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## Panic grasses for pastures

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W. McDonald

Special Agronomist (Pastures) Tamworth

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Panic grasses are widespread in New South Wales. There are 21 known species, both introduced and native. Some species are used not only in pastures but also for grain and forage production. Others are weeds.

This Agfact describes the species useful for livestock production and the most effective ways of using them.

### IMPROVED GRASSES FOR SOWING

#### **Makarikari grass (Bambatsi panic)**

Makarikari grass (*Panicum coloratum* var.

makarikariense) is popularly known as Bambatsi panic. It is a summer-growing perennial for areas that receive more than 450 mm rainfall. It is well suited to the cracking clay soils of the north-west and the central plains of New South Wales and to flooded country, but is rarely used in irrigated pastures.

The tolerance of plants to flooding is outstanding and superior to that of any other introduced grass used in these areas. Good survival of Bambatsi panic plants has been observed following three weeks of flooding in the Walgett district.

Several varieties of Makarikari grass (Bambatsi, Pollock and Burnett) have been registered in Australia, but

**Graziers inspect an excellent pasture of Bambatsi panic (Makarikari grass) in the Moree district.**



Bambatsi is the only variety that is commercially available in significant quantities.

Although for many years Bambatsi panic has been shown in NSW Agriculture trials to be highly persistent and useful, little use has been made of it inland. This is partly because it is difficult to establish and the seed is expensive, and partly because there has been a strong emphasis on cropping as opposed to livestock production over the past two decades.

**Performance.** Bambatsi panic grows best in mid-summer. Growth in spring and autumn is slower but relatively good for a tropical grass. Established plants have some frost tolerance and retain green material longer after the onset of frosts than many improved tropical grasses. Winter growth is very poor.

There is very little animal production information from New South Wales on stock grazing Bambatsi panic. In Queensland stocking rates of five to seven Merino wethers per hectare were maintained for four years on Bambatsi panic grown with lucerne on the inner Darling Downs. The potential is likely to be poorer in the north-west of New South Wales because the growing conditions are less reliable. Under irrigation at Trangie, Bambatsi panic was found to be equal to paspalum in overall production and superior to a range of summer growing grasses including buffel, Rhodes, setaria and kikuyu. It was found that Bambatsi under irrigation was capable of producing up to 15 t/ha of dry matter per year.

Photosensitisation is possible in stock grazing panic grasses.

**Bambatsi panic is an outstanding grass for heavy soils, especially those prone to occasional flooding.**



**Soil types.** Bambatsi panic grows best on cracking clay soils but also does well on loamier soils, for example Brigalow soils. Avoid light-textured soils, especially if they have low fertility.

**Seedbed preparation.** A fine tilth is highly desirable. As the seeds are very small (1.6 million/kg) a rough, hastily prepared seedbed will not give adequate seed-to-moist soil contact, which is essential for successful establishment. Start preparation early to ensure weed control and good sub-soil moisture levels at sowing.

On heavy soils a pasture roller may be used after sowing to help improve emergence, but it should not be used if there is a risk of soil crusting or increased erosion.

If irrigation is used, take particular care to avoid sealing or caking of the soil surface.

**Sowing.** Because of the variability of rainfall in the north-west there is no reliable sowing time for Bambatsi panic. The best soil temperatures occur from mid-spring to early autumn, but the most important factor by far is the occurrence of follow-up rain.

Spring sowings have the disadvantages of slow seedling growth (especially if sowings are made in early spring) and the emergence of summer growing weeds. Summer sowings have the disadvantage of being subject to very high evaporation rates.

Sowing in early autumn is often successful because the soil does not dry out as quickly as in summer, but there is a risk of frost damage to young seedlings.

Late January to early March has been found to be the most reliable sowing time in southern Queensland and northern New South Wales. The chance of success is invariably improved if the sub-soil is moist to a good depth (for example, one metre). If seedbeds are prepared during summer, producers should assess the danger of soil erosion.

Research is being done to determine the best sowing times. As well, aerial sowing of Bambatsi panic into standing wheat crops or stubble is being investigated.

Sow shallow (1–2 cm) into moisture wherever possible. Dry sowing (relying on subsequent rain) can be successful, but it is essential to have good sub-soil moisture and no likely weed problem following post-sowing rain.

The sowing rate should be 2 kg/ha for dryland and 4–5 kg/ha for irrigated pastures. If the germination rate is below 50 per cent, increase the sowing rate (the

minimum germination percentage standard is 20 per cent for panics).

**Companion legumes.** It is essential to include a legume unless burr medic is expected to regenerate well in the pasture. Lucerne and Sephi barrel medic are the most appropriate legumes to add. If you are planning long-term pastures add barrel medic, as lucerne will not persist.

Lucerne is added when sowing the panic in spring, summer or early autumn at 0.75–1 kg/ha. Avoid higher rates as lucerne competes successfully with panic grasses.

It is difficult to establish medic sown in the spring or summer as it will rarely set sufficient seed. Medic seed establishes poorly from oversowing, but it can be drilled into the pasture the following autumn/winter after the panic is well established.

If naturalised burr medic is abundant, Sephi or Cyprus medics may not compete successfully. Sow barrel medic seed at 2–4 kg/ha of seed. Sephi barrel medic is suitable for sowing in areas that receive 500 mm rainfall a year. Cyprus barrel medic can be sown in areas that receive a rainfall as low as 400 mm a year.

**Companion grasses.** Purple pigeon grass may be useful sown with Bambatsi panic. It is sown at a low rate of 1 kg/ha and can contribute to spring, summer and autumn feed production while the Bambatsi panic is establishing in the early years of the pasture. Avoid higher sowing rates as it will compete with the panic.

**Weed control.** Bambatsi panic has slow early growth and is sensitive to weed competition. 2,4-D and 2,4D-B have been successfully used once the grass has tillered and developed secondary roots. There are no herbicides available to remove grassy weeds from establishing panic. Trials have shown that some sulphonyl urea herbicides have potential for control of summer-growing broadleaf weeds. Check with NSW Agriculture for current herbicide registrations.

**Fertilisers.** Sow with phosphorus at the same rate you would use for cereals in the same situation. Bambatsi will respond to nitrogenous fertilisers, but they should not be used at establishment unless soil moisture is excellent and weed problems unlikely. To make Bambatsi panic persist and produce well it is essential to maintain a good legume in the pasture.

On low phosphate soils, maintenance applications of a phosphate fertiliser may be required.

**Grazing management.** Because of the high palatability and slow growth of seedlings, grazing during establishment should be deferred or lenient

until seedheads appear. It is essential to defer grazing until plants develop and are firmly anchored. Young seedlings may be uprooted if grazed early. Depending on seasonal conditions, grazing is often best deferred for the first year entirely.

Once established, Bambatsi panic has persisted well under set stocking as opposed to rotational management.

Grazing management should aim to avoid rank growth. If plant growth is not controlled, animal growth rates will be disappointing and the legume component will decline. It is important to maintain the legume component so that soil fertility can build up and improve the grass quality in turn.

As panic can regenerate slowly from seed, allowing pastures to seed occasionally can thicken them up.

### **Petrie Green panic & Gatton panic**

Two other panic grasses are used commercially in New South Wales, although their use is not widespread. They are Petrie Green panic (*P. maximum* var. *trichoglume*) and Gatton panic (*P. maximum*).

These two grasses are similar, although Gatton panic produces better than Petrie Green panic on soils of lower nitrogen status. They are both notably shade tolerant. Both have performed well on the lighter textured loamy soils of northern New South Wales (with a minimum average annual rainfall of 500 mm) and on the far north coast, with potential evident in the Hunter region.

They are tufted perennial summer-growing grasses producing feed over spring, summer and autumn. The spring response is better than that of many tropical grasses. Unlike Bambatsi panic, Petrie Green and Gatton panics have poor tolerance to flooding and inferior drought tolerance.

**Performance.** Both varieties are highly palatable and if kept short will often be preferentially grazed by stock. Stock reportedly do well on these grasses if growth is controlled. There is no trial information that can provide a guide to likely carrying capacities.

**Seedbed preparation.** The requirements for establishment are similar to those of Bambatsi panic. The seeds of these panics are very small (1.2 million/kg), so that a fine seedbed with shallow sowing is required for good moist soil-to-seed contact and rapid establishment.

**Sowing.** As for Bambatsi panic there is no reliable sowing time inland. The best chance of establishing these grasses inland is in mid-spring to late summer on soil moist to a good depth, or in late summer to

early autumn. As with Bambatsi panic, early follow-up rain has a big bearing on success or failure. Weed invasion has been a major cause of failure from spring sowings.

On the north coast, sowing may extend from mid-September to early March, with spring sowing preferred. Mid-summer sowings are less reliable.

Petrie panic is sown at 2-5 kg/ha and Gatton panic at 2-4 kg/ha.

**Companion legumes.** Inland, use lucerne and medics as described for Bambatsi panic. On the north coast, both panics have been combined with a large number of legumes as well as grasses. On well-drained soils, Siratro (1-2 kg/ha), Greenleaf desmodium (0.5-1 kg/ha), glycine (2-4 kg/ha) or Archer axillaris (0.5-1 kg/ha) can be used. On less well-drained soils, Haifa white clover (1-2 kg/ha) is useful, while Kenya white clover (2-3 kg/ha) has shown potential.

**Fertilisers.** Both varieties respond to high levels of soil fertility. Inland, sow with the same rate of phosphate you would use for wheat in the same situation. Nitrogen is best supplied through the companion legume.

On the north coast, superphosphate requirements at sowing vary from 250-500 kg/ha, depending on soil fertility. In coastal situations molybdenum may be required for companion legume growth on acid soils; it can be applied at sowing as molybdenised superphosphate. Similarly, a potassium deficiency may need to be corrected at sowing. Soil testing can be helpful here.

Maintenance topdressing with phosphatic fertiliser may be required, especially on coastal pastures.

**Grazing management.** Grazing management is the same as for Bambatsi panic.

#### **NATURAL/NATURALISED PANICS**

There are a number of panic grasses of economic importance in New South Wales. They are as follows.

##### **Native millet (*P. decompositum*)**

Native millet is a native panic of clay soils associated with floodplains in western districts. It is highly nutritious and palatable. It tolerates flooding and grazing well but has only poor resistance to drought.

##### **Rigid panic (*P. prolutum*)**

Rigid panic is well adapted to clay soils of floodplains and is very persistent, tolerating flooding, drought and grazing pressure well. It is regarded as being of only fair palatability and nutritive value.



**Petrie Green panic and Gatton panic are well adapted to shaded areas and lighter textured soils.**

##### **Hairy panic (*P. effusum*)**

Hairy panic is a short-lived perennial that is widespread throughout New South Wales. Although the young growth is very palatable and of reasonable quality it can cause photo sensitisation and 'yellow big head' in sheep if large quantities of the grass are eaten. Hairy panic will increase in density and production with increasing soil fertility.

##### **Sweet panic (*P. laevifolium*)**

Sweet panic is an introduced annual widely naturalised on the tablelands and slopes as well as on the north coast. It is a useful feed but can cause photosensitisation if large amounts are eaten by stock.

#### **SEED PRODUCTION**

Almost all seed sown in New South Wales has been bought from Queensland. However, there is increasing interest in both commercial scale seed production and opportunity harvesting to provide seed for further sowings on the same farm.

The cost of panic grass seed is high because there is a high input of labour and management into seed production and a high risk of crop loss. Some factors found to be important in southern Queensland are listed below.

- The number of harvests depends on seasonal conditions, soil fertility and management. Up to three harvests are possible with Petrie Green or Gatton panics and two with Bambatsi.
- Seed shedding is a major problem with all

varieties; it means a very short harvesting period and low yields.

- Petrie Green panic seed is ready to harvest when it turns from green to yellow; Gatton panic when the seed changes from purplish brown to yellow; and Bambatsi when the seed changes from greenish purple to bluish green.
- Low seed yields (10-50 kg/ha) are not uncommon, especially in young stands. Dryland yields of up to 140 kg/ha of Petrie Green panic and 105 kg/ha of Bambatsi panic have been achieved.
- Seed is normally dried by spreading on a tarpaulin in a shed to a depth of 10 cm and turning twice a day for up to three days, depending on moisture content and drying conditions.

There is no certification scheme for panic species in New South Wales.

### **PHOTOSENSITISATION IN STOCK**

Bambatsi panic, Gatton panic, and Petrie Green panic, as well as some naturalised or native panics, are capable of causing photosensitisation in stock.

Experience in Southern Queensland suggests that the condition is more likely to occur when:

- grass is young or growing rapidly (for example, after drought has broken)
- young stock (especially sheep) are involved
- stock are in a stressed condition.

Signs of photosensitisation include:

- scratching, excessive rubbing and arched necks
- animals difficult to muster and darting from shade to shade
- swollen ears and muzzle
- droopy ears
- fluid seeping from ears and eyes
- scabs forming on ears and face
- death.

If you suspect problems remove stock immediately and graze them on panic-free pastures with access to shade. Seek veterinary advice.

### **FURTHER INFORMATION**

For further information contact your local NSW Agriculture District Agronomist.

### **PUBLICATIONS AVAILABLE**

For a complete list of NSW Agriculture publications, Agfacts, Agnotes and Farm Enterprise Budgets, please see our Internet site at:

<http://www.agric.nsw.gov.au/Bookshop>

or write to NSW Agriculture Bookshop, Orange Agricultural Institute, Forest Road, Orange 2800.

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