

Manitoba survey of herbicide-resistant weeds in 2022

Charles Geddes, Mattea Pittman, Kim Brown-Livingston, and Julia Leeson

Herbicide-resistant weeds are a growing concern for Manitoba farmers. The percentage of annual-cropped fields occupied by herbicide-resistant weeds in Manitoba increased from 32% in 2002 to 48% in 2008 to 68% in 2016. Continued monitoring of the occurrence, distribution and impact of herbicide-resistant weeds is essential to understand how best to mitigate and manage this increasing threat to cropping systems. A randomized-stratified survey of 157 fields under annual crop production in Manitoba was conducted in 2022; twenty years after the baseline survey conducted in 2002. Fields consisted of randomly selected quarter sections stratified based on the area under crop production in each ecodistrict and the seeded area of crops in 2022. The fields were visited shortly before harvest and seeds were collected from all mature weed species visible from walking an inverted 'W' transect pattern. The samples were planted under controlled-environment and the plants were treated with tier 1 acetyl-CoA carboxylase (ACCase)- and acetolactate synthase (ALS)-inhibiting (Groups 1 and 2) herbicides. Plant survival was evaluated 21 days after treatment. Overall 1,037 tests were conducted on 576 samples representing 35 weed species. Herbicide-resistant weeds occupied 75% of the fields sampled, or an equivalent field area of 3.0 million ha. New issues of concern that warrant further investigation include: putative ACCase inhibitor-resistant barnyardgrass, quackgrass, and stinkgrass, and putative ALS inhibitor-resistant quackgrass, spiny sowthistle, lambsquarters, and horseweed. ACCase inhibitor-resistant wild oat was documented in all fields where the species was collected and tested, or 37% of fields overall. Extreme precipitation during the spring of 2022 caused late seeding, and potentially altered weed communities present. Based on previous grower estimates combined with the area where herbicide-resistant weeds were present before crop harvest in Manitoba in 2022, herbicide-resistant weeds cost Manitoba farmers about \$81 million annually.