Cenchrus pennisetiformis

Scientific name

Cenchrus pennisetiformis Hochst. & Steud.

Synonyms

Pennisetum pennisetiforme (Hochst. & Steud.) Wipff

Family/tribe

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

Morphological description

Annual or perennial (sometimes short-lived) tussock. Culms erect or geniculately ascending to (20–) 40–60 cm tall and to 80 cm at maturity, similar to smaller - medium types of *C. ciliaris*. Leaf sheath compressed, keeled, margins ciliate; ligule reduced to a ciliate fringe. Leaf blade convolute or flat, linear, to 20 cm long and 5 mm wide; glabrous to pilose, scaberulous. Inflorescence a pale beige to purplish spiciform panicle, 2–6 (–9) cm long and c. 1 cm wide, with numerous bur-like seed units (fascicles) inserted along a zigzag axis. Fascicle comprising 1–5 spikelets, 4–5.5 mm long, ovate to acutely lanceolate, surrounded by an involucre of bristles; involucral bristles deciduous with the fertile spikelets; with an outer whorl of thinner bristles; inner bristles longer than outer; with one conspicuously longer bristle; 8–16 mm long; bristles antrorsely barbed and hairy, giving the fascicle an adhesive quality. Caryopsis obovoid; dorsally compressed; 1.5–2 × 1 mm; dark brown; glabrous; truncate, or obtuse; apex unappendaged. 400,000 seed units/kg.

Similar species

***C. ciliaris*:** inner bristles of the involucre united at the base only.

***C. pennisetiformis*:** inner bristles of the involucre united for 1–3 mm above the base.

Common names

Africa: qoncorro (Borana, Kenya); k'onc'orro (Gabra, Kenya); garrao (Somalia)

English: Cloncurry buffel, white buffel, slender buffel grass (Australia)

India: dhamanio

Pakistan: dhaman gaa; lidder (also applied to *C. biflorus*); sitti

Distribution

Native:

Africa: Ethiopia; Kenya; Somalia; Sudan

Asia: India; Iran; Pakistan; Yemen


Tussock with culms erect or geniculately ascending to 80 cm at maturity.


Inflorescence a spiciform panicle


Seed units or fascicles


Early growth on flat country near Cloncurry, central north Queensland


Established permanent pasture in northern Australia.


Persists under dry conditions


Recovery after extended drought NW Qld Australia


Grazed (L), ungrazed (R), dry season, semi-arid NW Qld Australia


Senescent tussock with dying/dead centre, NW Qld Australia


Stabilizing river bank, NW Qld Australia

Naturalized:

Australasia: Australia (Northern Territory, Queensland, South Australia, Western Australia)

Uses/applications

Forage

Primarily for permanent pasture. Valuable standover feed in low-rainfall areas as it remains green well into the dry season.

Environment

It can be used for stream bank protection in rivers and creeks.

Other

Being investigated for antifungal properties of foliar extracts.

Ecology

Soil requirements

Prefers sandy soils, loams and alluvial silts, but does not extend onto heavy cracking clays. Best on fertile soils with high phosphorus and calcium levels, and pH >7. In Australia, it has spread from river alluvium to frontage woodlands and stony, undulating country beyond.

Moisture

Although mostly naturalized in the 370–560 mm annual rainfall zone in northern Australia, it is found in dune-land in central Pakistan where the annual rainfall ranges from 130 to 180 mm, with a long dry season. Excellent drought tolerance, remaining green during the dry season. However, extended severe droughts can kill plants. Survives seasonal flooding.

Temperature

Best adapted between 20° N and S latitudes and from sea level to 400 m asl. Grows in hotter areas than *C. ciliaris* (average temperature range: 10–30°C). Rated as moderately frost tolerant in Australia (leaves burnt but most plants recovering with onset of rain and warm conditions). However, native stands in central Pakistan are found in areas where summer temperatures can be as high as 52 ºC, and below 0 °C in winter.

Light

Grows in partial shade along river banks and under larger trees, as well as in open country.

Reproductive development

An early flowering short day plant. Flowers February–April and again August–October in Madhya Pradesh, India (latitude 21.2°–26.87° N)

Defoliation

Grazed early in the growing season, allowed to seed, and then stocked again to help spread the seed.

Fire

Recovers well following fire.

Agronomy

Guidelines for establishment and management of sown forages.

Establishment

Similar post-harvest dormancy to *C. ciliaris* and *C. setiger*. Needs some soil disturbance for establishment. Normally broadcast over a single light cultivation and around large trees, edges of roads and cattle tracks. Good seedling vigour. Establishes readily after flooding disturbance beside fertile water courses.

Fertilizer

It has been observed that *C. pennisetiformis* flourishes around the bases of trees where soil fertility is higher, and spreads more rapidly on alluvial soils where phosphorous levels are higher. However, while it responds to nitrogen and phosphorus, it is generally not economical to fertilize in semi-arid and arid areas.

Compatibility (with other species)

Plants are very competitive in well-suited environments. Usually grows as a monospecific sward once established.

Companion species

Grasses: There are currently no well-adapted grasses available where this species is best adapted.
Legumes: While few, if any, currently available legumes have proven adapted to the same environment as *C. pennisetiformis,* there may be *Desmanthus* spp. that can compete with this grass in some situations, *e.g. D. bicornutus, D. covillei, D. virgatus.*

Pests and diseases

No major pests or diseases in forages. Seed crops can be reduced by buffel grass seed caterpillars (*Mampava rhodoneura* Lepidoptera, Pyralidae) that feed on seed, webbing the heads together.

Ability to spread

Seed spread by wind, water movement and adhesion to livestock, mostly near watercourses where soil phosphorous levels are high and the soil surface is of a lighter texture. Gradually spreading into poorer soils.

Weed potential

Can displace less vigorous native grasses and tends to be linked with *C. ciliaris* in terms of threat posed to ecosystems outside its native range.

Feeding value

Nutritive value

Approaches that of *C. ciliaris*.

Palatability/acceptability

Stems are soft and the whole herbage is well grazed by sheep and cattle.

Toxicity

While no toxicity has been reported, "big-head" disease of horses from Ca /P imbalance should be considered if *C. pennisetiformis* is the major source of forage for extended periods.

Feedipedia link

Not available.

Production potential

Dry matter

Yields vary with proximity to trees, probably reflecting the higher fertility under trees due to cattle camping and litter drop. Yields of over 6 t/ha DM have been recorded under trees compared with 2–3.5 t/ha DM away from the base of trees.

Animal production

Prime condition bullocks can be produced on vigorous stands growing on fertile river frontage soils in the semi-arid tropics.

Genetics/breeding

2*n* = 35, 42, 54. Considered a natural hybrid between *C. ciliaris* and *C. setigerus*, most closely resembling the former.

Seed production

Seeds prolifically. Seeds can be easily harvested by hand or mechanically.

Herbicide effects

No information but probably similar to those for *C. ciliaris*:
"Can be controlled using a combination of glyphosate and ammonium sulphate, possibly in repeat applications. Seedlings can be controlled using the grass -selective herbicide, fluazifop-p-butyl or dicamba, 2,4-D, 3,6-dichloropicolinic acid, triclopyr, tebuthiuron, or hexazinone. Older stands, particularly freshly cut material can be at least reduced using hexazinone or tebuthiuron."

Strengths

- Ability to colonise the banks of streams in the dry tropics
- Good palatability compared with most other arid zone grasses
- Very drought tolerant
- Very persistent
- Maintains good ground cover preventing erosion in droughts

Limitations

- Does not grow on heavy cracking clays

- Poses a weed threat in conservation areas

Selected references

Bogdan, A.V. (1977) Tropical Pasture and Fodder Plants. Longman Inc., New York, USA. p. 74.

Hall, T.J. (1978) Cloncurry buffel grass (*Cenchrus pennisetiformis*) in north-western Queensland. Tropical Grasslands 12:10–19. bit.ly/2UkMASv

Cultivars

'Cloncurry' naturalized in Australia. The origin of this ecotype is uncertain other than it was first noticed in the Cloncurry district of north Queensland in the 1920s. Possibly from seed inadvertently introduced in stuffing of Afghan camel saddles.

Promising accessions

None reported.