Register of Australian Herbage Plant Cultivars

A. Grasses
20. Andropogon
Andropogon gayanus Kunth (gamba grass) cv. Kent

Reg. No. A-20a-1
Registered July 1986

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Origin

CSIRO conducted preliminary trials on *Andropogon gayanus* at the Katherine Research Station from 1946, using two introductions, CPI 2312 supplied in 1931 by C.P. Taylor from Zaria in Nigeria and CPI 9207 supplied by Ramos de Otero, Division of Agrostology, Deodora, Brazil in 1944 as var. *sqamulatus*. The original source of CPI 9207 in Africa is not known. Residual material of gamba grass from these introduction trials was grown by Mr. Frank Kent of the Northern Territory Administration at Berrima Experiment Farm in the mid 1950s. Progeny of this material was used to establish a larger area on Berrimah. This stand still existed in 1981 and formed the basis of the present cultivar (7). The exact introduction(s) from which cv. Kent originated is now unclear, but as the species is cross-fertilised and several generations have been produced since the original introductions, it probably has been derived by natural selection following crossing within and between CPI 9207 and CPI 2312.

Submitted for registration by the Northern Territory Department of Primary Production which will maintain a supply of breeders' seed. Recommended for registration by the Northern Territory Herbage Plant Liaison Committee. Registered July 1986.

Morphological description (1,2)

Andropogon gayanus is a large perennial grass forming dense hemi-sperical tussocks up to 70cm in diameter. Culms arise from freely branching rhizomes with very short internodes. Culms branch intravaginally (2). Height at maturity, if left unchecked, may be from 1 – 4m (8). Leaf laminae are linear, acute, up to 45cm long, 1.5 – 5cm wide with a strong white midrib. Lamina glabrous or pubescent on both surfaces. Adaxial surface of sheath pubescent, especially when young. Leaves are almost unribbed and tend to fold when dry. Ligule mostly present, membranous. Inflorescence a large spathate panicle with up to six groups of primary branches, 2 – 18 in a group; final branches filiform, 5 –8cm long, terminating in a pair of racemes. The spathes supporting the primary branches have well developed blades. Spatheoles supporting the rays have somewhat inflated sheaths, with blades reduced or absent. Racemes are 4 – 8cm long, with 10 – 14 joints which are 4 – 5mm long, inflated, usually hairy on sides, each bearing a pair of spikelets. The sessile spikelet of the pair 7 – 9mm long, bisexual, with a kneed and spirally twisted awn 1 – 4cm long. Pedicelled spikelet male, its pedicel similar to the raceme joint. Joints and pedicels ciliate on one (var. *gayanus*) or both sides (var. *sqamulatus* and var. *bisqamulatus*). The pedicelled spikelet is glabrous or puberulous in var. *sqamulatus* and hairy to villous in var. *bisqamulatus* (2). The species is cross-fertilised (1).

Cultivar Kent grows to 4m height and has pubescent leaves. Pedicels 4 –5cm long, conspicuously ciliate on both margins. Pedicelled spikelet 4 – 5mm long, sessile spikelet 5 – 8mm long, glabrous. Awn of sessile spikelet 15 – 30mm long, and of pedicelled spikelet 5 – 10mm long. Pedicelled spikelet puberulous of villous, hence Kent cannot be assigned to either var,. *sqamulatus* of var. *bisqamulatus*, but resembles the latter in height. Caryopsis, 2-3mm long, 1mm wide, about 890,000/kg, light brown to brownish black.

Agronomic characters (1,2,3,4,5,6,7,11)

Gamba grass is easily established, highly productive, highly palatable to livestock, compatible with legumes and drought resistant (1,9). The species in general and cv. Kent are adapted to seasonally wet tropics, with a 3 – 6 month dry season and a wet season with 750 – 1500mm rainfall. The species is adapted to a wide range of soils types from light sands to clay loams, and prefers well drained soils. It is not adapted to heavy clay soils that waterlog during the wet season (7,9). One of its most important agronomic characters is its ability to remain green well into the dry season, especially if grazed in the wet season, combined with the ability to provide a significant flush of early season growth at the beginning of the rainy season (1,7,9). Data from the Northern Territory indicate superior yield and animal productivity in the late dry/early wet season at the Coastal Plains Research Station (3) compared to pangola and native pasture. Dry matter yields of 4 – 9000kg/ha have been recorded for a full 12 month period (1). The species has a relatively low requirement for phosphorus for successful growth (6,9). Other observational data over a 20 year period between 1960-80 from a number of sites in the Northern Territory receiving between 800 and 1500mm of rain per annum indicate the ability of the cv. Kent to survive a regular annual burn in the dry season. It has also spread downwind at many of these sites (4,7).

Establishment can be effected by sowing as little as 1kg/ha of clean, de-awned seed of high viability. Rates as high as 40kg/ha may be required if seed is uncleaned (3,7). The density of thin stands will improve in the second year from self-sown seed (3,7). A range of legumes has been grown successfully with Kent. These include *Stylosanthes hamata* cv. Verano, *S. scabra* cv. Seca, *S. guianensis* cvv. Cook, Endeavour and Graham, *Centrosema pubescens*, *Macroptilium atropurpureum* and *Calopogonium muconoides*. Choice of a legume would depend on location and expected use of the pasture (1,3,7,9).

A. gayanus has three distinct types of root – fibrous roots close to the surface absorb water from the surface soil and probably contribute to its early vigorous regrowth, cord roots which are thick and both store starch and anchor the tussock, and vertical roots which are able to extract water from depth well into the dry season. This root system significantly contributes to the ability of the plant to be both drought resistant and to respond vigorously to early rains (2). Kent gamba grass is highly palatable when green and management of the stand should aim at high levels of utilisatin in the early wet to avoid rankness of growth. Management of a stand for animal production should strike a balance between yield and quality. It is considered a species of medium quality (1,3). *Andropogon guyanensis* is a short day plant with a critical daylength for flowering of 12-14hrs. (12), with cv. Kent flowering in Darwin in April (7). Tillers formed early in the season make the greatest contribution to the final seed yield and management for seed production should aim to stimulate early tiller production through fertiliser and husbandry (6). Seed is normally mature in late May and can be harvested by a beater-type harvester or a conventional header. Cleaning and handling the light, fluffy seed can be difficult (7). No diseases of any significance have been recorded on gamba grass in Australia.

References

1. Bogdan, A.V. (1977). *Tropical Pasture and Fodder Plants.* (Longman, London).
2. Bowden, B.N. (174). Studies on *Andropogon gayanensis* Kunth III. An outline of its biology. *J. Ecol* **52**, 255-71.
3. Ford, B.D., Calder, G.J., and Lemke, B.G. (1981). Unpublished data. N.T. Dep. Prim. Prod., Darwin.
4. Friend, T.E. (1981). Personal communication. Qld. Dep. Prim. Ind., Brisbane.
5. Graham, T.G. (1951). Tropical Pasture Investigations. *Qld. Agric. J.* **73**, 311-26
6. Haggar, R.J. (1966). The production of seed from *Andropogon gayanus. Proc. I.S.T.A.* **31**, 251-9.
7. Harrison, P.G. (1981). Personal communication . N.T. Dep. Prim. Prod., Darwin.
8. Hepper, F.N. (ed). (1972). *Flora of West Tropical Africa.* Vol. 3 Part 2. (Crown Agents for Overseas Governments and Administrations: London.)
9. Jones, C.A. (1979). The potential of *Andropogon gayanus* Kunth in the oxisol and ultisol savannas of Tropical America. *Herbage Abstr.* **49**, 1-6.
10. Philips, L.J. (1981). Personal communication. CSIRO Div. Trop. Crops and Pastures, Katherine.
11. Reid, P.A. and Miller, I.L. (1979). New grasses for the top end. Gamba grass. *Turnoff* **2**, 26-7.
12. Tompsett, P.B. (1976). Factors affecting the flowering of *Andropogon gayanus* Kunth. Responses to photoperiod, temperature, and growth regulators. *Ann. Bot.* **40**, 695-705.