

Management of giant rat's tail grass in the Miriam Vale district

CASE STUDY

Glenn Cox has progressively reduced the density and impact of giant rat's tail grass (GRT) on his property near Miriam Vale in the Gladstone region, through integrated management.

This approach included:

- focusing on GRT areas of manageable size on a paddock-by-paddock basis
- establishing improved pastures and using fertilisers for increased competition and productivity
- implementing grazing strategies to increase the effectiveness of wick-wiping and reduce GRT density
- removing and destroying GRT seed heads before spot-spraying in low-density paddocks.

About the property

Glenn's property comprises level to gently undulating alluvial plains, plus the eastern slopes and hills of adjoining ranges. It covers 607 ha and is located about 20 km south-west of Miriam Vale in the Gladstone region, Central Queensland.

Glenn purchased the property—which was previously a eucalypt timber plantation—in 2012 and has been progressively converting it to grazing with improved pastures. The property currently has about 350 Droughtmaster cattle at a stocking rate of about 0.6 head/ha.

Two-thirds of the property is alluvial plains with pitted bluegrass (*Bothriochloa decipiens* subsp. *decipiens*), forest bluegrass (*Bothriochloa bladhii* subsp. *bladhii*), black speargrass (*Heteropogon contortus*), Indian couch (*Bothriochloa pertusa*) and improved pastures. The remaining third of the property is hills with shallow granitic soils; it has been cleared and has native pastures on the lower slopes, and poor forest country on upper sections.



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While the long-term annual average rainfall for Miriam Vale is 1117 mm, rainfall has been low in recent years with only 460 mm recorded at the property in 2018.

The problem

Weedy *Sporobolus* grasses (WSGs), including GRT, are widespread pasture weeds in the Gladstone region. Glenn believes that GRT has been in the Miriam Vale district for about 30 years.

GRT was well established on the property when Glenn purchased it. When the property was a eucalypt plantation, some areas had been sprayed annually with glyphosate, but other areas had been largely unmanaged. Neither approach had effectively controlled GRT. Infestations were present across much of the property, though some paddocks were much worse than others. Glenn estimates that about 202 ha initially had severe infestations of GRT.

Management

Glenn aimed to gradually clear the eucalypt plantation areas (because of their poor quality and low value) and to focus on returning the alluvial plains to high-value grazing pasture. His plan was for pasture improvement and GRT management to complement one another, and he approached the task on a paddock-by-paddock basis.

The first priority was selecting a paddock with alluvial soils, little GRT and no invasion risk from the neighbouring property. The plantation timber was pulled (with two Cat® D8 dozers), stick-raked and burnt, and the cleared area was ploughed and seeded. Improved pasture sowing included:

- signal grass (*Urochloa decumbens*)
- humidicola (*Urochloa humidicola*)
- Pioneer, Callide and Reclaimer rhodes grass (*Chloris gayana*)
- Floren bluegrass (*Dichanthium aristatum*)
- Wynn cassia (*Chamaecrista rotundifolia*).

Since starting on the timber plantation areas in 2015, Glenn has cleared and improved 16–40 ha annually.

Once the improved pastures were established in previously high-GRT areas, Glenn spot-sprayed any low-density GRT and wick-wiped any moderate-density GRT.

Wick-wiping is undertaken with glyphosate herbicide, usually after cattle have reduced the height of more desirable pastures. The wick-wiper device Glenn uses, custom-made by a local, has angled industrial felt wipers that treat both sides of the GRT leaves, eliminating the need to treat infestations in two directions. This usually provides a 40–60 per cent kill rate, and after treatment pastures are locked up and left to recover.

The establishment of competitive pastures has been aided through application of the fertiliser diammonium phosphate (DAP) at 100 kg/ha (costing \$80–\$100/ha).

Sometimes, a stick-raked area was disced and planted with oats, as a green winter feed for cattle. After this, the area was ploughed and seeded with improved pasture, then sprayed with a mix of flupropanate and glyphosate. This was often undertaken in June to September to reduce seeding of GRT when spring rains fall.

Turning the soil over and using flupropanate provided a 2-year benefit; after this, a moderate re-emergence of GRT meant further herbicide control was needed.

Aerial application of flupropanate was not considered as an option to control GRT, as it affected some of the native pastures and was less economical for the situation.

Glenn found that paddocks under about 16 ha are manageable for GRT treatment and follow-up, but it is more difficult to maintain good results above this size. So, when subdividing paddocks and/or replacing fences, Glenn considers paddock size, landform and GRT density.

Glenn has been conscious of GRT seed movement, and established buffers of 10 m around the worst paddocks to protect his treated areas and reduce the risk to neighbouring properties.



The annual cost of GRT management is about \$5000 for herbicides; Glenn has not costed his labour contribution. He is particularly appreciative of the support of his parents, who provide extra help with GRT control at critical times.

Results

Within 7 years, about two-thirds of the major GRT infestation areas were reduced to a background level. Glenn is very pleased with his improved pasture response, and has observed good results from humidicola and signal grass, which are providing better competition against GRT reinvasion.

Glenn accepts that some paddocks will likely always have some GRT, but says 'You have to have plans, even if you don't quite get there sometimes'.

Paddocks that are now largely free from GRT are regularly spot-sprayed with glyphosate. Glenn can apply 30–50 L of mix in a couple of hours, often late afternoons. GRT plants yellow quickly after treatment (reducing the chance of double treatments) and are usually dead within a couple of weeks. GRT seed heads are removed during treatment to help ensure a declining soil seed load.

Additionally, cattle are not introduced into the paddock before treatment, so seeds are not spread via their coats or through digestion (seeds may take up to 8 days to pass in faeces).



Top: Glenn discussing his paddock-by-paddock approach to GRT management with senior biosecurity officer John Reeve

Bottom: A custom-made wick-wiper for GRT control

Removing and destroying seed heads in areas of low GRT density to help reduce soil seed loads





Spot-spraying to maintain GRT management results in paddocks with improved pastures



Scattered GRT plants in improved pastures



Livestock in paddocks where GRT has been managed

Low-density occurrences will likely remain on much of the property but incur minimal impacts to pasture productivity. Glenn's outcomes are being maintained through ongoing herbicide treatments, increased fertiliser use and the maintenance of competitive desirable pastures.

Lessons learned

1. A planned paddock-by-paddock approach has made GRT control a manageable exercise.
2. Turning the soil over provides relief from GRT impacts for up to 2 years but must be followed by herbicide treatment and/or more ploughing and good pasture management.
3. The regularity of herbicide treatments must be guided by their effects on desirable native and improved pastures.
4. Rainfall and seasonal conditions can have a significant impact on GRT control activities and their effectiveness.
5. Increasing improved pasture levels provides both better productivity and improved competition against GRT.
6. GRT is easier to remove in better quality country as improved pastures provide good competition against reinvasion.
7. Having good equipment on hand and having extra labour support at the right time is critical, especially when GRT flower and seed spikes are present.
8. Trialling new tools like the modified wick-wiper can help to assess their application within an integrated management program.
9. Removing and destroying GRT seed heads and then spot-spraying helps to maintain paddocks that are largely free from the weed.



Assessing results

Signal grass, an effective competitor against GRT

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