

ABSTRACT

Populations of group 1 herbicide resistant wild oats are regularly found in the sugar beet production area of southern Alberta. Soil-applied herbicides are commonly used for broadleaf weed control in Alberta, but current sugar beet products are not considered to be highly effective on wild oats when applied alone. Experiments conducted between 2002 and 2006 evaluated various non-group 1 soil-applied herbicide treatments as well as mechanical treatments for wild oat control and crop safety.

In 2002, multiple soil-applied treatments were evaluated including pre-plant incorporated (ppi) spring and fall broadcast applications of granular triallate at 1408 and 1705 g ai/ha, ppi spring broadcast applications of cycloate at 2669 g ai/ha and cycloate + liquid triallate at 1779 + 988 g ai/ha and preemergence (pre-e) spring band applications of liquid triallate at 1691 g ai/ha broadcast equivalent, ethofumesate at 2986 g ai/ha broadcast equivalent and liquid triallate + ethofumesate at 1691 + 2986 g ai/ha broadcast equivalent. Very high wild oat populations along with late flushing wild oats were observed in this trial. The pre-e liquid triallate + ethofumesate treatment provided significantly better wild oat control than other treatments applied.

In 2003, pre-e combinations of liquid triallate + ethofumesate continued to show improved wild oat control compared to applications of either of these products alone; however, treatments with this pre-e triallate + ethofumesate combination resulted in significant sugar beet injury and stand reduction in a 2004 trial.

In 2005, a treatment that combined a spring ppi broadcast application of liquid triallate at 1680 g ai/ha with a pre-e band application of ethofumesate at 2237 g ai/ha broadcast equivalent resulted in excellent wild oat control and acceptable levels of sugar beet injury. Wild oat control in September was 97% for ppi triallate + pre-e ethofumesate compared to 57% for pre-e triallate + ethofumesate and 52% for pre-e ethofumesate. Although late season wild oat control was significantly different between treatments, beet yield was similar with values of 20.6, 20.3 and 21.1 tonnes/acre for the ppi triallate + pre-e ethofumesate, pre-e triallate + ethofumesate and pre-e ethofumesate treatments, respectively. A weedy check yielded 7.2 tonnes/acre in this trial.

In 2006, the same rates of ppi triallate and pre-e ethofumesate were used as in 2005. Pre-plant incorporated fall or spring triallate followed by pre-e ethofumesate gave 98 and 100% wild oat control in May compared to 87% control with pre-e triallate + ethofumesate and 84% with pre-e ethofumesate. September wild oat control was 98, 99, 70 and 69% with these respective treatments. Beet yield was similar between treatments, indicating wild oats that grew through pre-e herbicide applications were not greatly impacting root yield. Spring or fall ppi triallate followed by pre-e ethofumesate yielded 33.0 and 32.5 tonnes/acre, respectively. Pre-e triallate + ethofumesate and pre-e ethofumesate yielded 33.4 and 32.8 tonnes/acre, respectively. A weedy check yielded 26.4 tonnes/acre and a weed-free check yielded 31.4 tonnes/acre in this trial.

Mechanical clipping treatments were applied in 2005 and 2006 using a gas powered hand trimmer to cut wild oats at a level corresponding to the top of the sugar beet canopy in early and late July. In 2005, beet yield was increased over a weedy check by 5.9 and 9.3 tonnes/acre with one and two July clippings, respectively. In 2006, beet yield increases over a weedy check were 5.2 tonnes/acre with one early July clipping, 5.5 tonnes/acre with one late July clipping and 7.4 tonnes/acre with two July clippings.