Tolerance of seedling plantain to broadleaf weed herbicides.

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Introduction

Plantain (*Plantago lanceolata*) is a perennial herb capable of producing high quality herbage for grazing animals year-round. It is adapted to a wide range of soils with $pH_{Ca(12)}$ from 4.2–7.8 in the higher rainfall zone (>550 mm) of NSW (Upjohn 2004). Plantain is often included in pasture mixes, however relatively little is known about its tolerance to commonly used broadleaf weed herbicides, particularly at the seedling stage. It is during the establishment phase that pastures are most susceptible to competition from weeds. Therefore it is important that the relative tolerance of the pasture components to commonly used broadleaf weed herbicides is well understood so that effective weed management strategies can be planned to ensure successful establishment, long-term production and persistence of perennial pastures. This experiment assessed the tolerance of seedling plantain to a range of commonly used broadleaf weed herbicides and herbicide mixtures. Seedling lucerne was used to compare relative tolerances of the two species.

Materials and methods

Tonic plantain and Aurora lucerne (*Medicago sativa*) were sown into separate plastic 10 cm diameter pots containing a red-brown earth $pH_{Ca(12)}$ 5.2. The experiment was a split-plot design with varieties as the main plot and herbicides applied randomly within the main plot. The experiment was replicated three times. Following germination the plants were thinned to eight plants per pot.

When the plantain reached the four–five leaf stage, herbicide treatments were applied to pots in a spray cabinet using a water rate of 100 L/ha. Thirteen herbicides and seven herbicide mixtures were applied (Table 1). After spraying pots were returned to the glasshouse. A visual estimate of damage was made 10 and 30 days after spraying (DAS). Only the results 30 DAS are shown in this paper. The damage scores reported range from 1 (no damage) to 10 (complete death). Scores of 4 or less indicate recoverable damage, that is, there may be significant yield depression, but plants will recover.

Results and discussion

In general, damage to seedling plantain as a result of the herbicide treatment was greater than that sustained by seedling lucerne (Table 1). The only herbicides/mixtures used which showed acceptable levels of damage on seedling plantain were bromoxynil, Brodal®, simazine and simazine plus Brodal®.

Results indicate that there are few herbicides available to control broadleaf weeds in pastures containing seedling plantain which will not cause unacceptable plant damage. The results of this experiment are only a guide and results could be more or less severe under field conditions.

Conclusion

Plantain is a potentially valuable high quality herb that can be successfully grown in the high rainfall zone in a variety of soils. However, producers and advisors need to be aware there are limited herbicide options for controlling broadleaf weeds in pastures containing plantain. Therefore paddocks need to be kept clean of broadleaf weeds in the years prior to sowing a pasture mix containing plantain. If severe broadleaf weed burdens are encountered in the establishment year other weed control options such as crash grazing may need to be considered.

References

Upjohn, B. (2004). Narrow leaf plantain (*Plantago lanceolata*). Agnote DPI-396, NSW Department of Primary Industries.

Disclaimer

Some of the herbicides used in this study may not be registered for use on pastures in general or on plantain or lucerne specifically. The label should be consulted to ensure the product can be used for the intended application.

Table 1 Visual damage score of seedling lucerne and plantain 30 DAS broadleaf weed herbicides. Grey shading indicates acceptable levels of damage from which plants could recover.

Chemical	Rate/ha	Lucerne	Plantain
Broadstrike*	25 g	1.0	6.0
Bromoxynil	1.4 L	2.0	2.5
Raptor*	40 g	1.0	7.0
Spinnaker* (240 g/L)	300 mL	1.5	5.0
2,4-DB	2 L	1.5	8.5
Jaguar*	750 mL	3.0	4.5
Brodal*	200 mL	3.5	3.5
2,4-D amine	1.7 L	8.0	9.5
Cadence* (700 g/kg)	200 g	9.5	5.0
Igran*	550 mL	5.0	5.0
Lontrel*	70 mL	9.0	7.5
MCPA (500)	750 mL	7.5	8.5
Broadstrike*/Bromoxynil	25 g/700 mL	2.5	7.0
Broadstrike*/MCPA	25 g/500 mL	8.0	9.5
Igran*/MCPA	550 mL/300 mL	8.5	9.0
Simazine/Brodal*	550 g/200 mL	3.5	3.5
Simazine/Broadstrike*	550 g/25 g	2.0	6.5
Simazine/MCPA	550 g/300 mL	4.0	7.5
Simazine (900 g/kg)	550 mL	2.5	2.5
Spinnaker*/Brodal*	300 mL/200 mL	2.5	7.5