Case Study - Improving pasture productivity for condition ‘D’ lands

**Desert Channels Queensland**

**Key Points**

- Improving pasture productivity in Queensland’s rangelands is being fast tracked in areas of poor condition (type D lands)
- Trials are occurring to identify techniques to regenerate pasture quickly to improve the areas to condition type A or B (good condition)
- Outcomes from these trials will support Queensland’s four pillar policy of doubling agricultural production.

**Background**

To ensure that funding for natural resource management in Queensland’s rangelands contributes to improving agricultural productivity, Desert Channels Queensland (DCQ) is currently undertaking trials to assist landholders improve pasture productivity.

On Auteuil, a property south of Aramac, extensive work has been carried out to identify areas of poor condition. These areas are often in such condition because of large scale infestations of prickly acacia that dramatically reduce the pasture biomass. These areas often contain little to no pasture (approximately 100kg/ha), greatly reducing the ability to run stock and increasing the likelihood of erosion over time, which will contribute to a further decline land condition. This type of land is classified as type D land under the Queensland Government Stocktake program.

An example of this on Auteuil is shown in Box 1, which shows the low levels of pasture in the area due to the competition for light and nutrients from the woody weeds.

Trials however are being implemented to transition these lands into more productive areas as shown in box 2. Moving the area into condition type A or B is likely to significantly improve carrying capacity and the production

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**Box 1 – Typical type D condition land on Auteuil with poor pasture production**

- Biomass of pasture – less than 100 kg/ha
- Carrying capacity – approx. 1 beef cattle for 40 ha
- Estimated production value – approx. $4/ha

**Box 2 – Aspirational land condition type A or B for Auteuil following trials**

- Biomass of pasture – greater than 2000 kg/ha
- Carrying capacity – approx. 1 beef cattle for 10 ha
- Estimated production value – approx. $16/ha
value of the property. Using data from Stocktake manuals, improving the pasture condition from D to A/B will improve the production value by a factor of 10. This will greatly improve the financial viability for the landholder, as well as ensure that the property is sustainable into the long term. In addition to having good pasture for stock, good ground cover will also assist in supporting native species and improving water quality.

The trials involve comparing two sites over five years to identify techniques required to quickly establish pasture and improve condition. As shown in the below map, site A will be fenced off from cattle and kangaroos. This site will be compared with site B which will have the dead prickly acacia pushed and the area seeded with buffel grass and no animal fencing. The results from this trial will provide clear information on how important stock exclusion is to quickly establish pasture grasses in very poor condition areas.

DCQ and the landholder will take 6 monthly records documenting pasture species, biomass, photos and any regrowth of weed species. Information gathered will provide a valuable guide to other landholders in the region who are undertaking similar programs to quickly regenerate pasture in poor condition sites.

**Outcomes of the trial site**

- Increased knowledge of regenerating pasture in type D condition lands.
- Significant increase in carrying capacity and production value for the property.
- Improved skills for the landholder to improve pasture production.

**Maps of the areas subject to the trial**
The trial site

Although the trial sites A and B (both 1 hectare) were chosen in December 2013 when the initial treatment program was conducted, Site A wasn’t fenced off until December 2014. Observations and changes are detailed in tables 1 and 2 below.

Table 1: trial site data (Site A)

<table>
<thead>
<tr>
<th>Date</th>
<th>Land condition</th>
<th>Prickly acacia stem density</th>
<th>Biomass</th>
<th>Groundcover</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dec 13</td>
<td>D</td>
<td>2500/ha</td>
<td>&lt;100kg/ha</td>
<td>5%</td>
<td>Time of initial treatment</td>
</tr>
<tr>
<td>Dec 14</td>
<td>D</td>
<td>0</td>
<td>&lt;100kg/ha</td>
<td>5%</td>
<td>325mm rain; high grazing pressure*</td>
</tr>
<tr>
<td>Sep 15</td>
<td>C/D</td>
<td>3</td>
<td>&gt;500kg/ha</td>
<td>30%</td>
<td>Low rainfall; good recovery trend</td>
</tr>
</tbody>
</table>

* an additional 2000 head of cattle were run on the property despite advice to landholder to wet season spell to aid recovery.

Table 2: trial site data (Site B)

<table>
<thead>
<tr>
<th>Date</th>
<th>Land condition</th>
<th>Prickly acacia stem density</th>
<th>Biomass</th>
<th>Groundcover</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dec 13</td>
<td>D</td>
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<td>&lt;100kg/ha</td>
<td>5%</td>
<td>325mm rain; high grazing pressure*</td>
</tr>
<tr>
<td>Sep 15</td>
<td>D</td>
<td>3</td>
<td>&lt;100kg/ha</td>
<td>5%</td>
<td>Negligible recovery trend</td>
</tr>
</tbody>
</table>

Conclusions

Despite the low rainfall for the 14/15 year, there was a marked recovery of pasture at Site A, the exclusion area. The noted increase in the diversity of grass species and biomass in the absence of good rain, lends weight to the benefits of wet season spelling of country to improve land condition.

While there was no measurable change in erosion, but sediment deposition indicates a slowing of runoff which, in turn, should mean less erosion. Future data on erosion will better indicate trend.

Prickly Acacia recovery rate of 3 stems per hectares reflects a kill rate well in excess of the targeted 99% for aerial application of residual herbicides. In addition, this recovery rate is well within the range for maintenance treatment by landholders.

Site B has similar levels of biomass and ground cover as was recorded prior to treatment. This not only reinforces the necessity of the exclusion fence, but it highlights how continued grazing (whether by domestic livestock or native herbivores) can hamper land condition recovery.

Photo representative of the increase in biomass at Site A. Green grass tussocks beside stem of dead prickly acacia at Site A.