



# Factors influencing rural landholder support for a mandated weed control policy



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## ARTICLE INFO

### Article history:

Received 2 December 2014

Received in revised form 20 February 2015

Accepted 14 March 2015

### Keywords:

Noxious weed legislation

Fireweed (*Senecio madagascariensis*)

Farmer attitudes

Australia

Logistic regression

## ABSTRACT

Mandated weed control has a long history as a tool to restrict the spread and impact of serious agricultural and environmental weed species. For mandated control to be effective, control requirements must be strictly enforced for both private and public landholders, and landholders themselves must be supportive of legal enforcement requirements. Using data from a 2011 landholder survey of fireweed (*Senecio madagascariensis*) impact and management in south-eastern Australia, we explored the factors influencing attitudes to mandated weed control. Factors associated with support for mandated fireweed weed control included compelling poorly performing neighbours to manage their weeds more effectively, optimism regarding the potential to restrict a weed's impact, current control activity, and the potential for mandated control to restrict or slow the spread of fireweed. Factors associated with opposition to mandated fireweed control included the burden it places on landholders, pessimism about the potential to restrict a weed's spread or reduce its impact, the view that bad fireweed problems result from certain land management practices, and a belief that declaration had not worked for other weed species. Mandated fireweed control is most likely to be of benefit in regions where the weed has not established fully, and there is a greater chance of successfully restricting its spread and establishment. It is critical to focus on lifestyle farmers and absentee farmers who are less likely to have an economic incentive to manage fireweed. In regions where fireweed is already established, the goal is to reduce its impact on farm productivity, rather than attempting containment or eradication. In this case, non-mandated control approaches are more appropriate, including education, control support, and encouragement of cross-boundary control activities.

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## Introduction

Weed control legislation has a long history in Australia. The first such legislation was enacted in South Australia in 1851 to address the ongoing spread of Scotch thistle (*Cirsium vulgare*), less than 20 years after initial European settlement of the colony. Similar legislation was enacted in the other Australian colonies over the next few years (Parsons and Cuthbertson, 2001). The early colonial legislation in Australia has formed the basis for legislative and regulatory arrangements with regard to invasive weeds in Australia today. Weed control legislation remains the responsibility of States and Territories. However, variation exists in the organisation/s responsible for weed control.

Generally, private rural landholders are left to make their own decisions with regards to weed management on their land, providing these decisions do not adversely impact their neighbours (Auld et al., 1987; Smith, 1987). However, in some cases a particular weed species will be determined to have a significant impact on agricultural production and/or the natural environment. At the same time, the current efforts of landholders to manage the species will have been considered inadequate to restrict its impact. In such cases, government legislative intervention is necessary to require both private and public land managers to achieve socially desired levels of control for the species (Auld et al., 1987; Smith, 1987).

Legislation is therefore one way in which government can address 'market failure' in weed management. That is, the failure of some landholders to control a weed because the benefits to the individual are insufficient to justify undertaking weed control activity (Pannell, 1994). Where this causes the weed to spread onto neighbouring properties, the failure of the individual landholder to control the weed optimally may impose an unacceptably high

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external cost on all landholders (Carter, 2000; Jones et al., 2000; Walton, 2004). Mandated weed control therefore has an important role to play in restricting the negative impact of weeds in Australia.

The functions of weed legislation in Australia are generally to restrict the movement and sale of particular plants, to specify responsibility for weed control, and to determine a framework for coordinated weed control (Carter, 2000). Provisions are made under legislation in all Australian States and Territories requiring landholders to control specific weed species. These species are referred to in different legislative frameworks by various names. For example, in New South Wales (NSW), they are referred to as 'noxious weeds', whereas in Queensland (Qld) they are referred to as 'declared plants' (Parsons and Cuthbertson, 2001). Declared weeds are often categorised on the basis of their current distribution, invasive potential, and impact.

In NSW, the *Noxious Weeds Act 1993* identifies four weed control classes, and one restricted class. The weed control classes range from State Prohibited Weeds (Class 1), having at most a limited presence in the State, through to Locally Controlled Weeds (Class 4), which are widely distributed in the local areas in which they are declared noxious. Control requirements for Classes 1–4 plants range from eradication, generally for more recently introduced weeds with localised distribution, through to continued suppression and attempts to limit widespread species. Restricted Plants (Class 5) do not have any control requirements for existing plants, though landholders must notify the local control authority of their presence, and the sale and movement of these plants is restricted (NSW DPI, n.d.; Weeds Australia, n.d.).

At the time of the survey, three categories of declared plants were specified in the Qld *Land Protection (Pest and Stock Route Management) Act 2002*. Class 1 plants were those not commonly present in the State, but were deemed to pose a high enough risk that their eradication was mandated. Class 2 plants were established in the State and deemed to have adverse impacts. Reasonable steps were required by landholders to keep their land free of these plants. Class 3 plants were primarily environmental weeds, for which mandated control could only be required for land adjoining environmentally significant areas (Weeds Australia, n.d.). At the time of writing, the state of Qld was in the process of revising the Act.

The decision to mandate the control of a weed species has been attributed in part to politics, and more specifically to the attitude of the public to the plant (Amor and Twentyman, 1974). In some cases in Australia, plants have been declared noxious with widespread public support for no apparent reason other than public perception, attributed to the highly visible features of the plant which have made it conspicuous to the public (Amor and Twentyman, 1974). In other cases, a weed species will have an identifiable impact on agriculture and/or the environment, but relatively few people will consider it necessary to control it, due for example to its inconspicuous nature or lack of toxicity. In these circumstances, people are less likely to comply with informal norms or weakly enforced legal requirements, and mandated control will need to be more strictly enforced (Panetta and Scanlan, 1995).

Consequently, the extent of support among landholders for the declaration of a particular weed species depends upon both their specific circumstances, and their perceptions of the nature of the species. While there appears to be no prior detailed examination of the factors that influence landholders' support for weed declaration, some possible factors are discussed below.

#### *Factors influencing landholders' support for weed declaration*

##### *Pessimism about the possibility of control*

Where landholders feel there is little hope in reducing the burden of a widespread weed species to a manageable level, they may be less likely to be supportive of legal requirements to control the

species, and less likely to adhere to these legal requirements, even where legal requirements acknowledge that some form of control should be achievable (Panetta and Scanlan, 1995). This pessimism may be due to the attribution of weed problems to factors beyond the control of the landholders, something that was found to be very common in studies by Wilson et al. (2008) and Doohan et al. (2010).

##### *Costs and benefits of control*

Panetta and Scanlan (1995) evaluated the potential for voluntary public compliance with declared weed legislation for over 180 noxious weeds that had an impact on Australian agricultural production. Each species was rated with regards to its visual impact, potential costs, and potential benefits. They suggested that for many declared species, a low impact rating meant that there was a low likelihood of compliance with legislative requirements for control. Similarly, Veitch and Clout (2001) suggested that public perceptions of species considered to be 'invasive' depended on factors such as the damage caused by the species to agricultural and natural ecosystems, the visual appearance of the species, management cost, and media portrayal. For example, when a farm is invaded by fireweed (*Senecio madagascariensis*), its presence is generally highly visible and the economic costs to production can be considerable (Sindel and Michael, 1988). However, the perception that weed declaration infringes on the personal liberties of individual landholders may also be considered a cost of control (Smith, 1987). Consequently, determining landholder support for weed declaration will require acknowledgement that the 'cost' associated with an infringement on personal liberties must be balanced against the potential 'benefits' of more effective mandated control of the weed (Smith, 1987; Blackmore, 2008).

##### *The neighbourhood context*

A significant proportion of farmers was found by Wilson et al. (2008) to attribute their weed problems to poor control on neighbouring land. In a subsequent study, Wilson et al. (2009) found that farmers paid particular attention to the management of weeds by neighbours and on nearby public land when determining their weed control approach. They also found that individual landholders tended to overlook the possibility of coordinated action among groups of landholders across an area. Willingness to undertake control can depend on perceptions as to whether others will also do so (Marshall, 2008). Careful publicity, education, and community-based approaches may overcome the reticence of landholders to trust that their neighbours will manage weeds effectively (Berney et al., 2012; Coulston et al., 2012; Magnussen, 2012; Verbeek et al., 2014). However, if neighbours are not trusted to control weeds on their properties for various reasons (Klepeis et al., 2009), then landholders could support declaration in the hope that it forces their neighbours to do so. Alternatively, if a landholder neither trusts neighbours to control their weeds, nor trusts government to enforce control of declared weed species, then they may fatalistically see little point in supporting weed declaration. Palmer et al. (2009), for example, found trust in government was important in adherence to good biosecurity practices among graziers. However, some landholders may be unwilling to manage even declared weed species, because they dislike external parties telling them how to manage their land. Because of this, weed declaration must be supported by strict legal requirements to attempt weed control, motivating those landholders who are otherwise disinclined to control these weeds (Berney et al., 2012).

##### *Other influences*

In addition to the influences upon landholders' support for weed declaration described above, there are several other influences. For example, landholders beset by a major weed infestation problem might prefer to tackle the problem at their own pace and in their

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