EFFECTS OF METSULFURON METHYL AND SILWET L-77 ON THE CONTROL OF YOUNG GORSE

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The withdrawal of 2,4,5-T from use in NZ has left a niche in the market for alternative herbicides to control gorse, broom, and other troublesome scrubweeds on agricultural and forest land.

Metsulfuron methyl is proving to be an effective pre-plant alternative in forestry, and research experience has shown that this product has good potential for control of gorse, broom and bracken (Balneaves and Cosslett 1983; Balneaves 1985a,b; Davenport and Preest 1986).

The additive Silwet L-77 has been shown to aid activity of glyphosate and metsulfuron, enhancing the effectiveness of both as scrubweed herbicides. Nevertheless, further work is still needed to determine the application rates of both metsulfuron and Silwet L-77 needed to achieve good control of weeds. A trial was established to test four rates of metsulfuron and four rates of Silwet L-77 to control 2-year-old gorse grown from seed. Comparisons were also made with Triton X-45, an alternative additive to Silwet L-77.

Gorse was raised from seed in 6.5 litre pots. At the time of spraying gorse plants were 2-years-old and in a "hardened" condition, i.e., the second spring growth had matured and spine formation was complete. The rosette leaves at the base of the stems had been shed and a woody basal tissue (<15 cm up the stem from soil level) had developed. Plant height at spraying averaged 55 cm with a range from 40 to 70 cm.

Metsulfuron (Escort) was used at four rates : 100, 150, 200 and 300 g/ha. To these, six additive options were tried: no additive, Triton X-45 at 0.25% v/v, and Silwet L-77 (Pulse) at 0.1, 0.2, 0.3, 0.5% v/v.

Five pots, each containing five gorse plants, were treated with one of the combinations of herbicide/additive.

Spraying was carried out on 5 March 1987 using a CO₂ precision boom spray unit, fitted with 730077 T Jet nozzles, at a pressure of 275 kPa. The herbicide/additive was mixed with water to give a total spray volume of 300 litres/ha. Conditions for spraying were calm with a temperature range of 10°C to 13.5°C. Cloud was 7/8 with a relative humidity of 85%.

Assessments were made at 6-weekly intervals from time of spraying. At the time of final assessment (8 October 1987) destructive harvesting to determine plant mortality related to treatment was carried out. This involved examination of stem and root tissue to determine if plants were alive or dead. Analysis of variance was used to analyse the results of this experiment.

Browning-off was slow to occur and was not significant until 18 weeks after application and was complete by 24 weeks when assessed on 18 August. At the final assessment date 31 weeks following application (8 October) some basal regrowth was evident.

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Table 1 summarises the mortality data, expressed here as a % of the total number of plants treated (25/treatment).

TABLE 1: The effect of metsulfuron with additives on the percentage mortality of 2 year old gorse plants.

Silwet L-77 (% v/v)	% Mortality of gorse plants				
	Metsulfuron (g ai/ha)				
	0	100	150	200	300
0	0	28a ¹ (a) ²	60a(b)	100a(c)	100a(c)
0.1	0	40b(a)	80b(b)	100a(c)	100a(c)
0.2	0	84d(a)	88b(a)	100a(b)	100a(b)
0.3	0	92d(a)	100c(b)	100a(b)	100a(b)
0.5	0	96d(a)	100c(b)	100a(b)	100a(b)
Triton X-45 (0.25)	0	60c(a)	100c(b)	100a(b)	100a(b)

Those figures with the same lettering are not significantly different P = 0.05 (' down the columns, ² across the columns).

At the lower rates (100 and 150 g/ha) of metsulfuron, increasing rates of Silwet L-77 greatly increased mortality. At the lowest metsulfuron rate, however, even the highest rate of Silwet L-77 (0.5% v/v) did not improve herbicide efficacy sufficiently to ensure a 100% mortality. Metsulfuron at 150 g/ha with 0.3% v/v Silwet L-77 resulted in a total kill of gorse plants. At the higher rates (200 and 300 g/ha) of metsulfuron, while browning-off was more rapid when Silwet L-77 was added to the tank mix, metsulfuron on its own was adequate for a total kill. Other work in progress is showing a similar trend.

Triton X-45 was not fully successful in enhancing the effect of metsulfuron at 100 g/ha, but was at higher rates.

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