



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

Brachiaria hybrid

Scientific name(s)

Artificial hybrids:

Brachiaria brizantha x *B. ruziziensis*
(*Urochloa brizantha* x *U. ruziziensis*)

Brachiaria ruziziensis x *B. decumbens* x *B. brizantha*
(*Urochloa ruziziensis* x *U. decumbens* x *U. brizantha*)

Strengths

- Well-adapted to acid and neutral soils of moderate to low fertility
- Tolerates high soil aluminium levels
- Very persistent, even under seasonally dry conditions
- Productive, capable of sustaining high stocking rates and grazing pressures
- High nutritional value for ruminants
- Maintains green leaf of relatively high nutritional value into seasonally dry periods
- Responds well to nitrogen fertiliser

Limitations

- Low seed production may limit availability
- Slow to establish if dormant seed is sown
- Dense growth means careful management needed to maintain companion legumes

Plant description

Plant: Low-growing, leafy perennial grass with a mostly erect habit. Leaf canopy to 80 cm above ground.

Stems: May contain short underground runners (rhizomes) and above-ground stems can root down at the nodes. Flowering stems commonly 3 - 5 mm diameter near the base and 60 - 70 cm tall. Leaf sheaths hairy.

Leaves: Triangular. Very soft and bright to dark green with soft hairs on the upper and lower surfaces. Variable length, commonly to 30 cm long and 25 mm wide. Fringe of fine bristles at the leaf base.

Seedhead: Made up of 3 - 6 rod-like branches (racemes) separated by 2 - 5 cm on the stem with one at the stem tip. Each raceme is 3 - 5 cm long, 3 - 5 mm wide and is made up of 2 rows of alternating seeds totalling about 40 seeds. Each row is attached to the underside of a zig-zag shaped stem. When flowering 'Mulato' has maroon stigmas (feathery structures emerging from immature seeds) and 'Mulato II' white stigmas.

Seeds: Egg-shaped seeds 4 - 5 mm long and 2 - 3 mm wide, smooth with a dull shine, a fringe of hairs near the tip and a distinctive 2 mm membrane where the seed meets the stem. Approximately 130,000 seeds/kg.

Pasture type and use

Permanent pasture suited to beef and dairy production, particularly when nitrogen-fertilised or grown with well-adapted companion legumes. Suited to hay production.

Where it grows

Rainfall

1,000 - 3,500 mm/year, including areas with a dry season of 5 - 6 months. Overseas experience suggests these hybrids may be useful in areas with annual rainfall as low as 700 mm.

Soils

Grows well on free-draining soils including weathered tropical soils characterised by low pH (acid) and high aluminium (Al) saturation. Tolerant of infertile soils, particularly low-phosphorous soils. Will tolerate short-term flooding, but not prolonged water-logging.

Temperature

Well adapted to the humid and sub-humid tropics, extending into the subtropics and elevated tropics. Regrows after frosts.

Establishment

Companion species

Grasses: Best sown as sole grass.

Legumes: Centro, creeping vigna, pinto peanut and villose jointvetch in intensive systems, with pinto most persistent under heavier grazing pressures; silverleaf and greenleaf desmodium and glycine under more lenient management.

Sowing/planting rates as single species

4 - 6 kg/ha good quality uncoated* seed for pasture (90+% purity and 70%+ total viability (germination + tetrazolium tests)), 5-10 kg/ha for seed or hay crops. Seed can have high dormancy levels due to either fresh dormancy or husk-induced dormancy. Seed should be at least 3 months old and may need to be scarified to increase establishment rate.

* coating can considerably increase the weight of uncoated seed and this varies between coatings. Sowing rates for coated seed may need to be adjusted based on the coating used and level of scarification achieved.

Sowing/planting rates in mixtures

Likely to be sown as the only grass in a pasture. If companion grasses are used, adjust the sowing rate to total 4 - 6 kg/ha. Do not adjust for legumes.

Sowing time

To avoid slow establishment associated with cool soils: sow during summer months in the sub-tropics and elevated tropics; spring/summer in tropical coastal areas. Plants will often establish from previously dormant seed over the summer growing period.

Inoculation

Not applicable.

Fertiliser

Although tolerant of low fertility, these hybrids will likely be sown on moderately fertile soils used for intensive animal production. Responds strongly to nitrogen (N) fertiliser. Phosphorus (P); sulphur (S) and potassium (K) deficiencies should be treated; lime application to reduce acidity will rarely be required.

Management

Maintenance fertiliser

Highly responsive to nitrogen application. In high production beef-finishing systems without legumes apply 50 - 60 kg/ha/yr fertiliser N (e.g. 110 - 130 kg urea) to maintain productivity, higher in split applications if higher production is sought. Pastures with high (30 - 50%) populations of legume (e.g. forage peanut) do not require nitrogen application. For tropical dairying, up to 350 kg/ha/yr fertiliser N can be applied. Applications of P, S, and K are recommended every 3-4 years in high production systems to overcome soil deficiencies.

Grazing/cutting

Graze lightly within 4 months of planting to encourage early plant development.
Very tolerant of cutting and grazing by cattle once established and can be grazed at high stocking rates suitable for dairy and beef-finishing in the humid tropics and sub-tropics.
Plants can regrow after fire.

Seed production

Seed production is lower than for signal grass. 'Mulato' produces lower header harvested seed yields (~100 kg/ha) than 'Mulato II' (over 250 kg/ha). Low seed production may limit availability of 'Mulato' seed. Flowering is strongest over April - May in north Queensland but seed development is otherwise poorly synchronised as for most tropical pasture grasses. Seeds are shed once mature. Recovery by direct heading is maximised through a February cleaning cut and high rates of nitrogen fertiliser which helps to synchronise seed head development and encourages a dense leaf canopy which can trap fallen seed.
Freshly harvested seed is often dormant and should not be sown within a few months of harvest. Seed may also require scarification to enhance establishment.

Ability to spread

Moderate. Plants colonise surrounding ground by expanding tussocks and rooting down at nodes of flowering and non-flowering stems under wet conditions.

Weed potential

No precedent in Australia. Likely similar to signal grass: low weed potential in undisturbed natural communities but possibly a weed of disturbed areas. Possibly a weed of certain grass field and seed crops and pastures due to seed longevity and plant persistence.

Major pests

None to date in Australia. May be affected by pests which occasionally damage signal grass, particularly fertilised pastures or seed crops: turf leaf hoppers, pasture webworms, army worms and cane grubs.

Major diseases

None to date in Australia.

Herbicide susceptibility

Selective control of grasses: tolerant of atrazine used pre- or early-post emergence. Intolerant of most other grass-controlling herbicides.

Control of broadleaved weeds: tolerant of 'hormone' herbicides such as 2,4-D, picloram+2,4-D and dicamba.

Animal production

Feeding value

High compared to other grasses grown in similar situations but dependent on soil fertility and age and proportion of leaf and stem. Crude protein (CP) of 12 - 16% for 25 - 35 day regrowth of nitrogen fertilised pasture. In vitro digestibility of leaf can reach 80%, more commonly 60 - 70%, under intensive grazing. Has higher nutritive value (N, P, K, Ca and Mg) than signal grass at a similar stage of growth and higher crude protein than *B. brizantha*. Crude protein higher in 'Mulato II' than 'Mulato' in some overseas trials.
Maintains quality into the dry season due to delayed flowering. Makes high-quality hay.

Palatability

Highly palatable to grazing ruminants. Maintains palatability into the dry season due to delayed flowering. Palatability to horses unknown.

Production potential

Can produce 10-15% more dry matter than signal grass with yields of 10 (unfertilised) - 28 T DM/ha/yr (fertilised). 'Mulato II' can produce approximately 20% of its dry matter during the dry season.

Individual beef-cattle liveweight gains to 0.9 kg/head/day and liveweight gains of pregnant cows and heifers of 1.6 kg/hd/day possible during favourable growing conditions and management. The *Brachiaria* hybrids can out-perform signal grass for beef production and signal grass and *B. brizantha* for wet and dry season milk production. 'Mulato II' can produce

higher milk yields than 'Mulato'.

Livestock disorders/toxicity

None reported. However, as for other Brachiaria species, including parents of the hybrids, may cause skin photosensitisation in cattle, deer and sheep (rarely fed to sheep) if a large component of the diet, although this is rare in Australia. Rotation with other grasses is recommended if symptoms (swelling skin and raw sores) occur. Similarly, may cause a 'big-head' disease in horses unless calcium is supplemented or alternative feed is provided.

Cultivars

Cultivar	Seed source/Information
Mulato [Ⓟ]	Plant Breeders Rights Office. Low seed production may limit commercial availability of this variety.
Mulato II [Ⓟ]	Plant Breeders Rights Office. Better prospects for commercial seed production than 'Mulato' because of higher harvested seed yields.

[Ⓟ] Denotes that this variety is protected by Plant Breeder's Rights Australia

Further information

Tropical Forages database (SoFT) - Brachiaria hybrid

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Author and date

Kendrick Cox

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