Hymenachne headaches: addressing management issues associated with a conflict species

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Summary Hymenachne (*Hymenachne amplexicaulis* (Rudge) Nees (hymenachne) cv. Olive) is referred to as a conflict species because it can provide both economic benefits and negative environmental impacts. Finding a balance between the two makes the already difficult task of weed management more complex in this case. The National Hymenachne Management Group (NHMG) undertook to develop management strategies that would reduce the level of conflict amongst stakeholders and increase the uptake of strategic on-ground management. Two initiatives are helping to achieve this: the National Hymenachne Zoning Strategy, and the Guideline for the Containment of Olive Hymenachne to Genuine Grazing Systems. This paper summarises the processes undertaken to develop these initiatives and facilitate their implementation, the results to date and their potential application to other weeds.

Keywords Conflict species, collaborative, management, strategy, guideline.

INTRODUCTION

Hymenachne or olive hymenachne is an invasive semi-aquatic grass, officially released in Australia in 1988 as dry season cattle fodder for use in ponded pastures. It quickly escaped from the production systems for which it was intended, invading wetlands, watercourses, water storages, irrigation channels and drainage lines in agricultural situations such as sugar cane (Wearne *et al*. 2010).

Hymenachne continues to encroach on iconic wilderness areas of Australia such as Kakadu National Park and parts of Arnhem Land in the Northern Territory, Queensland's Wet Tropics and Cape York Peninsula. Tropical and sub-tropical areas are most at risk of incursion, however hymenachne has shown it can persist in cooler climates by establishing infestations in inland Southern Queensland and Northern New South Wales.

Through its ability to spread both vegetatively and *via* prolific seed production (producing up to 4000 long-lived seeds per seed head) hymenachne is rapidly fulfilling its potential distribution in Australia. It can form dense stands that are difficult and costly to control. Hymenachne therefore requires surveillance, early detection and immediate control once discovered.

Whether they know it or not, hymenachne is of importance to all Australians.

It is of economic importance to the sugar cane industry through increased farm and irrigation management costs; commercial fishers through negative impacts to native barramundi fisheries; and, to graziers through control and containment costs. Conversely, hymenachne provides economic benefits to those cattle producers using it in purpose-built ponds in Queensland and seasonal floodplains in the Northern Territory.

It is of environmental significance to all Australians due to its ability to alter natural wetlands and their associated wildlife, but particularly to land managers at all levels.

It is of social importance to recreational fishers, boating enthusiasts, bird watchers and other recreational users of waterways. The general public is impacted as a result of infested water storages and harboured mosquitoes. It is of cultural importance to Aboriginal people as it is degrading culturally important sites and can interfere with species composition of traditional hunting and gathering places.

It is due to these far-reaching impacts that hymenachne was included as a Weed of National Significance (WoNS) and demonstrates why a collaborative, national approach is needed to mitigate its impacts.

Conflicting attitudes persist towards the control of hymenachne, primarily due to its economic importance to graziers in certain situations, and, the significant negative impacts to biodiversity.

Since being listed as a WoNS in 1999 some important steps have been taken to reduce the conflict between those benefitting and those suffering as a result of its spread. Key initiatives include development of the National Hymenachne Zoning Strategy (NHZS) and the Guideline for the Containment of Olive Hymenachne to Genuine Grazing Systems (the grazing guideline).

METHODS

National Hymenachne Zoning Strategy (NHZS) The NHZS was developed collaboratively through the National Hymenachne Management Group (NHMG),

a stakeholder group formed to provide oversight of hymenachne nationally, following its listing as a WoNS. The NHMG consists of representatives from industry (grazing, sugar cane), government (local and State/Territory), research, environment and the community.

The NHMG realised that a national strategy was needed to tailor management approaches to different parts of hymenachne's existing and potential distribution. This is because further spread is inevitable unless effective action is taken—there is substantial spatial variation in the risk of invasion, in its impacts, and its control options. Values attributed to the species differ widely from region to region. The management objectives agreed to within the NHMG were prevention (high and low risk), eradication, containment and asset protection (Grice *et al.* 2011).

Hymenachne spreads primarily *via* water and as a consequence it was deemed logical to differentiate management zones using catchment boundaries. The Australian mainland was accordingly divided into 22 management zones for the purposes of assigning management objectives.

A workshop was convened whereby the NHMG and other stakeholders prepared a national map with one of the four management objectives assigned to each of the catchment-based zones. This was based on existing infestation levels, habitat suitability and control feasibility. A process of consultation was then undertaken and, following some amendment, a final version of the NHZS was agreed to by all stakeholders in late 2010.

The process from conceptualisation to final agreement took approximately three years. This was due in no small part to conflicting management views of stakeholders. The consultation element of the development process, and its associated conflicts, essentially a by-product of a management strategy rather than the goal, should not be underestimated as a key factor in reducing the level of conflict between stakeholders that traditionally held disparate views. It has also paved the way for these stakeholders to undertake similar processes for other weeds that have conflicting values.

Importantly, it was recognised that broad acceptance of the NHZS by relevant land managers was vital to its success as a management strategy. Subsequently, members of the NHMG and particularly the National WoNS Coordinator continue to promote the NHZS nationally for effective management of hymenachne, as well as an example of a model using geographically differentiated zones to define management objectives for use with different weeds with different spread mechanisms, on all scales—from national, down to State/Territory, regional and local levels.

Grazing guideline A more recent initiative taken by the NHMG aimed to build on both the management and collaborative aspects of the NHZS by further engaging the grazing industry in the collaborative development of a guideline that articulates how economically important hymenachne infestations should be treated.

A code of practice approach had been proposed by various sectors as a means of resolving conflicting views on hymenachne management. An example of this approach has been in place in Queensland since 2000 for leucaena (*Leucaena leucocephala (Lam.) de Wit* subsp. *glabrata (Rose) Zárate*) in an attempt to mitigate against environmental impacts when the plant is used as part of a managed grazing system. The fundamental difference between leucaena and hymenachne from a management perspective however, is that leucaena is not a declared plant at the State/Territory level, while hymenachne is declared in every State and Territory of the country.

Subsequently, rather than adopt an approach such as that used for leucaena whereby those choosing to grow it voluntarily abide by a set of measures designed to contain the plant to the grazing system, the NHMG chose a subtly, yet importantly, distinctly different path. It was decided to develop a guideline to help graziers meet their legislative requirements by containing hymenachne to existing genuine grazing systems. The key difference with this approach and that used for leucaena, is that the guideline does not provide for new plantings of hymenachne. It recognises plantings exist (*via* promotion by well intentioned past governments and landowners acting in good faith), and seeks to minimise the negative impacts these may have. The guideline does not excuse landholders with hymenachne from their legislative management responsibilities. Indeed, it emphasises that all with hymenachne have an obligation to manage it.

At the core of hymenachne management conflict is the perceived grazing benefit it provides in circumstances outside genuine grazing systems. That is, when a creek, swamp, dam or other areas that do not dry out is infested, in reality it provides little if any grazing benefit due to stock reluctance to access and graze it when standing in water. Despite this, many graziers are reluctant to commit resources towards removing what they may see as another pasture grass. Therefore, the first and perhaps most crucial step in this process was to define 'genuine grazing systems' that the guideline would apply to.

An agreed definition was arrived at following discussions with several graziers in Queensland and the Northern Territory that use hymenachne as part of their grazing enterprises, albeit in different ways.

Essentially, the agreed definition includes ponded pastures in Queensland and planted floodplains in the Northern Territory. In both situations, the definition includes existing systems only, which are known to each jurisdictional government. These systems will generally (if not always) occur in *containment* zones of the NHZS.

Containment as a management objective for hymenachne is a work in progress, with research into its feasibility continuing. Acknowledging this, the guideline sets out practical measures for landholders to take that are likely to reduce spread away from genuine grazing systems.

Importantly, it acknowledges that any hymenachne outside these systems does not provide grazing benefit and should be removed by landholders. The peak industry bodies for grazing in both Queensland and the Northern Territory have participated in the development process of the guideline and endorsed its content. The guideline is consistent with legislation in both Queensland and the Northern Territory in that new plantings are prohibited and land managers have an obligation to prevent spread.

RESULTS

Both the NHZS and guideline have succeeded in resolving conflict surrounding the management of hymenachne at least to the extent that the key stakeholder groups have been brought together and now share common views on its management for the future. The NHZS sets out a strategic management approach that is understood by stakeholders due to its spatial representation and justified by parties charged with its implementation.

The guideline promotes hymenachne as a problem within the grazing industry and encourages all landholders that have it to manage it. By advocating this approach, industry is seen to be taking a proactive and environmentally and socially responsible approach.

It is acknowledged by the NHMG that weeds are not killed by strategies and guidelines alone. It is the landowners and managers that are responsible for control and it is they who must be engaged for either initiative to succeed. It is hoped ongoing promotion of both initiatives by government and community groups will help to achieve this.

DISCUSSION

Where to from here? Both initiatives will continue to be promoted to those with a stake in weed management. Anticipated legislative change in Queensland has been targeted by the NHMG as an opportunity to formalise the NHZS and guideline approaches. Most State and Territory pest management legislation enables zoned management of weeds, however few currently apply it. As mentioned previously, there is scope for this approach to be applied to other weeds with other spread mechanisms with refinement to all scales. Not all weeds are considered conflict species, but the management of all weeds will benefit from a collaborative, strategic and pragmatic approach.

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