DEPARTMENT OF LAND RESOURCE MANAGEMENT

BELLYACHE BUSH MANAGEMENT IN THE DALY RIVER CATCHMENT

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Protecting the production and biodiversity values of the Daly River catchment, through stakeholder engagement and adaptive integrated management of bellyache bush

Summary

Large scale integrated management strategies are required for bellyache bush (*Jatropha gossypiifolia*) in the Daly River catchment of the Northern Territory. A Biodiversity Fund project in conjunction with the NT Government aims to evaluate fire, grazing and chemical control options, with direction from the range of affected stakeholders in the catchment. Aerial herbicide application can be cost effective, but previous results have been variable, confounded by climatic conditions and water quality and coverage. A trial was implemented in the 2014-15 wet season to compare a range of herbicides, adjuvants and water rates. Damage to bellyache bush, effect on non-target species and regeneration of production and biodiversity values were evaluated. Early results indicate metsulfuron plus 2,4-D amicide with Bonza® was the most effective treatment. More conclusive results will be collated after measurements are conducted in the 2015-16 wet season. On-ground follow-up control is essential. Feedback and collaboration with the land managers has provided ownership of outcomes at a catchment level.

Background

- The Daly River catchment encompasses 54,000 km^2 and provides livelihoods for a range of stakeholders across a range of land tenures
- The catchment has the most extensive bellyache bush infestation in the Northern Territory infesting an estimated 12,000 ha
- Bellyache bush can form dense, impenetrable thickets often inaccessible during the optimal control time
- Affected landholders wanted to investigate options for cost effective catchment scale management
- A five year Australian Government Biodiversity Fund project co-funded by the Northern Territory Government was initiated in 2012
- Integration of fire, grazing management and chemical control, both aerially applied, and on-ground application, will be evaluated.

Collaboration

- A shared concern led to the formation of the Daly River Bellyache Bush Stakeholder Group, including pastoralists, aboriginal land managers, national parks and recreational users who provides direction for the project
- A cross-tenure catchment plan aims to reduce the rate of spread to clean areas, enhance the condition of the landscape, protect riparian values and to facilitate sustainable grazing practices
- Each year the group meets to review their management activities and plan for the next season.

Herbicide trials

- Aerial herbicide application is useful for broad scale integrated management, but factors effecting herbicide efficacy may be compounded
- Adjuvants can provide significant improvements to herbicide efficacy under non-ideal conditions
- Water volumes will influence cost-effectiveness
- Aerial herbicide trials were implemented with consideration of these factors.

Results

- Damage and mortality were evaluated; adult cohort results are presented in Table 1
- Preliminary results indicate metsulfuron with Bonza® at 150L/ha gave promising cost effective results, but that the addition of 2,4-D amicide may increase overall effectiveness
- Further evaluation is required in the 2015-16 wet season to determine if initial damage translates to mortality.

Conclusion

- Stakeholders have found that aerial application 'breaks up' large thick infestations by killing off many plants, meaning that feasibility for on-ground control is greatly increased, and fire can also be used more effectively
- Management requires targeted allocation of aerial herbicide application, on-ground application, fire and movement of stock to allow pasture regeneration to ensure bellyache bush does not re-establish
- Identification of strategic infestations and stakeholder priorities, led to development and implementation of a catchment scale plan
- Results from these trials will be used to further inform this catchment management plan.

Integrated bellyache bush management

Aerial herbicide application Plots of dense bellyache bush infestations were identified and marked with GPS by helicopter, and treatments randomly allocated.

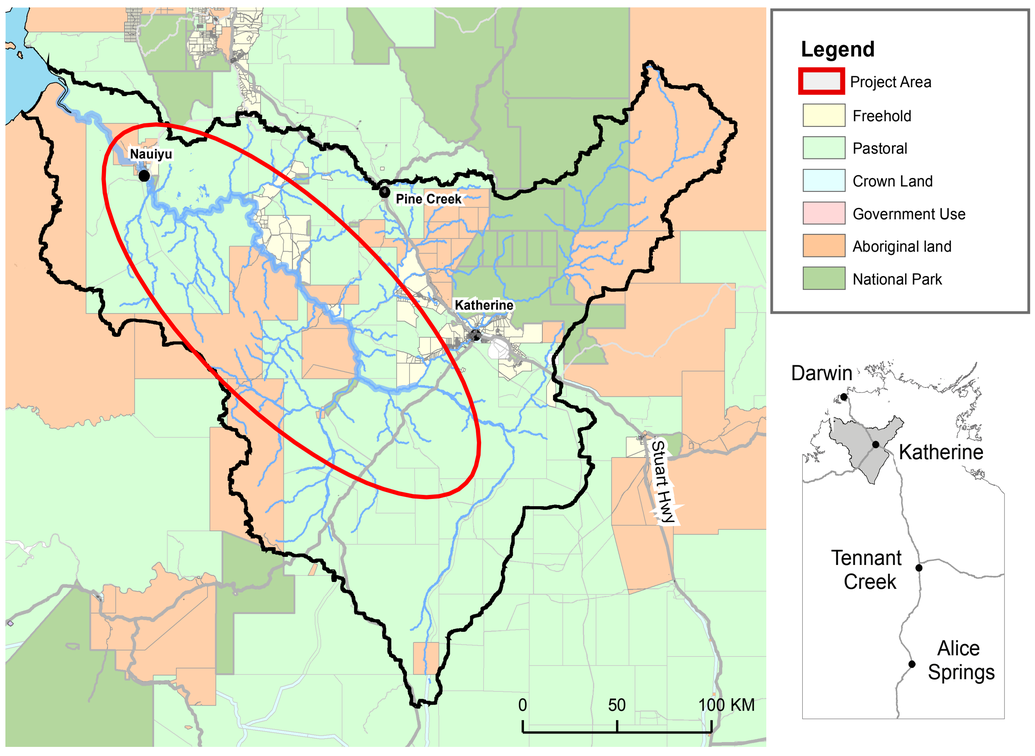
On-ground assessment Numbers of bellyache bush adults, juveniles and seedlings were assessed prior to herbicide application. Damage and mortality were assessed post-treatment

Before treatment Bellyache bush infestation prior to application of the metsulfuron (120g/ha product) and Bonza ® (500ml/100L) at 150L/ha treatment in February 2015

After treatment Results five months after aerial treatment application. Preliminary results show the metsulfuron treatment with Bonza® adjuvant at high water rate gave promising control.

Herbicide coverage Marker compound was added to selected tank mixes to compare herbicide coverage between treatments and to confirm level of herbicide interception by bellyache bush in woodland habitats.

Fire Burning is an essential component of integrated bellyache bush control and can be used effectively if thick infestations are 'broken-up' by aerial herbicide application.



Herbicide treatments

Table 1. Herbicide, adjuvant and water volume treatments. Products used: Metfuron 600WG®(metsulfuron-methyl 600g/kg); Amicide®Advance 700 (2,4-D amine 700g/L); Starane™Advanced (fluroxypyr 333g/L); Pulse® (1020 g/L polyether modified polysiloxane); Bonza® (471 g/L paraffin oil). Results for adult plants were qualified based on mortality % and damage ratings. Product cost is listed to compare between treatments.

Herbicide (Tradename)	Application rate (product)	Adjuvant	Adjuvant rate (ml/100L)	Water Volume (L/ha)	Success	Cost ($/Ha)
Starane™ Advanced	900 ml/ha	Pulse®	200	150	Poor	30.15
Amicide® Advance	1.5 L/ha	Pulse ®	200	150	Poor	18.75
Amicide® Advance	1.5 L/ha	Bonza ®	500	150	Poor	13.35
Metfuron® + Amicide® Advance	120 g/ha + 1.5 L/ha	Bonza ®	500	150	Very good	17.30
Metfuron® + Amicide® Advance	120 g/ha + 1.5 L/ha	Pulse®	200	150	Good	22.80
Metfuron®	120 g/ha	Pulse®	200	150	Poor	13.85
Metfuron®	120 g/ha	Pulse®	400	150	Good	23.75
Metfuron®	120 g/ha	Bonza®	500	150	Very good	8.40
Metfuron®	120 g/ha	Bonza®	1000	150	Good	12.80
Metfuron® + Amicide® Advance	120 g/ha + 1.5 L/ha	Pulse®	200	60	Poor	16.85
Metfuron® + Amicide® Advance	120 g/ha + 1.5 L/ha	Bonza®	500	60	Good	13.60

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