



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

Annual forage sorghum

Scientific name(s)

Sorghum spp. annual forage hybrids
Sorghum vulgare sweet sorghum
Sorghum spp. hybrid sweet sudan grass hybrids

Strengths

- Easy to establish
- Highly productive
- Good regrowth potential
- Provides standover forage in winter
- Can be grown in dryland and irrigated situations
- Can be used for grazing, hay &/or silage

Limitations

- Requires high fertility soils
- Requires good soil water or irrigation for maximum production
- Requires appropriate grazing management to obtain maximum potential
- Prussic acid poisoning though the potential is low in normal seasons
- Varietal selection must be made carefully, depending on the final use e.g. for grazing, hay production, pit silage or round bale silage

Plant description

Plant: vigorously-growing, erect, annuals with branched tillers reaching 2-3 m in height.

Stems: erect to 2-3 m.

Leaves: 2.5-4.0 cm wide.

Seedhead: large pyramidal panicles with secondary and tertiary branches.

Seeds: oval to round; size varies with cultivar between 30,000-75,000 seeds/kg.

Pasture type and use

Various species and their hybrids are grown as forage for livestock production or for hay or silage conservation. Coarse-stemmed varieties are not suitable for round bale silage production. The various types of hybrids have different agronomic features and uses.

Sudan grass and Sudan x Sudan hybrids

- Grazing, hay
- Suitable for repeated, heavy grazing with excellent recovery between grazing
- Feed quality is often higher than the Sudan grass x grain sorghum hybrids
- Suited to hay making because it tillers heavily and has finer stems than other sorghums
- Lower prussic acid levels than other forage sorghums

Sorghum hybrid

- Limited recovery from grazing
- High forage yield combined with high grain content
- Developed specifically for the silage industry

Sweet sorghum hybrids

- Grazing, hay or silage - coarse stemmed varieties for pit silage, narrow-stemmed varieties for round bale silage.
- Late-flowering cultivars for standover grazing into autumn.
- Slow recovery from grazing (poor regrowth)
- Tall late flowering types with thick stems and high sugar content are most suitable for standover feed into the autumn-winter
- Prussic acid levels are sometimes high. However, contemporary varieties have lower levels of prussic acid than older varieties and prussic acid is usually only a concern in drought years when plants are stressed
- Tall early flowering types with fine stems, have lower prussic acid and can be managed for silage by allowing them to set seed but harvest them when the seeds are soft. Fine-stemmed cultivars can be used in both pit and round bale silage
- Mainly used for standover feed into autumn-winter, or silage
- Preferred planting time December to January

Sweet sorghum x Sudan grass hybrids

- Compact and leafy with more juicy and sweet stems
- Grazing, hay
- Late-flowering cultivars for standover grazing into autumn
- Prussic acid levels are low
- Similar to sweet sorghums but with more rapid regrowth They grow rapidly but some cultivars selected for later flowering are easier to manage as they remain leafy for longer.

Sorghum x Sudan grass hybrids

- Suitable for repeated, heavy grazing with good recovery between grazing
- Potential for a high dry matter yield
- Best grazed at around one metre in height
- Early maturing types require strict grazing management in order to maximise both their fodder yield and feed quality

BMR sorghum x sweet sorghum

- Brown midrib varieties contain less lignin and have higher digestibility
- May be subject to lodging
- Graze at 1-1.2 m as with other varieties

Where it grows

Rainfall

Grown on stored subsoil water. Requires 500-800 mm rainfall or irrigation. Poor tolerance of flooding.

Soils

Performs best on heavy clay soils because of their high water holding capacity. When sown on lighter soils productivity will be reduced unless adequately fertilised and good seasonal rainfall occurs.

Temperature

Sow when the soil temperature is above 16°C.

Establishment

Companion species

Grasses: It is not recommended to sow with other grasses because of its quick growth and competitive nature.

Legumes: Lablab and cowpeas, though difficult to manage owing to different maturity times of the forage sorghum used and of the companion crops.

Sowing/planting rates as single species

Sorghum x Sudan hybrids and Sweet sorghum hybrids:

- 3-5 kg/ha under marginal dryland conditions
- 8-12 kg/ha under favourable dryland conditions
- 15-20 kg/ha under irrigation

Sudan grass types:

2-8 kg/ha under dryland conditions
10-20 kg/ha under irrigation

Sowing/planting rates in mixtures

Sorghum x Sudan hybrids and Sweet sorghum hybrids:

2-6 kg/ha under dryland conditions

Sudan grass types:

2-4 kg/ha under dryland conditions in favourable environments

Sowing time

When soil temperatures reaches 16°C

Inoculation

Not applicable

Fertiliser

Should be grown on fertile soils and so would need additional nitrogen on soils of lower fertility. N can be applied where adequate soil moisture is available.

Management

Maintenance fertiliser

Produces large quantities of forage and extract significant quantities of nutrients. Application of fertiliser will depend on usage. Where forage is harvested for hay or silage, fertiliser budgets should be done based on soil test and nutrient extraction, and an application of fertiliser, particularly N and K should be made to maintain feed quality and productivity.

Grazing/cutting

Tolerant of heavy grazing with coarse stems remaining unless grazed early. Commence grazing when plants have reached 1-1.2 m in height. Slashing after grazing will promote even regrowth. Should not be grazed below 15 cm if good regrowth is expected. Can expect 4 or more grazings under ideal conditions.

Seed production

Seed of the non hybrid sudan types can be harvested.

Ability to spread

Low

Weed potential

Regenerating seedlings can be a problem in crop rotations

Major pests

None of significance

Major diseases

None of significance

Herbicide susceptibility

Atrazine may be used as a pre-emergence herbicide for grass and broadleaf weed control with care with some hybrids (see label recommendations) but not with sudan grass.

Animal production

Feeding value

Nutritive value depends greatly on soil fertility or the amount of fertiliser applied, and on grazing

management where best results are achieved with a grazing height of 1-1.2 m. At this height, crude protein levels could be as high as 18% with energy levels of 8.8-9.5 MJ/kg DM.

Palatability

Moderately palatable and digestible when young. The sweet sorghum hybrids keep a higher free sugar content in the stem and are more suitable as stand-over feed into winter or the dry season.

Production potential

Generally, liveweight gains vary between 0.5 to 1.0 kg per head per day depending on plant height and leafiness.

Livestock disorders/toxicity

Leaves can be poisonous to grazing livestock due to prussic acid, especially in young stressed regrowth during a dry spell.

Having supplement blocks containing sulphur available will reduce the risk of prussic acid poisoning.

Nitrate poisoning can occur when grown on fertile soils containing high levels of nitrogen and when plants are stressed by dry conditions or frost.

Cultivars

Type	Time to flower	Cultivar	Important characteristics	Seed source/Information
sudan x sudan	late	Superdan	Fine stems, many tillers	Pacific Seeds
	late	PAC 8288	-	Pacific Seeds
sorghum x sudan	late	Pacific BMR		Pacific Seeds
	ultra late	Jumbo	Very leafy	Pacific Seeds
		Sweet Jumbo	Very high sugar content	Pacific Seeds
		BettaGraze		Pioneer
		Cow Pow		Pioneer
		Everlush		
		Lush		
		Bully Beef		
		Cow Candy		
		Zulu		
		Grazer - N2		
BMR sorghum x sweet sorghum		BMR Revolution		
		BMR Supreme		
		BMR Choice		
		Pacific BMR		
Sweet sorghum x sweet sorghum		Hunnigreen		
		Megasweet		
		Sugargraze		
Sweet sorghum x sudan		Nectar		
Sorghum x sorghum		Graze n sile		

Further information

Cropping Yearbooks from the various seed companies that breed forage sorghums

<http://www2.dpi.qld.gov.au/fieldcrops/6798.html>

Acknowledgements

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Author and date

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