

TOLERANCE OF OTEBO BEAN TO PREEMERGENCE HERBICIDES. Nader Soltani*, Darren E. Robinson, and Peter H. Sikkema. Research Associate, Assistant Professor, and Assistant Professor. Ridgetown College, University of Guelph, Ridgetown, Ontario, Canada N0P 2CO.

Otebo beans are a new market class of dry beans grown in southwestern Ontario. Efficient weed management programs are an important component of profitable otebo bean production. Weeds compete with otebo beans for light, moisture and nutrients, and can drastically reduce bean quality and yield. Weeds present at harvest can interfere with harvesting efficiency, increase mechanical damage to the pods and stain the beans. Otebo bean growers currently have only one herbicide registered for use in Ontario. Lack of registered herbicides means high input costs for cultivation and hand hoeing. In addition, otebo bean yield and quality are reduced. Therefore, there is a great need for new weed control products to keep Ontario otebo bean production competitive.

Preemergence (PRE) application of dimethenamid, S-metolachlor, clomazone, and imazethapyr have been used by growers in other crops to successfully control troublesome weeds such as green, yellow and giant foxtail, barnyard grass, fall panicum, witch grass, large and smooth crabgrass, lady's thumb, redroot pigweed, lambsquarters, velvetleaf, common ragweed, giant ragweed, smartweeds, wild mustard, wild buckwheat, cocklebur, and nightshades. However, there is little information on the tolerance of otebo beans to these herbicides under Ontario environmental conditions. Expanding the registration of these herbicides will provide otebo bean growers with additional control options for grass and broadleaf weeds. Research has shown that tolerance of dry beans to various herbicides is largely dependent on rate, cultivar, and environmental conditions.

The objective of this research was to determine the tolerance of otebo beans to the PRE application of dimethenamid, S-metolachlor, clomazone, and imazethapyr.

Field trials were conducted at four Ontario locations in 2003 and 2004 to evaluate tolerance of otebo beans to the PRE application of dimethenamid (1250 and 2500 g ai/ha), S-metolachlor (1600 and 3200 g ai/ha), clomazone (1000 and 2000 g ai/ha), and imazethapyr (75 and 150 g ai/ha).

Dimethenamid caused as much as 4, 3, and 1% visual injury and S-metolachlor caused as much as 5, 3, and 1% visual injury at 7, 14, and 28 days after treatment (DAT), respectively. However, these injuries were transient with no adverse effect on plant height, shoot dry weight, seed moisture content and yield of otebo beans. Clomazone caused as much as 13, 13, and 9% visual injury at 7, 14, and 28 DAT, respectively and reduced plant height by 10% and shoot dry weight by 25% compared to the untreated control. Imazethapyr caused as much as 0, 1, and 17% visual injury, at 7, 14, and 28 DAT, respectively. Crop injury was persistent over time and resulted in a decrease of up to 24, 42, and 24% in plant height, shoot dry weight, and yield of otebo beans, respectively.

Based on these results, dimethenamid and S-metolachlor applied PRE have potential for weed management in otebo beans. Additional research is needed to determine if there is an adequate margin of crop safety in otebo beans to the PRE application of clomazone. However, there is not an adequate margin of crop safety for imazethapyr at the rates evaluated in otebo bean production in Ontario.