

# GUIDE TO WEED MANAGEMENT IN Highbush Blueberry



Nova Scotia Guide to Pest Management in Highbush Blueberry  
2018 [HBBlue1-18]

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## IMPORTANT

This publication was compiled by representatives from Perennia using information from the Pest Management Regulatory Agency of Health Canada, and specific pesticide labels. **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, Perennia 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, Perennia has only listed a few 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	Group	Active Ingredient	Pesticide Product Name	Rate	Restricted Entry Interval (REI)	Pre-harvest Interval (days)	Remarks
<b>PLANTING YEAR</b>							
<b>Soil Applied:</b> <i>Broadleaf and grass weeds</i>	15	napropamide	<b>Devrinol DF</b> or <b>Devrinol DF-XT (50 DF-XT)</b>	9 kg/ha	12 hours	70	Apply once per season in the fall through early spring before weeds emerge. Incorporation by rainfall, irrigation or cultivation is essential. <b>Do not apply to frozen ground.</b>
	5	metribuzin	<b>Sencor 75 DF</b>	1 kg/ha	12 hours	730	Apply as a directed application in a band under the bushes. Apply to weed free soil after planting. <b>Do not harvest blueberries for 2 years.</b>
	15	s-Metolachlor	<b>Dual II Magnum</b> or <b>Dual Magnum</b>	1.25-1.75 L/ha	12 hours	30	Make one application per year in 150-300 L water/ha. Apply to soil as a banded application, directed to the base of the plants. <b>Avoid contact with trunk and foliage.</b>
	27	mesotrione	<b>Callisto 480 SC</b> plus <b>Agral 90</b>	0.3 L/ha <b>plus</b> 200 ml/ 100 L water	12 hours	60	<b>Apply once per year.</b> Apply either pre or post emergent to weeds. Apply in 100-200 L water/ha. Apply broadcast ground application, directed to base of blueberries. Apply up to 8 leaf stage of weeds and pre-bloom to crop.
<b>Post Emergence:</b> <i>Grasses</i>	1	fluazifop-p-butyl	<b>Venture L</b>	0.6-2.0 L/ha	12 hours	15	<b>Use one application per season.</b> Apply to actively growing grasses before tillering.
	1	sethoxydim	<b>Poast Ultra</b> plus <b>Merge</b>	0.32-1.1 L/ha <b>plus</b> 0.5-2 L/ha	12 hours	1	Apply to actively growing grasses before tillering. Apply up to 2 applications per year not exceeding 1.1 L/ha per season. Allow at least 14 days between applications. Apply in 50-200 L water/ha.

	1	clethodim	<b>Centurion plus Amigo</b>	0.125-0.38 L/ha plus 0.5-1.0% v/v	12 hours	14	Apply Centurion to actively growing grasses prior to tillering. Apply a maximum of one application per year, post emergent by ground equipment. Apply as broadcast spray directed to the ground. Apply in minimum volume of 100 L water/ha.
<b>Post Emergence:</b> <i>Broadleaf weeds</i>	4	clopyralid	<b>Lontrel 360</b>	0.42-0.83 L/ha	12 hours	45	Apply once per year directed under bushes on emerged weeds. Use lower rate on vetch, higher rate on clovers. Apply 100-200 L solution/ha.
	4	Clopyralid	<b>Pyralid</b>	0.504 L/ha for vetch. 0.996 L/ha for red and white clover	12 hours	45	Make one application per year, post emergent for the <b>control of vetch and red and white clover</b> . Apply as a broadcast treatment.
	27	mesotrione	<b>Callisto 480 SC plus Agral 90</b>	0.3 L/ha plus 200 ml/100 L water	12 hours	60	<b>Apply once per year.</b> Apply either pre or post emergent to weeds. Apply in 100-200 L water/ha. Apply broadcast ground application, directed to base of blueberries. Apply up to 8 leaf stage of weeds and pre-bloom to crop.
	14	oxyfluorfen	<b>Goal 2XL</b>	1 L/ha (broadcast rate)	12 hours	50	<b>For control of field pansy and wood sorrel.</b> Apply as a band on either side of the row when weeds are 2-4 leaf stage and actively growing. Do not spray the crop directly. Apply once per year in the equivalent of 500 L water/ha. Heavy rainfall or irrigation immediately following application may reduce effectiveness.

<b>Post Emergence:</b> <i>Non-selective</i>	9	glyphosate	<b>Roundup 360 various</b>	2.8-5.6 L/ha	12 hours	30	<b>Apply as a directed spray under the bushes.</b> Avoid new shoots. One application per season. Avoid contact with fruit, foliage and canes.
	14	carfentrazone-ethyl	<b>Aim plus Agral 90</b>	37-117 ml/ha plus 0.25% v/v	12 hours	1	<b>Must be applied with a hooded sprayer to control weeds between rows.</b> Apply only once per season. Apply in a minimum of 100 L water/ha. Avoid contact with fruit, foliage and canes.
<b>ESTABLISHED PLANTINGS</b>							
<b>Soil Applied:</b> <i>Broadleaf weeds</i>	2	halosulfuron	<b>Sandea</b>	35-47 (1-4 year bushes)  35-70 (>4 year bushes)	12 hours	14	<b>Do not</b> apply Sandea to plants established less than one year. Avoid contact with blueberry bushes to prevent plant injury. Apply uniformly with ground equipment in a minimum of 140L water/ha. Apply as a broadcast to the ground on either side of the row. Sandea can be applied as a singly or sequentially with a minimum of 45 days between applications. <b>Do not</b> apply more than 140g Sandea/ha per year. <b>Do not</b> spray on plastic mulch.
<b>Soil Applied:</b> <i>Broadleaf and grass weeds</i>	20	dichlobenil	<b>Casoron 4G</b>	175-225 kg/ha	12 hours	-	<b>Use only under plants established for at least three years.</b> Apply to cool moist but unfrozen soil in late fall or spring before weeds emerge. Do not apply if air temperature is above 10-15 °C. Do not use on light, sandy soil.

	15	napropamide	<b>Devrinol DF</b> or <b>Devrinol DF-XT (50 DF-XT)</b>	9 kg/ha	12 hours	70	<b>Apply once per season</b> before weeds emerge either in the fall or spring. Incorporation by rainfall, irrigation or cultivation is essential. Do not apply to frozen ground and do not apply to fruit or foliage.
	5	simazine	<b>Princep Nine-T</b>	2.5-3.75 kg/ha	12 hours	-	<b>Do not use in first year plantings.</b> Apply as a directed spray in early spring before the weeds emerge. Apply in 300-1000 L water/ha. Use lower rate on sandy soils.
	5	terbacil	<b>Sinbar WDG</b>	2.75-4.25 kg/ha	12 hours	80	<b>Make only one application per year.</b> Use only on plantings that have been established for at least one year. Injury may occur on sandy soils, even with low rate.
	15	s-Metolachlor	<b>Dual II Magnum</b> or <b>Dual Magnum</b>	1.25-1.75 L/ha	12 hours	30	Apply once per year in 150-300 L water/ha. Apply to soil as a banded application, directed to the base of the plants. <b>Avoid contact with trunk and foliage.</b>
	27	mesotrione	<b>Callisto 480 SC</b> plus <b>Agral 90</b>	0.3 L/ha <b>plus</b> 200 ml/ 100 L water	12 hours	60	<b>Apply once per year.</b> Apply pre or post emergent to weeds. Apply in 100-200 L water/ha. Apply broadcast ground application, at base of blueberries. Apply up to 8 leaf stage of weeds and pre-bloom of crop.

	14	flumioxazin	<b>Chateau WDG</b>	280-420 g/ha	12 hours	7	<b>Do not apply to blueberries established less than 2 years.</b> Do not make more than two applications in a growing season. Do not make a sequential application within 30 days of the first. Do not apply after bud break unless using a hooded sprayer. Do not apply to fine textured soils. Use low rate on coarse textured soils. Apply prior to weed emergence.
	2	rimsulfuron	<b>Prism</b> plus <b>Non-ionic surfactant</b> (CITOWETT PLUS, AGRAL 90, or AG-SURF)	60 g/ha <b>plus</b> 0.2% v/v	12 hours	21	Make a single application early post emergent to actively growing weeds with a recommended non-ionic surfactant. Use a directed spray application to provide complete coverage of the weeds and minimize spray contact with blueberry plants. When banded (50% band or less) Prism may be applied twice per year. <b>Do not</b> apply more than 60 g/ha on a broadcast basis per year. Only apply to blueberries that have gone through at least one growing season and are in good health. Apply in a minimum of 100 L water/ha (recommended spray volume of 140-190 L/ha).
	29	Indaziflam	<b>Indaziflam 500 SC</b>	150 ml/ha	12 hours	14	Use on plantings established for at least one year. Do not apply prior to any type of soil disturbance. Apply as a directed spray to the soil. Apply a maximum of one application per season, using ground equipment.
	29	Indaziflam <i>NEW 2018</i>	<b>Alion</b>	375 ml/ha	12 hours	14	

<b>Post Emergence:</b> <i>Grasses</i>	1	fluazifop-p-butyl	<b>Venture L</b>	0.6-2.0 L/ha	12 hours	30	<b>Use one application per season.</b> Apply to actively growing grasses before tillering.
	1	sethoxydim	<b>Poast Ultra plus Merge</b>	0.32-1.1 L/ha <b>plus</b> 0.5-2 L/ha	12 hours	1	Apply to actively growing grasses before tillering. Apply up to 2 applications per year not exceeding 1.1 L/ha per season. Allow at least 14 days between applications. Apply in 50-200 L water/ha.
	1	clethodim	<b>Centurion plus Amigo</b>	0.125-0.38 L/ha <b>plus</b> 0.5-1.0% v/v	12 hours	14	Apply Centurion to actively growing grasses prior to tillering. Apply maximum of once per year, post emergent by ground equipment. Apply as broadcast spray directed to the ground. Apply in minimum volume of 100 L water/ha.
<b>Post Emergence:</b> <i>Broadleaf weeds</i>	2	halosulfuron	<b>Sandea</b>	35-47 (1-4 year bushes)  35-70 (>4 year bushes)	12 hours	14	<b>Do not apply Sandea to plants established less than one year.</b> Avoid contact with blueberry bushes to prevent plant injury. Apply uniformly with ground equipment in a minimum of 140 L water/ ha. Apply as a broadcast application to ground on either side of the row. Sandea can be applied as a single or sequential application with a minimum of 45 days between applications. <b>Do not</b> apply more than 140g Sandea/ha per year. <b>Do not</b> spray on plastic mulch.
	4	clopyralid	<b>Lontrel 360</b>	0.42-0.83 L/ha	12 hours	45	Apply once per year directed under bushes on emerged weeds. Use lower rate on vetch, higher rate on clovers. Apply 100-200 L solution/ha.

	4	Clopyralid	<b>Pyralid</b>	0.42 L/ha (vetch), 0.83 L/ha (red/white clover)	12 hours	45	Make one application per year, post emergent for the <b>control of vetch and red and white clover</b> . Apply as a broadcast treatment.
	6	bentazon	<b>Basagran</b> plus <b>Assist</b>	1.75 L/ha <b>plus</b> 0.5% v/v	12 hours	25	For top growth control of yellow nutsedge. Make two applications 7-10 days apart when weeds are small. Do not make more than two applications per year.
	14	carfentrazone-ethyl	<b>Aim</b> plus <b>Agral 90</b>	37-117 ml/ha <b>plus</b> 0.25% v/v	12 hours	1	<b>Must be applied with a hooded sprayer to control weeds between rows</b> . Apply only once per season. Apply in a minimum of 100L water/ha. Avoid contact with fruit, foliage and canes.
	27	mesotrione	<b>Callisto 480 SC</b> plus <b>Agral 90</b>	0.3 L/ha <b>plus</b> 200 ml/ 100 L water	12 hours	60	<b>Apply once per year</b> . Apply either pre or post emergent to weeds. Apply in 100-200 L water/ha. Apply broadcast ground application, directed to base of blueberries. Apply up to 8 leaf stage of weeds and pre-bloom to crop.
	4	2,4-D Amine 600	<b>IPCO</b>	1.7 L/ha	12 hours	30	Use as a directed spray only (between rows of blueberries). <b>Do not overspray</b> . Do not apply more than once per season. Use 60-240L water/ha in early spring after weeds have emerged and are actively growing.



	14	oxyfluorfen	<b>Goal 2XL</b>	1 L/ha (broadcast rate)	12 hours	50	<b>For control of field pansy and wood sorrel.</b> Apply as a band on either side of the row when weeds are 2-4 leaf stage and actively growing. Do not spray the crop directly. Apply once per year in the equivalent of 500 L water/ha. Heavy rainfall or irrigation immediately following application may reduce effectiveness.
<b>Post Emergence:</b>  <i>Non Selective</i>	22	paraquat	<b>Gramoxone</b>	5.5 L/ha	24 hours	-	<b>Apply in 1100 L water /ha.</b> For spot spray apply 55 ml in 10 L of water and spray until foliage is wet. Only emerged weeds will be controlled. Direct spray at base of established plant in the spring before new shoots emerge. Repeat application as necessary
	22 5	paraquat <b>plus</b> simazine	<b>Gramoxone</b> plus <b>Princep Nine-T</b>	5.5 L/ha <b>plus</b> 2.5-3.75 kg/ha	24 hours	-	<b>For emerged weeds with residual control of germinating weeds.</b> Apply as a directed spray to established plantings. Apply with 1100 L water/ha. Use lower rate on sandy soils. <b>Do not</b> spray young shoots.
	9	glyphosate	<b>Roundup 360</b> <b>various</b>	2.8-5.6 L/ha	12 hours	30	<b>Apply as a directed spray under the bushes.</b> Avoid new shoots. One application per season. Avoid contact with fruit, foliage and canes.

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>

## Product Toxicity

COMMON NAME	TRADE NAMES	TOXICITY		
		TO BEES	TO APPLICATOR	
			ORAL	DERMAL
2,4-D	2,4-D Amine 500	low	mod	mod
bentazon	Basagran	low	low	low
carfentrazone-ethyl	Aim EC	low	low	low
clethodim	Centurion	low	mod	low
clopyralid	Lontrel 360	low	low	low
dichlobenil	Casoron	low	low	low
fluazifop-p-butyl	Venture	low	low	low
flumioxazin	Chateau	low	low	low
glyphosate	Roundup, Touchdown, Glyfos	low	low	low
halosulfuron	Sandea	?	mod	low
mesotrione	Callisto 480 SC	low	low	low
metribuzine	Sencor 75DF	low	low	low
napropamide	Devrinol DF and DF-XT	low	low	low
paraquat	Gramoxone	low	high	mod
simazine	Princep Nine-T	low	low	low
sethoxydim	Poast Ultra	low	low	low
s-Metolachlor	Dual II Magnum/Dual Magnum	low	low	low
terbacil	Sinbar	low	low	low

References: EXTTOXNET (<http://exttoxnet.orst.edu/pips/ghindex.html>) and individual product MSDS sheets.

# 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	Emulsifiable concentrate	kPa	kilopascal
F	Flowable	kg	kilogram
G	Granular	g	gram
L	Liquid	L	litre
WDG	Wettable dry granule	BIU	Billions of International Units
WP,W	Wettable powder	ppm	parts per million
SC	Suspension concentrate		
Sn	Solution		
SP	Soluble powder		

<b>Helpful Conversions*</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

**\* 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 have greater toxic effects in smaller amounts. Therefore, even small conversion errors can lead to the use of incorrect dosages (either too high or too low). Use metric – you will be glad you did!