

From prickly acacia to pasture – a mechanical control field study

Introduction

While a range of mechanical control options are available for prickly acacia (*Vachellia nilotica*), they have become less favoured due partly to the perceived risks of mass prickly acacia germination and the high follow-up control requirements. A field study, conducted during 2015-2017 at a property near Richmond in north-west Queensland, aimed to examine pasture and seedling responses to mechanical control (dozer pushing) of mature prickly acacia. Results were compared with adjacent untreated sites.

Materials and methods

The study site comprised an area of dozer-pushed prickly acacia trees (for drought fodder) and an adjacent area of untreated trees. Twenty mature trees were selected from the untreated and treated areas respectively. The sites were assessed for seedling presence and pasture cover once annually (late April - early May) over three years. For both treated and untreated sites, seedling counts were undertaken within a 5 m radius from the middle of the stem-base of each tree or where the tree had stood prior to treatment. Both live and dead seedlings were recorded. Pasture cover was assessed using representative quadrats within a 5 m radius of each tree stem-base in both treated and untreated sites.

Results - prickly acacia seedlings

High numbers of seedlings were counted in treated sites after the first wet season. However, only one seedling was found in the second year and low numbers in the third year (Table 1). No sapling establishment was recorded after three years in both the treated or untreated sites.

Table 1. Seedling counts (both live and dead) at untreated and treated sites

Monitoring year	Untreated sites Total seedlings	Average no. seedlings at untreated sites	Treated sites Total seedlings	Average no. seedlings at treated sites
2015	96	4.8	293	14.7
2016	0	0	1	0.1
2017	21	1.1	0	0

Results - pasture response

Low pasture cover was present when first assessed in 2015 with marginal increases in 2016 (Figure 1). Major increases in pasture cover occurred in 2017, with significantly more pasture at the treated sites than untreated sites (Figure 2) following improved rainfall (Figure 3).

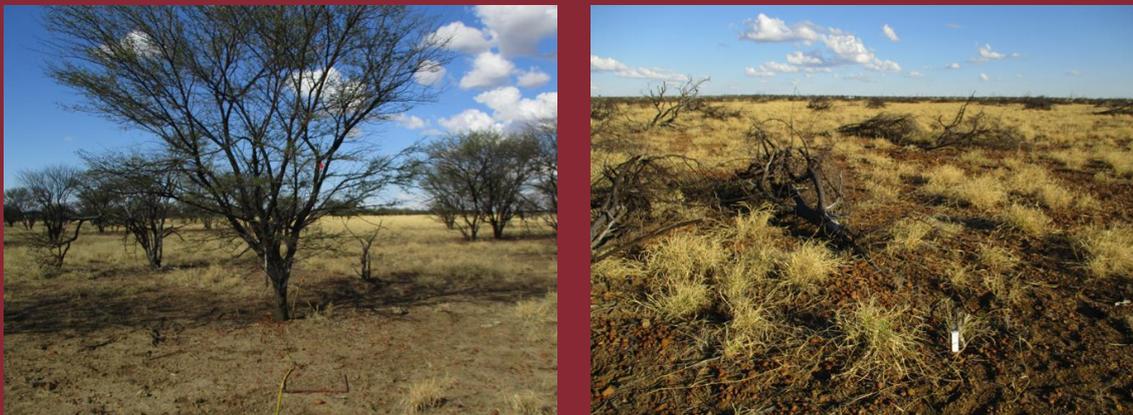


Figure 1. Pasture cover was noticeably higher at dozer-treated sites (right) than untreated sites (left) by the second year of monitoring.

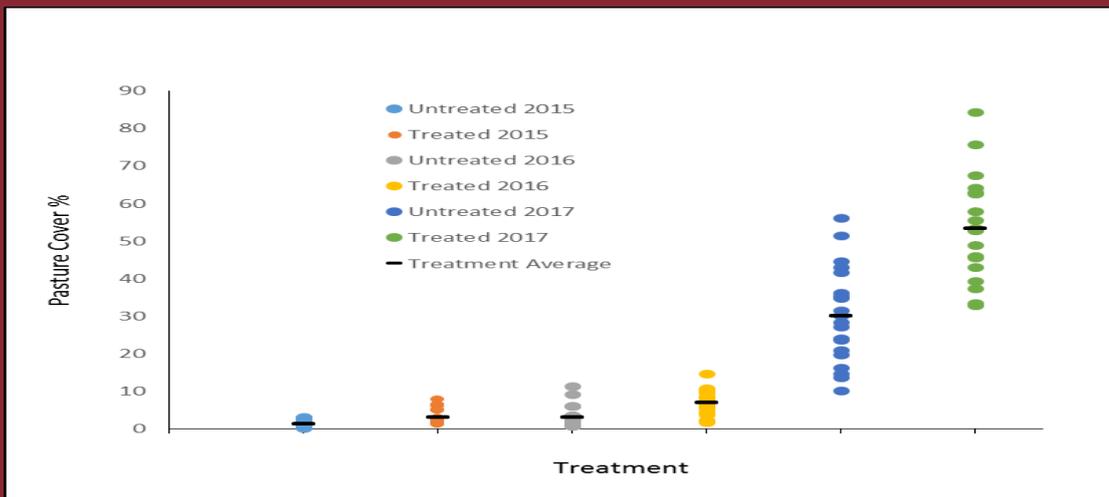


Figure 2. Pasture cover recordings over the duration of the study with lines representing average pasture cover of the untreated and treated sites.

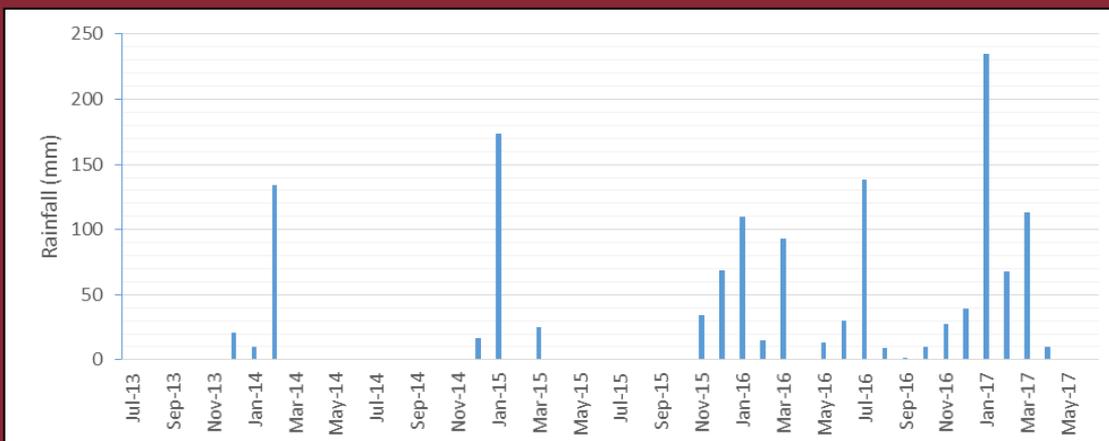


Figure 3. Monthly rainfall totals from 12 months before treatment to the end of monitoring in 2017.

Discussion

In this study, the landholder has gained foliage fodder of prickly acacia through dozer pushing and improved pasture cover in the following years with negligible follow-up control. While the use of mechanical control options may potentially increase the risk of seedling germination and survival in higher rainfall years, these results indicate it can also yield significant benefits without the need for excessive follow-up control when undertaken at preferential times such as during extended low rainfall periods.

Key lessons

- Timing mechanical control with periods of low rainfall will reduce prickly acacia germination and establishment risks.
- Target mechanical control at areas with lower soil seed loads.
- Mechanical control may provide benefits of fodder provision while also achieving complementary weed control objectives.



Figure 4. Monitoring of the dozer-pushed site in May 2017, three years after treatment, shows excellent pasture cover and negligible prickly acacia regrowth.

Acknowledgements

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Further information

Further information is available from SG NRM (call 1800 676 242 or visit <http://www.southerngulf.com.au/resources/fact-sheets/>) or from Biosecurity Queensland (call 13 25 23 or visit <http://bit.ly/2tZIGT9>).