



A collaboration between AWI, GRDC, MLA, RIRDC and Dairy Australia

Buffel grass

Scientific name(s)

Cenchrus ciliaris

Strengths

- Adapted to range of soil textures.
- Very persistent on lighter-textured soils.
- The most drought tolerant introduced grass.
- Quick to respond after relatively small falls of rain.

Limitations

- Only moderate palatability.
- "Fluffy" seed is difficult to sow.
- Needs high fertility for production.
- Establishment is difficult on clay soils.
- Intolerant of high levels of available soil aluminium and manganese.
- Frost-sensitive.
- Will not survive prolonged flooding or waterlogging.
- Can cause 'big head' in horses.
- Can invade certain sub-humid to arid environments.

Plant description

Plant: Low- to tall-growing, erect to sprawling, summer-growing, perennial tussocky grass with varying degrees of rhizome (underground stem) development. Deep, strong, fibrous root system to >2.0 m.

Stems: Branching and very fibrous, from about 0.3 - 1.5 m long at maturity, depending on variety and growing conditions.

Leaves: Leaf blades are long and slender, green, blue green to grey green in colour, with a rough edge, and sometimes hairy at the base.

Seedhead: Erect to nodding, straw, grey or purple coloured foxtail, 2 - 15 cm long and 1 - 2.5 cm wide, with seed units (fascicles) carried along a zig-zag axis.

Seeds: Each bur-like seed unit may contain one or more seeds. 330,000 - 550,000 seed units/kg.

Pasture type and use

Mainly used as a permanent pasture, but can be used for hay or silage if cut at a leafy stage. It is not suited to short-term pasture because it is fairly slow to establish, too difficult to remove and ties up nutrient.

Where it grows

Rainfall

The most drought tolerant of the commonly sown grasses, buffel grass is usually sown in areas with an annual rainfall between 300mm and 750mm, and up to about 1200mm. Winter rainfall should be below 400mm.

Soils

Although well-adapted to deep, freely draining sandy loam, loam, clay loam, and well-structured red and dark clay soils, buffel grass prefers lighter textured soils. It is slow to establish on black, cracking clay soils, but once established it grows well. It requires good fertility, with available phosphorus levels above 10 mg/kg. The ideal soil pH is between 7 and 8, but it will grow on soils with pH as low as 5.5. It is intolerant of high levels of soil aluminium and manganese. Buffel grass is moderately tolerant of soil salinity (less so than rhodes grass), but rooting depth may be limited by high levels of subsoil salinity, as well as high sodicity or low pH (<5). It does not survive prolonged waterlogging, particularly in cold season. Tolerance of flooding varies, the taller varieties appearing to be more flood-tolerant than the lower-growing types.

Temperature

Tops are killed by frost but plants mostly recover with resumption of warmer conditions. In general buffel grass performs best in areas where mean minimum winter temperatures are above 5° C.

Establishment

Companion species

Grasses: bluegrasses (creeping, Floren, Queensland), digit grass, green and Gatton panics, purple pigeon grass, rhodes grass, tall finger grass.

Legumes: burgundy bean, butterfly pea, cassia, clover (white, subterranean), desmanthus, glycine, lotononis, lucerne, medics, serradella, siratro, stylo (caatinga, caribbean, shrubby).

Sowing/planting rates as single species

2-3 kg/ha.

The "fluffy" nature of the seed makes it difficult to sow using conventional machinery as seed does not flow readily and tends to clog seeders. Drum seeders are more suitable. Seed is now available in a pelleted or coated form which makes it easier to handle and spread. Higher sowing rates are necessary with pelleted/coated seed.

Sowing/planting rates in mixtures

0.5-2 kg/ha.

Sowing time

Spring to late summer, depending on period of most reliable summer rainfall.

Inoculation

Not applicable.

Fertiliser

Because buffel grass seedlings require phosphorus for establishment, phosphate should be applied at sowing if available soil phosphate levels are low e.g. 50 - 150 kg/ha superphosphate, depending on soil type, fertility and rainfall. Available soil nitrogen levels are usually adequate at sowing with the nitrogen released during cultivation.

Management

Maintenance fertiliser

Maintenance dressings of 25 - 50 kg/ha superphosphate may be necessary from time to time depending on soil phosphorus levels. A vigorous legume in the pasture will help to provide the nitrogen needs of the grass. However, stand decline due to nitrogen rundown is common in buffel grass pastures.

Grazing/cutting

Buffel grass is slow to establish and grazing may need to be delayed anything up to 12 months, depending on establishment conditions. If possible, it is best to avoid grazing in the first year until after seed-set, which ensures plants are well-established, and gives lighter stands the opportunity to thicken up in subsequent years.

Once established, buffel grass is very tolerant of regular cutting or grazing. Since quality declines rapidly with age, buffel grass pastures should be grazed sufficiently regularly and

heavily to maintain in a leafy, more nutritious stage.

Seed production

Nitrogen is essential for seed production, seed yields being raised 10-fold and more with nitrogen fertiliser, usually at rates of 100 or 200 kg/ha N. Depending on growing conditions and variety, seed yields range between about 150 and 500 kg/ha.

Ability to spread

Buffel grass seed is spread by wind, water and grazing livestock, more readily on soils with a friable surface. Spread is extremely slow on soils with a hard-setting surface, and in more acid soils.

Weed potential

It is considered an environmental weed in parts of northern Australia where it has spread into various semi-arid and arid native plant communities.

Major pests

The buffel grass seed caterpillar can have an adverse effect on seed crops but does not affect grazing quality of the grass.

Major diseases

The fungal disease, buffel grass blight or pyricularia leaf spot can cause serious damage to stands of some cultivars under higher rainfall conditions.

Herbicide susceptibility

Buffel grass can be controlled using a combination of glyphosate and ammonium sulphate, possibly in repeat applications. Seedlings are susceptible to the grass-selective herbicide, fluazifop-p-butyl (Fusilade®) as well as dicamba, 2,4-D, triclopyr, tebuthiuron, or hexazinone.

Animal production

Feeding value

The nutritive value of buffel grass is not as high as that of some other improved pasture grasses. Crude protein values are mostly in the range of 6 - 16%, and digestibility, 50-60%, depending on age of growth, cultivar, and soil fertility (incl. fertiliser use). Phosphorus levels are usually higher than in other tropical grasses and range from 0.15 - 0.65% in the DM.

Palatability

Even when leafy, it is only moderately palatable, although there are differences between cultivars. It is less palatable than Bambatsi, green and Gatton panics, but more palatable than purple pigeon grass at the same stage.

Production potential

Yields vary with soil fertility, growing conditions, and cultivar, but are mostly in the range of 2 - 9 t/ha DM. A well-established stand of buffel grass on good can carry up to 1 steer or 6 sheep/ha, depending on rainfall and soil fertility. Cattle can gain up to 180 - 200 kg/hd/yr at 2 ha/beast on fertile soils under good growing conditions.

Livestock disorders/toxicity

Soluble oxalate levels of 1 - 2% in the DM of the plant can cause 'big head' in horses and oxalate poisoning in young or hungry sheep. However, at these levels there is rarely a problem with mature ruminants.

Cultivars

Should be selected on the basis of plant habit, maturity, and adaptation to soil type, as well as local experience.

Group	Cultivar	Seed source/Information
Tall varieties	Biloela	Australian Herbage Plant Cultivars

Intermediate height varieties	Bella Φ	-
	Gayndah	Australian Hebage Plant Cultivars
	Viva Φ	-
Short varieties	American	Australian Hebage Plant Cultivars
	West Australian	Australian Hebage Plant Cultivars

Φ Denotes that this variety is protected by Plant Breeder's Rights Australia

Further information

Tropical Forages database (SoFT) - Buffel grass

Acknowledgements

Lester McCormick and Bob McGufficke, NSW DPI "Buffel grass" Agnote DPI-289

Brian Johnson, DPI&F, Queensland "Buffel grass in south Queensland" 4140 above

Gavin Graham, DPI&F, and Lachlan Pegler, NRW "Pasture species in central Queensland Buffel grass" 3277 above.

Arthur Cameron, DPIFM, NT "Buffel Grass,(A pasture grass for sandy soils)" Agnote E28

Author and date

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