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Cowpeas – *Vigna unguiculata*

There are basically three different types of cowpea; forage, grain and dual-purpose cowpea types. It can be a prostrate, sub-erect or erect herbaceous annual summer legume with a well-developed taproot system. It is a multi-purpose crop, being used for human consumption as a pulse grain and vegetable, or as a forage crop being grazed or preserved. It is also often used as a cover crop/ green manuring. The minimum rainfall requirement for Cowpea production is 450 mm per annum.



Strengths

- Grain: 1-3 t/ha/season
- Forage: 3-10 t DM/ha/season
Depending on environmental conditions and management
- Multi-purpose legume
- High forage yield
- High forage quality and palatability
- Establishes easily on wide variety of soils
- Green manure and cover crop application (improves soil fertility)
- Drought tolerant

Limitations

- Pest and disease susceptible
- Annual crop
- Stressed by very wet soils and high humidity.
- Susceptible to leaf diseases under conditions of continuous rains, mist or high humidity.



What can it be used for?

Grazing: Light grazing of the crop can ensure regrowth. Rotational grazing is the best practice.

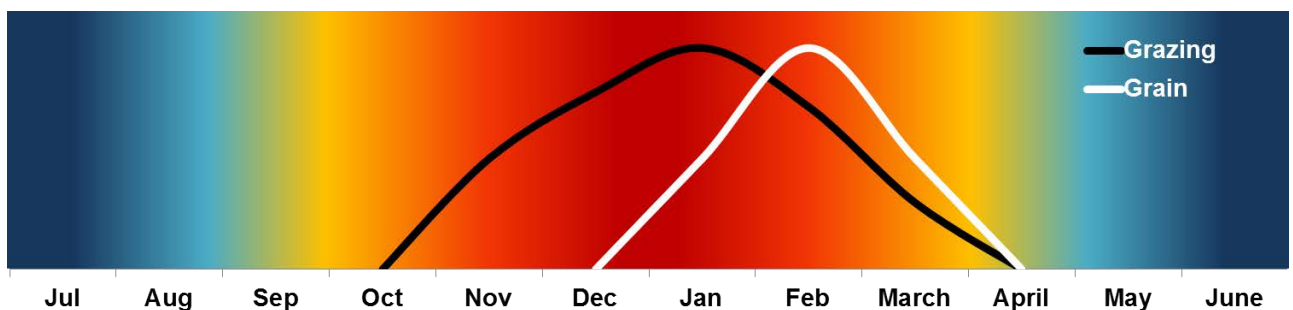
Hay: Cowpea hay can equal Lucerne hay quality.

Silage: Excellent silage can be made from blends of Cowpea and Forage Sorghum and/or Babala. If cowpeas are not mixed with Maize, Sorghum or Babala 20 litres of molasses can be mixed with 30 litres water and applied to each ton of green cowpeas to produce quality silage.

Cover Crop: Cowpea is a legume and fixes atmospheric N. It also improves soil quality by adding organic material, preventing erosion, conserving soil moisture and recycling nutrients. It builds soil aggregate stability and improves the water infiltration rate. It acts as a habitat for beneficial insects, such as pollinators.

Vegetables, Grain: Human consumption of leaves and grain.

Production potential: 3-10 t DM/ha/season can be expected in 8-12 weeks after planting if climatic conditions and management allow. Yields depend on soil fertility, climatic conditions and frequency of utilisation ^(1, 2). Grain production is by soil fertility, environmental conditions, the chosen cultivar, plant density and management.



Relative growth curves of Cowpeas grown either for grazing or grain production – one year cycle



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FORAGE

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Metabolic disturbances in animals on cultivated pastures:

Frothy Bloat: Build-up of gas in the rumen due to stable foam forming, causing animals to suffocate.

Establishment

Climate: Adapted to tropical and sub-tropical climates. Cowpeas are very frost sensitive.

Moisture: Under dryland conditions it requires at least 500 mm – 750 mm per annum for good forage production, but it can survive at a rainfall of 300 mm per annum if good moisture conservation is done and it is grown on deep soils with good water retention capability.

Soil: Does well on a wide range of soils as long as it is well drained. It prefers sandy soils that accommodate good root development. Soil pH (KCl) levels > 5.5 is recommended for optimum performance, however, it can survive pH (KCl) < 4.5. It does not tolerate salinity or waterlogging.

Fertilization: It can tolerate poor soil fertility, but reacts well to Phosphorus (P), Potassium (K) and Sulphur (S) as well as Molybdenum (Mo) application. Liming will always be beneficial if soil is acid. A soil analysis before establishment is essential ^(1, 2, 3).

	N (kg/ha)	P (mg/kg soil)	K (mg/kg soil)
Requirement for establishment*	0	25	120
Seasonal application (kg/ha)	0**	Use removal rates	
Production - Removal rates (kg/ton):			
Good quality fodder	39	5.2	36.1
Average quality fodder	29	2.4	19.1
Poor quality fodder	22	1.1	10.9

* Determined by production potential

**Fixed from atmospheric-N in symbiosis with *Rhizobium*

Phosphorus and 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%



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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. Plant seed 3 – 5 cm deep. Can be sown and lightly worked into the soil and consolidated thereafter. Seed can be inoculated with suited bacteria before planting. It is compatible with various native *Rhizobium* bacteria species. Inoculating seed prior to planting can be beneficial but not necessary.

Our prescribed seeding rate:

Forage:	Rows (30-60cm) ^(1,2)	Broadcast ^(1,2)
	12-25 kg/ha	60-90 kg/ha

Grain Production: 180 000 – 220 000 plants per hectare
Planting density is influenced by cultivar type, purpose of use and row width.

Planting time: The best time to establish Cowpeas is in October and November.

Management

Utilisation: Graze at a vegetative stage. Cut for silage at soft dough stage or when ensiled with Forage Sorghum or maize, use the latter as indicator. Disc and plough material into soil before flowering is initiated or 8 – 10 weeks after planting if used as green manure.

Cultivars

IT16 (IT82E-16)

This erect growing cultivar is suited to grain and hay production. This variety was selected for drought tolerance. The seed can be identified by small brown seeds with a red eye. From planting, it takes 50 – 55 days to reach the onset of the flowering stage and can be harvested after 90 – 110 days. Days to flower and days to harvest may vary from area to area and is also influenced by date of planting.

IT18 (IT82E-18)

Grain cowpea variety, also used for forage production, with erect to semi-erect growth habit selected for early maturity, grain yield and seed size. The seeds are brown in colour. From planting, it takes 50 – 55 days to reach the onset of the flowering stage and can be



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harvested after 90 – 110 days. Days to flower and days to harvest may vary from area to area and is also influenced by date of planting.

Brown mix

This creeping cultivar is mostly suited to hay production. From planting, it takes 60 – 70 days to reach the flowering stage and can be harvested after 120 days. Days to flower and days to harvest may vary from area to area and is also influenced by date of planting.

Dr Saunders

This semi-erect growing cultivar is suited to hay and grain production. From planting, it takes 55 – 60 days to reach the flowering stage and can be harvested after 110 days. Days to flower and days to harvest may vary from area to area and is also influenced by date of planting.

Black Eye

This erect (with semi-erect properties) growing cultivar is suited to both hay and grain production. From planting, it takes 50 – 55 days to reach the flowering stage and can be harvested after 100 – 110 day. Days to flower and days to harvest may vary from area to area and is also influenced by date of planting.

Glenda

This semi-erect cultivar is suited to both grain and hay production. From planting, it takes 55 – 60 days to reach the flowering stage and can be harvested after 110 days. Days to flower and days to harvest may vary from area to area and is also influenced by date of planting.

Resources

1. Tropical Forages: http://www.tropicalforages.info/key/Forages/Media/Html/Vigna_unguiculata.htm
2. Fodder Legumes in the summer rainfall areas of Southern Africa- Editor Dr. CS Dannhauser - SANSOR
3. Feedipedia - Animal feed resources information system – Cowpeas (*Vigna unguiculata*) - <http://www.feedipedia.org/node/233>
4. IITA, Genetic Resource Centre - <http://my.iita.org/accession2/>
5. Dannhauser CS. 1991. Die bestuur van aangeplante weiding in die somerreëval-dele, vol. 1. Warmbad
6. Truter, WF. Dannhauser, CS, Smith, H. and Trytsman, G. 2014. *Vigna unguiculata* (Cowpeas). Integrated Crop and Pasture-based livestock production systems. Conservation Agriculture – Part 22. SA Grain. ISSN 1814-1676. Page 22-24.



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