

# GUIDE TO PEST MANAGEMENT IN CARROTS

**Nova Scotia Vegetable Crop Guide to Pest Management 2011**  
[CAR1-11]

**Revised April 15, 2011 by**  
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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>	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.
	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	12 hours	7	
			<b>Touchdown® 480</b>	2.5-7.0 L/ha	12 hours	7	
<b>Stale Seedbed Technique</b>	22	Diquat	<b>Reglone® Desiccant</b>	2.3-4.6 L/ha	-	-	
	10	Glufosinate ammonium	<b>Ignite® 15 Sn</b>	2.7-5.0 L/ha	-	-	
	22	Paraquat	<b>Gramoxone®</b>	2.7-5.5 L/ha	24 hours	-	
<b>Preplant Incorporated Treatments</b>  <i>Germinating annual grasses and some</i>	3	Trifluralin	<b>Bonanza 400</b>	2.0-2.75 L/ha		-	Lightly incorporate, 8 to 10 cm depth within 8 to 24 hours of application or up to 3 weeks before planting (Treflan), following label instructions. Ragweed and mustards are not controlled. Some crop rotation restrictions exist. Mineral soils only. Use in conjunction with a post emergence
			<b>Treflan EC</b>	1.7-2.3 L/ha		-	

<i>broadleaf weeds</i>							herbicide.
<b>Preemergence Treatments</b>  <i>Annual Weeds</i>	7	Linuron	<b>Afolan F</b>	1.4-2.7 L/ha	-	-	Apply as a band or broad cast application after planting. Rain or irrigation is needed for good control. Additional postemergence treatments may be required. Should be applied soon after seeding. Use lower rate on sandy soils. Carrots are sensitive at time of emergence and heavy rains or irrigation following treatment may result in injury.
			<b>Lorox DF</b>	1.1-3.25 Kg/ha			
	5	Prometryn	<b>Gesagard 480SC</b>	3.75-4.58 L/ha	12 hours	85	Should be applied soon after planting. Do not use at or near time of emergence. Use low rate in sandy soils.
<b>Preemergence followed by Postemergence</b>  <i>Germinating annuals and emerged weeds</i>	7	Linuron	<b>Afolan F followed by Afolan F</b>	1.4-2.0 L/ha 2.0-2.7 L/ha	-	-	These treatments must be at least 2 weeks apart. See pre-emergence and post emergence remarks above. <b>If unusually heavy rains follow either application, sever injury may result.</b>
			<b>Lorox DF followed by Lorox DF</b>	1.1-2.25 Kg/ha 2.25-4.5 Kg/ha			
	5	Prometryn followed by	<b>Gesagard 480SC followed by:</b>	3.75-4.58 L/ha	-	-	
	7	Linuron	<b>Lorox DF or/ Afolan F</b>	1.1-3.25 Kg/ha 1.3-2.3 L/ha			On organic soils, a combination procedure which has been successful is to use the pre-emergence prometryn treatment followed by a post emergence linuron treatment as required.
<b>Postemergence Treatments</b>  <i>Annual broadleaf weeds</i> <i>Annual grasses</i>			<b>Herbicidal Oil (Weedkiller No. 1)</b>	600-800 L/ha (overall spray)  300-400 L/ha (rows only)	-	30	Apply undiluted. Apply as soon as true leaves develop but before carrots are thicker than a pencil. Later treatments may result in an oil flavor in carrots. Weeds should be less than 10 cm high.
	1	Diclofop-methyl	<b>Hoe-Grass 284</b>	3.5 L/ha	-	60	Apply when grasses are in 1 to 4 leaf stage. Do not tank mix with other products. Does not control quackgrass.
		Fenoxaprop-p-	<b>Excel Super</b>	0.67 L/ha			38

		ethyl					growing in the 1 to 6 leaf stage.
	7	Linuron	<b>Afolan F</b>	2.0-5.0 L/ha		-	Apply after carrots are 8 to 15 cm high. Temporary yellowing of carrot leaves may occur.
			<b>Lorox DF</b>	2.25-4.5 Kg/ha		-	
	15	S-metolachlor	<b>Dual II Magnum</b>	1.2-1.5 L/ha		30	Make only one application per year. Apply in 150 - 300L water/ha. Reduced levels of weed control may be observed when weed densities are high. Also controls nightshades. Apply when crop is 3-5 leaf stage and weeds are prior to 2-leaf.
<i>Quackgrass and annual grasses</i>	1	Fluazifop-p-butyl	<b>Venture L</b>	0.60-2.0 L/ha	-	50	Apply when crop is 10 cm in height or less. Use the high rate for quackgrass control. Do not tank mix with other herbicides.

Pest	Group	Active Ingredient	Pesticide Product Name	Rate	Restricted-Entry Interval (REI)	Pre-Harvest Interval (days)	Remarks
<b>INSECTS:</b>							
Aphids	1B	Diazinon	<b>Diazinon 500E</b>	1.1 L/ha	-	10	Apply in sufficient water to achieve thorough coverage of the attacked crop. Apply when the insects first appear and repeat as infestations warrant.
	9C	Flonicamid <i>Added June 16<sup>th</sup></i>	<b>Beleaf 50SG</b>	0.12-0.16 kg/ha	-	3	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. <b>Avoid overnight storage of spray mixtures, do not use liquid fertilizer as a carrier and do not use adjuvants.</b>
Aster Leafhopper	1A	Carbaryl	<b>Sevin XLR</b>	1.25-2.5 L/ha	-	1	Apply when leafhoppers first appear and repeat when the Action Threshold is reached. Otherwise, apply at 7-10 day intervals until the end of Aug. or 20 days before harvest for early carrots. <b>Action Threshold: 5 leafhopper adults/25 sweeps.</b>
	-	Kaolin	<b>Surround WP</b>	12.5-25 kg/ha	-	-	<b>This is an OMRI listed control product and is suitable for organic production.</b> 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.
Carrot Rust Fly (Larvae)	1B	Diazinon	<b>Diazinon 5G</b>	22 Kg/ha in furrow	-	-	Apply 22 kg per ha in furrow (38 cm apart) at seeding time, (equivalent to 85 gm per 100 lineal meters).
Carrot Rust Fly (Adult)	3	Cypermethrin	<b>Ripcord 400 EC</b>	175 ml/ha in 550 L of water	12 hours	35	Do not apply more than three times per season. <b>Action Threshold: for fresh market carrots 0.1 flies/trap/day. For processing carrots, 0.2 flies/tray/day.</b>
			<b>UP-Cyde 2.5 EC</b>	280 ml/ha in 550 L of			

				water			
	1B	Diazinon	<b>Diazinon 50W</b>	1.1 Kg/ha	-	10	Apply when flies first appear and repeat at 7-10 day intervals, as required. Apply in 550 L of water with no more than 3 applications per season. <b>Action Threshold: for fresh market carrots 0.1 flies/trap/day. For processing carrots, 0.2 flies/tray/day.</b>
	3	Lambda-cyhalothrin	<b>Matador 120 EC</b>	83 ml/ha	24 hours	14	First application should be applied at the 2-3 leaf stage when insects or damage appear. Timing of applications should be based on the presence of vulnerable pest developmental stages and significant populations as determined by local monitoring. Allow 7 days between applications. <b>Do Not apply more than 3 times per year.</b>
<b>Warrior</b>							
<b>Carrot Weevil</b>	3	Lambda-cyhalothrin	<b>Matador 120 EC</b>	83 ml/ha	24 hours	14	First application should be applied at the 2-3 leaf stage when insects or damage appear. Timing of applications should be based on the presence of vulnerable pest developmental stages and significant populations as determined by local monitoring. Allow 7 days between applications. <b>Do Not apply more than 3 times per year.</b>
			<b>Warrior</b>				
	1B	Phosmet	<b>Imidan 50 WP</b>	2.25 Kg/ha	5 days	40	Use up to 1000 L/ha. Do not apply more than twice per year. Imidan should not be used on carrots that will be shipped to the USA either as fresh or processed. <b>Action Threshold: 1.5 to 5.0 weevils/trap, (cumulative value) spray at two leaf stage.</b>
<b>Cutworms and Armyworms</b>	1B	Chlorpyrifos	<b>Lorsban 50 WP</b>	2.25-4.5 Kg/ha	24 hours	60	Apply when cutworms are noticed. 1 application per season.
			<b>Pyrinex 480 EC</b>	2.4-4.8 L/ha			
	3	Cypermethrin	<b>Ripcord 400 EC</b>	175 ml/ha	-	35	Do not apply more than three times per season.
			<b>Up-cyde</b>	280 ml/ha			
3	Permethrin	<b>Pounce 384 EC</b>	180-390 ml/ha	-	-	Apply up to 5 leaves. Applications should be made under warm, moist conditions in	

							the evening or at night when cutworm activity is highest. Will only control surface feeding and climbing stages.
<b>Diamondback Moth, Cabbage Looper and Imported Cabbageworm</b>	5	Spinetoram	<b>Delegate WG</b>	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. Maximum of 3 applications per year with a minimum re-treatment interval of 5 days.

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<b>DISEASES:</b>							
Cavity Spot	4	Metalaxyl-M and S-isomer	Ridomil Gold 1G	25 Kg/ha	12 hours	-	Apply in the seed furrow at the time of planting. Make only one application per year. Refer to the label for further information.
Cavity Spot, Root Dieback/Forking ( <i>Pythium spp.</i> )	21	Cyazofamid	Ranman 400SC	0.44 L/ha	12 hours	30	Maximum of one application per season. Apply as either a post-plant, pre-emergent application within 3 days after planting or as a soil-directed spray 14 days after planting. Either application should be incorporated into the soil with 1.25-2.5 cm of water. See label for banding instructions. Do not apply in dead calm or when winds are gusty. Do not apply with spray droplets smaller than the ASAE medium classification
Aster Yellows Disease							* See Aster Leafhopper in insect section.
Leaf Spots and Cercospora	7	Boscalid	Lance WDG	315 g/ha	12 hours	0	Begin applications prior to disease development at 7-14 day intervals. Maximum of 2 sequential applications. Maximum total of 3 Cabrio and 5 Lance applications per season. <i>*See label for control of Alternaria</i>
	11	Pyraclostrobin	Cabrio EG	560-840 g/ha	12 hours	3	
	7-11	Boscalid & Pyraclostrobin	Pristine WG	580-735 g/ha	-	0	Maximum 6 applications per year. Allow 7-14 days between applications. 3 day re-entry interval when hand harvesting. Also controls Alternaria.
	M	Chlorothalonil	Bravo 500	2.4-3.2 L/ha	48 hours	1	Apply at 7 to 10 day intervals beginning when disease is observed. Do not grow carrots successively in the same field.
	M3	Mancozeb	Dithane DG Rainshield NT	2.25 Kg/ha	-	7	
	M		Penncozeb 75DF	2.25 Kg/ha	24 hours	7	
	M		Manzate Pro-Stick	2.25 Kg/ha	-	7	

<b>Alternaria</b>	9-12	Cyprodinil & fludioxonil	<b>Switch 62.5 WG</b>	775-975 g/ha	12 hours	7	Maximum 3 applications per year. Allow 7-10 days between applications.
	7	Boscalid	<b>Lance WDG</b>	315 g/ha	12 hours	0	Maximum of 2 sequential applications.
	11	Pyraclostrobin	<b>Cabrio EG</b>	0.56-1.1 Kg/ha	12 hours	3	Maximum total of 3 Cabrio and 5 Lance applications per season.
<b>Rhizoctonia Root Rot, Crown Rot and Stem Canker</b>	11	Azoxystrobin	<b>Quadris</b>	4-6ml of product/100 m row in 50-100L water/ha	-	40	Apply either in-furrow at seeding or as a banded application over the row soon after emergence or within 30 days of emergence. Maximum 1 application per year.
<b>White mould (<i>Sclerotinia sclerotiorum</i>)</b>	-	<i>Bacillus subtilis</i>	<b>Serenade® MAX™</b>	2.0-4.0 Kg/ha	-	0	<b>Serenade Max and Serenade ASO are biopesticides that will only suppress the indicated diseases.</b> Begin applications soon after emergence and when conditions become conducive for disease development. Repeat as necessary on a 7-10 day interval.
	-		<b>Serenade® ASO™</b>	8.0-15.0 L/ha	-	-	
	12	fludioxonil  <i>Emergency registration until December 31<sup>st</sup>, 2010</i>	<b>Scholar 50WP</b>	227g / 378 L of water  Treats up to 90,000 kg of carrots	-	-	Apply as a post-harvest dip or drench immediately before storage. Maximum one application per year. Ensure Scholar solution remains in suspension by using agitation. Do not store carrots in direct sunlight. <b>MRL restrictions may apply to carrots sold outside of Canada.</b>

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 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

<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
EC, E	Oil-based emulsifiable concentrate	kPa	kilopascal
EG	Water dispersible granule	kg	kilogram
F	Flowable	g	gram
G	Granule	L	litre
L	Liquid	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)
WG	Wettable granule		
SC	Suspension concentrate		
Sn	Solution		

<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!