

# GUIDE TO PEST MANAGEMENT IN FIELD CUCUMBER

**Nova Scotia Vegetable Crop Guide to Pest Management 2011**  
[CUC1-11]

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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.**

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.** 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	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 Original</b>	2.5-7.0 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. 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.
			<b>Roundup WeatherMAX</b>	1.67-8.0 L/ha			
			<b>Touchdown® 480</b>	2.5-7.0 L/ha			
	14	Carfentrazone-ethyl	<b>Aim EC</b>	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.
<b>Pre-emergence</b>  <i>Stale Seedbed Technique</i>	22	Diquat	<b>Reglone® Desiccant</b>	2.3-4.6 L/ha	-	-	Apply in 300 – 1100L of water/ha to foliage of emerged weeds but before the crop has emerged.
			Paraquat	<b>Gramoxone®</b>	2.75-5.5 L/ha	24 hours	
<b>Preemergence/ PPI</b> <i>Grasses</i>	8	Bensulide	<b>Prefar 4.8 E</b>	12-14 L/ha	-	-	<b>Apply Pre-Plant Incorporated.</b> 2.5-5 cm deep. Mineral soils only.
<i>Broadleaf weeds</i>	19	Naptalam	<b>Alanap-3</b>	11-30 L/ha	-	-	Apply prior to crop emergence. May be applied post about one month after the pre spray when the crop has emerged following a clean cultivation.

<i>Germinating annual grasses and some broadleaves</i>	3	Chlorthal dimethyl	<b>Dacthal W-75</b>	9.0-15.5 kg/ha	-	-	Apply when plants have 4-5 true leaves but before weed seed germination (prior cultivation maybe required).
	13	Clomazone	<b>Command 360 ME</b>	0.78-1.17 L/ha	-	45	Apply as a pre-emergent application before emergence of the crop or weeds. Apply in 95-375 L/ha of spray volume. Apply low rate on coarse soils, high rate on fine textured soils. <b>Do Not apply on sandy soils.</b> Apply once per season. Do not incorporate. Some whitening or yellow of the crop may occur. <b>Read the product label.</b>
<b>Postemergence</b> <i>Inter-row shielded</i>	14	Carfentrazone -ethyl	<b>Aim EC</b>	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.
	22	Diquat	<b>Reglone® Desiccant</b>	2.3-4.6 L/ha	-	-	Do not spray solution on the crop plant since it could be injured or killed. Use gramoxone for best control of grasses.
		Paraquat	<b>Gramoxone®</b>	2.75-5.5 L/ha	24 hours	-	
<i>Grass weeds</i>	1	Sethoxydim	<b>Poast Ultra</b>  plus <b>Merge</b>	0.32-1.1 L/ha  1-2 L/ha	12 hours	30	Apply to actively growing grasses at the 1-6 leaf stage.
	1	fluazifop-p-butyl	<b>Venture L</b>	0.8-2.0 L/ha	-	30	Apply to actively growing grasses. One application per season.

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<b>INSECTS:</b>							
<b>Cucumber Beetle and Flea Beetle</b>	1A	Carbaryl	<b>Sevin XLR Plus</b>	2.5 L/ha	-	5	Do not apply when field is in bloom or adjacent fields are in bloom.
	2A	Endosulfan	<b>Thiodan 4 EC</b>	1.5 L/ha	-	2	Apply when beetles first appear. Make 4 applications at 7 day intervals.
			<b>Thionex 50 WP</b>	1.0 kg/ha	-	2	
	4	Imidacloprid	<b>Admire 240</b>	Soil: 18 ml/100m row	24 hours	21	Apply in furrow on or below seed in 200 L/ha or as a narrow surface band over seeding line.
				Transplant: 25 ml/1000plants			Apply into planting hole before planting. Apply dosage in 150 ml of planting water per plant.
	-	Kaolin	<b>Surround WP</b>	12.5-25 kg/ha	-	0	Cucumber beetle control only. Max 5 applications/yr.
-	Rotenone	<b>Rotenone 5% (Green earth insect spray)</b>	4.5 kg/ha	-	1	Repeat applications at 5-7 day intervals	
<b>Aphids</b>	2A	Endosulfan	<b>Thiodan 4 EC</b>	1.5 L/ha	-	2	Apply when aphids first appear. Make 4 applications at 7 day intervals.
			<b>Thionex 50 WP</b>	1.0 kg/ha	-	2	
	1B	Malathion	<b>Malathion 500E</b>	1.8 L/ha	-	3	Do not apply unless leaves are dry.
<b>Aphids and Whiteflies</b>	23	Spirotetramat	<b>Movento 240 SC</b>	220-365 ml/ha	12 hours	1	Minimum interval between applications is 7 days. Maximum of 730 ml/ha of product applied per season. <b>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.</b>

			<b>Movento 150 OD</b>	347-585 ml/ha	12 hours	1	Minimum interval between applications is 7 days. Maximum of 1.17 L/ha of product applied per season. <b>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.</b>
<b>Cutworms</b>	1A	Carbaryl	<b>Sevin XLR Plus</b>	2.5 L/ha	-	5	Do not apply when field is in bloom or adjacent fields are in bloom. Climbing cutworms only.
	1B <sup>1</sup>	Chlorpyrifos	<b>Lorsban 4E</b>	1.2-2.4 L/ha	24 hours	60	Do not apply more than once per season.
	1B		<b>Pyrinex 480 EC</b>	1.2-2.4 L/ha	24 hours	60	
<b>Mites</b>	3	Dicofol	<b>Kelthane 50 W</b>	1.0-1.25	-	7	Max 1 application/yr.
	23	Spiromesifen	<b>Oberon</b>	500-600 ml/ha	12 hours	7	Maximum of 3 applications per season. Minimum application volume of 100 L/ha. <b>Also controls whiteflies (including silverleaf, sweetpotato and greenhouse).</b> See label for buffer zone restrictions.

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<b>DISEASES:</b>							
<i>Pythium</i> damping -off	4	Metalaxyl-M and S-isomer	<b>Apron XL LS</b>	20–40 ml / 100kg of seed	-	-	One application as a seed treatment.
<i>Alternaria</i> Leaf spot	7	Boscalid	<b>Lance WDG</b>	460 g/ha	12 hours	0	Max 4 applications/yr. Do not make more than 2 applications before rotating to a different fungicide group.
	M3	Mancozeb	<b>Dithane DG Rainshield</b>	1.1-3.25 kg/ha	-	14	Start applications when runners begin to form or at first sign of disease, repeat on weekly intervals.
	M		<b>Manzate Pro-Stick</b>	2.25-3.25 kg/ha	-	14	
	11	Pyraclostrobin	<b>Cabrio EG</b>	560-840 g/ha	12 hours	3	Max 4 applications/yr. Do not make more than 1 application before rotating to a different fungicide group.
<i>Anthracnose</i> and Downy Mildew	M	Captan	<b>Captan 80 WDG</b>	2.0-4.2 kg/ha	48 hours	2	<b>Does not control Downy Mildew.</b>
			<b>Maestro 75 DF</b>	2.25-4.25 kg/ha			
	M	Chlorothalonil	<b>Bravo 500</b>	4.8 L/ha	48 hours	1	Not for Downey Mildew, also controls scab.
	M	Copper sulfate	<b>Copper 53W</b>	2.5-3 kg/ha	-	1	Apply in 1000L of spray water.
	M3	Mancozeb	<b>Dithane DG Rainshield</b>	1.0-3.25 kg/ha	-	14	Start applications when runners begin to form or at first sign of disease, repeat on weekly intervals.
			<b>Manzate Pro-Stick</b>	2.25-3.25 kg/ha	-	14	
	11	Pyraclostrobin	<b>Cabrio EG</b>	560-840 g/ha	12 hours	3	Max 4 applications/yr. Do not make more than 1 application before rotating to a different fungicide group.
Downy Mildew	-	<i>Bacillus subtilis</i>	<b>Serenade MAX</b>	1.0-3.0 Kg/ha	-	0	<b>Serenade MAX, Serenade ASO and Rhapsody ASO are biopesticides that will only suppress the indicated diseases. Begin application soon after emergence or</b>
			<b>Serenade ASO</b>	5.0-15.0 L/ha			

			<b>Rhapsody ASO</b>	1.0-2.0 L/100 L of water			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 fungicides.
	21	Cyazofamid	<b>Ranman 400SC</b> and <b>Sylgard 309 (organosilicone surfactant)</b>	0.15-0.2 L/ha  0.15 L/ha	12 hours	1	<b>Max 6 applications per crop per year. Do not make sequential applications of Ranman or products within the same group.</b> Apply in 200 – 600 L of water per hectare. Apply on a 7-10 day schedule beginning at initial flowering or when disease conditions are favorable but prior to an outbreak. A plant back interval of 30 days is required.
	11	Fenamidone	<b>Reason 500 SC</b>	400 ml/ha	-	14	Begin application as soon as crop and/or environmental conditions become favourable for disease development. Apply in 300-600 L/ha. Applications should be made on a 5-10 day interval. Maximum 4 applications per year. Plant back interval of 30 days. Do not apply more than 1 application of Reason 500 SC or any other Group 11 fungicide before alternating with a fungicide from a different Group.
	40	Mandipropamid	<b>Revus</b> plus <b>Non-ionic adjuvant</b>	400-600 ml/ha plus  0.25% v/v	12 hours	0	<b>Suppression of 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. Maximum four applications per year. <b>REVUS Fungicide may be tank mixed with Bravo 500 Agricultural Fungicide for any Field Cucurbits listed on that label. Follow the most restrictive use directions of either label.</b>
	U-M	Propamocarb / chlorothalonil	<b>Tattoo C</b>	1.8-2.7 L/ha	48 hours	2	Apply TATTOO C fungicide as a foliar spray in a preventative program. Apply in a

							spray volume of 300-600 L/ha. Begin applications when conditions are favourable for disease development but before infection occurs. Continue on 7-14 day intervals until the threat of disease is over. Use the high rate and shorter application interval under high disease pressure and when conditions of rapid disease development exist. When applying TATTOO C using intervals longer than 7 days, alternate with an application of a contact fungicide between TATTOO C applications. Do not apply more than 5 applications of TATTOO C per growing season.
	43	Fluopicolide	<b>Presidio</b> <b>(NEW)</b>	220-292 ml/ha	12 hours	2	Maximum of 4 applications per season, Do not make more than 2 sequential applications. Begin when conditions favour disease and repeat on a 7-14 day interval.  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. Follow the most restrictive use directions of either label.  Make foliar applications on a 7 to 10 day schedule beginning with initial flowering, or when disease conditions are favourable, but prior to disease development. Use the lower rate and longer interval as preventive applications. Use the higher rate and shorter interval if disease is present.
<b>Powdery Mildew</b>	-	<i>Bacillus subtilis</i>	<b>Serenade MAX</b>	3.0-6.0 Kg/ha	-	0	<b>Serenade MAX and Serenade ASO are biopesticides that will only suppress the indicated diseases.</b> Begin applications soon after emergence or transplant, when
			<b>Serenade ASO</b>	5.0-15.0 L/ha			

							conditions are conducive for disease development. Repeat applications on an interval of 7-10 days.
			<b>Rhapsody ASO</b>	1.0-2.0 L/100 L of water			<b>Rhapsody ASO is a biopesticide that will only suppress the indicated diseases. Powdery Mildew, Cercospora leaf spot, Gummy stem blight.</b> Begin application soon after emergence or transplant when environmental conditions in the greenhouse and plant stage are conducive to rapid disease development. Repeat as necessary on 7 to 10 day intervals. Thorough coverage is essential. Rhapsody can be rotated with other registered fungicides.
	M	Chlorothalonil	<b>Bravo 500</b>	4.8 L/ha	48 hours	1	Begin applications at first true leaf stage and repeat on 7 day intervals. Shorten the spray interval under severe disease pressure. Maximum of 7 applications per season.
	-	Potassium bicarbonate	<b>MilStop</b>	2.8-5.6 kg/ha	4 hours	0	Max 10 applications/yr. Apply at 7-14 day intervals in 500-1000 L/ha spray solution. Start application at first sign of disease. <b>Suppression only!</b>
	11	Pyraclostrobin	<b>Cabrio EG</b>	560-840 g/ha	12 hours	3	Max 4 applications/yr. Do not make more than 1 application before rotating to a different fungicide group.
<b>Septoria leaf spot</b>	M	Copper sulfate	<b>Copper 53W</b>	2.5-3 kg/ha	-	1	Apply in 1000L of spray water.
	M3	Mancozeb	<b>Dithane DG Rainshield</b>	1.0-3.25 kg/ha	-	14	Start applications when runners begin to form or at first sign of disease, repeat on weekly intervals.
	M		<b>Manzate Pro-Stick</b>	2.25-3.25 kg/ha	-	14	
<b>Gummy Stem Blight</b>	7	Boscalid	<b>Lance WDG</b>	460 g/ha	12 hours	0	Max 4 applications/yr. Do not make more than 2 applications before rotating to a different fungicide group.
	M3	Mancozeb	<b>Dithane DG Rainshield</b>	1.0-3.25 kg/ha	-	14	Start applications when runners begin to form or at first sign of disease, repeat on weekly intervals.
	M		<b>Manzate Pro-Stick</b>	2.25-3.25 kg/ha	-	14	
		11	Pyraclostrobin	<b>Cabrio EG</b>	840 g/ha	12 hours	3

							than 1 application before rotating to a different fungicide group.
<b>Phytophthora Blight/Crown Rot</b>	43	Fluopicolide	<b>Presidio (NEW)</b>	220-292 ml/ha	12 hours	2	Apply in 200-1000 L/ha 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. Maximum 2 applications allowed.

**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/ls-re/index-eng.php>

# PESTICIDE EMERGENCY CONTACT INFORMATION

<b>Poison Control Centres</b>		
Nova Scotia	800.565.8161 <b>or</b> 902.428.8161	IWK, Halifax, NS
New Brunswick	911	Ask for Poison Information
Prince Edward Island	800.565.8161 <b>or</b> 902.428.8161	IWK, Halifax, NS
Newfoundland	709.722.1110	Dr. Charles A. Janeway Child Health Care Centre, St. John's, NF

<b>Environmental Emergencies (Pesticide Spills)</b>	
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

<b>Formulation and Measurement Abbreviations</b>			
FORMULATIONS		MEASUREMENTS	
DF	Dry flowable	mL	millilitre
DG	Dry granule	kPa	kilopascal
EC, E	Oil-based emulsifiable concentrate	kg	kilogram
EG	Water dispersible granule	g	gram
WDG	Wettable dry granule	L	litre
WP, W	Wettable powder	BIU	Billions of International Units
Sn	Solution	ppm	parts per million (1000 ppb)
		ppb	parts per billion (1/1000 ppm)

<b>Helpful Conversions<sup>1</sup></b>	
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!