GORSE CONTROL BY STUMP TREATMENT

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SUMMARY

A range of herbicides was applied by different techniques to gorse (*Ulex europaeus*) stumps cut at different times of the year. Complete coverage of the stump by 2,4,5-T or triclopyr in diesel oil proved so satisfactory, at all times of the year, that the value of additives could not be tested. Amine formulations of both herbicides also proved effective when applied neat to the cut surface only. Treatment could be applied a week after cutting with little reduction in effect. Glyphosate in water and 2,4-D in diesel were less effective but 2,4,5-T in water gave good results.

INTRODUCTION

The treatment of freshly cut stumps with herbicide is a recognised technique for control of woody plants (Matthews 1975). Normally 2,4-D or 2,4,5-T in diesel oil is used and the recommendation is to cover the cut surface and basal bark completely, immediately after cutting.

In order to obtain more information on effectiveness of stump treatment for gorse control a number of herbicides were tested under various conditions.

METHOD

The trials were conducted on gorse up to 7 years old growing in poor pasture on a hill side near Palmerston North.

For the 1978-79 trials individual bushes were numbered, graded for size and allocated to treatments at random from each size group. In 1980-81 blocks of gorse were cut and treatments applied to individual stumps, at random, regardless of size. Bushes were cut with a chain saw, 10-20 cm above ground level.

The first trials tested 2,4,5-T and triclopyr, with and without picloram, as ester formulations applied in diesel oil to cover cut surface and remaining trunk. Water soluble amine formulations were also used applied neat to the cut surface only (Ivens 1970). Herbicides were applied immediately after cutting. Full details are shown in Table 1. Two of the materials, 2,4,5-T ester in diesel and 2,4,5-T amine + picloram were also applied at intervals up to 1 week after cutting. Bushes were cut in August, November or April. Each treatment was applied to five stumps at each time.

The 1980-81 trials examined methods of applying 2,4,5-T and included 2,4-D and glyphosate. Glyphosate had been shown to be effective as a cut stump treatment on a number of deciduous hardwoods (Evans 1980). Details are shown in Table 2. The spray treatments were applied by a drench gun fitted with a TG5 solid cone spray nozzle. Bushes were cut in August, December and March and 10 stumps were given each treatment at each time.

The stumps were inspected for regrowth at intervals up to 2 years after treatment for the first series and for 11-20 months for the second series.

RESULTS

Stump control in the first series was so good that no comparisons between treatments could be made. Diesel oil alone killed 7 of the 15 stumps treated. The only other survivors were 2 treated with 2,4,5-T amine on the cut surface only and one treated with 2,4,5-T ester in diesel. About 5% died from cutting alone. Size made no apparent difference to the chance of survival.

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TABLE 1: Details of herbicide treatments applied 1978-79 trials. Stumps were cut 17.8.78, 17.11.78 and 9.4.79.

Herbicide	g a.i./litre mixture	
diesel	)	applied by
*2,4,5-T butyl ester in diesel	50)	paint brush
2,4,5-T iso-octyl ester + picloram salt in diesel	50 + 12.5)	complete cover.
triclopyr ester in diesel	50)	Approx 20 ml/
triclopyr ester + picloram salt in diesel	50 + 12.5)	stump
2,4,5-T amine	200)	neat product,
*2,4,5-T amine + picloram salt	175 + 44)	applied by
2,4,5-T amine + dicamba	160 + 40)	paint brush, cut
2,4,5-T amine + 2,3,6-TBA	147 + 49)	surface only.
2,4-D amine + picloram	313 + 78)	Approx 1 ml/
triclopyr amine	360)	stump
triclopyr amine + picloram salt	200 + 50)	

* Herbicides used in time-post-cutting trial. Application made at 1 minute, 1 hour, 5-6 hours, 1 day and 1 week post-cutting.

A number of stumps initiated regrowth then died. Four months after treatment 18% were growing (excluding the diesel alone treatment) but after 12 months only 5% were showing regrowth and half of these died during the second year. The kill appeared a little quicker following ester and diesel treatment (11% growing at 4 mths) than following amine treatment (21% growing at 4 mths) but the final results were equally good. The kill was also slower following November cutting than at the other dates but the final result was comparable.

Delaying 2,4,5-T in diesel treatment for up to a week after cutting did not affect the control obtained but 2,4,5-T amine plus picloram appeared a little less effective when delayed 1 week.

In the 1980-81 experiments complete coverage by 2,4,5-T in diesel was the best treatment, whether applied by paint brush or sprayed. The total number of stumps killed by these two treatments was significantly greater (chi squared test) than the total number killed by the two 2,4,5-T in water treatments. However these latter treatments still controlled a high proportion of the stumps. Glyphosate and 2,4-D were significantly less effective than 2,4,5-T, killing only 57% and 53% of the stumps respectively. Spraying 2,4,5-T in diesel over the top of the stump was less effective than covering the bark as well. Though control increased with increasing volume of spray the results suggest that about twice as much herbicide would be needed for over the top spraying as for spray directed for complete cover of the stump and bark.

Treatment in August appeared to be more effective than treatment in December or March.

DISCUSSION

This work demonstrates the effectiveness of 2,4,5-T treatments on cut stumps for controlling gorse. The treatments were satisfactory at all times of the year tested though possibly better in winter, and could be applied at least 1 week after cutting. Where ester formulations were applied in diesel oil complete coverage of the bark was very important. Application by spray gun was as good as painting when the spray was applied all round the stump. Where concentrated water soluble amine formulations were used it was only necessary to cover the cut surface of the stump.

Good results were obtained following application of 2,4,5-T in water. The previous recommendation was to apply 2,4,5-T in diesel oil (Matthews 1975). The results of the work reported here suggests that water could be used as a cheaper, cleaner carrier.

TABLE 2: Details of herbicide treatments applied 1980-81 trials. Stumps cut 29.8.80, 31.12.80 and 30.3.81.

Herbicide	Method of application	No. of stumps out of 10 showing regrowth at 11-14 months following treatment on			Total/30 stumps
		29.8.80	31.12.80	30.3.81	
<u>Complete cover</u>					
<u>20 ml/stump</u>					
2,4,5-T in diesel	painted	0	1	1	2
2,4,5-T in diesel	sprayed	0	2	0	2
2,4,5-T in water	sprayed	0	2	3	5
2,4,5-T + 1% surfactant in water	sprayed	0	7	2	9
2,4-D in diesel	sprayed	4	5	5	14
glyphosate in water	sprayed	2	6	5	13
<u>Sprayed over top only</u>					
2,4,5-T in diesel	5 ml/stump	4	6	6	16
2,4,5-T in diesel	10 ml/stump	1	6	6	13
2,4,5-T in diesel	20 ml/stump	0	4	5	9
untreated		9	9	10	28

All herbicides at 65 g a.i./litre mixture. Esters used for 2,4,5-T and 2,4-D.

Glyphosate proved unsatisfactory, with some stumps regrowing between 6-12 months after treatment. 2,4-D in diesel also proved unsatisfactory on gorse though it is a preferred treatment on some woody species (Ivens 1970). Triclopyr was very effective.

The stumps were exposed to intermittent grazing throughout and some of the delayed action kill might have been due to the effect of continuous defoliation of the herbicide weakened stumps. This could account for the stump deaths occurring between 1 and 2 years after treatment observed in the longer running trial. The initial regrowth shoots were soft and palatable.

Stump treatment offers a useful method of control for isolated gorse bushes or those growing near other plants susceptible to 2,4,5-T. In any situation where gorse is cut the stumps could and should be treated.

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