



Herbicide-resistant weeds continue to increase

CATEGORY [weeds](#) | June 22, 2021

Weed surveys show that the incidence of herbicide-resistant grassy and broadleaf weeds continues to increase across the Prairies during the survey periods of 2014 through 2017. The perceived cost of herbicide resistance was estimated at \$13.36 per acre.

Regular surveillance for herbicide-resistant (HR) weeds has been conducted since the mid-1990s. A baseline survey was conducted across the Prairies during 2001 to 2003. A second round of surveys was conducted in Alberta in 2007, Manitoba in 2008, and Saskatchewan in 2009.

This third round of pre-harvest surveys was conducted in Saskatchewan in 2014 and 2015, Manitoba in 2016, and Alberta in 2017, totaling 798 randomly selected cropped fields across 69 million acres (28 million ha).

Grassy weed resistance

Overall, 45% of the 798 fields surveyed had Group 1-HR wild oat compared to 28% in second-round surveys and 11% in baseline surveys.

Of 578 fields where wild oat seed was collected, 69% of wild oat samples collected had a HR biotype. This compares to 44% in the 2007 to 2009 surveys. Group 1-HR wild oat was confirmed in 62% of the fields with wild oats. This compared with 41% in the second survey and 15% in the baseline survey.

Across the Prairie provinces, Group 1-HR wild oat was found in 58% of fields with wild oat in Alberta, 59% in Saskatchewan, and 78% in Manitoba.

Group 2 resistance was confirmed in 34% of fields where wild oat seeds were collected. This frequency of resistance compares with 12% in the second round and 8% in the baseline survey. This sharp increase in Group 2 shows the increased use of Group 2 herbicides to control Group 1 HR wild oats.

Group 2-HR wild oat was lowest in Saskatchewan at 32% of sampled fields, compared with Alberta at 40% and Manitoba at 43% -- similar to second-round surveys.

There were 158 fields with Group 1+2-HR wild oat populations representing 27% of fields sampled, compared with 8% of fields in the second-round and 3% in the baseline surveys.

Group 1-HR green foxtail was found in 25% of 187 fields where seeds were collected. This incidence of resistance is similar to that found in the second-round surveys. By province, Group 1-HR green foxtail occurred in 21% of Alberta fields sampled, 17% of Saskatchewan fields, and 44% of Manitoba fields. Similar to wild oat, incidence of Group 2 resistant green foxtail increased sharply since the last survey round, during which it was not detected.

Group 1+2-resistant green foxtail populations were confirmed in 1 field in Manitoba and two fields in Saskatchewan.

Of 60 fields in Manitoba where yellow foxtail was sampled, 42% had an HR population. Resistance in yellow foxtail has not been reported previously in Canada. Group 1-HR yellow foxtail was found in 19 fields (32%) where the weed was sampled.

Group 2-HR yellow foxtail was found in 17% of fields. Four fields had Group 1+2-HR yellow foxtail. The rapid evolution of this high incidence of Group 1 or Group 2 resistance in this weed is concerning and may help explain why the species has increased in relative abundance in Manitoba from 32nd place in 2002 to sixth place in 2016.

Group 2-HR barnyard grass was found in three of 11 fields sampled in Manitoba.

New broadleaf weed resistant biotypes confirmed

Group 2-HR common chickweed was confirmed in 9 of 30 fields sampled, mainly in the Aspen Parkland region of Alberta and Saskatchewan. The frequency in Alberta has remained the same since the last survey at around 40%, but increased in Saskatchewan to 20% where it was not previously reported.

Group 2-HR cleavers was found in 26% of the 119 fields sampled, mainly in the Parkland region. In Alberta, Group 2-HR cleavers has increased from 17% in the second-round survey to 44%, but has remained the same in Saskatchewan (20%) and Manitoba (11%).

Group 2-HR common lamb's quarters was documented in 1 of 34 fields sampled in Alberta, and was the first confirmed case in the province. Other Group 2-HR biotypes exclusive to Alberta included narrow-leaf hawk's beard found in two of seven fields, and smartweed found in five of eight fields, which were not detected in previous surveys. Group 2-HR spiny sow-thistle was found in four of 11 fields.

Group 2-HR stinkweed was confirmed in 12 of 79 fields in Alberta and Saskatchewan, and was not detected in previous surveys.

Group 2-HR redroot pigweed was found in 3 of 43 fields sampled in Saskatchewan and Manitoba.

Group 2-HR shepherd's purse was found in nine of 43 fields across the three Prairie provinces, and was not found in previous surveys.

Group 2-HR wild mustard was found in nine of 36 fields in Saskatchewan and Manitoba, which was similar to the previous survey.

Kochia and Russian thistle were not included in these pre-harvest surveys, but they were surveyed separately after harvest in Alberta in 2017, Manitoba in 2018, and Saskatchewan in 2019. All populations in Alberta in 2017 were Group 2 resistant, while glyphosate (Group 9) resistance was confirmed in 50% of the populations, and dicamba (Group 4) confirmed in 18%. Group 2+4+9 resistance was confirmed in 10% of populations.

The previous baseline survey in Alberta in 2012 indicated only 5% of kochia populations were glyphosate resistant. The same survey found 31 of 45 Russian thistle populations (62%) were Group 2 HR but not resistant to glyphosate or dicamba.

Cost of herbicide resistance

A management questionnaire was also conducted. Based on the 404 responses, the perceived cost of weed resistance to prairie growers averaged \$13.36/ac (\$33/ha). This additional expense includes herbicide costs, and estimated decreased crop yield or quality. The total cost of HR weeds to prairie growers is estimated at \$530 million annually.

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<https://www.cambridge.org/core/journals/weed-technology/article/abs/herbicideresistant-weeds-in-the-canadian-prairies-2012-to-2017/578367F2E81B1C78C09F700EF593D66B>