

# GUIDE TO PEST MANAGEMENT IN BEANS (DRY)

**Nova Scotia Vegetable Crop Guide to Pest Management 2011**  
[DRY1-11]

**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>	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 of 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® 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>Preplant Incorporated Treatments</b>	15	Dimethenamid	<b>Frontier</b>	1.25-1.4 L/ha	-	-	Use higher label rate on fine textured or high organic soils and for heavier weed problems. ( <i>Phaseolus vulgaris</i> only)
		Dimethenamid-P	<b>Frontier Max</b>	860-963 ml/ha	24 hours	-	
<i>Germinating annual grasses and some broadleaf weeds</i>	2	Imazethapyr	<b>Pursuit</b>	312 ml/ha	-	100	Apply one application per year to white or kidney beans only. Rotational cropping restrictions apply. <b>Also can be tank mixed with Treflan or Dual II Magnum. (Check label for allowable varieties)</b>
<i>Note allowable tank-mixes in comments section</i>	15-2	Dimethenamid-P and Imazethapyr	<b>Frontier Max and Pursuit</b>	860-963 ml/ha and 312 ml/ha	-	-	Incorporate into the top 5 cm of soil within 7 days of planting.
	8	Eptc	<b>EPTAM 8-E</b>	4.25-5.5 L/ha	24 hours	-	Must be applied to a dry clod-free soil surface and incorporated shortly after application. <b>Can be tank mixed with Treflan (Check label for allowable</b>

							<b>varieties).</b>
	15	S-Metolachlor	<b>Dual II Magnum</b>	1.15-1.75 L/ha	12 hours	-	Do not use on very sandy soils, or on soils high in organic matter. Use in conjunction with preemergence or postemergence herbicide for control of broadleaf weeds. Beans should be seeded 4 cm deep or crop injury may occur. Maximum 1 application per year. <b>Can be tank mixed with Pursuit (Check label for allowable varieties).</b>
	3	Trifluralin	<b>Bonanza 400 EC</b>	1.5-2.75 L/ha	-	-	Incorporate within 8 hours of application following label instructions. Ragweed and mustards are not controlled. Corn or cereal grains may be injured when planted in fields treated with trifluralin the previous year. <b>Can be tank mixed with Pursuit or EPTAM (Check label for allowable varieties).</b>
<b>Rival EC</b>			1.2-2.3 L/ha	12 hours	-		
<b>Treflan EC</b>			1.2-2.4 L/ha	12 hours	-		
<b>Preemergence Treatments</b>	15	Dimethenamid	<b>Frontier</b>	1.1-1.4 L/ha	-	-	Apply only to white and kidney beans. Incorporation by rainfall or irrigation after application is most effective. * <b>Rate depends on soil texture. Read product label.</b>
<i>Grasses (annual)</i>		Dimethenamid-P	<b>Frontier Max</b>	756-963 ml/ha	-	-	<b>* Rate depends on soil texture. Read product label for soil texture chart.</b>
<i>Annual grasses and broadleaf weeds</i>	2	Imazethapyr	<b>Pursuit</b>	312 ml/ha	-	100	Apply one application per year to white or kidney beans only. Rotational cropping restrictions apply. Also can be tank mixed with Treflan.
	15-2	Dimethenamid-P and Imazethapyr	<b>Frontier Max and Pursuit</b>	756-963 ml/ha and 312 ml/ha	-	100	<b>* Rate depends on soil texture. Read product label for soil texture chart</b>
	15	S-Metolachlor	<b>Dual II Magnum</b>	1.15-1.75 L/ha	12 hours	-	Do not use on very sandy soils, or on soils high in organic matter. Use in conjunction with preemergence or postemergence herbicide for control of broadleaf weeds. Beans should be seeded 4 cm deep or crop injury may occur. Maximum 1 application per year.

<b>Postemergence Treatments</b> <i>Broadleaf weeds</i>	6	Bentazon	<b>Basagran</b> plus <b>Assist Oil Conc.</b>	1.75-2.25 L/ha 1-2 L/ha	12 hours	-	Apply when beans area at the 4 trifoliolate stage. Do not apply when rain is expected within 6-8 hours. <b>Does not control grasses.</b>
			<b>Basagran Forte</b>	1.75-2.25 L/ha			
	14	Fomesafen	<b>Reflex</b> plus <b>Agral 90</b>	1 L/ha 2.5 L / 1000 L	-	84	Do not apply to a field more often than once every two years. <b>Do not apply to a crop under stress.</b> Apply when beans are in the 1-2 trifoliolate stage and weeds are small and actively growing.
<i>Grasses</i>	1	Clethodim	<b>Select</b> plus <b>Amigo</b>	0.19 L/ha 0.5% v/v	-	60	Apply a maximum of one application per year when grassy weeds are in the 2-6 leaf stage.
		Diclofop-methyl	<b>Hoe-Grass 284 EC</b>	3.5 L/ha	-	60	Apply when annual grasses are in 1 to 4 leaf stage. Controls volunteer corn but not volunteer cereals, quackgrass or crabgrass. Do not tank mix with other herbicides.
		Fenoxaprop-P-ethyl	<b>Excel Super</b>	670 ml/ha	-	60	Apply when annual grasses are in the 1 to 6 leaf stage and are actively growing. Excel can be tank mixed Basagran for control of several broadleaf weeds. Use a minimum of 200 L of water per hectare with the mixture.
		Sethoxydim	<b>Poast Ultra</b> plus <b>Merge</b>	1.1 L/ha 1 to 2 L/ha	12 hours	80	Treat at the 1 to 6 leaf stage of annual grasses. Use the higher rate for control of volunteer cereals and quackgrass. Apply in 50 to 200 L/ha of water. Merge should be use at 1% of water volume used.
<i>Annual grasses and broadleaf weeds</i>	1-6	Fenoxaprop-P-ethyl  Bentazon	<b>Excel Super</b>  plus <b>Basagran</b> plus <b>Assist Oil Conc.</b>	670 ml/ha  1.75-2.25 L/ha 2.0 L/ha	-	60	When mixing, add Basagran followed by Excel Super followed by Assist to a tank one-half full of water and then complete filling. Do not use excessive agitation. Temporary crop injury possible during hot, humid conditions. When these conditions occur reduce oil concentrate (Assist) to 1 L/ha.

	6-14	Bentazon Fomesafen	<b>Basagran</b> plus <b>Reflex</b> plus <b>Assist Oil</b> <b>Conc.</b>	1.75 L/ha 0.58 L/ha 2 L/ha	-	84	Refer to Basagran and Reflex labels on specific weed usage and height.
<b>Preharvest</b>	22	Diquat	<b>Reglone</b> plus <b>Agral 90</b>	1.25-1.7 L/ha 1 L/1000 L	24 hours	-	Apply Reglone when 80% of pods have turned yellow. Do not apply Ignite to dry beans grown for seed. Apply Ignite when 50 to 75% of the pods are yellow-brown. Apply Roundup or Roundup FastForward Preharvest 7 to 14 days before harvest and when grain moisture is less than 30%.
	10	Glufosinate ammonium	<b>Ignite 15 SN</b>	2.5-3.0 L/ha	-	-	
	9	Glyphosate	<b>Roundup Original</b>	2.5 L/ha	12 hours	-	
	9-10	Glyphosate and Glufosinate ammonium	<b>Roundup FastForward Preharvest</b>	3.0 L/ha	-	-	

Pest	Group	Active Ingredient	Pesticide Product Name	Rate	Restricted-Entry Interval (REI)	Pre-Harvest Interval (days)	Remarks
<b>INSECTS:</b>							
<b>Seed corn Maggot, Potato leafhopper, Wireworm</b>	4	Thiamethoxam	<b>Cruiser 350FS</b>	86-143 ml/100 kg seed	-	-	<b>Seed treatment for commercial seed treatment facilities only.</b> Use high rate for wireworm and to replace one foliar application for potato leafhopper.
<b>Aphids</b>	1B	Diazinon	<b>Diazinon 50 EC</b>	1.1 L/ha	-	7	Apply with enough spray volume to ensure adequate spray coverage.
			<b>Diazinon 500 E</b>	1.1 L/ha	-	3	
	2A	Endosulfan	<b>Thiodan 4 EC</b>	1.5-2.5 L/ha	-	2	Do not apply to lima beans.
	3	Lambda-cyhalothrin	<b>Warrior</b>	83-233 ml/ha	24 hours	21	<b>Do not use more than 3 applications per season.</b> Apply when the presence of vulnerable pest developmental stages and significant populations occur. Apply in 100-200 L of water / ha.
	1B	Malathion	<b>Malathion 500 E</b>	1.5-2.75 L/ha	-	7	Apply with enough spray volume to ensure adequate spray coverage.
<b>Two Spotted Spider Mite</b>	3	Dicofol	<b>Kelthane 50 W</b>	1-1.25 Kg/ha	-	7	1 application per season. Use high rate for larger plants.
<b>European Corn Borer</b>	11	<i>Bacillus thuringiensis</i>	<b>Bioprotec CAF</b>	2.8-4.0 L/ha	-	1	Maximum 4 applications per season. Allow 5-10 days between applications.
	3	Lambda-cyhalothrin	<b>Matador 120 EC</b>	83 mL/ha	24 hours	14	Apply with 100-200 L/ha of spray volume. Apply before larvae tunnel into stalk. Max 3 applications per season.
<b>Tarnished Plant Bug</b>	3	Lambda-cyhalothrin	<b>Matador 120 EC</b>	83 ml/ha	24 hours	14	Apply with 100-200 L/ha of spray volume. The need and timing of application should be based on the presence of vulnerable pest development stages.
	1B	Trichlorfon	<b>Dylox 420</b>	2.75-4.0 L/ha	24 hours	14	Apply with enough spray volume to ensure adequate coverage. Repeat as necessary.
<b>Cutworms &amp; Army worms</b>	3	Lambda-cyhalothrin	<b>Matador 120 EC</b>	83 mL/ha	24 hours	14	Apply with 100-200 L/ha of spray volume. The need and timing of application should be based on the presence of vulnerable pest development stages. Applications should be made as close to cutworm feedings as possible (ie. night).

	1B	Trichlorfon	<b>Dylox 420</b>	2.75-4.0 L/ha	24 hours	14	Apply with enough spray volume to ensure adequate coverage. Repeat as necessary.
<b>Western Bean Cutworm</b>	3	Lambda-cyhalothrin	<b>Matador 120 EC</b>	83-187 ml/ha	24 hours	21	Repeat sprays at 4-7 day intervals. Do not use more than 3 applications per season.
			<b>Warrior</b>				
<b>Potato Leafhopper</b>	-	Kaolin	<b>Surround WP</b>	6.25-12.5 kg/ha	-	-	<b>This is an OMRI listed control product and is suitable for organic production.</b> Apply in 250 L of water. Apply at 7-14 day intervals once initial infestation is detected. Use high rate for early applications. Do not exceed 12.5 kg/ha per application.
	3	Lambda-cyhalothrin	<b>Matador 120 EC</b>	83 ml/ha	24 hours	14	Apply with 100-200 L/ha of spray volume. The need and timing of application should be based on the presence of vulnerable pest development stages.

Pest	Group	Active Ingredient	Pesticide Product Name	Rate	Restricted-Entry Interval (REI)	Pre-Harvest Interval (days)	Remarks
<b>DISEASES:</b>							
<b>Botrytis (Grey Mold) and Sclerotinia (White Mold)</b>	-	<i>Bacillus subtilis</i>	<b>Serenade MAX</b>	3.0-6.0 Kg/ha	-	0	<b>Serenade MAX is a biopesticide that will only suppress the indicated diseases.</b> Make the 1 <sup>st</sup> application at planting and prior to crop emergence. Make a 2 <sup>nd</sup> application as a directed spray with multiple nozzles per seed line in sufficient water to ensure thorough coverage of lower plant leaves and surrounding soil surface within 7 days of thinning. Repeat applications on a 7-14 day intervals if conditions for disease development persist. <b>For Botrytis Pod Rot,</b> begin applications at the 1 <sup>st</sup> sign of disease, or when conditions become conducive for disease development. Repeat as necessary on a 7-10 day interval.
			<b>Serenade ASO</b>	4.0-15.0 L/ha	-	0	<b>Serenade ASO is a biopesticide that will only suppress the indicated diseases. For Botrytis blight and Sclerotinia stem rot:</b> Begin application soon after emergence or transplant and when conditions are conducive for disease development. Repeat on 7-10 day intervals.
	7	Boscalid	<b>Lance WDG</b>	560-770 g/ha	12 hours	7	Apply at 20-50% flowering to control <b>white mold</b> . Apply a second time 7-14 days later if disease persists, or weather conditions are favourable for disease development. Maximum 2 applications per season. Use a rate of 460 g/ha for <b>botrytis</b> .
	9-12	Cyprodinil and Fludioxonil	<b>Switch 62.5 WG</b>	775-975 g/ha	12 hours	7	Begin applications prior to or at the onset of disease and repeat applications at 7 day intervals if conditions remain favourable for disease development. For <b>white mold</b> control, make the first

							application at 10-20% bloom. In some locations, a single application at this timing will provide adequate disease control. Apply the higher application rate under conditions of high disease pressure. Apply in sufficient water to ensure thorough coverage: Ground: 175 – 225 L of water /ha Do not apply more than 2.9 kg /ha per crop.
	2	Iprodione	<b>Rovral WDG</b>	1.0-1.5 Kg/ha	-	Do not apply after bloom	Where white mold has been a serious problem in the past, apply Senator in early bloom prior to the rows closing in. Repeat if necessary. Apply Rovral as a preventative treatment when 25-75% of bloom is open. Apply Lance at 20-50% and 7-14 days later. Effective control can only be achieved by using drop nozzles and high pressure so that spray contacts blossoms. When conditions are dry before and during bloom, no fungicide is required.
	1	Thiophanate-methyl	<b>Senator 70 WP</b>	1.75-2.25 Kg/ha	-	14	
<b>White Mold</b> ( <i>Sclerotinia sclerotiorum</i> )	29	Fluazinam	<b>Allegro 500F</b>	1 L/ha	-	30	<b>Maximum of two applications per year</b> Apply in a water volume of 200-600 L/ha. Begin application when plants are at early to mid bloom (10-50% bloom) and make one more application 7-10 days later.
<b>Bacterial Blights</b>	M1	Copper hydroxide	<b>Parasol F</b>	2.3-3.12 L/ha	-	1	Apply at the first sign of disease and at 7 day intervals.
	M		<b>Kocide 2000</b>	1.6-2.3 kg/ha	-	1	For protective sprays, apply first application when plants are 15 cm high. Apply on a 7 to 14 day schedule depending on local conditions. Use high rate under high disease pressure and low rate under low disease pressure.
<i>Seed treatment</i>	M	Copper hydroxide	<b>Kocide 2000</b>	113g in 200ml water for 100kg of seed	-	-	For every 100 kg seed to be treated, add 113 g Kocide® 2000 to 200 ml of warm water and stir until dissolved. Additional warm water can be added as required to create a slurry of suitable consistency for use with commercial seed treatment equipment. Add this mixture to the bean seed as it is being gently tumbled to ensure even coverage.

							Allow treated seed to dry before planting. Label Seed: <b>“This seed has been treated with Kocide® 2000; do not use treated seed for food, feed or oil processing”</b> . <i>Kocide 2000 used as a seed treatment may cause some delay in seed germination. Treat a small quantity of seed using equipment similar to that planned for treating the total seed lot. Conduct germination tests on a small portion of seed before committing the total seed lot to a selected seed treatment. See label for further precautions.</i>
<b>Rust (Asian Soybean)</b>	11	Azoxystrobin	<b>Quadris</b>	0.5 L/ha	-	15	Apply at onset of disease no later than flowering and apply second application 14 days later.
	3	Propiconazole	<b>Tilt 250E</b>	500-756 ml/ha	-	30	Apply at first sign and at 14 to 21 days later. Two applications per season.
	11	Pyraclostrobin	<b>Headline EC</b>	0.4-0.6 L/ha	12 hours	30	<i>Phaseolus, Vigna, Lupinus</i> species only. Apply at the beginning of infection and 10-14 days later.
<b>Anthracnose, Powdery Mildew</b>	11	Pyraclostrobin	<b>Headline EC</b>	0.4 L/ha	12 hours	30	<i>Phaseolus, Vigna, Lupinus</i> species only. Apply at the beginning of infection and 10-14 days later.
<b>Anthracnose, Ascochyta, Mycosphaerella</b>	11	Azoxystrobin	<b>Quadris</b>	0.5 L/ha	-	15	Apply at onset of disease no later than flowering and apply second application 10-14 days later.

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
DC	Dispersible Concentrate	kPa	kilopascal
EC, E	Emulsifiable concentrate	kg	kilogram
EW	Water-based concentrate	g	gram
EG	Water dispersible 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)
Sn	Solution		
SC	Suspension concentrate		

<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!