

Aerial application of tetrapion for the control of serrated tussock  
(*Nassella trichotoma*)

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#### SUMMARY

The herbicide tetrapion was aerially applied, at 2.27 kg a.i./ha, to serrated tussock (*Nassella trichotoma*) on two sites near Mt. David, New South Wales, on 26 February, 1976.

The percentage kill, in October, 1977, was 98% on each site. Improved species growing with the serrated tussock on one site recovered well from the effects of tetrapion. Thus it proved possible to selectively removed serrated tussock from improved species by the aerial application of tetrapion.

#### INTRODUCTION

Campbell (1976) showed that tetrapion (sodium 2,2,3,3-tetrafluoropropionate) was efficient in killing serrated tussock (*Nassella trichotoma*) when applied from ground equipment. As 77% of the area heavily infested with serrated tussock in New South Wales occurs on non-arable land (Vere and Campbell, unpublished data), it was necessary to ascertain whether tetrapion was effective in killing serrated tussock when applied from aircraft.

#### MATERIAL AND METHODS

Two sites were selected near Mt. David, New South Wales (56 km south of Bathurst) on non-arable hill country. The serrated tussock on site 1 was growing in association with improved species but on site 2 there was little improved pasture with the tussock. The soil on both sites was derived from basalt.

On 26 February, 1976 tetrapion was aerially applied at 2.27 kg a.i./ha (3ℓ of product per ha) in 80 ℓ of water per ha to 2 ha of land on each site. A foam concentrate was added to produce a level of 0.5% and the total mixture applied from a Piper Pawnee aircraft.

Conditions for aerial spraying in early morning (6 a.m. to 9 a.m.) were good: wind, 0.9 km/hr from the south; relative humidity, 94% to 80%; temperature, 16°C to 19°C; overcast with mist hanging in valleys; soil moist from rain in previous two days; and tussock

plants saturated with dew. The serrated tussock had finished flowering and all seedheads had been blown away. Conditions for plant growth were good for one month before spraying, thus both serrated tussock and the associated pasture were growing well at spraying.

Six hours after spraying 7 mm of rain fell. The following three days were dry and then 50 mm fell in five consecutive days. Site 1 was grazed leniently after spraying but site 2 was grazed heavily with sheep from six weeks after spraying until measurements were taken.

In October 1977, the percentage kill of serrated tussock and the botanical composition of the pasture was ascertained from 40 random quadrats distributed on each site.

## RESULTS

Two months after spraying a slight browning of serrated tussock and improved species could be observed. Smaller tussocks appeared unaffected.

Six months after spraying the larger serrated tussock plants were seriously affected by tetrapion. Smaller plants were less affected. Subterranean clover (*Trifolium subterraneum*) plants present at spraying were seriously affected but younger plants which germinated after spraying were mainly healthy. White clover (*T. repens*), ryegrass (*Lolium perenne*) and phalaris (*Phalaris tuberosa*) were all affected by tetrapion but were beginning to recover.

By November 1976, 9 months after spraying, the three perennial improved species and the plants of subterranean clover which germinated after spraying were growing vigorously.

Serrated tussock appeared to finally die about March - April 1977, 13 to 14 months after spraying. However, to ensure serrated tussock plants were dead, measurement of percentage kill was not made until October 1977, 20 months after spraying.

	<u>% kill</u>
Site 1	98.6
Site 2	98.9

The only living tussocks present were in strips missed during spraying. This indicated that application of tetrapion should take place from above normal aerial spraying height. As tetrapion enters the plant through the soil it may not be as important to get complete cover of plant tissue as with other herbicides e.g. 2,2-DPA. As long as the total area of the treated site is covered the herbicide should perform effectively.

On site 2, 18% of the quadrats had tussock seedlings present at measurement in October 1977. This re-infestation was much less than expected as the site had been heavily grazed since soon after spraying. Measurement of tussock seedlings on site 1 was not possible due to the growth of improved species.

In October, 1977 an assessment was made of the botanical composition of the treated areas (Table 1).

Table 1. Botanical composition of treated areas in October 1977

	White clover	Subterr- anean clover	Rye- grass	Phalaris	Miscell- aneous*	Serrated tussock
	% ground cover					
Site 1	0	32	15	13	40	trace
Site 2	2	2	0	4	92	trace

\* Dead tussock litter, annual legumes, annual grasses and broadleaved weeds.

On site 1 all improved species except white clover were present 20 months after spraying. The absence of white clover was attributed to poor seasonal conditions in 1977 rather than residual tetrapion because white clover was quite vigorous and prevalent in spring 1976. The small amount of improved species on site 2 was consistent with the amount present at spraying.

#### DISCUSSION

These trials showed that serrated tussock is susceptible, and some improved species tolerant, to aerially applied tetrapion. The results achieved here from aerial application are comparable to those achieved from ground application (Campbell, 1976). Thus it is possible that lower rates than used here could be successful from aerial application because lower rates have proved efficient from ground application. This would be more economical and have less effect on the improved species.

Subterranean clover is most susceptible to tetrapion. Thus, if this species is present, tetrapion should be applied in summer when the clover is dormant. White clover, ryegrass and phalaris proved tolerant to the low rate of tetrapion used here. Recent tests show that lucerne (*Medicago sativa*) is quite tolerant to low rates of tetrapion and cocksfoot (*Dactylis glomerata*) is moderately tolerant.

#### ACKNOWLEDGEMENT

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#### REFERENCE

Campbell, M.H. (1976).- New herbicides for the control of serrated tussock. *Aust. Weeds Res. Newsl.* 23 : 38-43.