

# Prince Edward Island Weed Control Guide for Potatoes

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Prince Edward Island potato growers are well aware of the need for effective weed management. Mature weeds uncontrolled by herbicides or other management options can significantly reduce marketable yield, interfere with harvesting operations, and in some cases can harbour pests and diseases of economic importance. Compared to other field crops such as corn and soybeans, potatoes have relatively few herbicide modes of action available to use. In addition, researchers have begun to document substantial levels of herbicide resistance in important species such as lambsquarters and redroot pigweed.

Fundamental to a successful weed management program is following an Integrated Pest Management (IPM) strategy that takes into account not only chemical control options but also crop rotation, tillage operations, and other cultural weed control strategies. These may include:

- **Rotation of herbicide chemistries within the crop rotation**, employing different modes of action on different crops to reduce the risk of developing herbicide resistance,
- **Machinery cleaning/sanitation between fields**, avoiding the spread of weed seed,
- **Elimination of mature, seed-producing weeds** on headlands or field margins,
- **Mechanical weed control** prior to potato planting or at hilling to terminate young weeds,
- **Optimizing seed spacing** and/or row spacing by potato variety to shorten the time to full leaf canopy,
- **Using weed-suppressive crops** as either fall cover crops or full-season crops to reduce weed pressure. Examples include cereal rye, buckwheat, and oilseed radish.

- **Hand removal of weeds** when other management options have proven ineffective. This may be particularly required for invasive species (ie. mugwort) or perennial species.

## Herbicide Weed Control:

As noted, the list of registered herbicides available to potato producers is not long, and many of these products share the same mode of action. The most effective practice is to employ one or more pre-emergence herbicides applied after potato planting after hilling practices have taken place. These herbicides must be applied to the soil prior to emergence of both the potato crop and weeds, as they control weeds by disruption growth during weed emergence and early growth.

The two chemistries which generally serve as the “backbone” of PEI herbicide program in potatoes are **metribuzin** (trade names **Sencor, Metrix**, etc) and **linuron** (trade name **Lorox**). These two chemicals provide control of a wide range of grass and broadleaf weed species. They require adequate soil moisture to be effective, ideally a small rainfall within 7-10 days of application. Both products are not advised to be used on coarse-textured, low organic matter soils.

In recent years, metribuzin resistance has been documented in lambsquarters and linuron resistance has been found in redroot pigweed in the Maritime provinces. As a result, other pre-emergence herbicides are available to accompany metribuzin and linuron to improve weed control. These options include:



- **Dimethenamid-P** (trade name **Frontier Max**, group 15) for control of annual grasses, redroot pigweed and Eastern black nightshade.
- **S-metolachlor** (trade name **Dual II Magnum** or tank mix with metribuzin sold as **Boundary LQD**, group 15) for control of annual grasses, nightshades, lambsquarters and redroot pigweed. Some varieties (including Superior) are sensitive to s-metolachlor.
- **Pyroxasulfone** (trade name **Zidua SC**, group 15) for control of annual grasses, redroot pigweed and lambsquarters.
- **Fomesafen** (trade name **Reflex**, group 14) for control of primarily broadleaf weeds (including wild buckwheat, mustards, pigweed, and nightshades). This herbicide comes with plant-back restrictions to be considered.
- **Glufosinate** (trade name **Ignite**, group 10) for burndown of annual grasses and broadleaf species. Not effective on most perennial weeds and no residual soil activity. Only for use before ground crack of emerging potatoes.
- **Glyphosate** (trade name **Round-Up**, additional generic products, group 9) for burndown of both annual and perennial grasses and broadleaf species. Can only be used before ground crack, as it can cause significant damage to emerging potatoes. Not advised for use on seed potatoes, as residues can persist in seed tubers and can cause future emergence issues and yield loss. No residual soil activity.

Once potatoes have emerged, the following products are registered for use in potatoes:

- **Metribuzin (Sencor/Metrix**, group 5) can be used on emerged potatoes up to 10 cm in height for control of newly emerged weeds. There are a number of potato varieties (particularly

round white and red varieties) that are sensitive to metribuzin. If using also using metribuzin as a pre-emerge herbicide, do not exceed 0.6 kg per acre of total product applied.

- **Rimsulfuron** (trade name **Prism**, group 2) is often tank-mixed with metribuzin for post-emergence use on newly emerged weeds. Not very effective on weeds past 6 leaf stage, but can be used up to flowering in potatoes. Not recommended for seed potato acres, as herbicide can cause leaf discoloration that resembles viral symptoms.
- **Clethodim** (trade names **Select/Arrow**, group 1) for control of grass species. Must not be used after 60 days before harvest.
- **Sethoxydim** (trade name **Poast Ultra**, group 1) for control of grass species. Must not be used after 80 days before harvest.
- **Fluazifop-p-butyl** (trade name **Venture L**, group 1) for control of grass species. More effective than other Group 1 herbicides on couchgrass/quackgrass and has a shorter pre-harvest interval (45 days).

Potato growers are advised to read the labels of any herbicide they are considering using. Labels for several products indicate rates to be used for different soil types, weed species or weed populations. Labels also indicate preferred adjuvants to be mixed with herbicides as well as recommended water volumes for maximum efficacy. Lastly, labels will provide a comprehensive list of weed species that are either controlled or suppressed, including species that may not be included in this factsheet.

**Table 1: Pre-emergence herbicides labeled for use in potatoes in Canada, prior to weed emergence.**

	<b>Boundary</b>	<b>Dual II</b>	<b>Frontier</b>	<b>Lorox</b>	<b>Reflex</b>	<b>Sencor</b>	<b>Zidua</b>
<b>Chemical Name</b>	metribuzin + s-metolachlor	s-metolachlor	dimethenamid-p	linuron	fomesafen	metribuzin	pyroxasulfone
<b>WSSA Group</b>	5 + 15	15	15	5 (7)	14	5	15
<b>Rate per acre</b>	0.74 – 1.0 L	0.5 – 0.7 L	302 – 385 mL	0.9 – 1.48 L	0.4 L	0.2 – 0.6 kg	48 – 96 mL
<b>Re-Entry Interval (REI)</b>	12 hours	12 hours	24 hours	4 days	12 hours	12 hours	12 hours
<b>Post-Harvest Interval (PHI)</b>	60 days	none	40 days	4 days	70 days	60 days	none
<b>Apply after Hilling</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Requires Moisture for Activation</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Apply on coarse-textured soils with low soil OM</b>	No	No	Yes	No		No	
<b>Variety sensitivities</b>	Superior	Superior				See note 1	See note 2
<b>Apply after ground crack</b>	No	No	No	No	No	Yes	No
<b>Stand-alone product</b>	Yes	No	No	Yes	No	Yes	No

**Note 1:** Varieties that have been noted as sensitive to metribuzin include: Atlantic, Chieftain, Colomba, Constance, Dakota Pearl, Fabula, HiLite Russet, Innovator, Ivory Russet, Kennebec, Lamoka, Norland, Shepody, Snowden, Superior, Waneta (compiled by NBDAAF).

**Note 2:** Contact your seed supplier/variety agent for information on variety susceptibility

**Table 2: Post-emergence herbicides labeled for use in potatoes in Canada.**

	<b>Prism</b>	<b>Sencor</b>	<b>Select/Arrow</b>	<b>Poast</b>	<b>Venture</b>
<b>Chemical Name</b>	rimsulfuron	metribuzin	clethodim	sethoxydim	fluazifop-p-butyl
<b>WSSA Group</b>	2	5	1	1	1
<b>Rate per acre</b>	24 g	0.2 – 0.6 kg season max: 0.6 kg	50 – 152 mL	130 – 440 mL	240 – 800 mL
<b>Re-Entry Interval (REI)</b>	12 hours	12 hours	12 hours	12 hours	12 hours
<b>Post-Harvest Interval (PHI)</b>	30 days	60 days	60 days	80 days	45 days
<b>Latest Timing for Application</b>	Flowering	Potato plants are 10 cm tall	60 days pre-harvest	80 days pre-harvest	45 days pre-harvest
<b>Application timing for couchgrass/quackgrass</b>	3-6 leaf stage	not indicated	2-5 leaf stage (high rate)	0-3 leaf stage (high rate)	3-5 leaf stage (high rate)
<b>Application timing for annual grasses/cereals</b>	1-6 leaf stage	2-5 leaf stage	2-6 leaf stage	1-6 leaf stage	2-5 leaf stage
<b>Broadleaves controlled/ suppressed</b>	Some	Yes	No	No	No

**Table 3: Burndown herbicides labeled for use in potatoes in Canada, prior to potato emergence.**

	<b>Ignite</b>	<b>Round-Up</b>
<b>Chemical Name</b>	glufosinate ammonium	glyphosate
<b>WSSA Group</b>	10	9
<b>Rate per acre</b>	1.08 – 2 L	1 L
<b>Re-Entry Interval (REI)</b>	24 hours	12 hours
<b>Post-Harvest Interval (PHI)</b>	none	none
<b>Application Timing</b>	Prior to ground crack	Prior to ground crack
<b>Systemic Mode of Action?</b>	No	Yes
<b>Control of Annual Weeds</b>	Yes	Yes
<b>Control of Perennial Weeds</b>	Poor	Yes

### Helpful Hints for Herbicide Application:

- **Different herbicides work better at different air and soil temperatures.** Check your labels to ensure the optimum time of application. For example, glyphosate (Round-Up) works better applied during the day than early morning or evening.
- **Pre-emerge herbicides require soil moisture for activation.** Try to time application before a rainfall (10-15 mm) if possible.
- **Thoroughly clean your sprayer after Round-Up application** to avoid residual damage on potatoes. Even very small amounts of residual glyphosate can stunt plants and cause emergence issue the following year in seed potatoes.
- **Pre-emergence herbicides refer to pre-emergence of the weeds,** not just the potatoes! Efficacy is significantly reduced on emerged weeds!

**Table 4: Weed Control Ratings by Product:** *adapted from Andrew McKenzie-Gopsill, AAFC Charlottetown*

	Group	Annual Grasses					Annual broadleaves										Perennials			
		Barnyard grass	Crabgrass	Green foxtail	Wild oat	Yellow foxtail	Chickweed	Corn spurry	Lambsquarters*	Mustards	Nightshade	Pigweed*	Ragweed	Sow thistle, annual	Wild buckwheat	Canada thistle	Couchgrass	Field mint	Sow thistle, perennial	Crop tolerance
<b>Pre-Emergence Herbicides</b>																				
Boundary LQD	5+15	E	E	E		E	G	G	G	S	E	E		S		S	S	P	S	E
Dual II Magnum	15	E	E	E		E	P	S	G	S	E	G	S		S	P	P	P	P	G
Frontier Max	15	E	E	E		E		P	G	P	E	E	S		P					G
Lorox	5	E	S	G		G			G	G	G	G	G			G	G		G	
Sencor 75DF	5	G	G	G		G	E	G	E	E	S	E	E		G	S	S	P	P	G
Reflex	14								G	E	E	E	E	S	E	S			S	G
Zidua SC	15	E	E	E	G	E	G		G	S	P	E			P					G
<b>Pre-Emergence Herbicide (Weed Burndown)</b>																				
Ignite SN		E	E	E		E	E		E	G		E	E			G	S			P
Round-Up		E	E	E	E	E	E	E	E	E	E	E	E	E	S	E	E	G	E	P
<b>Post-Emergence Herbicides</b>																				
Clethodim	1	E	E	E	E	E											G			E
Poast	1	E	E	E	E	E											G			E
Venture L	1	E	E	E	E	E										E				E
Prism	2	E	S	E	E	G			G	E	S	E								
Sencor 75DF	5	E	E	E	E	E		S	E	E		E	E		E					

**Weed Control Ratings:** E – Excellent, Good – Good, S – Suppression, P – Poor, blank – No control or no data

\*Triazine-resistant populations exist throughout PE and NB

**Note:** Control ratings listed in this chart are provided to facilitate recommendations for the best treatment to target specific weed species and cannot be taken as a guarantee of performance. Factors such as weed size, weather, herbicide rate, water volume, environmental conditions post applications, and others can affect performance.

**Table 5: Recommended plant back chart for herbicides labeled for use in potatoes, listed in months.**

	Barley	Corn	Winter Wheat	Spring Wheat	Oats	Rye	Alfalfa	Red Clover	Field Peas	Soybean	Canola	Rutabaga
Boundary LQD	8	0	4	8	8	4	8	8	22	0	22	22
Dual II Magnum	4	0	4	4	4	4	4	4	0	0	4	0
Frontier Max	3.3	0	3.3	3.3	3.3	3.3	11	11	11	0	*	11
Lorox L	4	4	4	4	4	4	4	4	4	4	4	4
Reflex	*	10	4	10	*	*	*	*	0	*	*	*
Sencor 75 DF	8	8	3	8	8	8	8	8	*	0	22	*
Zidua	*	0	4	*	*	*	*	*	*	0	*	*
Select (clethodim)	1	1	1	1	1	1	1	1	1	1	1	*
Ignite SN	2.3	0	2.3	2.3	2.3	2.3	0	4	4	0	0	4
Prism	10	0	4	10	10	*	*	*	*	*	10	*
Poast Ultra	1	1	1	1	1	1	0	1	1	0	0	1
Venture L	12	12	3	12	12	3	0	0	0	0	0	12

\* Not indicated on label.