MANAGING BROME GRASS IN CROPPING SYSTEMS

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Introduction

Current systems for brome grass control in cereal crops rely on a number of strategies, mostly based on the reduction of the brome grass seed bank in the previous season(s) or in the short period before sowing the cereal crop. In this study we examined the effect of various rotational systems, mainly: (i) to determine the best cropping system for the management of brome grass, and (ii) to obtain sufficient demographic data to enable the prediction of population movements within a range of crop and herbicide rotational systems.

Materials and Methods

The seed banks of brome grass were determined periodically by soil sampling. Permanent quadrats were monitored to obtain data on the periodicity of seedling emergence, the fates of seedlings and their reproductive performance. The annual percentage rate of change of the brome grass seed bank and the effective seedling recruitment were then calculated accordingly for each of the basic treatments imposed.

Results and Discussion

Brome grass control under lupins was vastly superior to that achieved under pasture, with least control under the wheat crop. The most effective control strategy incorporated the lupin/wheat sequence with the application of a mixture of glyphosate and simazine as a pre-sowing treatment and fluazifop as a post-emergent spray during the lupin phase. One kill of brome grass seedlings with glyphosate was undertaken before sowing the wheat crop. This strategy led to the containment of brome grass below economic threshold levels in the wheat phase by the second cycle of the rotation. Any success in eliminating these small populations of brome grass, to prevent seed replenishment, is the key to the long-term solution for brome grass because of the virtual exhaustion of the brome grass seed reserves in the wheat phase following lupins.

Apart from the wheat/lupin rotation, combinations of wheat/pasture/lupins or wheat/lupins/lupins are likely to be highly effective against brome grass, as predicted by our demographic data. However, such systems have setbacks that need to be overcome, for example, the yield depression of lupins following pasture and the disease threat in two consecutive years of lupins .

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