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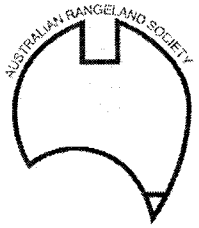

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WOODY WEED CONTROL IN CENTRAL AUSTRALIA USING THE HERBICIDE TEBUTHIURON

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ABSTRACT

The herbicide tebuthiuron was applied at rates varying from 3.7 to 10.7kg/ha (of product) on target species of mulga *(Acacia aneura)*, ironwood *(A. estrophiolata)* and witchetty bush *(A. kempeana)*. Control of all species was achieved but the desirable combination of low effective rates and good pasture response made only ironwood control economic. Initial effects included a complete denuding of all vegetation on some occasions, the duration of which appeared to be related to the application rate, rainfall/time and soil type. At the ironwood sites following good summer rain, standing pasture biomass on the treated sites exceeded that of the controls by up to 4 times.

INTRODUCTION

A high density of trees and shrubs can compete with valuable native pasture for moisture and nutrients thereby reducing the vigour and value of these pastures and turning productive areas into country of little pastoral value. Since the wet years of the 1970's significant local areas have had increases in the density of unpalatable native woody species. The associated loss in revenue could be substantial.

While fire and mechanical methods such as chaining or blade ploughing are capable of controlling excessive trees, for a variety of reasons these are not always the preferred options. The aim of this trial was to investigate the effectiveness, cost efficiency and environmental impact of the use of tebuthiuron for excessive native vegetation (woody weed) control.

METHODS

Two unreplicated trials were carried out north of Alice Springs within a 280mm rainfall area. The first was instigated in December 1987 where tebuthiuron was hand applied over a 3ha area at rates of 0, 5, 7.5 and 10kg/ha on each target species of juvenile ironwood (up to 18,000 plants/ha on alluvial soil) and mulga (up to 9,000 plants/ha on red clay, red earth soils).

The second trial was commenced in December 1989. Tebuthiuron was applied through a power mister/blower over a 1ha area at rates of 0, 3.7 and 4.9 kg/ha on juvenile ironwood and at 0, 5.1, 6.8 and 8.4kg/ha on witchetty bush, all on earthy sands. Visual appraisals were carried out until 1990 when pasture composition and yield assessments as per Bastin (1989) were commenced.

RESULTS

Rainfall of 350mm was received in early 1991 and produced an excellent pasture response. In May 1991 ironwood control in excess of 95% was achieved at all rates of application in both trials. Control of mulga in trial one was around 70 - 80% at rates in excess of 7kg/ha and witchetty bush control in trial two was 70% at 5.1kg/ha and 99% at 8.4kg/ha. Non-target vegetation within all the treated areas was also killed. Both forb species diversity and percent yield were greatly reduced in the treated areas compared with the controls.

Pasture yields in the 1987 ironwood trial sites were substantially greater on the treated areas at 1208 and 1360kg/ha, than on the control at 601kg/ha. This trend was repeated in the 1989 ironwood trial sites at the lower rates (1560 and 1872 kg/ha on the treated areas and 453 kg/ha on the control). Pasture yield on all other sites was either less than or similar to their controls.

For the 1987 trials the sites were denuded of vegetation for the first 18 months after application. While bare areas were still present on all treated sites in 1991, the grasses present were larger, more robust and vigorous than on the controls. Measurements of residual tebuthiuron at levels of 0.2mg/kg were obtained from soil samples taken 50m from the application site at a depth of 30 - 60cm 3 years after application.

DISCUSSION

With the heavier rates needed to achieve control in mulga and witchetty bush and the lack of grass response it appears that the use of tebuthiuron can be regarded as uneconomical for control of these species.

In the ironwood sites the largest yield increase of around 1400kg/ha was achieved at the lowest application rate of 3.7kg/ha. Based on figures of a 400kg beast utilising 50% of the increased feed and consuming 2.5% of its body weight daily, this represents a potential increase in carrying capacity of 20 beasts/sqkm. Using the estimate of the marginal return from one beast per annum being $60 (Cann pers comm) then increased returns represent $1200/sqkm/annum at an initial cost of $7400/sqkm for tebuthiuron. The economics appear to make the use of tebuthiuron for control of ironwood a reasonably acceptable proposition in valuable country. However, these figures were achieved in one season after good summer rain and will be monitored to determine if the results continue.

The depletion in both forb species diversity and percent biomass composition is not surprising as tebuthiuron is registered for the control of broad leaf plants only and the label states forage grass production usually increases following this control. While this was not the case initially in the 1987 trial where the sites were completely denuded, it was apparent in the 1989 trial. It is believed this initial denuding was influenced by the amount of rainfall received, herbicide application rate and soil type.

The manufacturer also claims that tebuthiuron has a moderate degree of mobility in the soil. Plant deaths occurred some 50m away from the treated area, 3 years after application.

A further trial was initiated in 1992 to determine if the rate for effective ironwood control can be reduced below 3.7kg/ha and to reduce the environmental impact of killing the mature trees and the initial complete denuding of the whole area.

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