

Fact sheet

Vigna unguiculata (Cowpea)



Figure 1 Cowpea East of Inglewood 2006

Summary:

Strengths of cowpea

- Multi purpose legume providing leaf, grain and forage.
- Improves soil fertility
- Ease of establishment.
- Very high nutritive value and high palatability
- Adaptation to a wide range of soils, better adaptation to acid soils than other crops used for green manure
- Drought tolerant.
- High yields in a short period of time.
- High seed production.

Limitations of cowpea

- Pest and disease susceptibility, host for pests of Phaseolus beans.

Uses/applications

Cowpea is one of the most widely used legumes in the tropical world. The grain is used widely for human nutrition, especially in Africa. It is one of the most important tropical dual-purpose legumes, being used for vegetables (leaves and flowers), grain, as fresh cut-and-carry forage, and for hay and silage. Mixing of different cowpea varieties for food and feed purposes is common in northern Nigeria.

The species has a high potential as a green manure. It can be incorporated into the soil or spread on the soil surface 8-10 weeks after sowing, and can provide the equivalent of 80 kg/ha N to a subsequent crop. In trials, maize grain yields, associated with the use of cowpea as green manure, have been doubled compared to unfertilised control treatments. Also, maize grain yields were 30% higher than those from treatments which had 80 kg/ha of inorganic N fertilizer applied. Estimates of fixed nitrogen from cowpea often range from about 50 to in excess of 100 kg/ha. In Australia, cowpea is grown as a green manure crop in coastal sugarcane areas, as a forage or dual-purpose grain and forage crop in coastal and subcoastal southern Queensland, and as a grain crop from central Queensland to central NSW.

Cowpea has the potential to make excellent hay. When grown specifically for this purpose, quality can equal lucerne hay. Even in smallholder systems, when used as a dual-purpose legume, residues can be used as animal feed or for soil enhancement. E.g. in West Africa cowpea hay is an important product for sale in local markets. Excellent hay, and particularly silage, can be made by harvesting a mixed crop of cowpea and forage sorghum or millet.

Ecology

Soil requirements

Adapted to a wide range of soils from sands to heavy, well-drained clays, with a preference for lighter soils that allow good rooting. Wide range of pH including very acid (pH 4), low-fertility soils. Better adapted to strongly acid soils than either *Lablab purpureus* or *Mucuna pruriens*. Grows well also on heavy textured strongly alkaline soils. Does not tolerate extended flooding or salinity.

Moisture

Moderately tolerant of drought but excessive soil moisture is harmful, reducing growth and favouring infection by fungal diseases. Nevertheless, well adapted to a wide precipitation range (650-2,000 mm). For forage, annual rainfall regimes of 750-1,100 mm are preferable. As a food crop for humans, often grown in annual rainfall regimes as low as 400 mm. Extended water logging or poor drainage should be avoided.

Temperature

Very susceptible to frost; grows well only in warm seasons with 25-35°C as optimum temperature. Grows from sea level up to 1,500 m also depending on latitude.

Agronomy

Establishment

Sowing arrangement according to intended use: for fodder and green manure, 30-60 cm between rows and 10-15 cm between plants are suitable; required seeding rate about 20 kg/ha. Other seeding rates reported are 10-40 kg/ha when sown in rows and

up to 90 kg/ha when broadcast. Most common 20-50 kg/ha. Sowing depth 3-5 cm. Seed is soft so germination is usually rapid if moisture and temperature are adequate. Promiscuous in its rhizobial requirements. Annual grasses and some broadleaf weeds can be controlled by a pre-sowing application of trifluralin which is the only herbicide registered for use on cowpea in Australia.

Fertiliser

Responses have been recorded to P, K and S as well as molybdenum on poor fertility soils.

Compatibility (with other species)

Grows well in association with cereal crops through intercropping .

Pests and diseases

Susceptible to a wide range of diseases and pests (including post-harvest) , particularly those attacking the grain. Cowpea acts as host to pests of Phaseolus beans. The most important disease in Australia is phytophthora stem rot (*Phytophthora vignae*).

Ability to spread

Commercial cowpeas are soft seeded annuals and have little potential for survival in the soil.

Weed potential

None.

Feeding and nutritive value

High nutritive value: CP in green foliage 14-21% and in crop residues 6-8%, in grain 18-26%; IVDMD of foliage >80%. IVDMD of residues after grain harvest 55-65%.

Palatability/acceptability

Very palatable, high intake.

Toxicity

None for ruminants; for monogastrics, trypsin inhibitors and some content of tannin need to be taken into account. 20-25% of grain in diet fed without treatment seems not to pose a problem. Heat treatment reduces trypsin inhibitors.

Production potential

Vegetative DM production 3-10 t/ha in 8-12 weeks; grain production 250-4,000 kg/ha.

Animal production

Very few studies available; when fed as supplement, 10-20% increase in milk yield (Colombia) and 50% higher animal LWG (67 g/day with sheep) are reported (West Africa).

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