



GUIDE TO PEST MANAGEMENT IN FIELD PEPPER

Nova Scotia Vegetable Crop Guide to Pest Management 2011
[PEP1-11]

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IMPORTANT

This publication was compiled by representatives from AgraPoint 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, AgraPoint 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, AgraPoint 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. If you have an old label, your pesticide supplier should be able to give you the newest label. 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 containers.

Pest	Pesticide Common Name	Pesticide Product Name	Rate	Days to Harvest	Remarks
WEEDS:					
Preplant <i>Perennial weeds including quackgrass</i>	glyphosate	Roundup 356 Sn	1.25-2.5 L/ha	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. The low rate (2.5 L/ha) will provide a minimum of one season control, while higher rates (4.75 to 7 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.
		Roundup WeatherMAX	1.67-8.0 L/ha	7	
		Touchdown 480	2.5-7.0 L/ha	7	
	carfentrazone-ethyl	Aim EC	36.5-117 mL/ha	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.
Preplant Incorporated <i>Germinating annual grasses and some broadleaves</i>	trifluralin	Treflan EC	1.25-2.4 L/ha	-	Transplants only. Incorporate within 24 hours of application. Ragweed and mustards are not controlled. This product has a carry over effect on corn and cereal the following year.
		Rival	1.6-2.2 kg/ha	-	
	napropamide	Devrinol 50 DF	2.24-4.5 kg/ha	-	Incorporate within 24 hours of application. Do not apply to soils with over 10% organic matter. Apply in 200-

					900 L of water / ha.
Preemergence <i>Germinating annual grasses and some broadleaves</i>	chlorthal dimethyl	Dacthal W-75	9.0-15.5 kg/ha	-	Apply 4-6 weeks after transplanting. If weeds have emerged, cultivate before application. Rainfall or irrigation (1 cm) is necessary for activation.
	s-metolachlor / benoxacor	Dual II Magnum	1.15-1.25 L/ha	80	Nightshades and annual grasses. Apply within 48 hrs of transplanting. Risk of crop injury when soil temperature is below 10 C.
Postemergence Grasses	sethoxydim	Poast Ultra plus Merge	0.32-1.1 L/ha 1-2 L/ha	30	Apply to actively growing grasses at the 1-6 leaf stage.
INSECTS:					
Aphids and Pepper Maggot	malathion	Malathion 500 E	1.25-2.75 L/ha	3	Also controls leafhoppers
	dimethoate	Lagon 480 E	0.7-1 L/ha	3	Maximum of 3 applications per season
	diazinon	Diazinon 500 E	0.55-1.1 L/ha	5	Aphids only
	acephate	Orthene 75 SP	750 g/ha	7	Max 4 applications/yr.
	endosulfan	Thiodan 4 EC	1.5-2.75 L/ha	2	Apply when insects first appear and repeat as necessary.
		Thionex 50 WP	1.1 kg/ha	2	
	acetamiprid	Assail 70 WP	56-86 g/ha	7	Aphids only Maximum 4 applications per season for Aphids. Do not apply more than once every 7 days. Apply in a spray volume of 200 L/ha. A thorough and uniform spray coverage is required to obtain adequate control. Use the high rate under heavy pest pressure.
	thiamethoxam	Actara 25 WG	105 g/ha	1	Aphids only. Maximum 2 applications per year. Apply before aphids reach

					damaging levels. Allow at least 7 days between treatments. Use at least 100 L of water per hectare.
Aphids, Psyllids and Whiteflies	spirotetramat	Movento 240 SC	220-365 ml/ha	1	Minimum interval between applications is 7 days. Maximum of 730 ml/ha of product applied per season. This product is TOXIC to bees through direct contamination of pollen and nectar. DO NOT apply this product during crop flowering period or when flowering weeds are present in the field, orchard or vineyard.
		Movento 150 OD	347-585 ml/ha	1	Minimum interval between applications is 7 days. Maximum of 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 this product during crop flowering period or when flowering weeds are present in the field, orchard or vineyard.
	Flonicamid	Beleaf 50SG	0.12-0.16 kg/ha	0 days	Aphids only. Thorough spray coverage of plant foliage is essential. Minimum of 94 litres of water/ha. Maximum of 3 applications per season, allow 7 days between applications. Avoid overnight storage of spray mixtures, do not use liquid fertilizer as a carrier and do not use adjuvants.
Cutworms	chlorpyrifos	Lorsban 4 E	1.2-2.4 L/ha	40	24 hr re-entry. Apply 3-7 days before transplanting or at the 2-5 leaf stage of the crop.
		Pyrinex 480 EC	1.2-2.4 L/ha	40	
	permethrin	Pounce 384 EC	180-390 ml/ha	-	Apply up to 5 leaf stage. Do not disturb soil for 5 days after treating.

European Corn Borer	deltamethrin	Decis 5 EC	250-300 ml/ha	3	Max 3 applications/yr
	permethrin	Pounce 384 EC	180 ml/ha	1	Apply when corn borer is first noticed, repeat every 7 days.
	carbaryl	Sevin XLR Plus	2.5-5.25 L/ha	2	Apply on 4 day intervals
	acephate	Orthene 75 SP	1.1 kg/ha	7	Max 4 applications/yr.
	spinosad	Success 480 EC	83 ml/ha	1	Max 2 applications/yr. Use only on small larvae
		Entrust 80 W	50-109 g/ha	1	Max 3 applications/yr. Allow 7-10 days between applications. Use low rate for ECB. Use high rate to control Cabbage looper and Diamondback moth.
	novaluron <i>(added May 3, 2010)</i>	Rimon 10 EC	410-820 ml/ha	1	The first application should be made just prior to egg hatch. Scout for European Corn Borer to monitor egg-laying and egg hatch to determine application timing. Use higher application rates and spray volumes for higher pest pressure, when larvae are large, or when the foliage canopy is tall or dense. Reapplication on a 7-10 day interval may be required to protect new growth or when monitoring indicates the need. For the most effective control, fields should be scouted and sprays applied in a timely manner. Do not apply more than 3 applications per crop per season.
Mites (Broad and two spotted spider mite)	spiromesifen	Forbid 240 SC	500-600 ml/ha	7	Maximum of 3 applications per season. Minimum application volume of 100 L/ha. Also controls whiteflies (including silverleaf, sweetpotato and greenhouse) 12 hour REI. See label for

					buffer zone restrictions.
Colorado Potato Beetle	acetamiprid	Assail 70 WP	40-80 g/ha	7	Maximum 2 applications per season for Colorado Potato beetle. Do not apply more than once every 7 days. Apply in a spray volume of 200 L/ha. A thorough and uniform spray coverage is required to obtain adequate control. Use the high rate under heavy pest pressure.
	endosulfan	Thiodan 4 EC	1.5-2.75 L/ha	2	Apply when insects first appear and repeat as necessary.
		Thionex 50 WP	1.1 kg/ha	2	
	chlorantraniliprole	Coragen	250-375 ml/ha	1	Begin applications when treatment thresholds have been reached. Use high rate under heavy insect pressure. Maximum of 4 applications per season. Do not apply more than once every 5 days. Do not exceed 1.125 L of Coragen per ha per season. Apply in a finished spray volume of 100L/ha.
Cabbage Looper	spinetoram	Delegate WG	140-200 g/ha	1	Time application with peak egg hatch. Repeat applications based on population monitoring. Use higher rate for higher infestations or advanced growth stages. Maximum of 3 applications per year with a minimum re-treatment interval of 5 days.
DISEASES:					
Bacterial Leaf spot	copper hydroxide	Kocide 2000	2.52 kg/ha	1	Apply at 7-14 day intervals
	copper sulfate	Copper 53W	4 kg/ha	1	Apply at 7-10 day intervals
	<i>Bacillus subtilis</i>	Serenade MAX	1.0-3.0 Kg/ha	0	Serenade Max, Serenade ASO and Rhapsody ASO are biopesticides that

		Serenade ASO	4.0-15 L/ha	0	will only suppress the indicated diseases. Begin application soon after emergence or transplant, when conditions are conducive to disease development. Repeat as necessary on 7-10 day intervals. When environmental conditions and plant stage are conducive to rapid disease development, use in a rotational program with other registered bacteriacides.
		Rhapsody ASO	1.0-2.0 L/100 L of water	0	
Leaf Blights	pyraclostrobin	Cabrio EG	560-840 g/ha	0	Anthracnose and early blight control. Max 6 applications/yr. Do not make more than 2 applications before rotating to a different fungicide group.
	boscalid	Lance WDG	175-315 g/ha	0	Early blight. Max 5 applications/yr. Do not make more than 2 applications before rotating to a different fungicide group. 4 hr REI
	<i>Bacillus subtilis</i>	Serenade MAX	4.5 Kg/ha	0	Serenade Max and Serenade ASO are biopesticides that will only suppress Early Blight. Make the 1 st application when plants are 6-10 cm high, or when conditions are conducive for disease development. Repeat on an interval of 5-7 days.
		Serenade ASO	8.0-15 L/ha	0	
Botrytis Gray Mold	<i>Bacillus subtilis</i>	Serenade MAX	3.0-6.0 Kg/ha	0	Serenade Max and Serenade ASO are biopesticides that will only suppress the indicated diseases. Make the 1 st application when plants are 6-10 cm high, or when conditions are conducive for disease development. Repeat applications on an interval of 5-7 days.
		Serenade ASO	4.0-15 L/ha	0	
		Rhapsody ASO	1.0-2.0 L/100 L of water	0	Rhapsody ASO is a biopesticide that will only suppress the indicated diseases. Begin application soon after emergence or transplant and when

					conditions in the greenhouse are conducive to disease development. Repeat as necessary on 7 to 10 day intervals.
	boscalid	Lance WDG	420 g/ha	0	Max 5 applications/yr. Do not make more than 2 applications before rotating to a different fungicide group. 4 hr REI
Powdery Mildew	<i>Bacillus subtilis</i>	Serenade MAX	3.0-6.0 Kg/ha	0	Serenade Max and Serenade ASO are biopesticides that will only suppress the indicated diseases. Begin application soon after emergence or transplant, and repeat on an interval of 7-10 days.
		Serenade ASO	5.0-15 L/ha	0	
	Potassium bicarbonate	MilStop	2.8-5.6 kg/ha	0	Start application at first sign of disease. Repeat as required on 7 day intervals. Apply in a spray volume of 1000 L/ha.
Phytophthora Blight <i>(Phytophthora capsici)</i>	mandipropamid	Revus plus Non-ionic adjuvant	600 ml/ha plus 0.125% v/v	1	Suppression of Phytophthora Blight. Make one application of REVUS Fungicide as a drench, immediately before transplant to the field. Maximum of one application per season. Volume of prepared Revus solution per plant (150-200 ml)
	fluopicolide	Presidio	220-292 ml/ha	2	For resistance management, Presidio Fungicide must be tank-mixed with a labelled rate of another fungicide registered for the target pathogen, but with a different mode of action. Apply Presidio Fungicide in a tank mix with Bravo 500 for late blight, Revus for phytophthora blight. Follow the most restrictive use directions of either label Phytophthora Blight: Apply as a soil or foliar application on a 7 to 10-day schedule beginning when conditions are

					favourable for disease development and prior to disease onset. For best results, application should begin at planting or transplanting.
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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.pmra-arla.gc.ca/portal/page?_pageid=34,17551&_dad=portal&_schema=PORTAL

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	Oil-based emulsifiable concentrate	kPa	kilopascal
EW	Water-based concentrate	kg	kilogram
EG	Water dispersible granule	g	gram
SP	Soluble powder	L	litre
Sn	Solution	BIU	Billions of International Units
WDG	Wettable dry granule	ppm	parts per million (1000 ppb)
WP, W	Wettable powder	ppb	parts per billion (1/1000 ppm)

Helpful Conversions¹	
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!