

2023



EXTENSION AND ADVISORY TEAM

# SPRAY GUIDE FOR RADISH

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Nova Scotia Vegetable Crop Spray Guide 2023  
[RAD1-23]



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## 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 .....	10

## 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 <sup>1</sup>	
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

### <sup>1</sup> 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
<b>WEEDS:</b>							
<b>Preplant</b>  <i>Perennial weeds including quackgrass</i>	9	glyphosate	<b>Roundup WeatherMAX</b>	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. The low rate (1.67 L/ha) will provide a minimum of one season control, while higher rates (1.67 to 4.67 L/ha) will provide longer term control. The low 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.
			<b>Touchdown Total</b>	1.8-5.0 L/ha	12 hours	7	
	14	carfentrazone-ethyl	<b>Aim EC</b>	36.5-117 mL/ha	12 hours	1	
<b>Preemergence</b>  <i>Stale Seedbed technique</i>	22	diquat	<b>Dessicash</b>	2.3-4.6 L/ha	24 hours	-	Apply in 300 – 1100 L of water/ha to foliage of emerged weeds but before the crop has emerged.
	26	Pelargonic acid	<b>Beloukhatha</b>	12 – 20 L/ha	Until dry	1	Apply as a burndown for seedbed preparation or inter-row weed control. Apply either before or after seeding but at least 3 days prior to crop emergence. After crop emergence, use a directed or shielded sprayer to avoid damage to crop.

Pest	Group	Active Ingredient	Pesticide Product Name	Rate	Restricted Entry Interval (REI)	Pre-harvest Interval (days)	Remarks
Postemergence	1	Clethodim	Centurion + Amigo (adjuvant)	0.125-0.19 L/ha Quackgrass: 0.38 L/ha  0.5% v/v  Quackgrass: 1.0% v/v	12 hours	30	<b>To be used only with the adjuvant AMIGO.</b> <u>Annual grasses:</u> Apply Centurion when the annual grasses and volunteer cereals are in the 2 to 6 leaf stage. Most effective control is achieved when application is made prior to tillering when grasses are small and actively growing. <u>Quackgrass:</u> Apply Centurion when the quackgrass is in the 2 to 6 leaf stage and 6 to 15 cm in height. Most effective results are achieved when application is made at the 3 to 5 leaf stage, when the canopy is uniform and actively growing. Apply a Max. 2 applications per year. If repeat application is required, allow at least 14 days between first and second application. <i>* Refer to section "MINOR USES" in the label for additional use instructions.</i>
Postemergence	-	Acetic Acid	Serene  <b>NEW 2023</b>	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.

Pest	Group	Active Ingredient	Pesticide Product Name	Rate	Restricted Entry Interval (REI)	Pre-harvest Interval (days)	Remarks
<b>INSECTS:</b>							
Root Maggots	1B	Chlorpyrifos <b>FINAL USE 2023</b>	Pyrinex 480 EC	85ml / 1000 m of row	24 hours	21	Drench with seed in 380 L water / 1000m of row. Apply once per season.
			Warhawk 480 EC				
	28	cyantraniliprole	Verimark	10-15 ml/100 m row	12 hours	21	Apply as a narrow band in-furrow. For the best results, direct spray on the seed pieces in the furrow. Thorough coverage of seed pieces is important to obtain optimum control.
Cabbage looper, Imported cabbage worm & Diamondback moth.	5	spinosad	Success 480 SC	0.182 L/ha	When dry	3	Max. 3 applications/yr. Allow 7-10 days in between applications.
			Entrust 80	109 g/ha	When dry	3	Max. 3 applications/yr. Allow 7-10 days between applications.
			Entrust SC	364 ml/ha			
		spinetoram	Delegate WG	140-200 g/ha	12 hours	3	Time application with peak egg hatch or small larvae. Repeat applications based on population monitoring. Use higher rate for higher infestations or advanced growth stages. Max. 3 applications per year with a minimum re-treatment interval of 5 days.
	11	<i>Bacillus thuringiensis, subsp. aizawai,</i>	XenTari WG	500-1000 g/ha	4 hours	0	Apply sufficient spray volume to ensure uniform deposition on all plant surfaces; recommend 500 L per ha.
28	cyantraniliprole	Exirel	250-500 mL/ha	12 hours	7	Begin applications when treatment thresholds have been reached. Thorough coverage is important to obtain optimum control. Max. 4 applications per season.	

Pest	Group	Active Ingredient	Pesticide Product Name	Rate	Restricted Entry Interval (REI)	Pre-harvest Interval (days)	Remarks
Aphids	1B	malathion	Malathion 500 E	1.4-3.0 L/ha	12 hours	7	Maximum 1 application per year.
	4	Thiamethoxam	Actara 25 WG	105 g/ha	12 hours	7	<b>Also controls Aster leafhoppers.</b> Apply before pests reach damaging levels. Scout fields and treat again if populations rebuild to potentially damaging levels. Max. 2 applications per season, at least 7 days apart. Thorough and uniform coverage is essential.
	4C	Sulfoxaflor	Closer SC	50-150 ml/ha	12 hours	7	Max 2 applications/growing season at least 7 days apart. Do not apply during crop flowering period or when flowering weeds are present. Minimum spray volume 100 L/ha for ground application.
	4D	Flupyradifurone	BYI 02960 200SL	500 – 750 mL/ha	12 hours	7	Apply as a directed foliar spray ensuring thorough coverage. Tops or greens from these crops may not be fed to livestock as feed or used for human consumption. Minimum of 10 days between applications. Minimum application volume = 100 L/ha (Ground). Maximum product use per season is 2000mL.
	28	Cyantraniliprole	Exirel	500-1500 mL/ha	12 hours	7	Begin applications when treatment thresholds have been reached. Thorough coverage is important to obtain optimum control. For optimum control of aphids, apply Hasten NT Spray Adjuvant* at an application rate of 0.25% v/v or MSO Concentrate with LeciTech* at an application rate of 0.5% v/v.
	29	Flonicamid	Beleaf 50SG	0.12-0.16 kg/ha	12 hours	3	Thorough spray coverage of plant foliage is essential. Minimum of 94 L water/ha. Max 3 applications/season, at least 7 days apart. <b>Avoid overnight storage of spray mixtures, do not use liquid fertilizer as a carrier; do not use adjuvants.</b>



Pest	Group	Active Ingredient	Pesticide Product Name	Rate	Restricted Entry Interval (REI)	Pre-harvest Interval (days)	Remarks
Aphids (cont.)	NC	Potassium salts of fatty acids	<b>Kopa Insecticidal Soap</b>	8L in 400L water applied at 700-1900 L/ha solution	-	0	Do not spray when plants are under stress. Avoid spraying during full sun. Spray early in morning or evening or when overcast.
	-	Mineral Oil	<b>SuffOil-X®</b> <i>NEW 2023</i>	13 L/ 100 L of H2O	12 hours	0	<b>Deter Feeding.</b> Begin applications when pests appear. Apply at 7-14-day intervals. Do not apply more than 8 applications per year.
Flea beetles	1A	carbaryl	<b>Sevin XLR Plus</b>	1.25-2.5 L/ha	5 days (hand harvest, irrigation), 12 hours (scouting, hand weeding, thinning).	7	Apply when insect or insect damage appears. Repeat on 7–10-day intervals.
	1B	malathion	<b>Malathion 500 E</b>	1.4-3.0 L/ha	12 hours	7	Repeat applications as necessary
	3	permethrin	<b>Pounce 384 EC</b>	180 ml/ha	12 hours	2	Apply when insect or insect damage appears
	5	Spinetoram	<b>Delegate WG</b>	200 g/ha	12 hours	3	Apply when pests appear. Max. 3 applications per year with a minimum re-treatment interval of 5 days.
		Spinosad	<b>Entrust</b> <b>Success</b>	364 ml/ha 182 ml/ha	When dry	3	For the suppression of flea beetle, apply at the emergence of adults and reapply in 7–10-day intervals as necessary.

## SPRAY GUIDE FOR RADISH

Pest	Group	Active Ingredient	Pesticide Product Name	Rate	Restricted Entry Interval (REI)	Pre-harvest Interval (days)	Remarks
Carrot weevil	28	Cyantraniliprole	Exirel	1000-1500 ml/ha	12 hours	1	Begin applications at the 2-3 leaf stage or when scouting indicates the presence of weevils. Consult local agricultural authorities to determine appropriate threshold levels for carrot weevil in your area. Do not make more than 4 applications per season. Do not apply more than once every 7 days.
Spider Mites	-	Mineral Oil	SuffOil-X <sup>®</sup> <i>NEW 2023</i>	13 L/ 100 L of H2O	12 hours	0	<b>Suppression only.</b> 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
<b>DISEASES:</b>							
<b>Alternaria, Cercospera, Powdery Mildew and Downy Mildew</b>	4	metalaxyl-M and S-isomer	<b>Ridomil Gold 480 SL</b>	1.2-2.4 L/ha	12 hours	21	<b>Downy mildew suppression.</b> Use the higher rate in areas with a history of high disease pressure. Max. 1 application per season. Apply in sufficient water to provide uniform coverage of soil. Preplant Incorporated (Broadcast or Banded): Apply and mechanically incorporate in the top 5 cm of soil. Soil Spray (Broadcast or Banded): Apply at planting. For banded applications, use an 18 cm band. DO NOT apply beyond the at-planting stage.
	7	Penthiopyrad	<b>Fontelis</b>	1-1.75 L/ha	12 hours	0	<b>Powdery Mildew.</b> Begin applications prior to disease development and continue a 7-14-day interval. Use higher rate and shorter interval when disease pressure is high.
	7, 3	Pydiflumetofen, Difenoconazole	<b>A20259 fungicide</b>	1.0 L/ha	12 hours	7	<b>Alternaria, Powdery Mildew.</b> Apply on a 7 -14-day interval, starting prior to disease establishment. If disease pressure is high, use the shortest interval. Apply as a broadcast spray in sufficient water (minimum of 150 L/ha) for thorough coverage. Maximum of 4L used per season.
	7, 11	Fluopyram, azoxystrobin	<b>Luna Sensation</b>	300-500 mL/ha	12 hours	7	<b>Alternaria, Powdery Mildew.</b> Begin fungicide applications preventatively. Continue as needed on a 7-14-day interval. When disease pressure is severe, use the higher rates.

Pest	Group	Active Ingredient	Pesticide Product Name	Rate	Restricted Entry Interval (REI)	Pre-harvest Interval (days)	Remarks
<b>Alternaria, Cercospora, Powdery Mildew and Downy Mildew</b> <i>(cont.)</i>	7, 11	Pyraclostrobin, Fluxapyroxad	<b>Merivon</b>	0.3 – 0.4 L/ha	7 days (hand harvesting) 12 hours (general)	7	<b>Alternaria, Cercospora, Powdery Mildew.</b> Begin applications prior to onset of disease development and repeat on a 7-14-day interval. Apply subsequent applications if disease persists or weather conditions are favourable for disease development. Max. 3 applications per season.
	11	pyraclostrobin	<b>Cabrio EG</b>	0.56-1.1 kg/ha	3 days (hand harvesting) 12 hours (general)	3	<b>Alternaria, Cercospora, Powdery Mildew.</b> Max. 3 applications/yr. Do not make more than 1 application before rotating to a different fungicide group. Can be used on <b>radish tops</b> . Begin applications prior to disease development. Use the higher rate and shorter interval when disease pressure is high. Do not apply more than one (1) application
		Trifloxystrobin	<b>Flint</b>	280 g/ha	12 hours	7	<b>Alternaria leaf spot.</b> Begin applications preventatively and continue as needed on a 7-day interval. Use sufficient water to obtain thorough coverage. DO NOT apply more than 560 g/hectare per season.
	40	Mandipropamid	<b>Revus</b>	400 – 600 mL/ha	12 hours	1	<b>Radish Leaves. Downy Mildew.</b> Applications should begin prior to disease development and continue throughout the season on a 7–10-day schedule of fungicides, following the resistance management guidelines. The use of a non-ionic adjuvant (0.25% v/v) is recommended. 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
<b>Alternaria, Cercospera, Powdery Mildew and Downy Mildew (cont.)</b>	43	fluopicolide	<b>Presidio</b>	292 ml/ha	12 hours	7	<b>Downy Mildew.</b> Apply in 200-1000 L/ha. For resistance management, Presidio must be tank-mixed with a labelled rate of another fungicide registered for the target pathogen, but with a different mode of action. Apply in a tank mix with Bravo 500. Follow the most restrictive use directions of either label. Make foliar applications on a 7–10-day schedule beginning with initial flowering, or when disease conditions are favourable, but prior to disease development. Use lower rate and longer intervals as preventive applications. Use higher rate and shorter interval if disease is present.
	49 & 40	Oxathiapiprolin, Mandipropamid	<b>Orondis Ultra</b>	0.6 L/ha	12 hours	1	<b>Downy Mildew.</b> Begin applications prior to disease development and continue a 7-10-day interval. Use shorter intervals when disease pressure is high. The use of a non-ionic (NIS) surfactant is recommended. Minimum application volume of 100L/ha recommended. Maximum of 4 applications per crop.
	BM02	<i>Bacillus subtilis</i>	<b>Serenade Opti</b>	1.4 Kg/ha	4 hours	0	<b>Biopesticide that will only suppress the indicated diseases. Downy Mildew:</b> Begin application when environmental conditions are conducive to disease development; repeat on 7–10-day intervals.
	-	Potassium bicarbonate	<b>Milstop</b>	Greenhouse: 0.28-0.56 kg/1000m <sup>2</sup> Field: 2.8-5.6 Kg/ha	4 hours	0	<b>Powdery Mildew. Greenhouse and Field Radish. Suppression only.</b> Start application at first sign of disease. For best protection, repeat at one- or two-week intervals as indicated until conditions are no longer favorable for disease development.

Pest	Group	Active Ingredient	Pesticide Product Name	Rate	Restricted Entry Interval (REI)	Pre-harvest Interval (days)	Remarks
<b>Rhizoctonia root rot and stem canker</b>	11	azoxystrobin	<b>Quadris</b>	4-6 ml/ 100m of row	12 hours	15	Max. 1 application/yr. Apply either in-furrow at seeding or as a banded application over the row soon after emergence. Apply in 50-100 L of water/ha.
			<b>Azoshy 250 SC</b>			15 (radish) 40 (Daikon)	Includes Daikon radish. Apply either in-furrow at seeding or as a banded application over the row soon after emergence. Use the higher rate when the weather conditions are expected to be conducive for disease development or if minimum or low till programs are in place.
	BM02	<i>Bacillus subtilis</i>	<b>Serenade Soil</b>	2.7-14 L/ha	-	0	<b>Suppression only.</b> See label for application methods.
<b>White mould (Sclerotinia sclerotiorum)</b>	7, 3	Pydiflumetofen, Difenoconazole	<b>A20259</b>	1.0 L/ha	12 hours	7	<b>Suppression.</b> Apply on a 7-14-day interval, starting prior to disease establishment. If disease pressure is high, use the shortest interval. Apply as a broadcast spray in sufficient water (minimum of 150 L/ha) for thorough coverage. Maximum of 4L can be applied in a season.
	7	Penthiopyrad	<b>Fontelis™</b>	1.25 to 1.75 L/ha	12 hours	0	<b>Suppression only. Begin applications prior to disease development and continue a 7- to 14-day interval.</b>
	9, 12	Cyprodinil, fludioxinil	<b>Switch 62.5 WDG</b>	775-975 g/ha	12 hours	7	Begin applications prior to or at the onset of disease and repeat applications on a 7–10-day interval if conditions remain favorable for disease development. Do not make more than 2 applications per season.
	BM02	<i>Bacillus subtilis</i>	<b>Serenade Opti</b>	1.1-2.2 Kg/ha	4 hours	0	<b>Serenade Opti is a biopesticide that will only suppress the indicated diseases.</b> Begin application soon after emergence and when conditions are conducive to disease development. Repeat as necessary on a 7–10-day interval.

Pest	Group	Active Ingredient	Pesticide Product Name	Rate	Restricted Entry Interval (REI)	Pre-harvest Interval (days)	Remarks
Gray Mold	7	Penthiopyrad	Fontelis	1.0-1.75 L/ha	12 hours	0	Begin applications prior to disease development, continue a 7–14-day interval. Use higher rate and shorter intervals when disease pressure is high. Max seasonal rate is 4.5 L/ha. Do not make more than 2 sequential applications before switching to another mode of action.
	9, 12	Cyprodinil, fludioxinil	Switch 62.5 WDG	775-975 g/ha	12 hours	7	Begin applications prior to or at the onset of disease and repeat applications on a 7–10-day interval if conditions remain favorable for disease development. Do not make more than 2 applications per season.

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>