Thistle control: A farmer perspective

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Abstract

There are a number of constraints placed on the landholder which affect the type and amount of weed control they are actually able to conduct. During this talk I will discuss a brief history of why thistles have got out of hand on the property. Black thistle was on the property but was not a major problem. This was followed by saffron thistle which was brought in from grain for drought feeding, and there was the odd Scotch thistle which was not a problem at the time. Twenty five years later I am battling a major Scotch thistle problem. Other land holders in the area have also not been as vigilant as perhaps they should have been in battling the problem and even if the problem on my property had been cleared the seeds from neighbouring properties would still have come in either wind blown or by birds etc. Other constraints include the time needed to battle other noxious weeds such as serrated tussock which is a major problem in the region. Nodding thistle and vipers bugloss are also becoming a problem along with St. Johns wort but not yet African lovegrass (*Eragrostis curvula*). Another major constraint is the decline in terms of trade. In the past I was able to employ a Station hand, then that was reduced to a casual hand, now I am battling to afford even casual labour and am now operating a one man 2700 acre property of mainly non-arable tableland country. Spraying has been conducted on open basalt country ten years ago and again there was no co-ordinated response from neighbours which raises the question of why persist when its still on the fence line all around you. Another land holder on a larger operation was conducting an annual aerial spray and concluded it was ineffective, repetitious and expensive. This lead to a number of financial contributions being made to the biological control program from various people in the district.

Landholder attitudes to *Onopordum* thistles and their control: A preliminary view

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Summary

Landholders participating in a redistribution network for biological control agents of *Onopordum* thistles were asked to complete a questionnaire on control methods currently being used, their cost and effectiveness. The 60 replies received to date provide an interesting insight into landholder perceptions of the impact of *Onopordum* thistles on their farming enterprises and of current thistle management. Overall, there is no uniform control strategy, and many landholders have devised their own management plans. While cultural methods such as rotational cropping or sowing improved pastures are important, herbicides form the key component of control measures. A variety of chemicals are used, alone or in combination, with MCPA and Dicamba being the main ones. The pattern and frequency of use of herbicides is quite variable, as is their overall effectiveness. Despite some local successes, the overall picture is that current control strategies are, at best, only preventing a worsening of infestations rather than reducing the problem.

Introduction

As part of a redistribution program for biological control agents of *Onopordum* thistles, CSIRO is providing co-operating landholders with an information kit on the agents and other forms of control. This kit includes a questionnaire designed to obtain information on the extent and cost of the problem caused by these thistles, as well as current control measures and their effectiveness, and landholder attitudes to the management of thistle infestations. The information will provide a baseline by which to evaluate the impact of biological control agents, once they have become well-established and have reached damaging population levels i.e. it will permit a measurement of the changes in other control methods due to biological control. In addition, the survey data provides an interesting picture of landholder attitudes to the management of thistle populations and, as such, should help in the task of determining what the gaps in knowledge are and what information is being sought by the client groups of research into thistle control. This paper summarizes the responses of 60 landholders in south-eastern New South Wales who have, to date, responded to the questionnaires. It therefore gives a preliminary overview of the management of *Onopordum* thistles in those areas that are worst affected by these noxious weeds.

Methods

The details of the redistribution scheme are described in detail by Briese *et al.* (1996), and comprised 15 separate release networks covering 13 shires in south-eastern New South Wales (Bombala, Boorowa, Cooma-Monaro, Cootamundra, Crookwell, Gundagai, Gunning, Harden, Snowy River, Tallaganda, Yarrowlumla, Yass and Young) where *Onopordum* thistles cause the most problems (Briese *et al.* 1990). Participating landholders were selected initially by District Agronomists, Shire or County Council Noxious Weeds Officers, and the Landcare group co-ordinators based on the extent of thistle infestations on their properties, availability of suitable release sites and ability to manage a release site.

The survey form comprised 26 questions, mainly requiring a tick or single number as a response. One set of questions related to details of the property concerned and the enterprises conducted on it, a second to the location and extent of *Onopordum* thistle infestations on the property and possible reasons for them, a third to detailing control methods currently used and their cost and effectiveness, and a final set of questions sought information on landholders views of the overall value of control.

Results

Impact of Onopordum infestations

Wool and meat production are the main industries affected by *Onopordum* thistles, with 82% of the landholders listing wool production as a major enterprise, and 85% listing meat production, with cattle slightly predominating over sheep. The size of moderate to severe infestations on individual properties ranged from 20 to over 2000 ha (mean of 280 ha). Most infestations occurred on non-arable improved pastures, followed by arable and non-arable unimproved land types. Very little infestation occurred in land that was cropped or irrigated. Landholders perceived a lack of competitiveness in pasture grasses as the main reason for infestation by *Onopordum* thistles. This is exacerbated

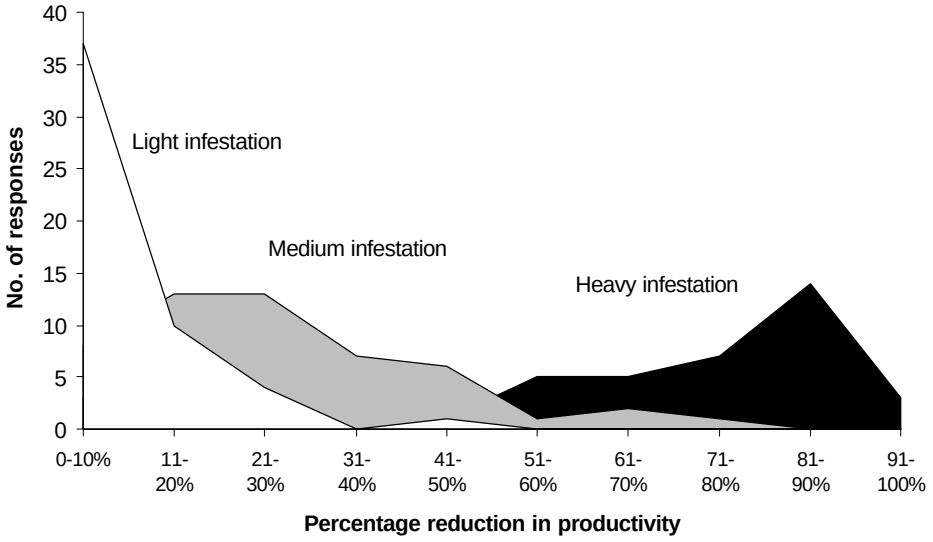

Figure 1. Estimated productivity losses due to different levels of *Onopordum* infestations.

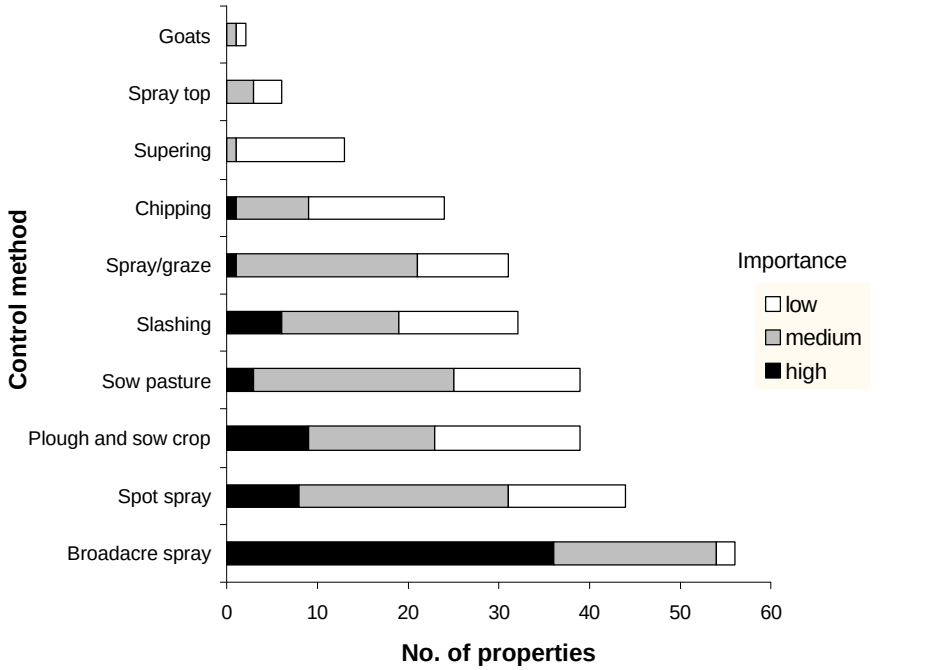

Figure 2. Control methods currently used for *Onopordum* thistles and their importance.

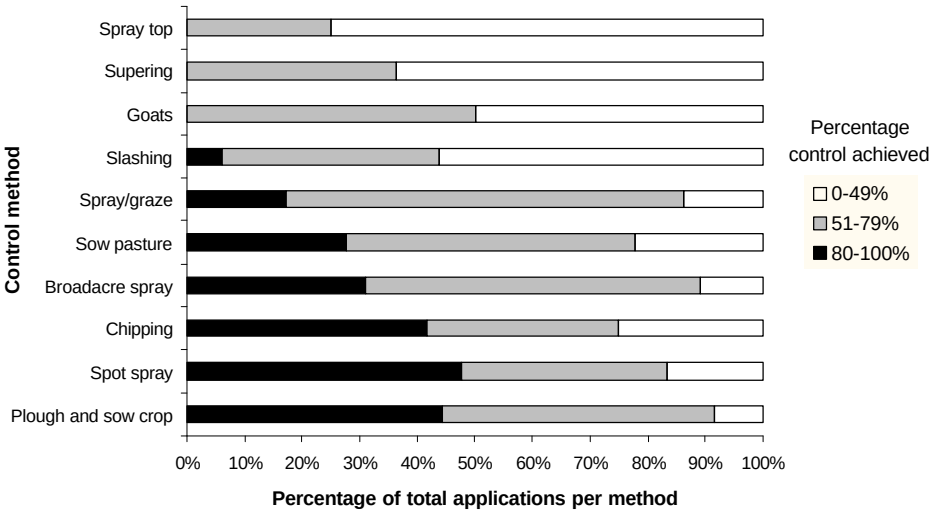

Figure 3. Effectiveness of current control methods for *Onopordum* thistles.

by the lack of grass cover at critical times (e.g. when thistles germinate), and the opening up of pastures by drought and, to a lesser extent, by overgrazing. In some cases the addition of fertilizer and pasture improvement programs have also led to a worsening of existing thistle infestations.

On most properties the problem has been a long-term one, with only 13% having been infested for less than 15 years. On half the properties there had been an increase in infestations over the past five years, while 30% reported a decrease and 20% indicated that there had been no change. The main detrimental effect of *Onopordum* thistles was considered to be a reduction in pasture and pasture access, and hence productivity. Reduced prices due to vegetable fault in wool, the impact of infestations on property values and difficulties in mustering were also considered to be problems caused by these thistles. Estimates of productivity losses are difficult to make and varied considerably between individual landholders (Figure 1), but the median losses were estimated at less than 10% for light, 21–30% for medium and 61–70% for heavy infestations of thistles.

Current control methods for Onopordum thistles

All 60 landholders have an active control program for *Onopordum* thistles, and have used a variety of measures (Figure 2). The landholders generally used combinations of these control measures, but clearly chemical herbicides form the basis of current management strategies, coupled with cultural control methods such as ploughing and cropping, sowing improved pastures and slashing. Combinations such as spray / graze are used to a lesser extent, while alternative techniques such as goat grazing are rarely employed. Control has generally increased over the last five years, with 33% of landholders doing more, 54 % the same or varying between years and only 13% claiming to have reduced control measures in that period. The median annual cost of control was $15–20 per ha, but this often did not include labour costs. Given that 60% of landholders spent between than 10 and 30+ man-days a year on control (Table 1), costs with labour included were as high as $50 per ha.

Table 1. Labour required to implement *Onopordum* thistle control programs.

No. of man-days	No. of properties
1–3	0
3–5	5
6–10	19
11–20	13
21–30	9
>30	14

The most effective form of control is to plough and sow to a crop (Figure 3), but this is only practicable on arable land. Methods aimed at isolated plants, such as spot spraying and chipping, are also effective but, because of the labour input, are limited to small patches or very light infestations. For more severe broadacre infestations, herbicide treatment and sowing to improved pasture and spray-graze are the most effective control measures, while slashing and related techniques had little effect on infestations (Figure 3). It needs to be borne in mind though, that the data refer to control over a single season and none of the methods provided consistently high levels of control on its own (Figure 3). The majority of landholders (55 out of 60) found that combining methods gave improved control, with the most common combinations being the use of chemical herbicides together with either pasture improvement, grazing management or cropping rotations.

A major factor influencing the success of control is the consistency with which it was practised. Only two of the 60 landholders claimed to treat all their infested areas every year, with a variety of treatment frequencies being applied to different proportions of infested areas by the remainder (Figure 4). Where chemical herbicides are used, the time of application also varies (Figure 5), while a total of 6 chemicals have been applied in 9 different combinations (Table 2). The bulk of herbicide treatments comprise MCPA and Dicamba either alone or in combination and MCPA / Lontrel® (clopyralid), and these chemicals seem the most effective, though timing of application is important. The seasonal spread of applications reflects, in part, the ability of *Onopordum* to germinate in all but the coldest months and, as a consequence, wide variability in plant age and size at any one time. Too often though, timing is dictated by other on-farm demands for labour.

There was a trend toward two distinct strategies of control; reduction and containment. The former was characterized by concentrating treatment on medium and heavy infestations with a view to lowering thistle numbers. Often this was done systematically, one paddock at a time. The containment strategy emphasized treatment of light infestations to prevent their development and limit spread, while leaving the more severe core infestations untreated. Often these core infestations are restricted to more inaccessible terrain.

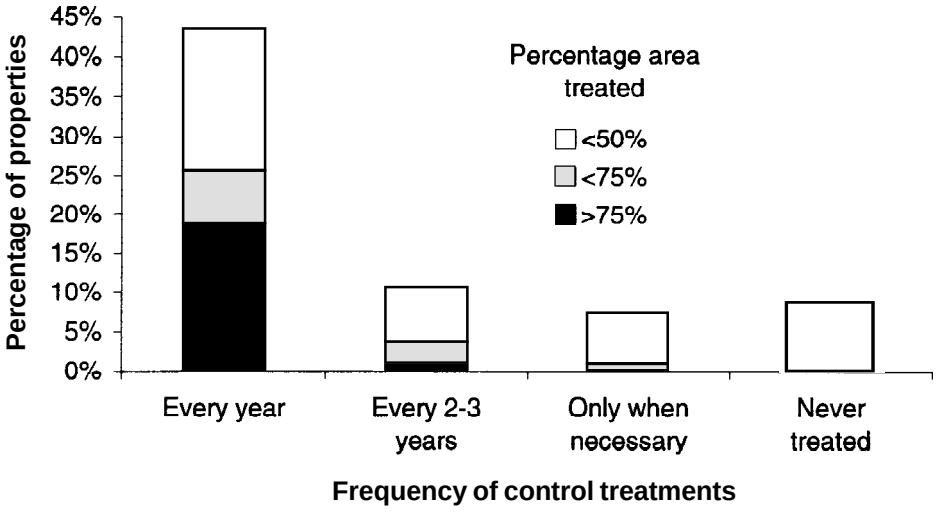

Figure 4. Frequency and extent of *Onopordum* infested areas treated for thistle control.

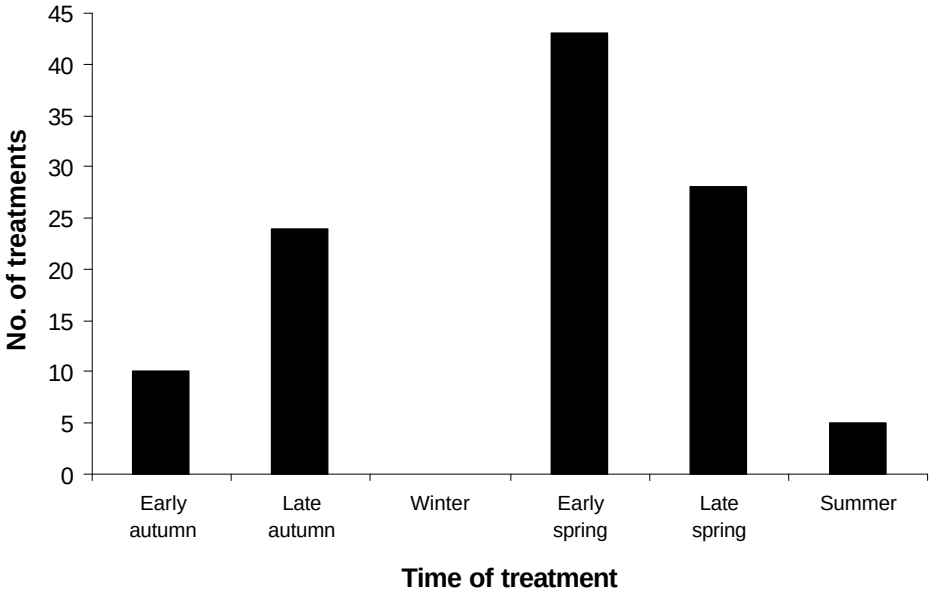

Figure 5. Time of spraying herbicides for the control of *Onopordum* thistles.

Does it pay to control Onopordum thistles?

Despite strong indications of variable responses by *Onopordum* to control methods, 52% of the landholders thought control very worthwhile, while 40% thought it only just paid for itself or were unsure of the value, and 8% thought it didn't pay. Seventy six per cent noticed an increase in productivity following control, while the remainder reported no difference. Most landholders have realistic expectations of control, with 85% viewing it as an ongoing process, 7% being uncertain and only 8% thinking that the problem could be controlled in 10 years or less.

The main disadvantage that landholders perceived in current control practices was the cost (principally of chemicals), while competition for time from other on-farm tasks made it difficult to maintain an effective control program in the long-term. A few felt that the herbicides available were not effective, and others were discouraged by the length of time needed to achieve satisfactory control. A major problem with the most effective herbicide, Dicamba, is its deleterious effect on legumes present in pastures (Keys 1987).

Discussion

Notwithstanding the small sample size, the overriding view of affected landholders is that some kind of management strategy for *Onopordum* thistles is

Table 2. Frequency of use of different herbicides against *Onopordum* thistles (alone or in combination).

Chemical	Broadacre	Spot spray
MCPA	32	14
Dicamba	23	21
Clopyralid	13	3
2,4-D	7	7
Glyphosate	1	6
Paraquat	1	0
Chemicals used	6	5
Combinations	9	9

essential. Many have devised particular plans for their properties, often with the guidance of local government advisors. However, the different competing needs of on-farm management and the general downward trend in real returns to landholders in Australia (Campbell 1991) means that few control programs are being maintained effectively. Because of the large and long-lived seed banks (Cavers *et al.* 1995), any disruption to a control program can nullify the gains of previous efforts. Thus, despite current control procedures there has been a trend toward an increase in the overall problem posed by *Onopordum* thistles.

Information from the questionnaires suggests that research is needed on more selective herbicides and the development or improvement of low input control methods such as grazing management and biological control. Most urgent, though, would appear to be the integration of methods appropriate to particular enterprises and extension support to ensure the coordination and maintenance of an overall strategy. The majority of growers clearly have no illusions concerning the difficulties of current control strategies, and accept that new methods such as biological control are long-term solutions, and must be viewed as part of an overall management package. The challenge of this workshop will be to develop appropriate guidelines and suggest what research is needed to improve methodologies so that such an effective package can be produced.

Acknowledgments

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