

Brachiaria humidicola



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Scientific name

Brachiaria humidicola (Rendle) Schweick

Sometimes mistakenly referred to as *B. dictyoneura*, a species to which it is very closely related. This fact sheet refers to those forms known worldwide as *B. humidicola* and represented by cvv. Tully and Llanero. Cv. Llanero was originally released as *B. dictyoneura*, but recently reclassified as *B. humidicola*.

Synonyms

Urochloa humidicola (Rendle) Morrone & Zuloaga
Panicum humidicola Rendle [basionym]

Family/tribe

Family: *Poaceae* (alt. *Gramineae*) subfamily: *Panicoideae* tribe: *Paniceae*.

Common names

koronivia grass, humidicola, creeping signal grass (Australia); false creeping paspalum (English); braquiaria dulce, kikuyu de la Amazonía, pasto húmídico, pasto húmídico dulce (Spanish); capim agulha, pontudinho, quicúio da Amazônia (Portuguese); ya humidicola (Thailand).

Morphological description

A strongly stoloniferous and rhizomatous perennial grass, forming a dense ground cover. Vegetative culms prostrate or arched in the lower part where they root from the lower nodes. Flowering culms erect, 20–60 cm high. Leaf blades lanceolate, flat, bright green, rigidly pointed, 5–16 mm wide, up to 25 cm long, but usually 12 cm or less, glabrous or sparsely hairy with thickened margins. Ligule a fringe of short hairs. Sheath bluntly keeled, the lower spreading away from the culm. Inflorescence 7–12 cm long; supporting 2–5 spike-like, hairy racemes widely spaced on a central axis. Racemes 2.5–5.5 cm long, light green tinged with purple. Rachis narrow, angled, hairy, wavy. Spikelets 4.5–5.5 mm long, hairy, green, tinged with purple, 2 flowered; arranged in two rows along each side of a narrow, angled axis. Glumes unequal, lower and slightly shorter than the rest of the spikelet, glabrous, strongly flushed with purple and with a few faint cross veins on upper part. Upper glume as long as the spikelet, hairy and green with well defined cross veins all along. Both glumes are many-nerved. Lower floret male with a lemma like the upper glume, but less hairy and with few nerves. Upper floret bisexual, glossy, light green or white.

Cv. Tully has longer leaf blades than most members of the species, up to 25 cm long. Seed is similar to that of *B. decumbens* cv. Basilisk, but readily distinguishable by the much longer lower glume and lower density of hairs. Spikelets are marginally longer and wider in cv. Tully and the caryopsis itself



shorter, broader and much shallower. Approximately 200,000 seeds/kg.

Distribution

Native to:

Africa, from southern Sudan and Ethiopia in the north to South Africa and Namibia in the south.

Grown widely in humid-tropical countries of South America, the Pacific Islands and south-east Asia, and in coastal regions of northern Australia.



Uses/applications

Sown for permanent pasture for grazing and as ground cover for control of erosion and weeds. In East Venezuela, also used for hay. Good nematode control.

Ecology

Soil requirements

Grows on a very wide range of soil types from very acid-infertile (pH 3.5), high Al soils, to heavy cracking clays, to high pH coralline sands. Grows well in infertile soils with low P levels, but will respond to N and P. Has a low Ca requirement. Tolerant of poor drainage and often found on seasonally wet clays in valley bottoms.

Moisture

In the native range, annual rainfall varies from 600–2,800 mm, but because of the associated high elevation (600–2,400 m asl) rainfall is more effective than similar amounts in lowland environments. In exotic environments, *B. humidicola* requires 1,000–4,000 mm of reasonably well-distributed annual rainfall.

Less vigorous in environments with <1,600 mm annual rainfall and >6 months dry season. Will stay green during moderate dry seasons but turns to a reddish colour under more extreme dry conditions.

More tolerant of poor drainage and short-term flooding than *B. decumbens*.

Temperature

In its native range in equatorial Africa, grows at altitudes of up to 2,400 m asl. In exotic environments, *B. humidicola* is considered to be a grass for tropical lowland environments, but can extend to 1,000 m altitude and can be found in lowlands at latitudes up to 27°. Produces less cool season growth, but more hot season growth than *B. decumbens*. Poor frost tolerance.

Light

Grows best in full sunlight but has moderate shade-tolerant (e.g. as under mature coconut plantations). Less shade tolerant than *B. subquadriflora* and *Stenotaphrum secundatum*.

Reproductive development

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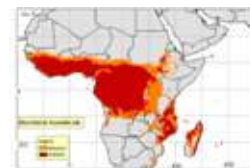
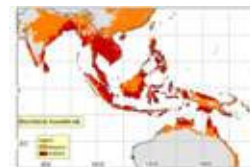
Field data from Australia, Brazil and Vanuatu suggest that *B. humidicola* is a long-day plant, flowering into mid-summer and only flowering strongly at latitudes $>10^{\circ}$. However, some publications suggest that it is day-neutral, or even short-day in photo-period response.

Defoliation

Performs best under moderate to heavy grazing pressure due to its strongly stoloniferous growth habit. Will maintain good ground cover even under very heavy grazing. Under light grazing, the dense mat of decumbent leaves and stems, associated with humid conditions, forms a bulk of low quality herbage.

Fire

B. humidicola is not often burned because frequent heavy grazing and humid climate reduce the chance of a build up of dry fuel. However, it will recover well from accidental fire.



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Agronomy

Guidelines for the establishment and management of sown pastures.

Establishment

B. humidicola is favoured by many smallholders with grazing land because it establishes reliably and spreads rapidly from stem cuttings planted at 1 m x 1 m spacings. Larger areas can be planted by spreading stolons over cultivated soil and lightly incorporating with disc harrows.

Seed can be used for larger commercial plantings. Seed may be dormant for 6 months after harvest and so should be stored or acid-scarified before planting. Seed is broadcast at 2–8 kg/ha (depending on germination percentage) onto a well-prepared seedbed and lightly harrowed. Seed will decline in quality rapidly if stored inappropriately and poor seed quality has been the cause of many planting failures.

Fertiliser

B. humidicola is well adapted to infertile soils but responds well to N and P fertiliser.

Compatibility (with other species)

B. humidicola is very aggressive. Its ability to spread rapidly and to form a dense bulk of herbage under light or no grazing prevents other species invading. This may also be related to its ability to inhibit nitrification. It is thus very useful for establishing a pasture in the humid tropics because it prevents the normal explosion of broad-leaved weeds. For the same reason, it is not compatible with most forage legumes, but can combine well with creeping legumes under moderate to high grazing pressures.

B. humidicola can be planted under coconut palms. However, dense ungrazed grass can tie up soil nitrogen turning young palms chlorotic.

Companion species

Legumes: *Desmodium heterophyllum*, *D. heterocarpon* subsp. *ovalifolium*, *Arachis* spp. Combines well with *Trifolium semipilosum* and *Lotononis*

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bainesii in Zimbabwe.

Pests and diseases

Tolerant of, but not truly resistant to spittlebugs (*Aeneolamia* spp., *Deois* spp. and *Zulia* spp.); more tolerant than *B. decumbens* and recovers quickly making it useful in parts of South America, but can be badly attacked in the humid tropics of Brazil. In Brazil, accession IRI 409 favours spittlebug multiplication. Highly resistant to leaf-cutting ants (*Acromyrmex* spp. and *Atta* spp.), but can be severely attacked by striped grass worm (*Mocis latipes*).

A leaf rust (*Uromyces setariae-italicae*), introduced from Africa, has attacked *B. humidicola* in Brazil, Colombia, Peru and Ecuador, and can lead to 100% loss of yield.

Ability to spread

Rarely naturalises from spread by seed but will spread well over short distances by stolons.

Weed potential

Can invade and then dominate multi-species pastures. Like many grasses, it has the potential to colonise disturbed sites, although its spread is predominantly from stolons and therefore slow.

Feeding value

Nutritive value

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Although the leaf appears hard and fibrous, nutritional value is good (5–17% CP) considering the low fertility of the soils in which it is often grown. In the Colombian savannah, 6-week old foliage in a 54-accession collection had 5.2–8.5% CP content in the rainy and 3.3–9.3% in the dry season; IVDMD was 59–66% and 51–67%, respectively. Lower quality than other *Brachiaria* species such as *B. decumbens*, *B. brizantha* or *B. ruziziensis*.

Digestibility (48–75%) declines quickly if not grazed.

Palatability/acceptability

Only moderately palatable in comparison to many softer grasses, but readily eaten by cattle when kept short and leafy. Palatability of koronivia grass growing on acid-infertile soils can be low as the leaf blade becomes fibrous and strongly pigmented with anthocyanin. In Malaysia, sheep grazing koronivia grass growing on acid-infertile soils received facial lacerations from the sharp leaf tips of the fibrous leaf blades. This resulted in patch grazing and the requirement for regular slashing.

There are reports that it is actively selected for by horses, however, note potential toxicity below.

Toxicity

Photosensitization has been recorded in horses grazing *B. humidicola* pasture for over 5 months, but is not common. Its low Ca concentration and high levels of oxalate may induce 'big head' disease (parathyroidism) in horses. Can be overcome by feeding of appropriate mineral supplements.

Production potential

Dry matter

DM production is strongly influenced by soil fertility and ranges from 7–34 t/ha/year. In Fiji, unfertilised koronivia grass produced an annual DM yield of 11 t/ha DM, whereas DM increased to 34 t/ha with the application of 452 kg/ha N. There was a linear yield response to nitrogen. In humid-tropical Vanuatu, annual yield declined from 28 t/ha DM, to 17 t/ha DM as fertility declined. Annual DM yields of 7 t/ha and 5–9 t/ha were reported from Paraguay and Brazil, respectively.

Animal production

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In Colombian savannas, LWGs of 80 kg/head/yr and 240 kg/ha/yr from pure swards increased to 134 kg/head and 402 kg/ha/yr when grown with *Arachis pintoii*.

In humid tropics of Ecuador, pure stands, grazed at 2 head/ha gave LWGs of 0.56 kg/head/day and 406 kg/ha/yr. In humid tropics of Peru, with *A. pintoii*, at 4 head/ha, LWGs were 0.43 kg/head/day and 692 kg/ha/yr. In Panama, pure stands grazed at 4 head/ha, gave LWGs of 0.32 kg/head/day and 501 kg/ha/yr while with *Pueraria phaseoloides*, the corresponding LWGs were 0.38 kg/head/day and 585 kg/ha/yr.

In humid tropical Vanuatu, steers grazing koronivia/legume pastures gained 0.74, 0.68 and 0.55 kg/head/day at stocking rates of 2, 2.5 and 3.5 head/ha, respectively, over a two-year period.

Genetics/breeding

No breeding programs have been undertaken to date. Commercial cultivars, and at least half of the accessions studied to date, are aposporous apomicts. As a result there is limited variation among accessions. Cv. Tully is an apomictic hexaploid. Chromosome number $2n = 4x = 36$, $2n = 6x = 54$.

Seed production

Seed can be hand harvested, stoked and threshed, or direct headed. Yields of 290 kg/ha pure seed have been recorded in hand harvested experimental plots in Colombia, and of 80–500 kg/ha in Brazil. In tropical Australia, yields of 200 kg/ha are typical under commercial conditions with direct machine heading, but experimental yields can exceed 500 kg/ha.

The large seed may be dormant for up to 9 months. Must be stored in low temperature and low humidity conditions to prevent seed quality decline, which can be severe.

There is very limited flowering and seed production at low latitudes.

Herbicide effects

Spraying with glyphosate (3 l/ha of 36% a.i.) will give sufficient control to establish a pasture legume.

Strengths

- Adapted to low fertility soils.
- Easy establishment and rapid spread from cuttings.
- Excellent ability to suppress weeds.

- Maintains good ground cover under heavy grazing.
- Some tolerance of spittlebugs.
- High LWGs per ha because of supporting high stocking rates.

Limitations

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- Can be unpalatable to stock, particularly sheep.
- Difficult to maintain companion legume .
- Needs frequent grazing/cutting to maintain quality.
- Susceptible to rust.
- Lower quality than other *Brachiaria* spp.

Other comments

Selected references

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Internet links

<http://www.fao.org/ag/AGP/AGPC/doc/Gbase/data/pf000190.htm>

<http://www.pi.csiro.au/ahpc/grasses/pdf/tulley.pdf>

http://www.ars-grin.gov/cgi-bin/npgs/html/tax_search.pl?urochloa+humidicola

Cultivars

Cultivars	Country/date released	Details
'Tully' (CPI 16707, CIAT 679, RA001627)	Australia (1981)	Introduced as CPI 16707 from Rietondale Experiment Station, Pretoria, South Africa, by J.F. Miles in 1952. Subsequently introduced to Fiji and Papua New Guinea, and reintroduced to the Tully area of North Queensland from PNG in 1973. It is from this reintroduction that commercial seed of cv. Tully is derived. A vigorous and dense mat-forming grass, tolerant of heavy grazing and resistant to weed invasion.
Koronivia	Fiji (1958)	CPI 16707 introduced to Fiji in 1957 where it was subsequently grown commercially, but never formally registered as a cultivar.
'INIAP- NAPO 701'	Ecuador (1985)	Derived from CPI 16707 ('Tully').
'Aguja'	Venezuela (1989)	Derived from CPI 16707 ('Tully').
'Humidícola'	Panama (1990)	Derived from CPI 16707 ('Tully').
'Chetumal'	Mexico (1991)	Derived from CPI 16707 ('Tully').
'Pasto humidícola'	Colombia (1992)	Derived from CPI 16707 ('Tully').
'Llanero' (CIAT 6133, CPI 118939, BRA 001449, ILCA 12470, CPAC 3139, CNPGC 0769/86, RWS 436)	Colombia (1987)	Originally released as <i>B. dictyoneura</i> , but recently reclassified as <i>B. humidicola</i> . Collected in northern Zambia at 1,240 m asl. Similar to 'Tully' in agronomy and productivity, but reported to be of higher nutritive quality.
'Ganadero'	Venezuela (1992)	Country release of cv. 'Llanero'.
'Gualaca'	Panama (1992)	Country release of cv. 'Llanero'.
'Brunca'	Costa Rica (1994)	Country release of cv. 'Llanero'.

Promising accessions

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Promising accessions	Country	Details

CIAT 6369	Colombia Venezuela	Hillside stabilisation. High drought tolerance.
CIAT 16868, CIAT 16886	Colombia	Selected for better nutritive value and seed production than existing cultivars.
UF 717	USA (Florida)	Good salt tolerance.



cv. Llanero seedcrop and seeds.

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cv. Llanero with *Centrosema macrocarpum*, being grazed in Colombia.

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Better Pastures for the tropics - banner

Humidicola or Koronivia grass

(*Brachiaria humidicola*)

Koronivia - illustration

- **vigorous creeping grass for high rainfall areas**
- **more tolerant of waterlogging than signal grass**
- **tolerates very acid soils**
- **liked by horses.**

Brachiaria humidicola (Rendel) Schweick. - 1 habit leafy stems; 2 inflorescence.

Although officially known as **Koronivia** grass in Queensland and throughout the Pacific, graziers in north Queensland now generally refer to it as '**humidicola**'. The released cultivar is **Tulley**.

Although it has been released for the humid tropics, humidicola will grow as far south as Brisbane; however, it is not frost hardy and its cool season growth is lower than that of signal grass.

Humidicola is a stoloniferous perennial that roots strongly at the nodes and forms a tight sod. The leaf blades are mostly smooth, narrow and folded, and rise to a sharp point at the end. The foliage appears rather hard, but cattle readily eat humidicola and horses prefer it to [signal grass](#).

While signal grass is a softer more productive species, humidicola is more tolerant of waterlogging, salinity and very acid soils. It is very resistant to heavy grazing, standing high stock densities over the wet season, indeed it should not be allowed to become too rank. It is aggressive against weeds and also legumes, except for [hetero](#).

Humidicola was planted from runners, but seed is now available.

Creator: Ian Partridge,
Date created: 14 April 1998 Revised: 15 January 2003

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