EFFECT OF HERBICIDES ON GORSE IN A DRY YEAR

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SUMMARY

Six herbicides were tested on mature gorse (*Ulex europaeus*) in a dry year. Best results were obtained with a mixture of triclopyr and picloram (69% kill) or metsulfuron-methyl and polyalkyleneoxide modified dimethyl polysiloxane (pdp) (63% kill). Poor results were obtained with 2,4,5-T butyl ester alone (14 to 32% kill) but results improved when picloram was added to 2,4,5-T (up to 58% kill). Results with clopyralid and 2,4,5-T (35-49% kill) were not significantly different from those with picloram. Metsulfuron-methyl alone gave very poor results (11% kill) but when (pdp) at 0.2% v/v was added, results were much improved (63% kill).

INTRODUCTION

Earlier work (Balneaves 1978) showed the best time to apply 2,4,5-T alone or with picloram for control of mature gorse plants was in late spring-early summer. In dry winter/spring seasons, reduced herbicide effectiveness has been noted.

North Canterbury experienced a dry winter and spring in 1982 with rainfall May 1982 to March 1983 201 mm below average. During this dry period the trials reported here were commenced.

METHOD

Six herbicide formulations (Table 1) were evaluated under these dry conditions.

Highest rates of products used were based on label, or manufacturers recommendations. Lower rates were also tested in case maximum rates were more than adequate.

TABLE 1 Percentage material dead 15 months after treatment

Product	Rate (kg active ingredient/ha)	% Dead
2,4,5-T butyl ester (Hi-ester 2,4,5-T)	6.120	14a
	7.920	32b
2,4,5-T iso-octyl ester (Tordon 520 Brushkiller)	4.250	56bc
plus picloram potassium salt	5.500	58bc
2,4,5-T butyl ester (Tordon Brushkiller DS)	4.250	39b
plus picloram amine salt	5.500	57bc
triclopyr butoxyethanol ester (Garlon 520)	4.131	42b
plus picloram amine salt	5.346	69c
clopyralid amine salt plus (IWD 3598)	2.500	35b
2,4,5-T butyl ester	3.125	34b
	3.750	49b
metsulfuron-methyl (DPX-T6376)	0.750	11a
metsulfuron-methyl (+0.2% v/v pdp)	0.750	63c

Metsulfuron-methyl was tested with and without pdp (Pulse) at 0.2% v/v.

Each treatment was applied to four replicates of a randomised block design trial at Mt Thomas (Ashley Forest) in North Canterbury. The gorse had been burnt 9 years previously and was up to 2 m tall, growing from closely spaced individual stems. Plot size was 5 x 2 m.

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Treatments were applied in 300 litres/ha using a 2 m boom sprayer fitted with 730077 flat fan nozzles and operated at 276 kPa. The herbicide rates are shown in Table 1 as total active ingredient. Spraying was done on 14 December 1982 when the gorse was showing 5-7 cm of new seasons's shoot growth. All treatments were applied in a double pass. Soil conditions under the gorse canopy were dry in spite of 11 mm rain the day before. At the time of spraying the ambient air temperature ranged from 8 to 12 °C and relative humidity from 66 to 52%. Seven mm rain fell 9 days after spraying.

Treatments were assessed 15 months after application by harvesting 45 stems/replicate. Each stem was cut into 20 cm lengths to determine the amount of stem kill by noting presence or absence of green cambial tissue.

Results were statistically evaluated using analysis of variance.

RESULTS AND DISCUSSION

Table 1 shows the percent of biomass killed.

While initial brown-out looked promising following application of all the herbicides the percentage of material killed was generally low when assessed 15 months after application. Best results were obtained from the higher rate of triclopyr and picloram (69% kill) or metsulfuron-methyl and pdp (63% kill). Poor results were obtained with 2,4,5-T butyl ester alone (14 and 32% kill) but improvement was noted when picloram was added to 2,4,5-T (up to 58% kill). There was no significant difference between clopyralid/2,4,5-T and 2,4,5-T/picloram despite lower rates of the former.

Metsulfuron-methyl alone gave poor results (11% kill) but when pdp was added results were much improved (63% kill).

The trial was inspected again 24 months after spraying, when gorse regrowth was vigorous in all treatments except for those treated with metsulfuron-methyl/pdp. Regrowth in these plots was insignificant although there did not appear to have been further dieback.

In a trial such as this it is not possible to spray gorse at the same site and time with the same herbicides but with adequate rainfall. Balneaves and Zabkiewicz (1981) using various formulations of 2,4,5-T with or without picloram additives, obtained a gorse kill of over 80%. Examination of the data showed that in those trials higher than average rainfall occurred during the winter/spring months leading up to spraying in the December, though at times, summer rainfall following spraying was minimal.

This work suggests that prolonged moisture stress seriously reduces the activity of most herbicides on gorse. However, the fact that bushes treated with metsulfuron and methyl had not regrown 2 years after treatment suggest this herbicide may overcome the problem.

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