HERBICIDE RESISTANCE IN WILD OATS AND ANNUAL RYEGRASS

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Wild oats (*Avena* spp.) and annual ryegrass (*Lolium rigidum*) are important weeds that infest the southern Australian wheat belt (1). The development of herbicide resistant wild oats and annual ryegrass populations in this region ensures persistence of these weed species. A survey was undertaken to determine the extent of herbicide resistant wild oats and annual ryegrass in the mid-north cropping zone of South Australia.

MATERIALS AND METHODS

In November 1993, 236 cropping paddocks were randomly sampled; wild oat panicles and annual ryegrass seed heads were collected. The paddocks were located within a 160*50 km^2 region and ranged from Greenock (34°28' 138°56') in the South-east, to Wirrabara (33°02' 138°16') in the North-west. All seed samples were stored outside over summer; the following winter, seedlings were grown in containers and sprayed with diclofop-methyl at 563g a.i./ha. A total of 121 wild oat and 36 annual ryegrass populations were treated. Seedling kill was evaluated 23 days after herbicide application and weed populations that contained greater than 20% survivors were classed as resistant. Seed was collected from wild oat plants which survived the diclofop-methyl and the testing procedure repeated in 1995 to confirm resistance.

RESULTS AND DISCUSSION

Evaluation of the samples determined that 4% of the 1993 cropping paddocks contained diclofop-methyl resistant wild oats and 40% contained resistant annual ryegrass. Resistant populations of each weed species were evenly located through out the sampling area. Both wild oats and annual ryegrass were widely distributed, occurring in 90% of the cropping paddocks sampled. Each wild oat sample was also classified into species; 15% of paddocks contained *A. fatua*, 45% *A. sterilis* ssp. *ludoviciana* and 40% comprised a mixture of both. Visual assessment of paddock weed infestation levels indicated that 34% of the paddocks contained greater than 10 wild oat plants/m^2, and 33% of the paddocks more than 20 annual ryegrass plants/m^2.

The results demonstrated that wild oats and annual ryegrass are not only serious cropping weeds in the mid-north of South Australia, but resistance of both species to a Group A selective herbicide has reached significant levels, particularly in annual ryegrass. Continued reliance on post-emergence selective herbicides by cropping farmers in this region will guarantee increased resistance to these chemicals. Further investigation of the wild oat populations is continuing.

ACKNOWLEDGMENTS

Funding from the Grains Research and Development Corporation is greatly appreciated.

REFERENCES

1. Medd, R.W. 1987. Plant Protection Quarterly 2, 31-34.