

GUIDE TO PEST MANAGEMENT IN CELERY

Nova Scotia Vegetable Crop Guide to Pest Management 2011
[CEL1-11]

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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
WEEDS:							
Preplant <i>Perennial weeds including quackgrass</i>	14	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.
	9	Glyphosate	Roundup Original	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.
			Roundup WeatherMAX	1.67-8.0 L/ha	12 hours	7	
			Touchdown® 480	2.5-7.0 L/ha	12 hours	7	
Postemergence Treatments <i>Seedling annuals</i>	-	-	Herbicidal Oil (Weedkiller No. 1)	600-800 L/ha (overall spray) 300-400 L/ha (rows only)	-	-	
	7	Linuron	Afolan F	2 - 2.7 L/ha	-	-	Apply to transplant as soon as new growth has started. Some temporary discoloration may occur.
			Lorox L	1.9 - 4.7 L/ha			Apply to transplant as soon as new growth has started. Use lower rate on lighter soils

							(lower in clay or organic matter) and higher rates on heavier soils. Some temporary discoloration may occur.
	5	Prometryn	Gesagard 480 SC	3.75-4.58 L/ha	24 hours	54	Apply to transplanted celery only, 21 days after transplanting and before weeds reach 5 cm in height. Only one application per season.
Stale Seedbed Technique	22	Diquat	Reglone® Desiccant	2.3-4.6 L/ha	-	-	Apply before crop emergence to foliage of emerged weeds.
		Paraquat	Gramoxone®	2.7-5.5 L/ha	24 hours		

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INSECTS:							
Leafhopper	1A	Carbaryl	Sevin XLR Plus	1.25-2.5 L/ha	-	5	Aster leafhoppers spread aster yellows. Apply 3 to 4 sprays at 7 to 10 day intervals beginning early July. Also spray weeds in headlands and control leafhoppers on adjacent carrots and lettuce. Discontinue sprays 20 days before harvest.
	3	Cypermethrin	Ripcord 400 EC	86 mL/ha	-	7	
			UP-Cyde 2.5 EC	140 ml/ha	12 hours	7	
	1B	Malathion	Malathion 500E	2.25 L/ha	-	7	<i>*Same remarks as Sevin XLR Plus*</i>
	-	Kaolin	Surround WP	12.5 - 25 kg/ha	-	-	This is an OMRI listed control product and is suitable for organic production. Apply in 500 L of water. Apply at 7-14 day intervals once initial infestation is detected. Use high rate for early applications. Do not exceed 25 kg/ha per application.
Tarnished Plant Bug	1B	Acephate	Orthene 75 SP	563-825 g/ha in 225 to 1650 L of water	24 hours	21	Do not re-enter sprayed area until product has dried. Maximum 4 applications per season.
	2A	Endosulfan	Thiodan 4EC	2 L/ha	-	14	Apply when pests appear. Trim celery at harvest.
Thionex 50 WP			1.75 Kg/ha	14			
Aphids	1B	Acephate	Orthene 75 SP	563-825 g/ha in 225 to 1650 L of water	24 hours	21	Do not re-enter sprayed area until product has dried. Maximum 4 applications per season.
	4	Acetamiprid	Assail 70 WP	56 – 86 g/ha	12 hours	7	Maximum 5 applications per year and alternate with other insecticide families.
	1B	Dimethoate	Lagon 480 E	700 mL/ha	-	3	Do not apply more than 3 applications per growing season. Begin application 3

							weeks after transplanting.
	2A	Endosulfan	Thiodan 4EC	2.0 L/ha	-	14	Apply when pests appear. Trim celery at harvest.
			Thionex 50 WP	1.75 Kg/ha			
	4	Imidacloprid	Admire 240	0.73-1.3 L/ha	24 hours	45	Apply specified dosage in one of the following methods: <ul style="list-style-type: none"> • Apply specified dosage 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.
	1B	Malathion	Malathion 25 WP	4.25 Kg/ha	-	7	Apply if aphids are plentiful. Trim celery at harvest.
		Naled	Dibrom	1.1 - 1.65 L/ha	48 hours	4	Apply in 100-300 L of water per ha. Do not apply in temperatures over 32°C. Maximum 2 applications per season.
	9B	Pymetrozine	FulFill 50WG	193 g/ha	-	14	Apply when aphids first appear. Do not exceed 2 applications per season. Allow 7 days between applications. Causes feeding cessation shortly after application but aphids may remain on the plant for 2-4 days before they die. The use of a non-ionic surfactant at a rate of 0.25% v/v is recommended to improve performance under drought stress conditions.
	9C	Fonicamid	Beleaf 50SG	0.12-0.16 kg/ha	-	0 days	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.
Aphids and Whiteflies	23	Spirotetramat	Movento 240 SC	220-365 ml/ha	12 hours	3	Minimum interval between applications is 7 days. Maximum of 2 times full rate 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			
Cabbage Looper	11	<i>Bacillus thuringiensis</i>	Thuricide HPC	2-4.25 L/ha	-	0	THURICIDE HPC is a biological insecticide and is intended for use against leaf-chewing larvae (caterpillars) of lepidopterous species. Apply at first sign of infestation when worms are small and repeat at 7-10 day intervals when needed to maintain control.
	28	Chlorantraniliprole	Coragen	250 ml/ha	12 hours	1	Begin applications when treatment thresholds have been reached. Maximum of 4 applications per season. Do not apply more than once every 3 days. Do not exceed 1 L of Coragen per ha per season. Apply in a finished spray volume of 100L/ha.
	2A	Endosulfan	Thiodan 4EC	2 L/ha	-	14	Apply when pests appear. Trim celery at harvest.
			Thionex 50 WP	1.75 Kg/ha			
	1B	Naled	Dibrom	1.1 - 1.65 L/ha	48 hours	4	Apply in 100-300 L of water per ha. Do not apply in temperatures over 32°C. Maximum 2 applications per season.
	5	Spinetoram	Delegate WG	140-200 g/ha	12 hours	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.
Spinosad			Success 480 SC	182 ml/ha	12 hours	1	Maximum of 3 applications per year. Allow 7-10 days between applications.
	Entrust 80 W	109 g/ha					

Leaf Miner	6	Abamectin	Agri-Mek 1.9 EC	0.6-1.1 L/ha	-	14	Maximum of 4 applications per season. Do not make 2 sequential applications.
	4	Acetamiprid	Assail 70 WP	86 g/ha	12 hours	7	Maximum of 5 applications per season. Do not apply more than once every 7 days.
	17	Cyromazine	Citation 75WP	188 g/ha	12 hours	7	Apply when larvae first appear. Repeat after 7 days. Do not apply more than 5 times a year. Read label for company liability statement.
Imported Cabbage worm and Diamondback Moth	5	Spinosad	Entrust 80 W	109 g/ha	12 hours	1	Maximum of 3 applications per year. Allow 7-10 days between applications.

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DISEASES:							
Damping Off	M	Thiram	Thiram 75 WP	1.5 Kg/1000 L of water	-	7	Apply in 1000 L of water per Ha.
Early and Late Blight	7 - 11	Boscalid, pyraclostrobin	Pristine WG	1.0 Kg/ha	24 hours	0	For suppression of early and late leaf blight. Apply once per season for <i>Cercospora</i> (early blight) and twice per season for <i>Septoria</i> (late blight). For hand harvesting and thinning in leafy vegetables do not enter for 9 days after application. * Wash and trim celery at harvest.
	M	Chlorothalonil	Bravo 500 F	1.6-2.4 L/ha (early blight) 2.4-4.0 L/ha (late blight)	48 hours	7	
	M ²	Copper oxychloride	Guardman	4 kg in 1000 L of water	-	-	
	M	Copper sulphate	Copper 53 W	3.25-6.5 kg/ha	-	1	
	M3	Mancozeb	Dithane DG	2.25 Kg/ha	24 hours	14*	

			Rainshield				
	M		Penncozeb 75 DF	2.25 Kg/ha			
			Manzate Pro-Stick	2.25-3.25 Kg/ha			
	M ²	Metiram	Polyram DF	2.25-3.25 Kg/ha	-	14*	
	M	Thiram	Thiram 75 WP	1.5 Kg/1000 L of water	-	7	Apply 70 to 105 litres per 100 m ² at 3 day intervals
Pink Rot (<i>Sclerotinia sclerotiorum</i>)	-	<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 approx. 8 weeks before harvest and repeat on a 14 day interval. Apply as a directed spray in sufficient water to ensure thorough coverage of the base of the plants and the surrounding soil surface.
			Serenade ASO	5.0-15.0 L/ha			
			Rhapsody ASO	1.0-2.0 L/100 L of water			
	7 - 11	Boscalid, pyraclostrobin	Pristine WG	1.0 – 1.3 Kg/ha	24 hours	0	For suppression of white mold. Apply up to twice per season before disease develops. For hand harvesting and thinning in leafy vegetables do not enter for 9 days after application.
Powdery mildew (<i>Erysiphe</i>)	-	<i>Bacillus subtilis</i>	Serenade ASO	4.0-12.0 L/ha	-	0	Serenade ASO and Rhapsody ASO are biopesticides that will only suppress the indicated diseases. Begin applications
			Rhapsody ASO	1.0-2.0			

<i>cichoracearum)</i>				L/100 L of water			when conditions are conducive to disease development. Repeat as necessary on a 7 to 10 day interval. Apply in sufficient water to ensure complete coverage of entire plant. For improved performance use in a rotational program with other registered fungicides.
Grey mould (<i>Botrytis cinerea</i>)	-	<i>Bacillus subtilis</i>	Serenade ASO	4.0-12.0 L/ha	-	0	Serenade ASO and Rhapsody ASO are biopesticides that will only suppress the indicated diseases. For suppression, begin applications soon after emergence or transplant and continue as necessary on a 7 to 10 day interval. When environmental conditions are conducive to rapid disease development, use in a rotational program with other registered fungicides. Thorough coverage is essential.
			Rhapsody ASO	1.0-2.0 L/100 L of water			

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	Oil-based emulsifiable concentrate	kPa	kilopascal
F	Flowable	kg	kilogram
L	Liquid	g	gram
SC	Suspension concentrate	L	litre
Sn	Solution	BIU	Billions of International Units
SP	Soluble powder	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!