

Teff - *Eragrostis tef*

Teff is an annual grass species adapted to a wide range of conditions. This tufted grass produces ample fine leaves and stems which makes it an ideal crop for hay production for livestock and commercial hay farmers. The fast emergence of seedlings provides protection to the soil and is often used as erosion control. This grass is best adapted to areas where the annual rainfall is approximately 600 mm per annum, but can be cultivated in areas with an annual rainfall as low as 400 mm per annum.



Strengths

- 4 – 8 t DM/ha/season
Depending on environmental conditions and management
- High quality hay
- Widely adapted to different growing conditions
- Tolerance to salinity
- Drought tolerant
- Valuable in erosion control

Limitations

- Scantly tufted
- High amount of waste when grazed and should therefore not be grazed



What can it be used for?

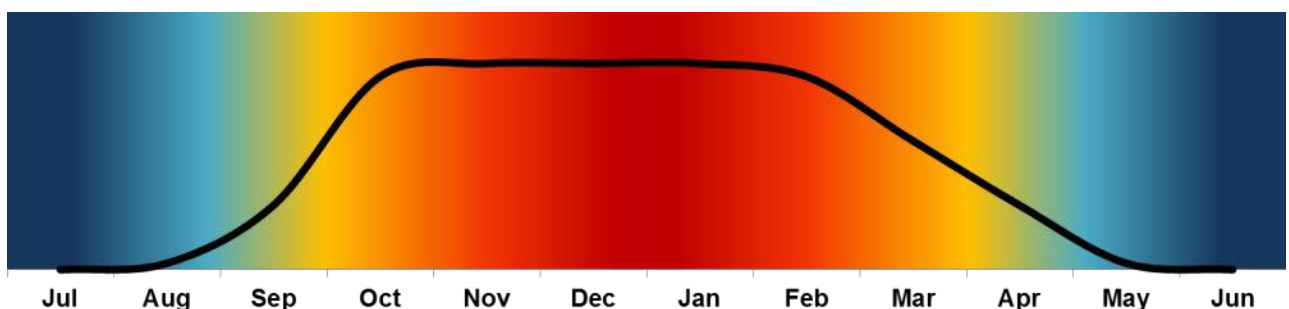
Hay: Good quality hay can be produced and should be cut before initiation of the flowering stage.

Nurse crop: The quick establishment of this crop protects the soil and the slow establishing perennial crop, such as Smuts Finger Grass. As a nurse crop, care must be taken to adapt the sowing density to prevent inhibiting the establishment of the perennial crop.

Cover Crop: The growth tempo of Teff puts pressure on the establishment of weeds and is excellent at erosion control. It improves the water infiltration rate, builds the stability of soil aggregates and soil organic material.

Grain: Teff grain is a popular gluten-free grain, also classified as an ancient grain. Although the brown seed can be used as grain, the white grain is more aesthetically pleasing and popular.

Production potential: The average production ranges between 4 – 8 t DM/ha/season. This depends on soil fertility, environmental conditions and cutting frequency. If well managed, 2 – 3 cuts of hay can be achieved in one season ^(1, 2). Grain production is influenced by the soil fertility, environmental conditions, the cultivar chosen, plant density and management.



Relative growth curve of an early established Teff stand - one year cycle





Metabolic disturbances in animals on cultivated pastures:

No toxicities have been recorded

Establishment

Climate: Optimal emergence can be achieved at a minimum soil temperature of 18 °C ⁽¹⁾. Early frost may damage stands. It performs best in warm climates.

Moisture: Under dryland conditions, optimal production requires at least 600 mm per annum, but can be successfully cultivated in areas with rainfall as low as 400 mm per annum.

Soil: Teff is widely adapted to a wide range of soils. Poorly drained soils are however not ideal. Ideal soil pH (KCl) is above 5, but it grows well in soils with a pH as low as 4.5.

Fertilization: Teff has a low fertility requirement. A soil analysis before establishment is essential ^(2, 3).

	N (kg/ha)	P (mg/kg soil)	K (mg/kg soil)
Requirement for establishment***	20-40*	15	100
Seasonal application (kg/ha)	40-100**	Use removal rates	
Production - Removal rates (kg/ton):			
Good quality fodder	23	1.7	18
Average quality fodder	15	1.3	12
Poor quality fodder	10	0.9	7

*Fertilizer just after establishment (kg/ha)

**Selected rate should maximise profit

***Determined by production potential

Phosphorus (P) and Potassium (K) can 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 ⁽⁸⁾. 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/planting will ensure good seed-soil contact and subsequently better germination and establishment.

Our prescribed seeding rate:

Forage:	Annual rainfall	Row establishment ⁽³⁾	Broadc asting ⁽³⁾
Low	< 500 mm	5-8 kg/ha	
Medium	500 - 600 mm	8-12 kg/ha	
High & Irrigation	> 600 mm	12-20 kg/ha	15 - 25 kg/ha

Nurse Crop: 1-2 kg/ha
Grain Production: 8-12 kg/ha

Planting time: Optimal establishment periods are between October (as soon as minimum soil temperature reaches 18°C) and January.

Management

Utilisation: Cutting at the onset of the flowering stage (65 – 75 days after planting) can allow for at least 2 - 3 harvests if established before December. Establishment after this period will reduce the chances of a second cutting. Teff is more suited to hay than grazing, as grazing results in a large portion of waste.

Cultivars

SA Bruin/ SA Brown

SA Brown is the most common Teff variety planted in South Africa.





Resources

1. New Mexico State University - Teff Grass: Crop Overview and Forage Production Guide, A guide for producers, extension, educators and seed marketers - <http://forages.nmsu.edu/documents/teffgrassguidepci2011.pdf>
2. Pasture Handbook, Kejafa Knowledge Works, ISBN 0-620-31994-1
3. Feedipedia - Animal feed resources information system – Teff (Eragrostis tef) - <http://www.feedipedia.org/node/439>
4. Cornell University Cooperative Extension: Teff as Emergency Forage - <http://nmsp.cals.cornell.edu/publications/factsheets/factsheet24.pdf>.
5. FAO - <http://www.fao.org/ag/agp/AGPC/doc/Gbase/data/Pf000247.htm>
6. University of Kentucky - <https://www.uky.edu/Ag/Forage/Teff%20Old%20plant%20-%20new%20use.pdf>.
7. Utah State University Cooperative Extension: Teff Hay Production Guidelines – <http://extension.usu.edu/htm/publications/file=14886>.
8. Dannhauser CS. 1991. Die bestuur van aangeplante weiding in die somerreënvaldele, vol. 1. Warmbad
9. SANSOR - <http://sansor.org/sub-tropical-grasses/>

