



A collaboration between AWI, GRDC, MLA, RIRDC and Dairy Australia

Setaria

Scientific name(s)

Setaria sphacelata

Strengths

- Palatable
- Establishes easily from seed
- Persists under moderate grazing
- Adapted to a wide range of soils
- Responds well to fertiliser nitrogen
- Tolerant of flooding and waterlogging
- Some lines frost tolerant
- High forage production early spring, summer and autumn
- Competes well with fireweed
- Although little growth occurs in winter, green leaf carries well into winter

Limitations

- High levels of oxalate in some varieties can cause problems with milking cows, horses and donkeys
- Quality drops rapidly with onset of seeding

Plant description

Plant: Tufted perennial grass growing 1 - 2m tall, and up to about 30cm diameter at the base.

Stems: Smooth and shiny, sometimes slightly waxy.

Leaves: Young shoots are flattened at the base, and the leaves folded (not rolled). Leaves are generally hairless, soft to the touch and bluish grey-green in colour, often reddish around the stem; leaf blades to 50 cm long and over 1 cm wide.

Seedhead: Seeds are borne on a bristly, cylindrical "spike" 6 - 25cm long, and about 1cm across, varying in colour from golden to dark brown.

Seeds: Very small, averaging about 1.5 million/kg

Pasture type and use

Good for intensively grazed permanent pastures in the humid subtropics, and upland and southern tropics, as well as for hay production.

Where it grows

Rainfall

Setaria is mostly sown in areas receiving an average annual rainfall of over 1,000 mm, and is well-suited to irrigation.

Soils

It grows well on most soils providing moisture and fertility are adequate. It is not well adapted to alkaline, very acid, or saline soils.

Temperature

See "Cultivars"

Establishment

Companion species

Grasses: normally not sown with other grasses

Legumes:

- twining: glycine, siratro
- trailing: Greenleaf and Silverleaf desmodium
- creeping: Maku lotus, pinto peanut, Shaw vigna, white clover

Setaria competes strongly with companion species for plant nutrients in less fertile soils, and may suppress them in the absence of added fertiliser.

Sowing/planting rates as single species

2 - 4 kg/ha for nitrogen-fertilised grass

Sowing/planting rates in mixtures

1 - 2 kg/ha, the lower rate for creeping legumes.

Sowing time

It can be sown successfully from spring to early autumn. As a general rule, it is best to choose a suitable sowing time for any associated legume.

Inoculation

Not applicable

Fertiliser

Because it grows best in at least moderately fertile soils, it is advisable to use an establishment application of say 200 - 300 kg/ha of superphosphate and 50 kg/ha of muriate of potash on less fertile soils. A post-emergence application of 100 kg/ha of urea (= 46 kg/ha N) is beneficial in pure stands.

Management

Maintenance fertiliser

Annual dressings of up to 200 kg/ha of superphosphate and 100 kg/ha of muriate of potash (depending on soil fertility), are required to maintain high production levels. In pure stands, where high levels of fertiliser nitrogen are used (e.g. up to 300 kg/ha of nitrogen in three split applications), occasional dressings of lime may also be necessary to overcome increasing soil acidity.

Grazing/cutting

Although it is fairly tolerant of mowing or grazing, it will give way to creeping grasses such as blue couch or mat grass if grazed heavily over a prolonged period. Setaria decline is more rapid if nitrogen fertility is low.

Seed production

Seed is produced over much of the growing season, with good commercial yields usually of the order of 100 kg/ha. Seed crops are fertilised with 100 - 150 kg/ha of N/ after a cleaning cut ha, and are usually direct headed when 10 - 15 per cent of the seed has shattered.

Ability to spread

Setaria spreads effectively by seed, and readily colonises disturbed areas such as roadsides.

Weed potential

Although listed as a weed in some regions, it rarely invades undisturbed areas.

Major pests

Severe attack by armyworm and pasture webworm can destroy much of the leaf, particularly young leaf. Buffel grass seed caterpillar can cause considerable damage to seed crops from late January onwards.

Major diseases

Pyricularia leaf spot is prevalent under hot humid conditions and can retard the growth of ungrazed stands.

Herbicide susceptibility

Setaria is susceptible to glyphosate.

Animal production

Feeding value

Protein content of the grass depends on nitrogen fertility of the soil, and age of regrowth of the stand (best if less than 4 weeks' regrowth). Young leafy regrowth (3 weeks) can have digestible dry matter levels of 70%, but after 6 - 8 weeks, digestibility levels drop to 50 - 55%. Sodium levels are often low requiring supplementation in the diet. See "livestock disorders/toxicity"

Palatability

Setaria is extremely palatable when young, but becomes stemmy and unacceptable with onset of seeding.

Production potential

Livestock disorders/toxicity

Setaria develops high levels of oxalate in the leaf, especially in young, well-fertilised, vigorous growth. This causes hyperparathyroidism ('big head' disease) in horses and donkeys, and can cause nephrosis (kidney disease) in ruminants. It can also lead to hypocalcaemia (milk fever) and/or hypomagnesaemia (grass tetany) in ruminants, particularly in high-producing dairy cows. This is less of a problem in animals that graze setaria regularly. 'Kazungula' and 'Splenda' develop the highest oxalate levels, followed by 'Narok' and 'Solander', with 'Nandi' the lowest.

Cultivars

Cultivar	Seed source/Information
Kazungula	Australian Herbage Plant Cultivars
Nandi	Australian Herbage Plant Cultivars
Narok	Australian Herbage Plant Cultivars
Solander	Australian Herbage Plant Cultivars
Splenda	Australian Herbage Plant Cultivars

Further information

Tropical Forages database (SoFT) - Setaria
NSW Department of Primary Industries - Setaria Agnote DPI-293

Acknowledgements

Mr Bede Clarke, NSW DPI, Casino

Author and date

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