

A survey of the use of flupropanate in New South Wales for the control of serrated tussock (*Nassella trichotoma* (Nees) Arech.)

C.C. Lee and G.M. Gurr, Orange Agricultural College, The University of Sydney, Orange, New South Wales 2800, Australia.

Summary

Flupropanate (sodium 2,2,3,3-tetrafluoropropionate) has been used in efforts to control serrated tussock (*Nassella trichotoma*), a major pasture weed in Australia. However, this product has been withdrawn from sale in Australia. This study presents results from a postal survey to determine the degree of reliance of landholders on this herbicide in New South Wales. Of 71 questionnaires returned, 45 were from landholders who reported infestations of *N. trichotoma*. Amongst affected landholders, 34 used flupropanate and this was the sole reported control method used by 18 respondents. Users tended to view this herbicide as a reliable, easy to use method which gave a high level of control and so justified the significant costs of purchase and application. The majority viewed it as constituting a low or no hazard to the operator, family, consumer and environment. Other herbicides and non-chemical methods (physical and pasture improvement) were used by small numbers of growers. Of the 37 growers who commented on the possible removal of flupropanate, 35 favoured its retention on the market.

Introduction

Serrated tussock is a perennial grass native to South America and a weed which has infested large areas of New Zealand, South Africa and Australia (Campbell 1982). It is a problem in parts of eastern Australia (Jones and Campbell 1998), particularly the central and southern

tablelands (Auld and Medd 1992). Serrated tussock has little grazing value as it has a high fibre content (86%) and low protein content (4%), so affected rural producers face considerable losses in livestock production (Jones and Campbell 1998).

Flupropanate (sodium 2,2,3,3-tetrafluoropropionate) sold as Frenock® has been widely used by affected landholders (Griffiths 1998). However, this product was withdrawn from the Australian market late in 1998.

The aim of this study was to determine the extent of reliance on this product for serrated tussock control in New South Wales (NSW) in the lead up to its withdrawal and thereby assess the likely implications of it no longer being available.

Materials and method

In September 1998, 200 questionnaires were mailed to graziers in the central and the southern tablelands of NSW. Landholders were selected randomly from the 'Graziers' listing in the Yellow Pages (Anon 1998). The questionnaire sought information on whether serrated tussock was a problem on the property, the methods used for its control, and attributes of the herbicides used. A reply paid envelope was enclosed to allow return of the completed form.

Results

Of the seventy one returned questionnaires, 45 landholders reported a problem with serrated tussock. Of these, 34

reported using flupropanate and this was the sole method of control reported by 18 respondents (Table 1). Both glyphosate and gramoxone were used by small numbers of growers but the majority of these also used flupropanate. Use of physical methods—digging, chipping, tillage or fire—without herbicides was reported by just eight landholders but 22 used such methods in combination with herbicides. Four of these growers reported sowing improved pastures as part of their control strategy.

No landholders gave information on attributes of herbicides other than flupropanate. Twenty seven growers gave information on attributes of flupropanate but not all answered every question. Of these, just four viewed it to be a low cost product, and 13 and nine respectively viewed it to be a medium or high cost option. Seventeen of 27 respondents viewed application of flupropanate to be expensive in terms of time. The majority viewed it to be a reliable product with just five of 26 respondents rating it as only medium or low reliability.

Flupropanate was also regarded as easy to use, with just two of 22 reporting the contrary. Five of 25 respondents rated the level of control they had achieved as medium or low, but only 12 of the 24 growers who commented on the duration of control considered it to give long term control. The majority of respondents rated the risk of flupropanate to the operator, family, consumer or environment as low or no risk. The number of respondents giving a medium rating against these hazards was 3/24, 1/24, 1/25 and 3/25, respectively. Just one respondent out of 25 considered the herbicide to constitute a 'high' hazard to the consumer.

Many landholders were concerned about the future control of this weed without flupropanate. Of the 45 affected landholders, 35 indicated that flupropanate should remain on the market, two did not think it should remain and eight did not respond to this question.

Table 1. Numbers of landholders in New South Wales reporting various methods of serrated tussock control (n=45, some growers indicated use of more than one method).

Herbicide	Herbicide-only Control	Physical methods ^A + herbicide (as left)	Pasture improvement + herbicide (as left)	TOTAL
Flupropanate	18	5	3	26
Glyphosate	1	1	0	2
Other (unspecified)	0	1	0	1
Flupropanate + glyphosate	3	3	0	6
Flupropanate + gramoxone	1	0	0	1
Flupropanate + glyphosate + gramoxone	0	1	0	1
Nil	N/A	7	1	8
TOTAL	23	18	4	45

^APhysical methods were hoeing, digging, tillage and fire.

Discussion

The findings of the present study are in agreement with Jones and Campbell (1998) in showing that serrated tussock is a weed of significant importance in NSW. Despite a fairly small sample size, a very clear trend was evident with a heavy degree of reliance on chemical control and flupropanate shown to be the most widely used herbicide. This was despite the significant expense perceived by users, of the order of \$75 ha⁻¹ (Dellow 1995), though the cost of 'spot spraying' smaller infestations would clearly be lower.

Because flupropanate was viewed as a reliable, easy to use, effective herbicide with low associated hazards, the prospect of it being withdrawn from sale was of concern to the majority (35/37) of landholders surveyed. Comments from individuals included that there was 'no other chemical' available and that its removal would 'set back by 20 years' serrated tussock management on their property. Others recognized the utility of glyphosate but commented that this compound was less selective and has a greater requirement than did flupropanate for the weed to be actively growing at the time of application (Campbell and Vere 1995). This reduced the flexibility of herbicide use to a 'few months' when they were busy with other tasks such as shearing. The majority of respondents felt that flupropanate should remain on the market, at least until a suitable alternative became available. The fact that this has not happened suggests that the rate of spread of serrated tussock could increase substantially, particularly on non-arable land. In order to prevent this occurring, a short-term extension effort is warranted to make landholders aware of how best to use other herbicides in a sustainable manner. This should involve promoting herbicide use and manual removal for localized infestations, with the sowing of introduced pasture species and improving pasture management in more extensive areas to prevent reinfestation occurring after treatment.

Acknowledgments

We thank the landholders who participated in this survey, and Dr. Malcolm Campbell for advice on a draft of this manuscript.

References

- Anon. (1998). 'Yellow Pages 1998'. (Telstra Communication Ltd., Sydney).
- Auld, B.A. and Medd, R.W. (1992). 'Weeds. An illustrated botanical guide to the weeds of Australia', p. 49. (Inkata Press, Melbourne).
- Campbell, M.H. (1982). The biology of Australian weeds. 9. Serrated tussock. *Journal of the Australian Institute of Agricultural Science* 48, 76-84.
- Campbell, M.H. and Vere, D.T. (1995). *Nassella trichotoma* (Nees) Arech. In 'The biology of Australian weeds', eds. R.H. Groves, R.C.H. Shepherd and R.G. Richardson, p. 189-202. (R.G. and F.J. Richardson, Melbourne).
- Dellow, J.J. (1995). 'Weed control in lucerne and pastures 1995-96'. Agdex 130/540. (NSW Agriculture, Orange).
- Griffiths, J. (1998). 'Frenock® can't go'. *The Land*, 16 July, p. 8.
- Jones, R. and Campbell, M.H. (1998). The economics of serrated tussock in the Monaro: impact and options to control weed spread. Proceedings of the Eleventh Annual Conference of the Grasslands Society NSW, p. 120.