Setaria sphacelata var. splendida

Scientific name

Setaria sphacelata (Schumach.) Stapf & C.E. Hubb. var. *splendida* (Stapf) Clayton

Synonyms

Setaria splendida Stapf

Family/tribe

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

Common names

broadleaf setaria, splendida setaria, sekoi (Malaysia); bunga-bunga (Philippines); ya taiwan (Thailand); co duôi chÓ, co ro'om (Vietnam).

Morphological description

Most robust of *Setaria sphacelata* complex. Perennial tussock to >3 m tall, with short rhizomes. Leaves grey-green, soft, largely glabrous, sometimes with dense hairs on sheath; leaf blades 30-80 cm long and up to about 2 cm wide. Lower parts of culms and the basal leaf-sheaths compressed and keeled. Inflorescence a tightly contracted false spike (panicle), 15-30 (rarely -50) cm long and about 8 mm wide (excluding the dense, radiating golden-yellow bristles); stigmata purple or white.

Distribution

Native to:
Africa: Sudan, Kenya, Tanzania, Uganda, South Africa (Cape Province, Natal).
Largely in grasslands on swamp margins and flood plains. Rare in the wild but often cultivated.

Now found in southeast Asia, India, Australia and other parts of the tropics. Distribution limited by need for vegetative establishment.

Uses/applications

Permanent pasture, hay, silage, cut and carry, soil conservation , hedgerow.

Ecology

Soil requirements

Will grow in most soils provided moisture is readily available. Can survive at low fertility but responds well to applications of nitrogen and phosphorus, and sometimes potassium, in infertile soils.

Moisture

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Found in areas with annual rainfall >1,000 mm. Mostly cultivated in areas with rainfall above 1,500 mm/yr, although useful >1,000 mm in moist areas. Can survive long dry season but best with short or no dry season. Leaf reddening often associated with moisture stress. Very tolerant of flooding.

Temperature

Grows well in tropics and subtropics; generally better adapted to the tropics than *Setaria sphacelata* var. *anceps*. Some provenances grow at altitude in Kenya and Uganda.

Light

Low shade tolerance.

Reproductive development

Flowers January to June in Republic of South Africa. Generally later flowering than *Setaria sphacelata* var. *anceps*.

Defoliation

Persists under frequent cutting or grazing, but requires controlled management to achieve optimum results. For best combination of regrowth and quality, particularly in dairying systems, plants should be cut at 30-45 cm at least every 30 days. Maximum regrowth was measured in the Philippines cutting at 45 cm every 60 days.

Fire

Top

Rarely grown in areas where fire is an issue.

Agronomy

Guidelines for the establishment and management of sown pastures.

Establishment

Produces little viable seed. Planted from rooted tillers; clumps topped to about 15 cm and separated into pieces each with 2-3 tillers; planting material should be fresh (not allowed to dry out); planted with tops exposed on a grid from 70 x 90 cm to 45 x 100 cm. Can be planted in wider rows, allowed to grow tall, and rolled flat to facilitate nodal rooting and sward formation.

Fertiliser

Responds to application of nitrogen, provided other nutrients are adequately supplied.

Compatibility (with other species)

A strong competitor for nutrient, particularly potassium. Will suppress legume if not well fertilised with P and K in particular, or well managed. N fertiliser increases competitiveness of the grass .

Companion species

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Grasses: Best not planted with other grasses.
Legumes: *Desmodium intortum* , *Lotus uliginosus* , *Macroptilium atropurpureum* (marginal), *Neonotonia wightii* (marginal), *Vigna parkeri* .

Pests and diseases

Not seriously affected by pests or diseases.

Ability to spread

Negligible seed set. Spreads by growing tall, falling over and developing new plants at nodes touching the ground.

Weed potential

Nil.

Feeding value

Nutritive value

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1.36% N (8.5% CP), 0.33% P, 4.94% K, 0.20% Ca, 0.06% Na, 0.18% Mg, and 1.14% Cl in 5-week regrowth of CPI 15899 from Tanzania. Ability to accumulate Na varies with provenance - CPI 33084 (= K 61106) from Kenya had Na level of 1.11%.

Palatability/acceptability

Well eaten by all classes of livestock, but should not be fed to horses (see below).

Toxicity

Oxalate levels from 4.5-6.7% of DM in 3-week regrowth. Such high levels can cause 'big head' disease' (*Osteodystrophia fibrosa*) in horses and 'milk fever' (*Hypocalcaemia*) caused by a shortage of calcium in the blood. It can be treated with an injection of calcium borogluconate solution. Cattle introduced gradually to, and maintained on setaria develop a rumen flora that can detoxify the oxalate. 'Grass staggers' (*Hypomagnesaemia*) can also occur in animals grazing *Setaria sphacelata* var. *splendida*, a disease caused by too little magnesium in the blood system, induced through low levels of Mg and high levels of K in the feed. In dairy cows, one is often a complication of the other. It is therefore wise to use a combined treatment of calcium borogluconate and magnesium hypophosphite.

Production potential

Dry matter

Annual yields of 4 to about 24 t/ha DM, depending on fertility and

Annual yields of 4 to about 24 t/ha DM, depending on fertility and moisture.

Animal production

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No information, but probably similar to *Setaria sphacelata* var. *anceps*.

Genetics/breeding

Cross-pollinating; 2*n* = 36, 45, 54, and 63.

Seed production

Seed set varies with ecotype, but mostly little or no seed produced.

Herbicide effects

Susceptible to pre-emergence atrazine; can be controlled with glyphosate.

Strengths

- High quality feed.
- Good for cut-and-carry.
- Tolerates poor drainage.
- Survives in low fertility.

Limitations

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- Low sodium content in some provenances.
- High oxalate levels (should not be fed to horses).
- Must be propagated vegetatively.

Other comments

Selected references

Hacker, J.B.and Minson, D.J. (1972) Varietal differences in *in vitro* dry matter digestibility in *Setaria*, and the effects of site, age, and season. *Australian Journal of Agricultural Research*, **23**, 959-967.

Internet links

http://www.fao.org/ag/AGP/AGPC/doc/Gbase/data/pf000317.htm
http://www.pi.csiro.au/ahpc/grasses/pdf/splenda.pdf

Cultivars

Cultivars	Country/date released	Details
'Lampung' (CPI 15899)	Indonesia	Variety most commonly used in southeast Asia

'Splenda'	Australia (1981)	Hybrid from crosses between the tetraploid var. *splendida*, CPI 15899, and two tetraploid accessions of var. *sericea*, CPI 19915 and CPI 16067. Selected for seed production (up to 80 kg/ha cleaned seed) and conformity to var. *splendida* phenotype (late flowering and leafiness). Well adapted to wet tropical situations but also of value in other tropical and subtropical regions with a rainfall exceeding 750mm. Not suitable for horses because of high oxalate concentration in the dry matter of young leaf about 4.7% (91% soluble). Na and K concentrations were 0.74 (a Na accumulator) and 4.47% respectively.

Promising accessions

Top

Promising accessions	Country	Details
None rep		

Soft, easy to cut, palatable foliage - suitable for cut and carry.

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Cut and carry of cv. Lampung in Java, Indonesia.

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Cattle grazing a pure stand of cv. Lampung in Java, Indonesia.

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