SPOT TREATMENT OF RAGWORT AND NODDING THISTLE WITH DPX-L5300

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SUMMARY

The efficacy of DPX-L5300 as a spot treatment for the control of ragwort (*Senecio jacobaea*) and nodding thistle (*Carduus nutans*) was investigated at three sites in the Waikato region. Control of ragwort was generally poor compared with that achieved by picloram + 2,4-D. Control of nodding thistle varied with time of application. The use of rates of DPX-L5300 higher than those recommended should be investigated.

INTRODUCTION

Ragwort and nodding thistle are serious weeds of grazed pasture in New Zealand and other countries. Small plants can be controlled by broadcast application of selective pasture herbicides such as those containing MCPA and 2,4-D, but larger plants frequently survive and regrow. Spot treatment of these plants with mixtures of picloram or dicamba with either 2,4-D or MCPA usually provides adequate control. However, damage to treated pasture can be severe. Soil persistence of picloram and dicamba may lead to clovers not re-establishing in treated areas for up to 12 months. These compounds are synthetic plant growth regulators and very small quantities can interfere with normal plant growth. Thus there is a high risk of damage through spray drift to sensitive non-target crops, such as kiwifruit or grapes. The expansion of horticultural development into traditionally pastoral farming areas is highlighting the need for effective herbicides which are safe to use in the vicinity of sensitive crops.

A series of field trials was set up in the Waikato region to investigate the efficacy of DPX-L5300, a non-hormone broadleaf herbicide, as a spot treatment for the control of large ragwort and nodding thistle plants. DPX-L5300 is a sulphonyl urea compound and has been developed for use in cereals. It shows good activity against most broadleaf species while cereals show a high level of tolerance. It has a relatively short residual life in soil allowing resowing and pasture establishment soon after application. In New Zealand it has also been tested for use on buttercup (*Ranunculus* spp), winged thistle (*Carduus tenuiflorus*) and variegated thistle (*Silybum marianum*).

MATERIALS AND METHODS

Trials were started in September 1986. Two rates of DPX-L5300 (Express) were compared with picloram + 2,4-D (Tordon 50-D) as spot treatments for multicrown ragwort plants and with picloram + 2,4-D and MCPA (IWD-MCPA) for nodding thistle. Details of the treatments are given in Table 1. No surfactants or other additives were included in the spray solutions. Applications were made to ragwort on 10.9.86 and 31.10.86 at Arohena on a Taupo silty sand and on 15.5.87 and 10.7.87 at Wharepapa South on an Otorohanga silt loam. Applications were made to nodding thistle at Buckland Road, near Hinuera on a Tirau sandy loam soil on 11.9.86, 5.11.86 and 10.7.87. All pastures were grazed by cattle over the trial period. The Arohena site was trimmed to approximately 7 cm height in early December. All treatments were applied by knapsack sprayer onto individual ragwort and nodding thistle plants to wet the foliage. At each time plants typical of those requiring spot treatment were chosen from the trials. Prior to application the position and diameter of plants were recorded on one of four permanent transect lines for each treatment. Approximately 40 nodding thistle plants or between 58 and 90 ragwort plants were marked for each application.

Assessments of plant vigour and pasture damage were made throughout the trials commencing 2-4 weeks after applications. The final assessments were made

Proc. 41st N.Z. Weed and Pest Control Conf.

approximately 4 to 7 months after treatment when plants had either died or were recovering from herbicide damage. The mean plant diameter and growth stage at treatment are given in Table 1. Estimates of the area of severely reduced pasture and bare ground associated with recorded plants were also made at each assessment of the nodding thistle trials.

RESULTS

A summary of the results of the seven spot treatment trials on ragwort and nodding thistle is presented in Table 1.

Ragwort: Treatment of ragwort by picloram + 2,4-D consistently achieved 97% to 98% control of plants over the four trials. Treatments using DPX-L5300 were less effective and more variable. Applications in September to plants recovering from defoliation over the winter achieved less than 50% control while treatment at other times resulted in 63% to 78% of plants dying. All applications of DPX-L5300 at 2 g/100 litre achieved better control than those at 1 g/100 litre although differences were significant only in May and October.

Nodding Thistle: Applications of picloram + 2,4-D consistently controlled from 95% to 100% of plants over the three trials (Table 1). Applications of MCPA to rosettes in July controlled 100% of plants but MCPA was less effective when applied at other times. In July both the 1 g and 2 g rates of DPX-L5300 controlled at least 90% of rosettes, but only the higher rate achieved this in September. Control of bolting thistles with DPX-L5300 applied in November was poor. In September and November the higher rate of DPX-L5300 achieved greater control than the lower rate although these differences were not significant.

A simple analysis showed control by DPX-L5300 was not directly correlated with plant size.

The area of severely depressed pasture and bare ground associated with treated nodding thistles visually assessed 6 to 8 weeks after herbicide application showed no significant differences between treatments. Late spring applications caused the greatest pasture damage and winter applications the least (data not presented).

TABLE 1: Percent control of ragwort and nodding thistle by spot treatment with DPX-L5300, picloram + 2,4-D and MCPA

Date applied	GS at treatment	Mean dia. (cm)	Final assessment	(g ai/100 litre)					SED
				DPX-L5300		Picloram + 2,4-D	MCPA		
				1	2	60 + 240	375		
Ragwort									
10.9.86	Multi-rosette	32	2.2.87	42	48	98	—	9	
31.10.86	Bolting	44	8.4.87	68	75	97	—	3	
15.5.87	Multi-rosette	33	16.12.87	63	78	98	—	4	
15.7.87	Multi-rosette	36	16.12.87	65	72	98	—	4	
Nodding Thistle									
11.9.86	Rosette	37	19.2.87	74	92	95	63	10	
5.11.86	Bolt-flower	65	19.2.87	40	50	98	88	13	
10.7.87	Rosette	30	10.12.87	91	90	100	100	10	

DISCUSSION AND CONCLUSION

In these trials treatments were applied to large, well established ragwort and nodding thistle plants typical of those that require spot treatment. The standard solution of picloram + 2,4-D caused rapid plant senescence and breakdown in at least 95% of plants at all times. Applications of MCPA in July controlled all thistles treated while spring applications to larger, rapidly growing plants were less successful. DPX-L5300 is a slow acting herbicide taking 2 or more months to produce maximum effect. It provided relatively poor control of multicrown type ragwort. Many ragwort crowns remained firm after the collapse of plant foliage and recovered to produce new shoot

growth. Applications of DPX-L5300 in July provided adequate control of nodding thistle. In September only the higher rate gave adequate control while neither rate was effective against bolting plants in November.

Clovers were severely damaged and their growth reduced by DPX-L5300 and MCPA but recovery was generally advanced or complete by the final assessment. Picloram + 2,4-D eliminated clovers from treated areas which had not fully recovered at the final assessment. Grasses were weakened in areas where treated plants had been but this appeared to be due to a smothering effect of the plants rather than herbicide damage.

The generally greater weed control achieved by the 2 g rate of DPX-L5300, suggests that higher rates of application may provide better control than was achieved here. At present retail prices, DPX-L5300 used at double the higher recommended rate, would still compare well in cost to the standards used. The addition of a surfactant to the spray solution is recommended in the promotional literature of the commercial formulation of DPX-L5300 (Anon 1987), which was released after these trials had commenced. It is possible that the addition of a surfactant to spray solutions may improve the control of ragwort and nodding thistle by DPX-L5300 although we have no data on this.

In these trials, at the rates tested, DPX-L5300 applied alone as a spot treatment was relatively unsatisfactory for the control of multicrown ragwort and large rapidly growing nodding thistles. However, further work with higher rates and the use of additives is required.

ACKNOWLEDGEMENTS

We wish to thank Messrs M. Owsley, J. Pearse and B. Richardson for providing trial sites and Dr J.E. Waller for statistical analysis.

REFERENCES

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