ed. Seeds can be ground into flour to prepare porridge. Immature seeds and stems may be eaten cooked as a vegetable or used in soups. Seeds can be pressed or roasted for making oil and butter respectively.

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References


Scientific name: *Tylosema esculentum*
Family: Fabaceae
Common names: Gemsbuck beans, Gemsbokboontjies, Braaiboontjie, Marumama, Muraki, Tamani berry, Morama

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Origin and distribution
Marama bean is native to Botswana, Namibia and South Africa. It also occurs in Zambia and Mozambique.

Growing areas in South Africa
Marama bean grows naturally in the arid and semi-arid areas of the Northern Cape, Limpopo, Gauteng and North West provinces.

Description of the plant
Mature plant
It is a perennial, herbaceous or woody prostrate and trailing plant.

Stems
The stems are prostrate and trailing, up to 3 m in length.

Leaves
The leaves are double-lobed, soft and red brown when young, but later turn leathery and greyish green at maturity.

Roots
The roots are deep, tuberous and sugar-beet size.

Flowers
The flowers are borne in a raceme, yellow in colour and up to 25 mm long.

Pods
The pods are very hard and they usually have 1–3 seeds.

Seeds
The seeds are oval to round in shape, very hard and reddish to brownish black in colour.

Essential parts
Seeds and tubers are the essential parts of the plant.

Climatic and soil requirements
Temperature
Marama bean occurs naturally in an extremely high temperature of 37 °C.

Rainfall
Marama bean thrives in dry areas that receive less than 100 mm of rain annually. The optimum rainfall for growth ranges from 250 to 600 mm.

Soil requirements
The plant occurs naturally in sandy soil with low organic matter and poor in nutrients, especially nitrogen. It prefers a neutral soil pH and cannot tolerate waterlogging conditions.

Cultivation practices
Propagation
Marama bean is propagated by seed.

Soil preparation
Prepare a soft, well-drained soil, free of weeds. This is ensured by ploughing the soil, followed by harrowing it to ensure a smoothness and evenness in the texture.

Planting
The seeds should be scarified to ensure germination. Soaking should be avoided as they will die off. The seeds should be planted in moist, neutral to acidic soil, preferably not waterlogged. A planting depth of 5 to 15 cm is recommended when the soils are wet and 20 cm in dry planting. It is advised to put in one seed per hole.

Fertilisation
The plant thrives naturally in nutrient-poor and low organic matter soil because of its association with microorganisms in the soil. No chemical fertilisation is recommended as yet.

Irrigation
Irrigation is not recommended for marama production. The plant thrives in dry areas receiving less than 100 mm rain annually. However, when the plant has reached physiological maturity after two rainy seasons, early resprouting can be triggered by watering, which will result in early flowering and reaching the harvesting stage.

Weed control
A marama field should be weeds free, particularly at the time of seed planting and at the time of harvesting. No weed control chemicals have been tested so far in marama fields, and none is recommended.

Pest and disease control
The most problematic pests for marama bean are leaf eaters and pod borers which can be sprayed with standard sprays.

Some filamentous fungi associated with the leaf blotches or pod rot have been reported, however, the impact on the plant was minimal. Spraying with general fungicides is recommended to avoid spreading of the fungi.

Harvesting
Harvesting starts when the pods are brown in colour, usually at the onset of winter temperatures (April to June). The seeds and tubers are collected by hand and hand-digging respectively.

Uses
The tuber (2 years or younger) can be eaten raw, boiled or baked. Seeds are also eaten boiled or roast-