EFFICACY OF METSULFURON ON RUBBER VINE IN NORTH QUEENSLAND

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Summary. Foliar applications of metsulfuron has shown promising control of rubber vine, *Cryptostegia grandiflora.* Foliar treatments applied in April/May and November/February resulted in rapid defoliation and vine mortality 30-40 DAT. No dramatic increase in vine mortality was observed after 165 DAT. Rubber vine in this instance may not be critically influenced by seasonal application but rather its condition at the time of spraying. The degree of control of rubber vine increased only marginally as rates were increased.

INTRODUCTION

Rubber vine, *Cryptostegia grandiflora*, native to Madagascar, is a poisonous woody climber but forms shrubs when unsupported. It affects the grazing industry through reduced productivity and increased costs in production through mustering difficulties, reduced pasture production, and cattle deaths (2,3).

Several herbicides are affective on young rubber vine plants, but only variable control is obtained on older plants (4,5,6,7).

Metsulfuron (Brush Off^{R}) is a potent inhibitor of plant cell division and growth, particularly the growing tips of sensitive plants. Acropetal and basipetal translocation can occur. Metsulfuron is mainly taken up by the foliage of both sensitive and resistant species and moves rapidly within the plant (1). Selectivity depends upon the ability of the plant to metabolize the herbicide; sensitive plants show little metabolism, while resistant plants rapidly convert the product to inactive compounds.

METHODS

Trials 1 and 2 were located at Rockhampton, and Trial 3 was located at Bowen. A randomised complete block design with four replicates was used. Each treatment consisted of 5 mostly multi-stemmed plants, 1.5 to 2.5 m high. Treatments were applied with a power operated sprayer using a handgun fitted with a D6 nozzle tip and operating with a pressure of 750 kPa. The fine spray droplets produced were applied in successive horizontal sweeping motions starting at the base of the bush and continuing upward to the top. A non-ionic surfactant (Agral 60^{R}) was added at 0.1% (v/v). Metsulfuron is a dry flowable formulation and was added to water in the spray tank.

Metsulfuron was compared to 2,4-D ethyl ester (D-800^{R}), 2,4,5-T iso-octyl ester/picloram iso-octyl ester (Tordon 1040^{R}) and hexazinone (Velpar^{R} L).

Metsulfuron and 2,4-D ester were foliar applied, 2,4,5-T/picloram was applied in diesel as a basal bark treatment, and hexazinone was applied to the soil using the Spotgun^{R} method. Treatments were assessed at various intervals for percent defoliation and mortality.

Trial 4 was located 45 km north of Charters Towers, on a relatively uniform

stand of rubber vine growing on a previously ploughed area. Plots of 10x10 m were randomly located and replicated twice. Spray treatments were applied on all dates at 9.00-10.00 a.m., relative humidity ranged from 48-54% and temperature from 30-33°C.

A pneumatic sprayer was used to apply metsulfuron (0.012% w/v) and triclopyr (Garlon^{R} 480) (0.4% w/v) as an overall spray to the point of run off. A non-ionic surfactant (Nufarm Non-ionic^{R}) was added to each herbicide at 0.2% (v/v).

RESULTS AND DISCUSSION

In all trials metsulfuron provided good control of rubber vine when applied under good growing conditions. Almost complete defoliation was achieved in all treatments (Table 1).

Table 1. Effects of autumn and spring application of herbicides on rubber vine 165 DAT

Herbicide	Spray concentration (% w/v)	Assessment criteria	
		Defoliation (%)	Mortality (%)
Trial 1 (April)			
Metsulfuron	0.006	93	70
Metsulfuron	0.009	100	95
Metsulfuron	0.012	97	85
2,4-D ester	0.4	100	50
Trial 2 (May)			
Metsulfuron	0.006	100	87
Metsulfuron	0.009	100	85
Metsulfuron	0.012	100	85
Hexazinone[a]	2x1 g per plant	10	0
Trial 3 (November)			
Metsulfuron	0.006	98	85
Metsulfuron	0.009	100	80
Metsulfuron	0.012	100	100
2,4,5-T/picloram	0.008/0.002	100	100

[a] Treatment efficacy and death not expected until year 2 and 3 after treatment.

Metsulfuron symptoms observed included necrosis of the growing point (within one week of application), leaf chlorosis (3 weeks after application) and leaf necrosis before leaf drop/death. Foliage of plants that recovered after initial treatment, showed no secondary symptoms. A similar response was observed for triclopyr. The 2,4-D, 2,4,5-T/picloram and hexazinone treatment produced deformed leaves after regrowth.

Table 2. Trial 4. Effect of time of application of metsulfuron and triclopyr on the control of rubber vine (% mortality)[a].

Herbicide	Concentration (% w/v)	Time of application			
		12.11.86	10.12.86	16.1.87	12.2.87
Metsulfuron	0.012	66	91	75	47
Triclopyr	0.4	14	31	3	17

[a]Plants were at vegetative growth stages at all times of application except in February when the rubber vine plants were flowering. Plants were moisture stressed at the time of the November and February applications. Assessments were made on 2-3 April 1987.

Interim assessments of Trials 1, 2 and 3 showed that late spring (November) application of metsulfuron resulted in faster defoliation and vine dieback to base (84 DAT) than autumn application (102 DAT). No real differences were apparent after 165 DAT (Table 1). This was also apparent in Trial 4 where rubber vine death occurred 30-40 DAT. Results of April application (Trial 1), particularly at the lower rate (0.006% w/v) may have been influenced by the fact that some vines had grown into adjacent trees making coverage difficult.

Though the assessment may be slightly premature, vine mortality does not appear to increase over time, and a final assessment for metsulfuron could be made as early as 150-180 DAT. The condition of the plant appears to be more critical as seen in Trial 4, where application after vigorous growth gave over 90% kill.

Metsulfuron compared favourably with the standard treatment of 2,4-D ester while 2,4,5-T/picloram also was effective. Rate response of metsulfuron is marginal between 0.006 and 0.012% (w/v). Triclopyr at the time of assessment was not giving adequate control for rubber vine. As limited rainfall followed application, hexazinone cannot be properly assessed for another 1-2 years.

Regular assessment showed that, except for temporary effects on native legumes, metsulfuron did not affect pastures.

Metsulfuron is suitable for the control of rubber vine. Efficacy does not appear to be critically influenced by season of application, but the results show that application under moisture stressed conditions should be avoided, and good spray coverage is required.

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