facts Natural Resources and Mines
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pest series

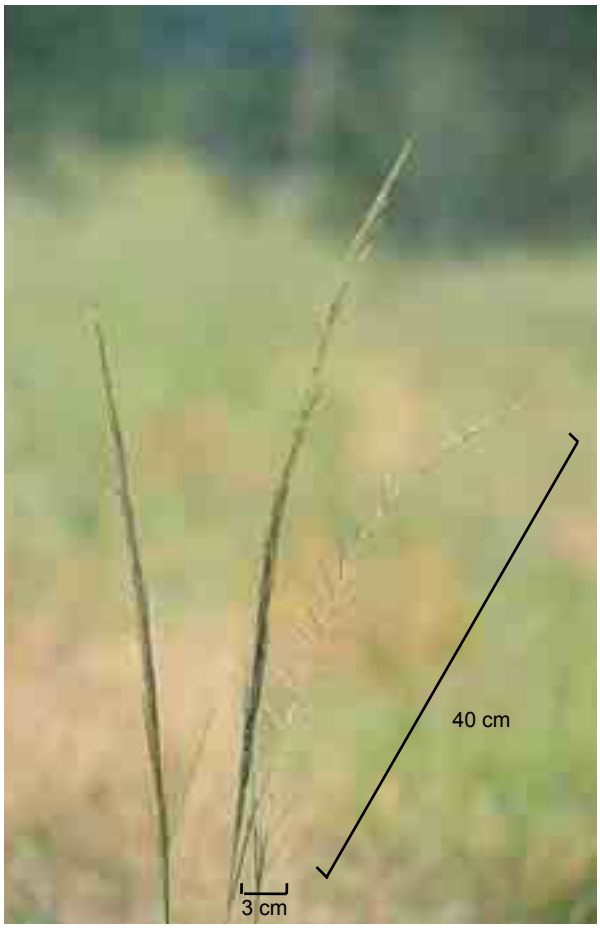
# Giant rats tail grass

## and other weedy *Sporobolus* species

***Sporobolus pyramidalis, S. natalensis, S. jacquemontii, S. fertilis and S. africanus***

**DECLARED CLASS 2**


**Above: Weedy *Sporobolus* can out-compete desirable pasture grasses.**




**Above: GRT is capable of producing up to 85 000 seeds/m2/year with initial seed viability of about 90%.**

Giant rats tail (GRT) grass and other weedy *Sporobolus* grasses are aggressive grasses that can reduce pasture productivity, out-compete desirable pasture grasses, and cause significant degradation of natural areas.

Five species of introduced *Sporobolus* grasses are declared in Queensland. These are giant rats tail (GRT) grass (*S. pyradmidalis* and *S. natalensis*), American rats tail grass (*S. jacquemontii*), giant Parramatta grass (*S. fertilis*) and Parramatta grass (*S. africanus*).

These species were originally introduced as contaminants in pasture seed. Parramatta grass was introduced in the early 1800s, while *S. pyramidalis* and *S. natalensis* (collectively referred to as GRT grass) were introduced as early as 1960. All species have adapted well to large areas of eastern Australia.

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# Description

Weedy *Sporobolus* grasses are robust, tufted, perennial grasses growing up to 2 m tall. They are difficult to distinguish from other pasture grasses before maturity, however the leaves are noticeably tougher than any other species. They can also be difficult to identify from the other native *Sporobolus* grasses. Native *Sporobolus* grasses tend to be shorter, softer and have less dense seed heads than GRT grass. The seeds of all species are indistinguishable in pasture seed samples using current seed sample identification techniques.

# Giant rats tail grass

GRT grows to a height of between 0.6−1.7 m, with a seed head of up to 45 cm long and 3 cm wide. Seed heads change shape from a 'rats tail' when young, to an elongated pyramid shape at maturity. Unlike Parramatta grass and giant Parramatta grass, GRT does not develop 'sooty spike' on its seed heads.

Distribution *S. natalensis*—Rockhampton (Qld) to Port Macquarie (NSW).

Distribution *S. pyramidalis*—Cooktown (Qld) to central coast (NSW).

# American rats tail grass

American rats tail grass grows to a height of between 50−75 cm, with a seed head of up to 25 cm long and 0.5−3 cm wide.

Distribution—Cape York (Qld & NT) to south-east Queensland.

# Giant Parramatta grass

Giant Parramatta grass grows to a height of between 0.8−1.6 m, with a seed head of up to 50 cm long and 1−2 cm wide. The branches of the seed head are appressed to the axis and overlapping, although lower ones generally spread at maturity.

Distribution—Mossman (Qld) to central coast (NSW).

# Parramatta grass

Parramatta grass grows up to a height of 0.15−1.1 m, with a seed head of up to 50 cm long and 1−2 cm wide. The leaves of mature plants are slender and erect in appearance, 6−18 cm long. Parramatta grass is not as aggressive as giant Parramatta grass.

Distribution—Brisbane (Qld) to Adelaide (SA).

# Problem

Weedy *Sporobolus* grasses are aggressive, have low palatability when mature, and are difficult to control. They can quickly dominate a pasture, especially following overgrazing or soil disturbance.

Mature leaf blades are tough and difficult for cattle to graze. Tough leaves and stems have been known to loosen teeth of cattle and horses whilst grazing.

Some properties have shown losses in carrying capacity and decreased production ranging from 10−80%. Stock can take an extra 12 months to finish on weedy *Sporobolus* infested pastures and stocking rates halved. Anecdotal evidence suggests weaning percentages and weights are also reduced.

Weedy *Sporobolus* grasses can set seed throughout the frost-free period of the year. For example, GRT is capable of producing up to 85 000 seeds/$m^2$/year with initial seed viability of about 90%. Established stands of GRT have large soil seed banks (up to 20 000 seeds/$m^2$). It is estimated that a significant proportion of this seed can remain viable for up to 10 years.

Weedy *Sporobolus* seeds are spread:

- by livestock (up to 30 000 viable seeds/beast/day) in manure and on fur and hooves
- by both feral and native animals
- on vehicles and machinery (especially slashers and earth moving equipment)
- in hay and untested pasture seed
- by fast flowing water
- with turf.

Soil disturbance caused by stickraking, ploughing, renovation of pastures, grading of roadsides, or dam building etc can favour establishment of weedy *Sporobolus* grasses, where a complete management operation is not implemented. In spring the dry unpalatable weedy *Sporobolus* grasses can become a serious fire hazard.

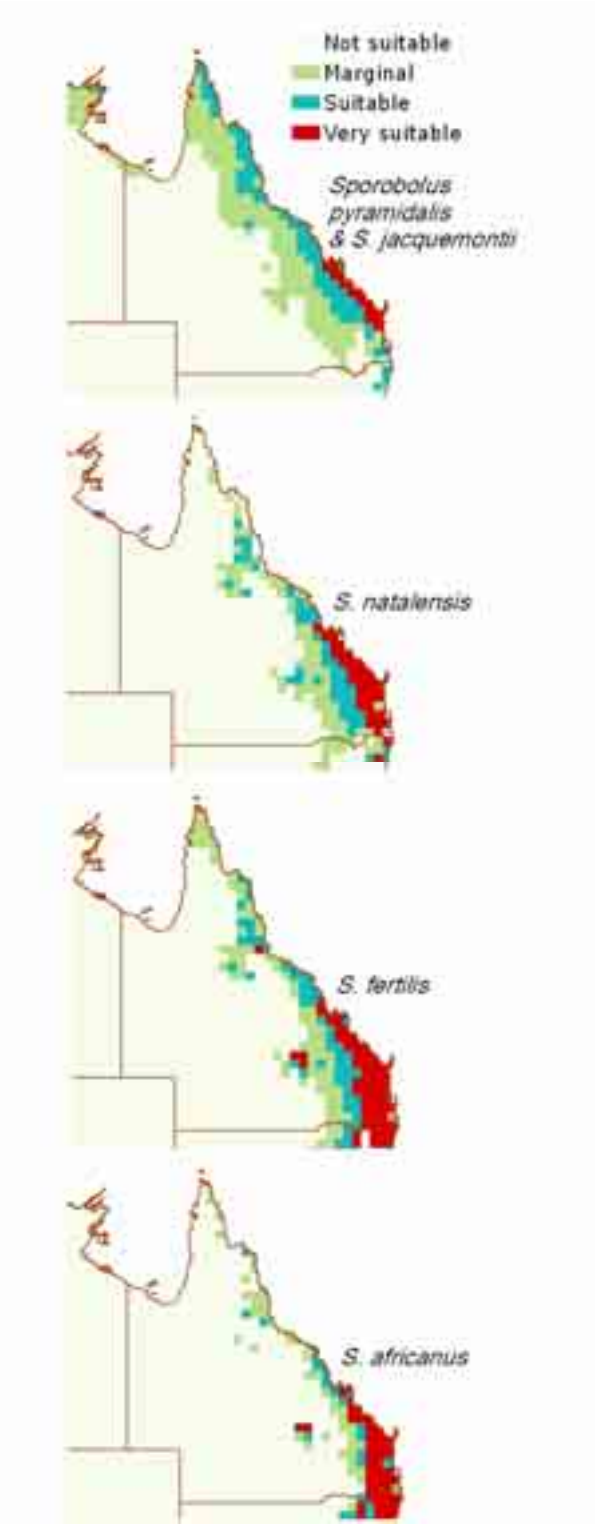
# Habitat and distribution

GRT grass has adapted to a wide range of soils and conditions (see figure 1). Figure 2 shows the potential distribution of the declared five weedy *Sporobolus* species.

Ecoclimatic modelling suggests GRT is suited to conditions present in 30% of Australia (223 million ha) and 60% of Queensland (108 million ha), including areas receiving as little as 500 mm average annual rainfall.

**FIGURE 1—DISTRIBUTION OF GIANT RATS TAIL GRASS IN QUEENSLAND**

**FIGURE 2–POTENTIAL DISTRIBUTION OF DECLARED *SPOROBOLUS* SPECIES IN QUEENSLAND**




# Declaration details

GRT grass, American rats tail grass, giant Parramatta grass and Parramatta grass are declared Class 2 plants under Queensland's *Land Protection (Pest and Stock Route Management) Act 2002.* Declaration requires landholders to control declared pests on the land and waters under their control. Local Government may serve a notice upon a landholder requiring control of declared pests.

# Prevention

Maintaining pastures in a vigorous and dense condition reduces the chance of invasion and increases competition against weedy *Sporobolus* seed establishment. Heavy grazing will not control weedy *Sporobolus* grasses – research indicates that grazing may actually favour its spread.

Stock movement from infested areas into clean areas is not recommended unless they are spelled for at least five days in yards. Similarly, purchased stock from known or suspected infested areas should be spelled in the yards before release into larger paddocks. New stock can also be quarantined in a densely pastured, well-monitored holding paddock. Moving stock when there is no dew or rain will decrease the amount of seed sticking to their coats. Refer to Table 1 which provides best practice guidelines to be used in weedy *Sporobolus* infested areas.

Establishment of weed-free buffer strips along boundary or perimeter fences, drainage lines and roadsides will restrict the spread of weedy *Sporobolus* grasses. It is important to clean machinery very thoroughly after working in infested areas.Integrated control strategies using herbicides and other control methods, combined with good property hygiene are essential. Research is under way to find suitable alternative pasture grasses that will restrict the establishment of weedy *Sporobolus* grasses under a range of environmental conditions. The use of higher grass seed sowing rates will increase seedling competition.

The attributes of replacement pasture grasses need to be considered when deciding what to sow. The following attributes are preferred and will increase the likelihood of success:

- well adapted to the local environmental conditions and soil type
- stoloniferous or rhizomatous growth habit
- resistant to heavy grazing
- palatable and productive
- provides competition year round (i.e. does not open up in late winter/spring)
- does not decline as soil fertility decreases
- fast to establish.

If a sown pasture species does not contain the majority of the above attributes it is unlikely to be successful as part of a weedy *Sporobolus* grass control program.

Some pasture species, while providing strong competition once established, are weak competitors with weedy *Sporobolus* grasses in their early stages of establishment (e.g. Koronivia grass or Bisset creeping blue grass). These grasses are most successful against weedy *Sporobolus*' when sown with other grasses that are vigorous when young and provide early competition against weedy *Sporobolus* grasses (e.g. rhodes grass).

A person (a supplier) must not supply any thing containing reproductive material of a plant that is a class 1 or class 2 pest prescribed under the Land

Protection (Pest and Stock Route Management) Regulation 2003.

(Consult your local DPI&F Pasture Agronomist or Grazing Lands Extension Officer for the latest advice on pasture replacement planting. DPI&F Call Centre 13 25 23)

# Herbicide control

Before using any herbicide always read the label carefully. All glyphosate rates listed are based on the formulation which has 360 grams of active ingredient per litre. **Apply all herbicides strictly in accordance with the directions on the label.**

# Management strategies

Always commence control programs in areas of light infestation, and work towards the denser infestations. Some details of management options are provided below.

## 1. Scattered plants and light infestations

Either:

(a) spot spray with glyphosate;

**or** (b) spot spray with flupropanate;

**or** (c) use glyphosate through a pressurised wick wiper;

**or** (d) hand chip, bag and remove stools from the paddock **and** burn them.

## 2. Dense infestations on arable land

**(a) Cropping option**

**First early summer**

1. Boom spray with glyphosate @ 6 L/ha and burn prior to ploughing.
2. Spot spray **or** hand chip fence lines, headlands, drainage lines, shelter belts etc. for weedy *Sporobolus* grasses missed in cultivation. Plant a long season forage sorghum variety using a recommended pre-emergent herbicide.
3. Spot spray **or** hand chip any surviving weedy *Sporobolus* grasses to prevent reseeding.

**Second summer**

1. Boom spray with glyphosate to control new seedlings and crop regrowth prior to cultivation.
2. Follow the same procedures and similar cropping as for the first summer.

**Third summer**

1. Boom spray with glyphosate to control crop regrowth and any weedy *Sporobolus* seedlings.
2. Plant paddock with improved pastures using minimum tillage techniques to restrict bringing buried seed to the surface. Use a direct drill planter or surface broadcasting and rolling techniques. Plant aggressive pasture grasses at triple the standard sowing rates to compete with weedy *Sporobolus* seedlings.
3. Fertilise the pasture for fast pasture establishment.
4. Spot spray **or** hand chip weedy *Sporobolus* seedlings.

**(b) Pressurised wick wiper option**

The effective use of a pressurised wick wiper requires a package of 3 treatments over an 18 month period (Christmas/Easter/Christmas).

**First treatment (mid summer)**

1. Make sure there is a 30 cm height difference between weedy *Sporobolus* and other pasture plants by selective grazing of the ‘good’ pasture.
2. Wick wipe weedy *Sporobolus* grass using glyphosate @ 1 part glyphosate to 2 parts water.
3. Graze using increased stocking rates after wick wiping.

**Second treatment (late summer/autumn)**

1. Wick wipe weedy *Sporobolus* grass using glyphosate @ 1 part glyphosate to 2 parts water.

**Third treatment (next summer)**

1. Wick wipe weedy *Sporobolus* grass using glyphosate @ 1 part glyphosate to 2 parts water.

## 3. Dense infestations on non-arable land

**In summer**

Either:

- apply glyphosate through a pressurised wick wiper if terrain and timber allow;

**or**

- boom or blanket spray with glyphosate in split applications of 3 L/ha (Table 2 for further details) **and** replant the pasture using aggressive pasture grasses at double the standard sowing rates.

**or in winter/spring**

- boom **or** blanket spray with flupropanate at recommended rates. Consult the label for withholding periods.

# Further information

Further information is available from the vegetation management/weed control/environmental staff at your local government.

Also refer to the Giant rats tail grass best practice manual (Queensland Department of Primary Industries, 2001).

## TABLE 1—BEST PRACTICES FOR MANAGEMENT OF WEEDY *SPOROBOLUS* INFESTED PADDOCKS

| Do's | Don'ts |
|---|---|
| **Cattle** | |
| • manage grazing and stocking rate to maintain good ground cover of pasture | • don't overgraze as this will create bare patches allowing weedy *Sporobolus* grass seedlings to emerge. |
| • muster only in the afternoon when the plant and the seed is dry | • don't muster on wet days or in muddy soil conditions |
| • restrict cattle to a small paddock or a laneway (on hay) for 5 days after grazing the weedy *Sporobolus* paddock | • don't deliberately overstock weedy *Sporobolus* infested paddocks |
| • muster on foot or on horseback to prevent seed contamination of machinery | • avoid creating bare ground from trampling around mineral licks etc. |
| **Machinery** | |
| • provide a specific hose down tarmac to clean contaminated machinery | • don't slash infested paddocks unless as part of a wick wiping program |
| • keep roadways, laneways, stock routes and machinery corridors free of weedy *Sporobolus* | • don't drive vehicles through infested paddocks |
| **Other hygiene** | |
| • specimens for identification should be enclosed in a tied fertiliser bag | • don't drive around the farm with a suspected weedy *Sporobolus* specimen in the cabin or in the back of the ute |
| **Pasture management** | |
| • maintain pasture vigour with maintenance fertiliser program | • don't allow soil fertility rundown as this favours weedy *Sporobolus* establishment |
| • band seeding is the 'safest' method to plant legumes into an infested pasture | • don't renovate an infested pasture |
| • plant the recommended competitive pasture grasses | • don't burn the pasture unless as part of a wick wiping, pre-cropping pasture replacement strategy. |
| **Hay and pasture seed** | |
| • determine the origin of hay and ask for a Weed Hygiene Declaration | • don't knowingly purchase hay contaminated with weedy *Sporobolus* |
| • feed hay in a yard, feedlot or small holding paddock | • don't buy seed without knowing its origin |
| • only purchase seed from a reputable seed merchant | • don't buy seed without a Weed Hygiene Declaration |
| **Control strategies** | |
| • choose the best control strategy based on the paddock situation and the weedy *Sporobolus* population before starting the job | • don't spot spray with glyphosate using a high pressure gun from the cabin of the ute |
| • if spot spraying with glyphosate, operate close enough to step on the plant, and spray downwards | • don't wave the spray gun around—if the weedy *Sporobolus* is that dense, you should not be spot spraying |
| • low pressure spray equipment reduces the risk of over spraying | • don't over-spray with glyphosate past the point of spray runoff |
| • always spot spray the single 'scout' plants around the perimeter of the infestation first, then work inwards | |

## TABLE 2—HERBICIDES REGISTERED FOR CONTROL OF GIANT RATS TAIL GRASS AND OTHER WEEDY *SPOROBOLUS* GRASSES

**(Always read the label thoroughly before using chemical)**

| Situation | Herbicide | Rate | Comments |
|---|---|---|---|
| scattered plants/small clumps | Flupropanate[1] | 2 ml/L water + (non-ionic) wetter (1 ml/L) | **Spot spraying.** Need follow up spraying of 'missed' weedy *Sporobolus* grasses and new seedlings. Can add a dye to act as a spray marker. Minimise spray overlap as double application has been known to kill patches of sown pasture. |
| scattered plants/small clumps | glyphosate (360 g/L) | 15 mL/L water | **Spot spraying.** Need follow up spraying of 'missed' weedy *Sporobolus* grasses and new seedlings. Can add crystalline ammonium sulphate @ 20 g/L water to improve uptake. |
| Light and dense infestations | glyphosate (360 g/L) | 1:2 water in wick wiper[2] | **Pressurised wick wiper.** Ensure 30 cm height differential above the other pasture plants. Use increased stocking to ensure this. |
| Dense infestations | glyphosate (360 g/L) | Two split applications of 3 L/ha | **Blanket spraying.** Split applications a few months apart during summer give good control. |
| Dense infestations | flupropanate | 2 L/ha | **Boom spraying.** Slow acting (6−12 months).<br>4 month withholding period for stock. |

**Notes**

1. Flupropanate is residual, slow to act, does not adversely affect pasture legumes and most pasture grasses (e.g. Callide Rhodes and paspalum) if used at the recommended application rates. There is a 14 day withholding period for stock after spot spraying. Flupropanate cannot be used where lactating dairy cows and goats are grazing (refer label).
2. Use of a pressurised wick wiper makes it possible to treat large areas quickly, selectively and most economically. Effective wick wiping entails a package of 3 treatments over an 18 month period.

## TABLE 3—GIANT RAT'S TAIL GRASS AND OTHER WEEDY *SPOROBOLUS* GRASS CONTROL STRATEGIES

| Density of weedy *Sporobolus* grass infestation | Land accessible by tractor | | Land not accessible by tractor |
|---|---|---|---|
| Occasional plants only | • Spot spray<br>• Chip out/bag up | | • Spot spray<br>• Chip out/bag up |
| Scattered plants/small clumps | • Spot spray (<2000 stools/ha) | | • Spot spray |
| Dense infestations | **Arable land** | **Non-arable land** | |
| | • Fodder pre-crop before pasture replanting<br>• Direct pasture replacement<br>• Pressurised wick wiper | • Pressurised wick wiper<br>• Direct pasture replacement | • Fence off and restrict stock movement to clean country<br>• Helicopter spray with glyphosate herbicide and aerially re-sow the pasture |

Source—Adapted from the joint DNR/DPI Giant Rats Tail Grass Project, March 1999

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