

Buffel grass management in Indigenous communities

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Summary Buffel grass has been recognised as one of the greatest threats to biodiversity, in South Australia's arid and semi-arid rangelands, (Williams and Barauch 2000). It has the capacity to transform ecosystems through habitat loss, competition with native plants and alteration of natural fire regimes. Buffel grass is increasingly impacting on the culture and health and safety of Indigenous communities and new approaches to the management of this devastating weed are being employed.

Advances gained from South Australian research has resulted in the application of new control options, increasing the efficiency and effectiveness of herbicide application. The emergence of new technologies has resulted in the use of drones and user-friendly platforms for the mapping of buffel grass infestations in Indigenous communities.

These new and innovative ways of effectively managing buffel grass are being employed to improve the condition of country and manage the threats posed to the environment and culture in Australia's rangelands.

A focus on building the capacity of Indigenous communities has seen a changing face of Indigenous managed lands. 'Healthy country planning' is being used to develop achievable management objectives for a range of cultural and environmental issue such as weed management.

Keywords Great Victoria Desert, natural resources, Indigenous communities, herbicides, technology.

INTRODUCTION

Buffel grass (*Cenchrus ciliaris* L.) is a deep-rooted, perennial grass native to eastern Africa, Saudi Arabia, Afghanistan, Pakistan and India. Buffel grass was widely planted between the 1960s and 1980s across vast expanses of central Australia as both a pasture grass and dust suppressant in remote communities. It has since spread across large areas of Northern Territory (NT), Queensland, South Australia (SA) and Western Australia (WA) threatening the very things that make Australia unique, our Indigenous culture and world-renowned biodiversity.

Considered one of the world's worst invaders, buffel grass is listed as a key threatening process to

Australia's biodiversity and is considered the most significant invasive grass of the Australian arid heartlands with the capacity to alter entire ecosystems in a relatively short time frame (Williams and Baruch 2000).

The ability of buffel grass to change the fire regimes of entire landscapes could be the most significant impact. Being more flammable than native grasses and invading areas at high density, buffel grass produces high-intensity fires more frequently, damaging ecosystems never previously exposed to such extreme temperatures. Increased frequency of fires results in an inability of plants such as *Triodia* (spinifex) to grow, mature and set seed due to their evolution under natural fire regimes. High frequency and intense fire regimes kills many woodland trees and shifts woodlands towards a degraded grassland ecosystem dominated by buffel grass and without the biodiversity that once thrived in these areas. People in the remote outback also are at risk from more intense frequent fires threatening communities. Buffel grass is threatening specific species of high conservation and cultural importance, such as the endemic Everard garland lily (*Calostemma abdicatum* P.J. Lang) and EPBC (*Environment Protection and Biodiversity Conservation Act 1999*) listed Black-footed Rock Wallaby and Malleefowl. Impacts in Indigenous communities include a loss of bush foods and bush medicines, reduced availability of hunting opportunities through species decline, reduced ability to track prey and infestation of rock holes and sites of cultural significance as depicted in this short film *Storm on the Horizon* (<https://vimeo.com/206163898>)

The 'Healthy country planning' (HCP) process has a strong emphasis on traditional owner engagement. An inaugural Southern Desert Ranger Forum was held in the Great Victoria Desert (GVD) in 2017 as part of the 'Buffel Free GVD' project, providing an opportunity for Indigenous rangers from SA, NT and WA to learn from the experiences of researchers, fellow rangers and traditional owners. This presentation outlines research findings and provides an overview of buffel grass management in Indigenous communities.

MATERIALS AND METHODS

A three-year project titled 'Buffel Grass Control in Arid Rangelands' commenced in 2013 with a focus

on developing best practice buffel grass control options through extensive herbicide trials. Trials were undertaken in three locations throughout the state including the Anangu Pitjantjatjara Yankunytjatjara (APY) Lands (a remote Indigenous community in North-Western South Australia). Further trials have recently been undertaken in the Anangu Pitjantjatjara Yankunytjatjara Lands to refine the application rate and assess the effectiveness of aerial application of a granular form of flupropanate, enabling efficient treatment of buffel grass in remote, difficult to access terrain without a requirement for large quantities of water (often a limiting factor in the arid rangelands of central Australia).

Since 2007, numerous Indigenous ranger groups have been established, providing opportunities for rangers to participate in both formal and informal training opportunities as well as conducting a variety of works on country to protect both the cultural and environmental assets of the region.

Extensive HCP is being undertaken in Indigenous communities throughout the GVD in an effort to identify threats to the health of Indigenous culture and the environment in which it is intrinsically interconnected. Healthy Country Plans are developed in close consultation with communities in an effort to build ownership over land management issues such as fire management, rock-hole management, threatened species management and predator control. Buffel grass management has been rated the highest priority in many of the HCPs with aspirational goals identified such as eradicating buffel grass from the region within a 10-year period. Supported by Ten Deserts org, Rangelands NRM, Indigenous Desert Alliance, Alinytjara Wilurara Natural

Resource Management (AW NRM) and others, project planning is underway for a collaborative cross-border Buffel Free GVD project.

RESULTS

A key outcome from this project includes the results of trials identifying a grass selective residual herbicide Taskforce® (RTH and RTL) effective in controlling mature buffel grass tussocks and suppressing new germinations for approximately 18 months (Figure 1). Use of this herbicide enables treatment all year round as opposed to the limited window when buffel grass is actively growing and dramatically reduces the amount of follow-up control required as detailed in Bowman and Prider (2016). For further information regarding the results of the herbicide trials can be found elsewhere (Bowman and Prider 2016).

Trials undertaken by a University of Adelaide student (Tschirner 2016) led to the discovery of an organic herbicide (Bioweed™) proven to be effective in destroying both aerial and surface seed in addition to the temperature and duration of heat exposure required to destroy buffel grass seed (Figure 2).

DISCUSSION

The Buffel Free GVD project will provide opportunities for Indigenous land managers and ranger groups from across the GVD (both WA and SA) to prioritise and implement buffel grass control strategies together, not only through on-ground control efforts but also through planning and ranger exchanges to build capacity within all groups. Indigenous land managers will be able to communicate with others about the negative impacts of buffel grass and the long-term goals of a

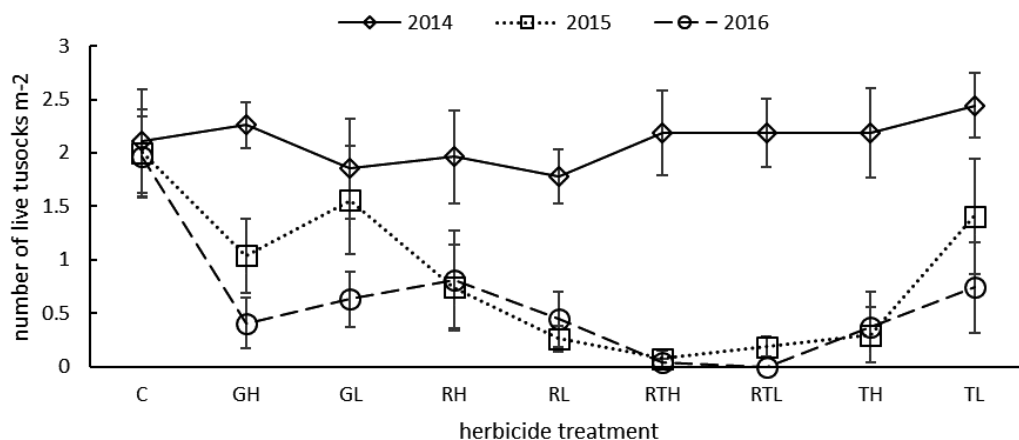


Figure 1. Results of the buffel grass herbicide trials.

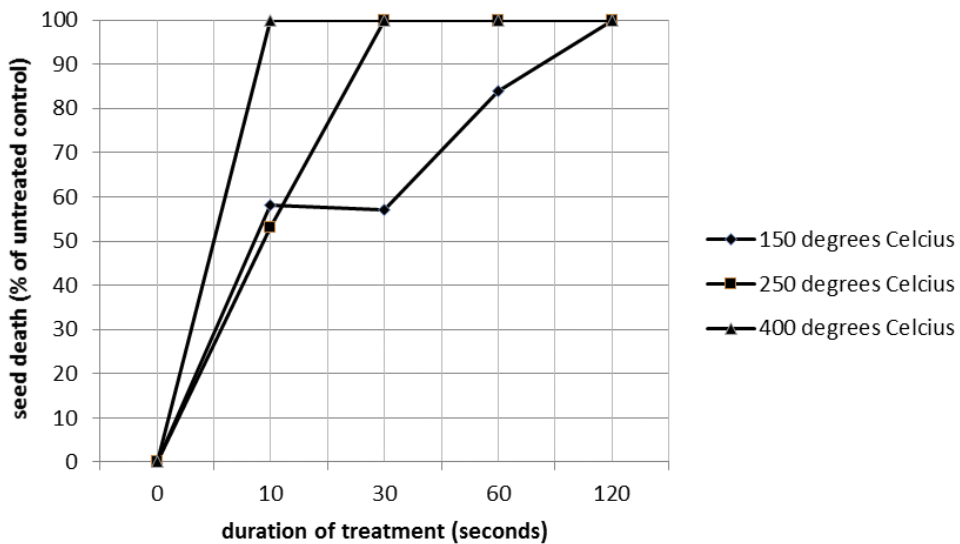


Figure 2. Temperature and duration of heat exposure required to destroy buffel grass seed.

Buffel Free GVD to ensure community buy-in and long-term stakeholder support across the region. The development of a 'GVD Bioregional Buffel Grass Management Plan' will incorporate existing plans, consult stakeholders and develop an integrated plan with maps to highlight priority areas including ecological hotspots, cultural sites and introduction pathways for treatment both at an individual organisational level and suitable for strategic responses. The development of the Plan will incorporate digital and cloud based data collection and monitoring.

Indigenous communities in the GVD are embracing new control tools and are now moving toward an integrated approach using liquid and granular flupropanate in combination with the organic product and burning to destroy aerial and surface seed.

Indigenous communities throughout SA and the GVD are increasingly adopting new tools and technologies for managing buffel grass. Communities have undertaken extensive mapping and monitoring of infestations through the use of tablets and mobile phones and in the case of Spinifex Land Management, recently undertaken aerial mapping of the Tjuntjuntjara community through the use of a drone.

Spinifex rangers have not only proactively tackled buffel grass infestations, they have also been instrumental in delivery of training to other Indigenous communities in the region. This peer-to-peer training methodology has proven hugely successful and has been praised by those involved. Spinifex Land Management undertook a total of 2078 km of roads and

tracks in 2016, representing 79% of known tracks (up from 22% in 2015).

In addition to adoption of new control tools and technologies, Indigenous communities are increasingly involved in opportunities to share learnings and experiences to improve the condition of country at a landscape scale. The inaugural Southern Deserts Ranger Forum was held in Ilkurlka in June 2017 with the 2018 forum held in the WA Goldfields. The forums were a resounding success and all of the Indigenous rangers in attendance strongly supported the idea of such a forum being an annual event.

The events have attracted more than 150 people from across Western Australia, South Australia and the Northern Territory, 102 of whom were Indigenous rangers. Collectively the ranger groups in attendance manage an area of 1.2 million square km across Western Australia and South Australia.

In addition to oral and practical sessions on buffel grass management, the forum was an opportunity for ranger groups to discuss camel management, rock hole and threatened species management, firearm safety, the importance of monitoring and data management and predator control.

AW NRM Board are the authority responsible for planning, coordinating and facilitating buffel grass management in Indigenous communities of North-Western South Australia. The region is committed to eradication of all infestations in the Maralinga Tjarutja (MT) Lands and protection of key sites of cultural and environmental significance in the APY Lands.

The region will provide ongoing support to build the capacity of Indigenous communities to manage buffel grass through the provision of both formal and informal training opportunities and the purchase of equipment to enable best practice surveillance and control.

CONCLUSION

Buffel grass has been recognised as one of the greatest threats to biodiversity in South Australia's rangelands. Co-design of HCP and formal and informal training opportunities are a focus on Aboriginal managed lands. Indigenous ranger forums provide a valuable capacity building opportunity for Indigenous land managers and improving buffel grass management throughout South Australia, Western Australia and the Northern Territory. Improved best practice management of buffel grass is being used throughout Aboriginal managed lands with a tri-state buffel grass management project commencing throughout the GVD in 2018.

REFERENCES

- Bowman, T. and Prider, J. (2016). Buffel grass herbicide trials. http://www.pir.sa.gov.au/__data/assets/pdf_file/0004/288652/Bufel_Grass_Herbicide_Trial_Report.pdf (accessed 1 August 2018).
- Tschirner, A (2016). The effects of temperature extremes and two herbicides on the germination of buffel grass (*Cenchrus ciliaris* L.) and implications for its management. Honours Thesis, University of South Australia.
- Williams, D.G. and Baruch, Z. (2000). African grass invasion in the Americas: ecosystem, consequences and the role of ecophysiology. *Biological Invasions* 2, 123-40.