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Forage Sorghum – *Sorghum spp*

Forage Sorghums are erect, annual, summer grasses. They are widely adapted, but thrive in hot areas. The main stream Forage Sorghums in SA are hybrids and many different types of crosses exist. The most commonly planted types are Sweet-sorghum X Sweet-sorghum- and Sorghum X Sudan grass hybrids, which are grouped into different flowering dates (early to ultra-late). Early flowering hybrids usually grow fast, but have a short growing season, while late flowering hybrids grow slower, and have a longer growing season. Forage Sorghums are very drought tolerant and can produce with rainfall as low as 350 – 400 mm per year, or under irrigation for more intensive production systems.



Strengths

- Up to 35 t DM/ha/season.
Depending on environmental conditions and management
- High producing crop on fertile soils
- Establishes easily followed by rapid growth.
- Planted as nurse crop with perennial grasses
- Drought tolerant
- Good quality forage

Limitations

- Demands high soil fertility
- Can cause Prussic acid poisoning.



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What can it be used for?

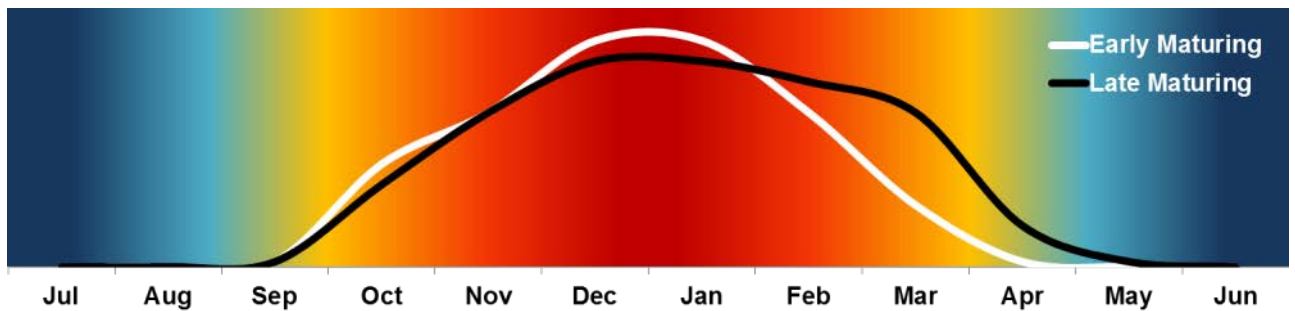
- Grazing:** In grazing systems, early flowering Sorghum-Sudan grass crossing are some of the quickest with regards to the days-to-first-graze and regrowth after each graze.
- Silage:** The high sugar content of Sweet-sorghum X Sweet-sorghum crossings makes them highly suitable for top-quality silage production.
- Foggage:** Sweet-sorghum X Sweet-sorghum hybrids can be left after a late planting date to graze as foggage in winter.
- Cut-and-carry:** Sweet-sorghum X Sudan grass hybrids produce abundant leaf material with thin stems, which makes it suitable to utilize successfully as green chop.
- Cover Crop:** Forage Sorghum is tolerant to saline conditions in the soil and extract certain heavy metals from the soil. The growth rate and height of Forage Sorghum suppresses the establishment of weeds. It also inhibits nematodes and diseases. It improves the infiltration of water, reduces soil compaction and builds soil aggregate stability and soil organic material. While it is used as forage for livestock and game, it is also a habitat for beneficial insects.
- Biofuels:** Sweet Sorghum X Sweet Sorghum-hybrids are recommended for ethanol production.

Production potential: The production potential of Forage Sorghum varies between different hybrids, flowering dates, specific cultivars and management. Yields range from 20 to 35 t DM/ha/season under irrigation. This depends on soil fertility, environmental conditions and utilisation ^(1,2).



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Relative growth curve of early and late maturing Forage Sorghum stands - one year cycle

Metabolic disturbances in animals on cultivated pastures:

Prussic acid poisoning: Forage Sorghum is inherently capable of causing prussic acid poisoning. Hydrogen cyanide levels in plants can reach toxic levels in stressed plants.

Nitrate poisoning: Nitrate build up in plants under periods of poor growth, especially after high N fertilisation. Do not graze in an early growing stage, especially when wilted.

Establishment

Climate: Forage Sorghum performs best in warm areas. Optimal emergence can be achieved at soil temperatures of 18 °C minimum

Moisture: Under dry land conditions, good production is achieved at a minimum rainfall of 600 mm per annum, but it can be successfully cultivated in areas with rainfall as low as 350 – 400 mm per annum.

Soil: Forage Sorghum does best on clay/ loamy soils with pH (KCl) > 5, and acid saturation < 15%. It can tolerate some salinity, but not waterlogging.

Fertilization: Forage Sorghum does not have a high fertility requirement to survive, but reacts well to fertilizer application if water is not limiting. A soil analysis before establishment is essential ^(1, 2, 3).



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	N (kg/ha)	P (mg/kg soil)	K (mg/kg soil)
Requirement for establishment***	20-40*	15-20	80-120
Seasonal application (kg/ha)	40-160**	Use removal rates	
Production - Removal rates (kg/ton):			
Good quality fodder	30	2.4	28
Average quality fodder	18	1.6	18
Poor quality fodder	7	0.7	8

*Fertilizer just after establishment (kg/ha)

**Selected rate should maximise profit

***Determined by production potential

Phosphorus (P) and Potassium (K) will be recycled back to pastures when grazed by animals. This is dependent on the grazing system and the type of animals used. Up to 40% of P and 90% of K can be recycled ⁽⁵⁾. It is however necessary to do annual soil analysis to determine the level to which recycling occurred. The difference should be fertilized.

Methods: Establish on a firm, fine, weed free seed bed. Consolidating (rolling) the seedbed after sowing will ensure good seed-soil contact and subsequently better germination and establishment. Plant seeds about 10 – 25 mm deep.

Our prescribed seeding rate:

	Annual rainfall	Row establishment ^(1, 2)	Broadcasting ^(1, 2)
Low	< 500 mm	4-8 kg/ha (1.2 – 1.5 m rows)	
Medium	500 - 700 mm	8-15 kg/ha (0.8 – 1.2 m rows)	
High & Irrigation	> 700 mm	15-25 kg/ha (0.4 - 0.8 m rows)	25 kg/ha

Every kilogram Forage Sorghum seed can have between 30 000 and 45 000 seeds, depending on the seed lot.

Planting time: Optimal establishment period is between October and January (as soon as minimum soil temperature reaches 18°C). If Forage Sorghums are to be grazed, stagger plantings over an extended period. This will spread the production and make the fodder flow programme more manageable. For Silage purposes, earlier planting dates are recommended. If a silage-type is to be planted for autumn or winter



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foggage, plant early, make silage earlier and have a grazing cycle after the silage harvest.

Management

Utilisation: Graze when the stand is 750 – 800 mm in height (1000 mm at the highest). Graze to no lower than 250 mm. This will keep the stand in a vegetative stage. By keeping the stand vegetative, waste caused by trampling is also reduced. It is very important to manage early flowering types. If allowed to flower, regrowth is severely compromised.

Cultivars

Supergraze 1000

Advance Seed is the exclusive distributor of Supergraze 1000, an early flowering Sorghum X Sudan grass cultivar suited for grazing only. 50% flowering stage can be reached within 70-80 days when established early in spring. This is however subject to climate, growing environment and management.

Foragemaster Plus

Foragemaster Plus is an early flowering Sorghum X Sudan grass cultivar. 50% flowering stage can be reached within 70-80 days when established early in spring. This is however subject to climate, growing environment and management.

Resources

1. Pasture Handbook, Kejafa Knowledge Works, ISBN 0-620-31994-1
2. Tropical Forages: [http://www.tropicalforages.info/key/Forages/Media/Html/Sorghum_\(annual\).htm](http://www.tropicalforages.info/key/Forages/Media/Html/Sorghum_(annual).htm)
3. Feedipedia - Animal feed resources information system – Sorghum forage-
<http://www.feedipedia.org/node/379>
4. Gids tot die volhoubare produksie van weiding. Alles oor natuurlike veld en aangeplante weiding vir kleinvee, grootvee en wildboere. Prof Hennie Snyman, 2012.
5. Dannhauser CS. 1991. Die bestuur van aangeplante weiding in die somerreëval-dele, vol. 1. Warmbad
6. SANSOR - <http://sansor.org/sub-tropical-grasses/>
7. Truter, WF. Dannhauser, CS, Smith, H. and Trytsman, G. 2014. *Sorghum spp.* (Forage sorghum). Integrated Crop and Pasture-based livestock production systems. Conservation Agriculture – Part 11. SA Grain. ISSN 1814-1676. Page 20-22.



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