Management of PSII-Inhibitor Resistant Common Lambsquarters in Atlantic Canadian Potato Production

Potatoes and Herbicide-Resistant Common Lambsquarters

Atlantic Canadian potato producers have relied on PSII-inhibiting herbicides like metribuzin and linuron for weed management in potatoes. Producers in the region have recently reported poor control of common lambsquarters (*Chenopodium album* L.) following the use of metribuzin. Common lambsquarters are highly competitive with potato plants and can reduce yield and quality. Poor control of common lambsquarters after using PSII-inhibiting herbicides is a concern as resistance has been well documented in this species across Canada. Researchers from Agriculture and Agri-Food Canada studied whether poor common lambsquarters control was due to resistance in potato producing regions of New Brunswick (NB) and Prince Edward Island (PE). They tested herbicides from different modes of action how they provided control of common lambsquarters in Atlantic Canadian potato production.

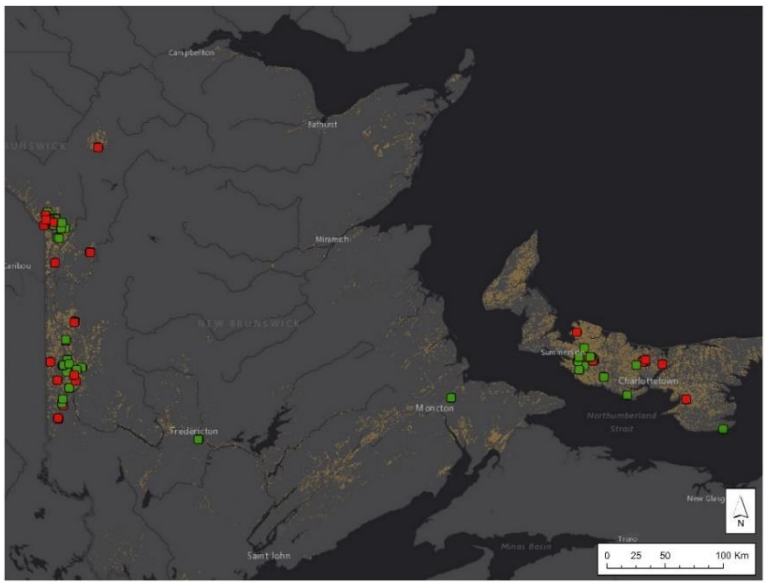

Figure 1. Location of collected common lambsquarters populations from NB and PE potato fields screened for resistance. Red is resistant and green is not resistant

PSII-Inhibitor Resistance Lambsquarters is Widespread Across NB and PE

Almost half (46%) of fields surveyed across the potato-producing regions of NB and PE had PSII-inhibitor resistant common lambsquarters. Cross resistance testing found that these populations were resistant to atrazine and metribuzin, but not linuron.

PSII-Inhibitor Resistant Common Lambsquarters are Controlled by Other Modes of Action

Very good to excellent control (91-100%) of common lambsquarters was obtained with tank mixes of pre-emergent herbicides, while the remaining provide at least suppression (60-79%) or good to very good (80-90%) control (see Table 1). None of these herbicides caused crop injury nor negatively impacted yield. Metribuzin and sulfentrazone had significantly higher marketable yield than the weedy check and provided effective control of other problematic weeds in Atlantic Canadian potato production (red-root pigweed, *Amaranthus retroflexus*; hairy nightshade, *Solanum sarrachoides*; barnyard grass, *Echinochloa crus-galli*; large crabgrass *Digitaria sanguinalis*).

Table 1. Pre-emergent herbicides for controlling common lambsquarters tested in Fredericton NB and Harrington PE.

Treatment	WSSA Group	Rate (g a.i. ha^{-1})	Control 4 WAA	Control 8 WAA
Metribuzin + sulfentrazone	5 + 14	600 + 105.12	Very Good to Excellent	Very Good to Excellent
Saflufenacil + dimethenamid-P	14 + 15	74.8 + 660	Very Good to Excellent	Very Good to Excellent
Fomesafen + S-metolachlor + metribuzin	14 + 15 + 5	240 + 1570 + 372.5 + 0.1% NIS	Very Good to Excellent	Very Good to Excellent
Metribuzin + linuron	5 + 7	825 + 1800	Very Good to Excellent	Good to Very Good
S-metolachlor + metribuzin	15 + 5	1570 + 372.5	Good to Very Good	Very Good to Excellent
Metribuzin	5	1100	Good to Very Good	Good to Very Good
Linuron	7	2208	Good to Very Good	Suppression
Saflufenacil	14	25.2	Good to Very Good	Suppression
Fomesafen	14	240 + 0.1% non-ionic surfactant	Good to Very Good	Suppression
Sulfentrazone	14	105.12	Suppression	Good to Very Good
S-metolachlor	15	1600	Suppression	Suppression
Dimethenamid-P	15	693.36	Suppression	Suppression

How Producers can Delay Resistance

Once herbicide resistance develops, it increases the cost and difficulty of weed management. To delay resistance, producers should focus on rotating herbicides within a crop and throughout their crop rotation. The addition of alternative weed management practices like cultivation and an integrated weed management (IWM) plan can help to disturb weed development and delay herbicide resistance.

For more information reach us at www.agr.gc.ca or call us toll-free 1-855-773-0241.
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