

Bothriochloa bladhii subsp. glabra

Scientific name

Bothriochloa bladhii (Retz.) S.T. Blake subsp. *glabra* (Roxb.) B.K. Simon

Synonyms

Andropogon glaber Roxb.

Bothriochloa glabra (Roxb.) A. Camus

Family/tribe

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

Common names

Australian bluestem, australian beardgrass, old world bluestem, caucasian bluestem, plains bluestem, forest bluegrass, purple plume grass, blouklosgras; desum (Palau); latoka grass, thamboni grass (Fiji).

Morphological description

A variable subspecies; ascending to erect, tufted perennial with foliage 40-80 cm, culms largely unbranched, 1-1.5 m high at maturity; sometimes with short stolons. Leaf blades glabrous or hairy, 20-30 (rarely -50) cm long and 5-7 (rarely -10) mm wide, linear-lanceolate, tapering gradually from the base to a fine point. Inflorescence a subdigitate panicle, comprising up to 20, mostly simple, green to purplish racemes. Seed unit comprising sessile and pedicellate spikelet, with 11-18 mm awn arising from the sessile spikelet. Distinguished from subsp. *bladhii* by presence of a dorsal pit in the lower glumes of the sessile spikelet. Leaves and inflorescence strongly aromatic when crushed. 1.6 million seed units/kg.

Distribution

Native to:

Bothriochloa bladhii (Retz.) S. T. Blake is a diverse species distributed widely through Africa, Asia and Australia. The distributional limits for subsp. *glabra*, which is distinguished from subsp. *bladhii* (syn. *B. intermedia*) by the presence of pits on the lower glume of the sessile spikelet, are not clear. References in the literature to *Bothriochloa glabra*, may correctly refer to this subspecies, or incorrectly to other members of the complex. Common names probably largely refer to the latter. It appears that subsp. *glabra* is largely confined to India, Indonesia, Madagascar, and south central Africa, from Zambia to north and east South Africa.

It occurs in savannas, open forest and grasslands, often on alluviums, but also in 'vleis'.

Now naturalised elsewhere, including Australia. To date, cultivated material originates (or probably originates) from India.

Uses/applications

Primarily used as permanent pasture on lower fertility soils. Fine leaf and stem make good hay providing cut before flowering. Limited value for standover feed due to high concentration of inflorescences and loss of quality due to rust disease.

Ecology

Soil requirements

Grows on soils with textures from sandy loam to clays and hard-setting clay loams, with pH from 5.5-8.4. Grows on both fertile and infertile soils, provided exchangeable aluminium levels are fairly low.

Moisture

Occurs naturally in areas with rainfall to >2,000 mm, often with a distinct dry season. A drought-hardy species, particularly if well grazed to reduce the amount of foliage and hence, water use. Cultivars have been successful mostly in areas with rainfall above 750 mm, although can tolerate as low as 600 mm/yr. Can stand temporary waterlogging and flooding, but not tolerant of permanently wet conditions.

Temperature

Occurs from sea level near the equator to >2,500 m at 32° latitude, representing a difference of some 14°C in average annual temperature over the distributional range. Grass temperatures where cultivars have been successful can be as low as -8°C.

Light

Low to moderate shade tolerance.

Reproductive development

Flowers throughout the growing season, although cultivars have a flush of flowering towards the end of March in the southern hemisphere subtropics.

Defoliation

Tolerant of heavy grazing, including by sheep, adjusting growth habit to prostrate to accommodate pressure. Grazing should be managed to maintain as leafy a sward as possible, entailing increasing grazing pressure at flowering if necessary.

Fire

Very tolerant of fire.

Agronomy

Guidelines for the establishment and management of sown pastures.

Establishment

Fresh seed has low germination and takes 6-7 months after harvest to reach maximum germination. Establishes well from seed broadcast onto a cultivated surface, sown at 1-3 kg/ha. This is a fluffy seed, so there may be benefit in pelleting de-awned seed to make it easier to pass through planting equipment.

Fertiliser

Not fertility demanding. Responds to applied nitrogen on infertile soils.

Compatibility (with other species)

Grows well with legumes and other grasses. May become dominant when sown with more palatable grasses such as *Digitaria eriantha*.

Companion species

Grasses: *Bothriochloa pertusa*, *B. insculpta*, *Heteropogon contortus*.

Legumes: *Aeschynomene falcata*, *Chamaecrista rotundifolia*, *Lotononis bainesii*, *Stylosanthes hamata*, *S. scabra*, *Trifolium subterraneum*.

Pests and diseases

In Australia, the same pests and diseases attack introduced varieties, as are found on the native ecotypes of *Bothriochloa bladhii*. Seed crops can be adversely affected by a leafhopper, *Balclutha rubrostriata* (*Cicadellidae*) that infests the inflorescence. Leaf rust caused by *Puccinia duthiae* is often severe late in the growing season, and is favoured by wet weather. The combination of rust affected leaf and the high stem component at flowering renders the forage unpalatable to livestock late in the growing season in lightly summer-grazed stands.

Ability to spread

Spreads by seed, colonising away from the parent stand under favourable conditions. Can spread into sward grasses such as *Axonopus fissifolius* and *Digitaria didactyla*.

Weed potential

Shows indications of becoming a weed of turf.

Feeding value

Nutritive value

CP levels of 7-14% and IVDMD of up to 58% have been recorded. The higher levels decline rapidly with age of regrowth and with the onset of flowering.

Palatability/acceptability

Cultivars and elite accessions are well accepted by all grazing livestock when young and leafy. Less acceptable as leaf ages, and with flowering and attack by rust disease. Not as palatable as *Digitaria eriantha* or *Bothriochloa pertusa* at the same stage of growth, but 50-80% of available forage consumed. Indonesian ecotypes appear to be unpalatable at all stages.

Toxicity

No record of toxicity.

Production potential

Dry matter

Yields of rain-grown forage between 5 and 10 t/ha DM, and >20 t/ha DM under fully irrigated conditions.

Animal production

90-135 kg/hd LWG and 0.5-0.9 kg/hd/day over 5-6 month growing season. In a seasonally cold, sub-humid environment, can raise carrying capacity from 1.5 sheep/ha to 4 sheep/ha when used in association with legume.

Genetics/breeding

Facultative apomict . While *Bothriochloa bladhii* is recorded as having chromosome number of $2n = 40, 50, 60, 80$, there is no record of the chromosome number for subsp. *glabra* specifically. Introgresses with *Dichanthium* and *Capillipedium* in native populations.

Seed production

Possible to obtain a light crop early in the growing season , and a heavy crop later in the season. *Balclutha rubrostriata* can be controlled with dimethoate if numbers become excessive. Small plot yields of up to 500 kg/ha clean seed have been achieved.

Herbicide effects

Tolerant of pre- and post-emergent (2-3-leaf stage) applications of metsulfuron methyl and triasulfuron. Susceptible to imazapic in both pre- and post-emergent treatments.

Strengths

- Grows on low fertility soils.
- Drought tolerant.
- Tolerates heavy grazing.

Limitations

- Less palatable than some other C4 grasses.
- Susceptible to leaf rust.
- Becomes unpalatable with maturity and rust.

Other comments

Cultivars have much in common with *Bothriochloa ischaemum* (L.) Keng and *Bothriochloa caucasica* (Trin.) C. E. Hubb., the latter now being considered synonymous with *Bothriochloa bladhii* (Retz.) S. T. Blake. Ecologically comparable with *B. decipiens* var. *decipiens* and *B. macra* in Australia.

Selected references

Internet links

<http://www.fao.org/ag/AGP/AGPC/doc/Gbase/data/pf000182.htm>

<http://www.fao.org/ag/AGP/AGPC/doc/Gbase/data/pf000183.htm>

<http://www.fao.org/ag/AGP/AGPC/doc/Gbase/data/pf000185.htm>

http://www.affa.gov.au/content/pbr_database/plant_detail.cfm?AID=357039

http://www.affa.gov.au/content/pbr_database/docs/1995114.doc

Cultivars

Cultivars	Country/date released	Details
'Swann' (CPI 11408)	Australia (1994)	Introduced as <i>Andropogon ischaemum</i> (subsequently revised to <i>B. ischaemum</i> , and then to current status). From Guyana Highlands (4°N). Similar in most respects to 'WW-B. Dahl', suggesting northern Indian origin. Selected for persistence in low fertility, hard setting, upland soils in the sub-humid subtropics where few other C4 grasses survive.
'WW-B. Dahl' (PI 300857, A-8965, WW-857))	USA (1994)	From Manali, India (32°N, 2,600 m asl, rainfall 1,600 mm, 7 months dry season). Erect, lower-growing, leafy, multi-culmed type, foliage usually about 50 cm high, becoming prostrate under heavy grazing. Extensively tested in Texas. Higher yielding but less winter hardiness than other old world bluestems.

Promising accessions

Promising accessions	Country	Details
CPI 52194	Australia	From Mampikony, Madagascar (16°S, 130 m asl, rainfall 1,600 mm). More robust tussock type, well grazed.
CPI 104802A	Australia	From Madhya Pradesh, India (23°N, 450 m asl, rainfall 1,420 mm). Shortly stoloniferous type, well grazed.



Seedheads and seeds.



Cv. Swann and B-Dahl - tufted perennials.



Cv. B-Dahl.



Young tussocks of cv. Swann.



Tufts become 'stemmy' and lose palatability with maturity.

