A holistic approach to the control of weedy *Sporobolus* species.

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Introduction

The sporobolus weeds giant rats tail (GRT) grass (*Sporobolus pyramidalis*) and giant Parramatta grass (GPG) (*S. fertilis*) are aggressive invasive grass weeds that have infested pastures in large areas of coastal NSW and Queensland, and are continuing to spread. Both species are capable of dominating pastures as cattle are less inclined to eat them as they mature. Both grasses greatly reduce pasture quality.

This paper presents a case study of dealing with GRT on a property owned by Leon and Gaye Blank at Running Creek in south-east Queensland, near the Queensland/NSW border. Soil at the site is chocolate basalt, with some creek flats but with a large percentage of moderate to steep hills. The average annual rainfall is around 1200 mm with a summer/ autumn dominance and a dry spring.

History of GRT and GPG on the property

The property contains both GRT and GPG. However, both species are very similar and so the management used on GRT should apply equally well to GPG. It is thought that GRT was first introduced onto the property as a contaminant of setaria (*Setaria sphacelata*) seed in the 1960s. In a few years the GRT dominated this paddock because the cattle favoured the improved species, but were far less inclined to eat the more fibrous GRT, especially when it became rank. Cattle and vehicles gradually spread the GRT seed to other paddocks, where it established and significantly reduced pasture productivity. The GPG has spread onto one section of the farm in the last 10 years from roadside infestations and is proving to be equally as troublesome.

Methods used to control GRT and GPG

Initial control attempts

Most of the farm is too steep to use a boom spray, so in the mid 1980s a helicopter was used to spray a GRT infested paddock with glyphosate. It killed most of the GRT and temporarily suppressed the Rhodes grass (*Chloris gayana*), setaria, and paspalum (*Paspalum dilatatum*). However, the huge bank of seed soon resulted in GRT regeneration and this coupled with the cattle's reluctance to eat it, saw it dominating again in about three years.

Spot spraying using fluproponate (745 g/L) at 200 mL/100 L of water was also used to treat patches of GRT with a hand operated hose. Providing the spots were not over-sprayed, this technique was effective in selectively killing GRT plants, but the labour component was too high.

Developing a successful control and utilisation program

In 1997 a roto-wiper was used to apply glyphosate to control GRT. This requires the useful pasture species to be closely grazed, so that the less palatable target weeds are standing high above the pasture - maximising wiper and herbicide contact with the GRT and other weeds. Glyphosate was initially applied at 1 L (360 g/L) to 20 L of water with a wetting agent and a one-way wipe. This method was generally quite effective at killing the GRT, however, the bigger tussocks often recovered because one side of the plant did not receive a high enough herbicide dose. The glyphosate was also very good at killing other problem weeds such as blady grass (*Imperata cylindrica* var. major), snow grass (*Poa sieberiana*), croften weed (*Eupatorium adenophorum*), lantana (*Lantana camara*), bracken fern (*Pteridium esculentum*) and eucalypt regrowth.

Since the large GRT tussocks often recovered from the single glyphosate wiping, a single fluproponate wipe at 1 L (745 g/L) to 20 L water was then used. This herbicide was much more effective in killing the GRT, but took much longer to work and did not stop the GRT from producing more seed. The other deficiency with this herbicide was that it did not control any of the other problem weeds mentioned above. To overcome both these short comings a roto-wiper mix of 700 mL fluproponate (745 g/L) with 400 mL glyphosate (420 g/L) to 20 L of water in a single wipe was applied. This gave good control of GRT, reduced seed set, and gave adequate control of the other pasture weeds mentioned. The speed of travel used with roto-wiping is a slow walking pace of around 5 km/hr. It should be noted that in NSW the use of fluproponate through a wick wiper is not covered by registration or permit, but that one distributor is currently working towards registration for this usage.

During the course of a 25 year battle against GRT on this property, thinking gradually changed from GRT eradication to a "use it/reduce it" policy adopting an integrated holistic approach. Together with council and departmental advisers, the property owners have developed a program incorporating cost-effective herbicide usage integrated with other management practices to use and reduce GRT and the other problem weeds - or at worst, to keep them at bay.

The adoption of a rotational grazing system (using one mob in a six paddock system in the worst GRT area of the farm) is an essential part of the program. The cattle from this six paddock system are quarantined and not allowed to spread seed to other clean parts of farm. More control over grazing means cattle become less selective and can be encouraged to consume young, leafy and more palatable GRT, when its feed quality is still good. Periods of rapid pasture growth, when GRT quickly becomes 'stemmy' and unpalatable, are ideal times to graze heavily – producing the large height differential between useful pasture and GRT, which is needed for successful herbicide wiping. This tool is used to take the advantage away from the weeds. Ideally, wiping is carried out twice a year around Christmas and Easter. If GRT decreases below about 1000plants/ha, spot spraying with fluproponate (745 g/L) at 200 mL/100 L water and glyphosate (420 g/L) at 100 mL/100 L water) is the preferred method of control.

The other part of the program is pasture improvement focusing on encouraging well adapted legumes such as white clover (*Trifolium repens*) and creeping vigna (*Vigna parkeri*). This mainly involves overcoming any nutrient deficiencies by applying appropriate fertiliser such as elemental sulphur to enhance legume performance, and using grazing management to prevent grasses and weeds from dominating. The return from legumes is a nitrogen input to encourage the better grasses and increased pasture quality to improve animal performance.

Conclusion

The property owners in conjunction with council and departmental staff have developed an excellent program to minimise the impact of GRT and GPG on their property. This management strategy is applicable to other areas where GRT and GPG cause significant decline in pasture quality and consequently animal production. Through experimentation the property owner have devised a program that allows utilisation of these troublesome weeds while minimising their spread.

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