# Northern Downs – Factsheet 3: Controlling prickly acacia to improve drought resilience

**Key finding**

Treating prickly acacia across the whole property was profitable, but had a large peak deficit ($1.3M).

Prioritising minimal and low-density infestations rather than high level infestations provided better returns when investing $10,000 initially.

The economic impact of a range of management strategies and technologies was analysed by Queensland's Department of Primary Industries to identify potential strategies that could make grazing businesses in the Northern Downs more profitable and drought resilient (*see Factsheet 1 in this series*). This factsheet provides more information on the costs and benefits from controlling the woody weed Prickly Acacia.

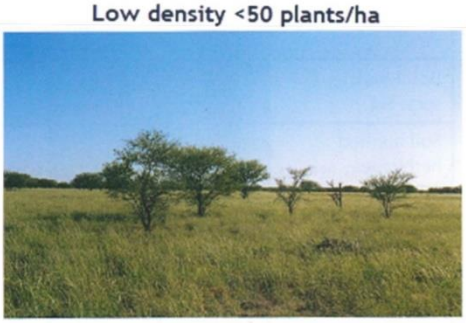
Prickly acacia (*Vachellia nilotica* subsp. *indica*) is estimated to have infested millions of hectares in Queensland. It is having an ongoing negative effect on livestock carrying capacity and the associated productivity and profitability of affected properties. The evaluation presented in this factsheet is based on a 16,000-ha Mitchell grass downs property that has 80% of its area already infested with prickly acacia, to at least a low degree (low to high density, see images below).

## Production impacts from infestations

Prickly acacia infestations can significantly reduce pasture production potential depending on the level of infestation. The table below outlines the assumed pasture production potential for each infestation level. Across the whole property, carrying capacity was reduced by 25%.

| Infestation level | Property area | Canopy cover | Pasture *(% of production potential)* |
|---|---|---|---|
| High | 5% | >50% | 10% |
| Moderate | 15% | 25-50% | 50% |
| Low | 60% | 10-25% | 75% |
| Minimal | 20% | <10% | 100% |

Low density <50 plants/ha



50 plants/ha

Medium density 50-150 plants/ha

150 plants/ha

High density >150 plants/ha

650 plants/ha

## Control methods and costs

Controlling prickly acacia can be achieved by using mechanical means (e.g. loader and bucket, double chain pulling) or by applying herbicides (e.g. Tebuthiuron with Skattergun or hand applicator / Fluroxypyr with basal bark or foliar spraying. The cost to effectively control prickly acacia using a combination of methods includes follow up treatments applied to regrowth each year (see table below).

| Infestation level | Treatment costs ($/ha) | | Maintenance costs ($/ha) |
|---|---|---|---|
| | *Yr 1* | *Yr 3* | *Every 5 yrs* |
| High | $250 | $125 | $5 |
| Moderate | $100 | $25 | $2 |
| Low | $50 | $15 | $2 |
| Minimal | $2.50 | - | $2 |

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Prickly acacia infestation was assumed to reduce pasture production by 0.5% per year in all levels of infestion up until a wet sequence of years occurred. A sequence of wetter than average years was assumed to have the effects on pasture production detailed in the table to the right.

| Existing infestation | Pasture *(% of production potential)* | Pasture production decline (*without control*) |
|---|---|---|
| High | 10% | 0.5% per year |
| Moderate | 50% | 50% to 10% over 5 years |
| Low | 75% | 75% to 10% over 10 years |
| Minimal | 100% | 100% to 80% over 20 years |

## Was controlling prickly acacia profitable?

The table below outlines the investment results for two treatment scenarios: 1) whole property vs 2) $10,000 upfront targeting either high, moderate, low or minimal infestations. All scenarios included maintenance costs. The $10,000 investment allowed either 40-ha of high, 100-ha of moderate, 200-ha of low, or 4,000-ha of minimal infestations to be treated. Results are presented here for a sequence of above average rainfall years occurring 10 years after the initial investment. The full report also explores these sequences occurring 5 and 20 years after the initial investment.

Treatment across the whole property was assumed to restore long-term carrying capacity in 5 years and provided a positive Net Present Value (NPV), indicating an increase in profitability. Importantly though, the very large peak deficit would likely be beyond the capacity of many managers to fund, hence preventing a rapid rollout of weed control. Instead, property owners are more likely to target only part of the infestation given limited resources. The analysis indicates that it is more economically efficient to prioritise treating 'at risk' areas with minimal infestation first before moving onto increasingly higher levels of infestation as funds allow.

| | NPV ($/yr) | Rate of return | Payback period | Peak deficit (year of) |
|---|---|---|---|---|
| ***Whole property*** | $92,000 | 11% | 17 years | -$1,328,300 (yr 4) |
| ***$10,000 upfront plus maintenance costs*** | | | | |
| High | $1,900 | 6% | 25 years | -$16,000 (yr 5) |
| Moderate | $20,800 | 14% | 13 years | -$13,100 (yr 3) |
| Low | $36,600 | 16% | 13 years | -$13,600 (yr 3) |
| Minimal | $103,700 | 16% | 15 years | $39,400 (yr 8) |

Importantly, treated areas need to be effectively maintained over the long term to prevent re-infestation from other infected paddocks. Other practical considerations include prioritising the control of prickly acacia around dams, watercourses and bore drains along with managing cattle movement of seed during seed pod opening. Please note, these results are specific to the assumptions used for the analysis.

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*This project is jointly funded through the Australian Government's Future Drought Fund and the Queensland Government's Drought and Climate Adaptation Program.*

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