

2016 Manitoba General and Herbicide Resistant Weed Survey

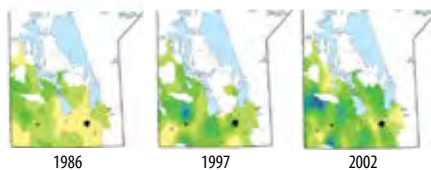
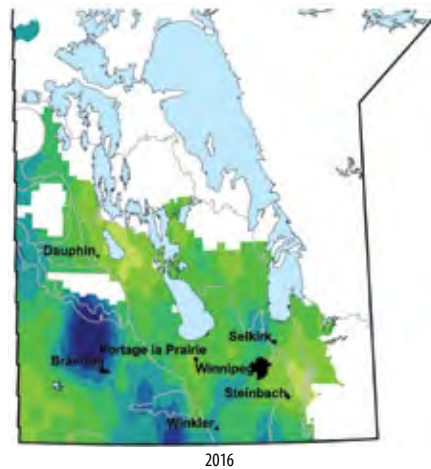
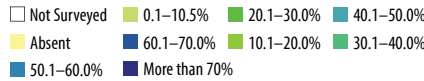
Volunteer canola was the most abundant weed in soybeans and 68% of surveyed fields had Group 1 and/or 2 herbicide-resistant weeds.

PROVINCIAL WEED SURVEYS help us understand changes in weed populations both geographically and over time. Identified trends inform industry, research and extension efforts in weed management and highlight new threats that farmers may need to manage.

The fifth general weed survey was conducted in 2016, 14 years since the previous. The eight most common annual crops were surveyed: canola, spring wheat, soybeans, oats, barley, corn, flax and sunflowers. Soybeans, corn and sunflowers were included for the first time, representing an enormous change to our crop rotations and production practices. A minimum of 20 fields per crop and a total of 658 fields were randomly selected and sampled. Weeds were counted within a 0.25m² quadrat at 20 locations in each field. Counts were taken between July 18–Sept. 2, identifying the extent of troublesome weeds that escaped control measures.

A total of 139 weed species were identified. The 10 most abundant weeds (a function of weed frequency, field density and field uniformity) are listed in Table 1. A notable change from past surveys was wild oats, which fell from second most abundant weed to fourth, surpassed by wild buckwheat and barnyard grass. Spiny annual sow thistle increased the most in abundance since 1970 (now ranked 15th), but levels had not increased from 2002 to 2016. Yellow foxtail, broadleaved plantain and biennial wormwood appeared in the top 20 most abundant weeds for the first time in 2016. The densities of annual grass and broadleaved weeds were the lowest ever recorded, while the abundance of perennials and facultative winter annuals were the highest on record.

The Frequency of Volunteer Canola Across Manitoba



Soybeans had the lowest weed density of all crops (9.2 weeds/m²), were among the least diverse (4.5 weed species/field) and had a relatively high proportion of weed-free quadrats (44.6%). The most abundant weed was volunteer canola, followed closely by wild buckwheat. These results are not surprising, as these weeds are both resistant and somewhat tolerant to glyphosate, respectively. Grassy weeds, such as foxtails and wild oats were relatively less abundant than in other crops.

A subset of 151 fields was also surveyed for Group (Gr) 1 and 2 herbicide-resistant (HR) weeds. All weeds with mature seeds were sampled prior to harvest. Four grass and ten broadleaved weeds were screened in pot assays in the greenhouse.

Overall, 68% of surveyed fields had HR weeds compared to 48% in 2008 and 32% in 2002. Most wild oat populations sampled (79%) were HR (78% Gr 1, 43% Gr 2, 42% Gr 1+2) and 48% green foxtail were HR (44% Gr 1, 6% Gr 2, 2% Gr 1+2). This was the first survey to document HR in yellow foxtail where 42% were HR (32% Gr 1, 17% Gr 2, 8% Gr 1+2). Group 2 resistant barnyard grass was found in 27% of fields, which was also the first occurrence of this biotype.

Four broadleaved species had Gr 2 resistance. The proportion of surveyed fields with HR was 11% for cleavers, 25% for wild mustard, 5% for redroot pigweed and 2% for shepherd's purse. This was the first survey to document HR shepherd's purse.

Based on this survey, an estimated 5.4 million acres in Manitoba are infested with HR weeds and the additional cost to manage HR weeds is estimated at \$74 million annually. ▶

Table 1. Top 10 most abundant weeds in 2016 across Manitoba.

Ranking	All Crops (658 fields)	Soybeans (118 fields)
1	Green foxtail	Canola
2	Wild buckwheat	Wild buckwheat
3	Barnyard grass	Barnyard grass
4	Wild oats	Dandelion
5	Canola	Redroot pigweed
6	Yellow foxtail	Wheat
7	Dandelion	Green foxtail
8	Redroot pigweed	Yellow foxtail
9	Wheat	Wild oats
10	Round-leaved mallow	Broadleaved plantain