New Brunswick	911	Ask for Poison Information
Prince Edward Island	800.565.8161 or 902.428.8161	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!