Management of giant rat's tail grass in the Murgon district

CASE STUDY

Scott Cossens and Selina Carey have progressively reduced the impact of giant rat's tail grass (GRT) on their property near Murgon in South East Queensland, through a focus on pasture improvement.

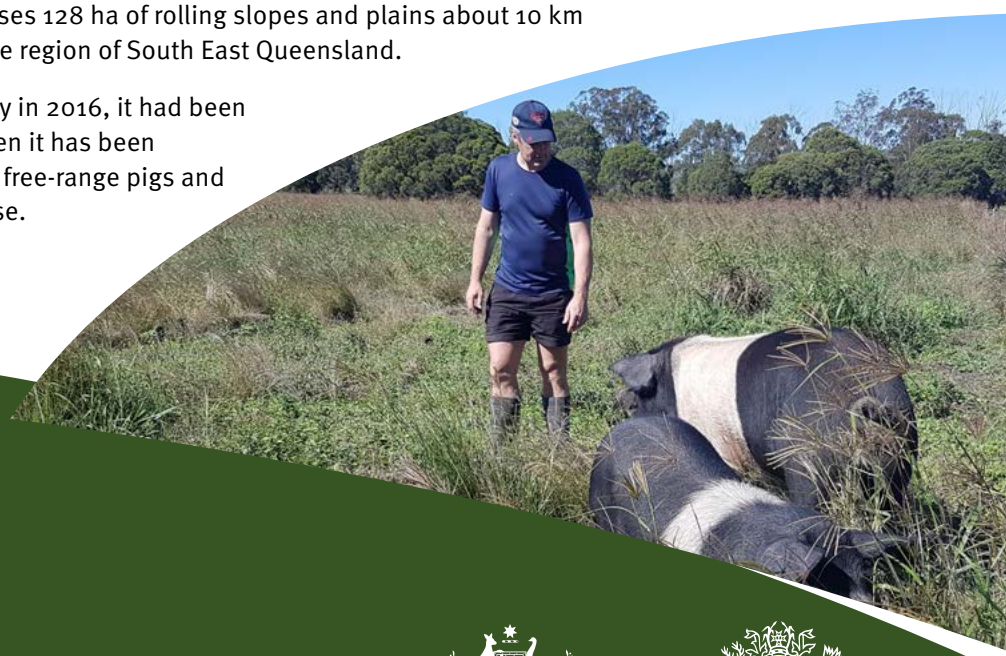
Their management approach included:

- temporarily reducing grazing pressure to enhance pasture recovery
- establishing 'practice areas' where they could trial GRT management at small scales
- applying herbicide every 2 years in paddocks with medium to high densities of GRT
- regularly ploughing, introducing forage crops and reseeding with desirable competitive pastures
- following biosecurity procedures to prevent the spread of GRT seeds.

About the property

Scott and Selina's farm encompasses 128 ha of rolling slopes and plains about 10 km north-east of Murgon in the Gympie region of South East Queensland.

Before they purchased the property in 2016, it had been solely a grazing property. Since then it has been transformed to run a small herd of free-range pigs and a complementary grazing enterprise.



Free-range pigs, now part of the property enterprise

Australian Government

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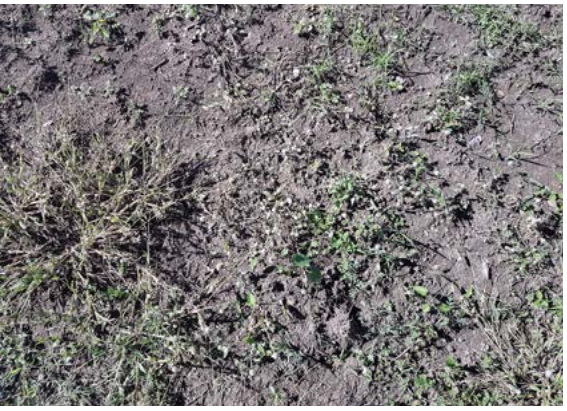
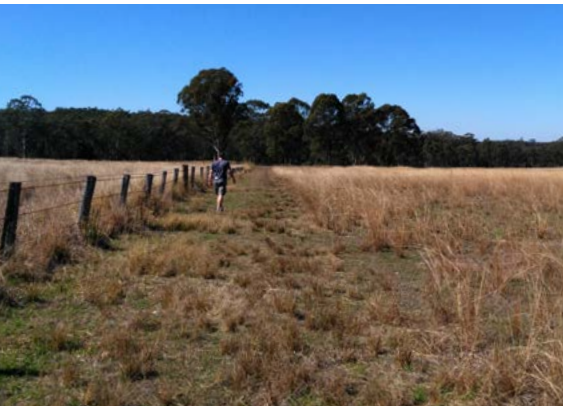
Pastures on the property include native bluegrass (*Dichanthium sericeum*), Callide, Katamborah and Reclaimer rhodes grass (*Chloris gayana*), Bisset creeping bluegrass (*Bothriochloa insculpta*) and humidicola (*Urochloa humidicola*). Soils range from black cracking clays to sandy loams.

Recent annual rainfall at the property has been recorded as 640 mm (2018), 507 mm (2017) and 614 mm (2016). The long-term annual average for nearby Murgon is 807 mm.





Top: Degraded soils, a result of poor past management

Bottom: High-density GRT, now mostly reduced to low levels

The problem

Weedy *Sporobolus* grasses, including GRT, are common pasture weeds in the Gympie region. Consequently, it was not surprising that Scott and Selina's farm had extensive GRT infestations when they acquired it. Scott was told that the weed may have originated from contaminated silk sorghum seed in the 1980s.

Initially, Scott found that uncontrolled intense grazing had both degraded pastures and aided GRT establishment across most of the property. Some pastures were up to 90 per cent GRT, and this significantly impacted their potential grazing productivity.

After settling into their farm, Scott and Selina realised that remediation was required to bring back competitive desirable grasses. These grasses would benefit the farm by not only improving future productivity, but also by enhancing landscape health and providing sustained competition against GRT invasion and re-establishment.

Management

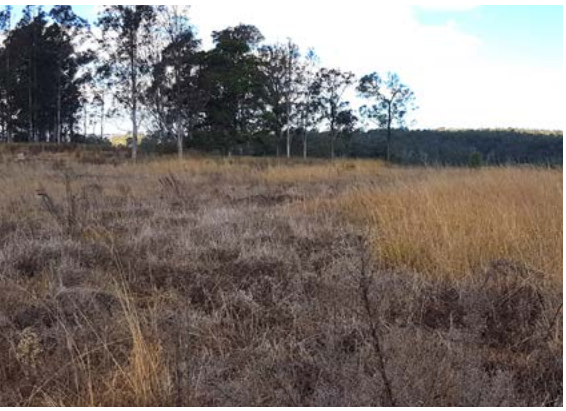
Scott and Selina enclosed 5 ha of the property to run free-range pigs—they do not treat these pastures with herbicides. They have kept cattle (Droughtmaster) numbers very low for the remaining land.

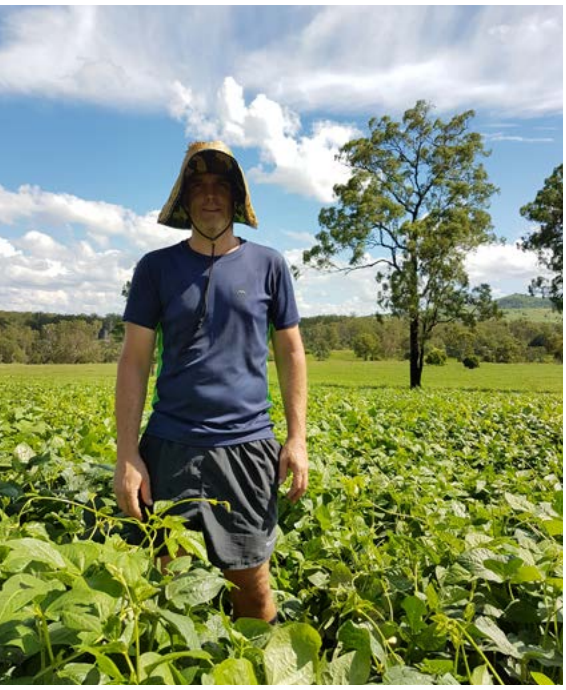
Off-farm income has allowed them to focus on pasture improvement and the management of GRT.

To control GRT infestations, the previous owner had heavily used a mix of flupropanate and glyphosate herbicides. Scott and Selina decided to not continue with this, as overuse of the mix had dramatically hampered pasture recovery. There was a lack of grass competition to hinder GRT returning, low desirable pasture seed loads in the soil and overall poor soil condition.

Scott established small 'practice areas' where they could trial different integrated management actions to learn about pasture and GRT response.

Selina boom-sprayed flupropanate (such as Taskforce®) in December 2016. January rainfall of 20 mm helped to achieve a 90 per cent kill rate for GRT. Further rainfall in March contributed to good recovery of native bluegrass. The soil was ploughed and turned over in September 2017, planted to cowpea (*Vigna unguiculata*) and then grazed. This sequence of actions provided 2 years of benefit before there was patchy return of GRT and a further application of flupropanate was needed.





Top: Strips of GRT missed during flupropanate aerial treatment

Bottom: A great crop of cowpea, a forage legume, to improve nitrogen levels and overall soil health

The worst GRT area, a paddock known as the 'mystery paddock', was aerially treated with flupropanate granules at 15 kg/ha in 2017. This helicopter-based application fast-tracks GRT treatment—1.5 hours of helicopter operation covers the same area as 3 months of part-time on-ground treatment. The aerial treatment cost $13 000 for 48 ha, averaging $255/ha. While the results were generally good, some missed strips and treatment shadows from trees required follow-up on-ground control with a hand spreader.

Scott believes that the key to beating GRT is the improvement of soil condition to aid competitive pastures. He has spread animal manures and/or fertiliser across portions of the farm, and has grown the forage legume cowpea. Forage legumes do not only provide fodder—they also significantly improve soil nitrogen levels by nitrogen fixation or by incorporation in soil as a green manure crop.

To control areas of GRT that are of low to medium density, Scott and Selina follow this sequence:

- Remove GRT seed heads, to help reduce soil seed loads.
- Slash the area to 40–50 cm high—this will ensure an even coverage when boom-spraying, and will increase the organic matter, helping to retain moisture.
- Boom-spray the slashed area with flupropanate, then leave it for pasture recovery.

Based on the current results, Scott anticipates that at most 3 sprays will be needed over 5–6 years before GRT can be controlled by mop-up spot-spraying.

Results

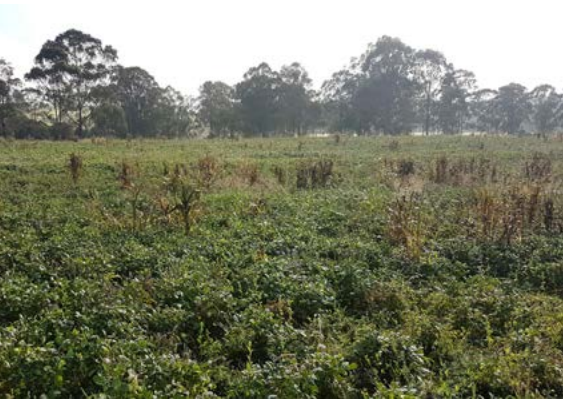
Within 3 years, most of the large-scale, high-density infestations of GRT on Scott and Selina's farm were eliminated. Some low-density GRT and small patches of high-density GRT remain.

Treatments with flupropanate will continue every 2 years, followed by ploughing and cropping, with a view to reseed new pasture in the future.

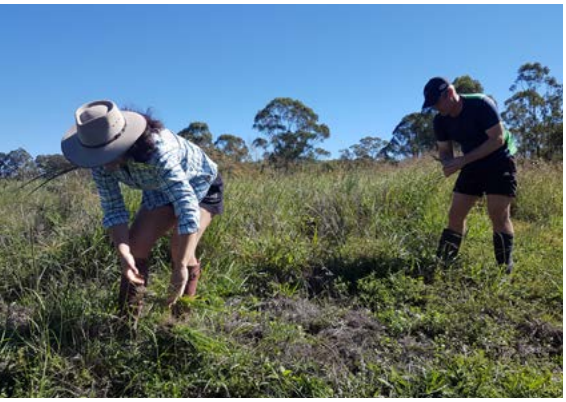
At some stage, much of the farm will stabilise at mop-up stage and only require spot-spraying.

While the region has entrenched GRT infestations, buffer strips of dense bluegrass on property boundaries will reduce GRT seed spread into and out of neighbouring properties.

Overall, GRT management, light grazing and improved soil condition has resulted in a dramatic reduction in GRT infestations, with a slow return to healthy dense pastures over many areas of the farm.



Improved pastures following fertiliser application and planting of forage legumes

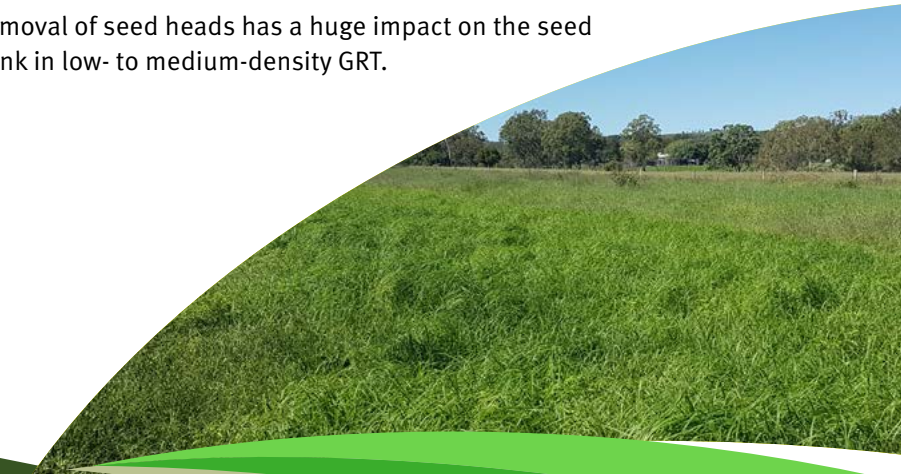


Scott and Selina removing GRT seed heads to help maintain their management results

Scott says he plans to gradually increase cattle stocking rates to 40–60 steers, noting that maintaining competitive pastures is a priority over the long term.

Lessons learned

1. An incremental 'learn by doing' approach, with 'practice areas', helps when the outcomes of various GRT control and management options are uncertain.
2. Herbicide treatments and regular turning of the soil progressively reduce GRT soil seed loads and reduce the threat of reinvasion.
3. Herbicide treatments provide up to 2 years of benefit, but must be followed by further spraying and/or ploughing and pasture management to maintain the results.
4. Rainfall and seasonal conditions can have a significant impact on GRT control activities and their effectiveness.
5. Improving soil health through reduced herbicide use, and addition of animal manures and legume forage crops, has benefits for both competitive desirable pastures and GRT management.
6. Developing and maintaining an integrated GRT control and land management activity schedule helps ensure priority actions are not missed.
7. A key goal for GRT control is good pasture management. For long-term benefits, the competitive advantage of desirable pastures complements GRT control objectives.
8. The risk of carrying seed between paddocks (and beyond the property) on vehicles and equipment is reduced by using a dedicated 'blow-down' area close to the exit point of each paddock.
9. Removal of seed heads has a huge impact on the seed bank in low- to medium-density GRT.



Dense Bisset creeping bluegrass and Rhodes grass pasture strips providing a buffer to reduce GRT invasion from the neighbouring property

Acknowledgements

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