

high in organic matter. When grown in sandy soils, it must be frequently fertilised, as soluble nutrients readily leach from the root zone. Its optimum range of soil pH is between 5.8 and 6.5. A soil test will indicate if lime is required to adjust the pH and the amount to apply. If lime is recommended, dolomite should be used, applied 3 to 4 months before the crop is seeded. Okra is sensitive to salinity. Okra can grow in a wide range of rainfall regimes, but needs 400 mm of water for the growing period of about 3 months

Planting:

Okra plants may be established by direct seeding in the field. To facilitate speedy germination, okra seed should be soaked in water overnight before planting. About 8 to 10 kg of seed is required per hectare. Planting depth is about 1.5 cm. Spacing varies: 45x45 cm, 50x30 cm or 60x15 cm between the rows and within the rows, respectively. Fertilisation: Well-composted kraal manure should be applied at planting at the rate of 15 to 20 t/ha (17 to 20 gm/plant). It should be mixed thoroughly with the soil in the planting hole. The plants should be top dressed using 140 kg of CAN (calcium ammonium nitrate) /ha split in two applications. The first application at the rate of 70 kg/ha (68 gm/plant) should be done 3-4 weeks after planting and the second application 3 to 4 weeks later. Rotation: Okra should be rotated with maize, peas, onions, potatoes, fodder grass or small grains. Being in the same family as cotton - with which it shares the same complex of pests and diseases - okra should not be grown before or after cotton. Weed control: Okra is harvested over a long period and weed control is important throughout the cropping season. Harvesting: Most varieties are ready to pick 45 to 55 days after planting. Pods are harvested when still tender and on attaining length of 7 to 15 cm, depending on variety and market requirements.

5. CUCRBITs

The common cucurbits grown in Mpumalanga include:



5.1 Pumpkins-Cucurbita pepo, C. Moschat and C. maxima-(pampoenblare, ibobola; cetshana intanga, umliba; mphodi, monyaku, motshatsha, thanga, and mophotse; mekopu and maphutse, lephotse, phuri and thanga tinwembe),



5.2. Bitter melon-Citrullus lanatus (bitterwaatlemoenblare; ibotola; habu, umxoxozi, ujodo, ityabontyi, ibece, ikhabe, mogapu, le hapu, makataan, kgengwe, lekatane and makopuntji)



5.3. Bitter gourd-Momordica balsamina (nkaka) a local climber, is a popular vegetable in the Lowveld areas of Mpumalanga. It is seldom cultivated and is collected from the wild.

In Mpumalanga, pumpkins and melons are often grown as a minor crop with maize covering the soil surface which helps to control weeds. These are directly sown in spring after the period with frost has ended.

6. YAM (DIOSCOREA Spp.)

Yam is the common name for some species in the genus Dioscorea (family Dioscoreaceae). These are perennial herbaceous vines cultivated for the consumption of their starchy tubers in Africa, Asia, Latin America and Oceania. There are many cultivars of yam.



It is a versatile vegetable that can be barbecued; roasted; fried; grilled; boiled; baked; smoked and when grated it is processed into a dessert recipe. Yams are a primary agricultural and culturally important commodity in West Africa, where over 95 percent of world's yam crop is harvested. Some varieties of these tubers can be stored up to six months without refrigeration, which makes them a valuable resource for the yearly period of food scarcity at the beginning of the wet season.

7. TARO/COCOYAM-Colocasia Esculenta (madumbi)

Taro is a tropical plant grown primarily as a vegetable food for its edible corm, and secondarily as a leaf vegetable. It is believed to be one of the earliest cultivated plants.



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INDIGENOUS VEGETABLES

Indigenous crops are the crops that have originated locally (in Africa). These plants have great potential, and could contribute in a significant way to ensure the food security and balanced diets of rural households. Most of these crops are harvested from the wild where it is considered as weeds. Further research on the various aspects such as nutritional importance, production practices, uses etc of these indigenous vegetable species, is therefore warranted.

1. Amaranth-Amaranthus spp.

(pigweed, cockscomb, varkbossie, imbuya, thepe, umbuya, thebe). There are many species of Amaranth and they can be distinguished by either the size of the plant, the colour of the leaves or flowers or the presence or absence of spines. Amaranth leaves are highly nutritious and because of its high protein, iron and vitamin A content amaranth is one of the most nutritious leafy vegetables.

Planting:

Land should be well prepared and mixed with cattle, chicken or compost manure at a rate of 2 kg/m². Sow seed on ridges, or broadcast onto flat beds. During the dry season where water is scarce, use sunken or flat beds. During the rainy season, use raised beds. The fine seeds should be mixed with sand (at a ratio of 1:3) to make them easier to spread evenly, and sown at a depth of 0.5 to 1 cm in rows 20-30 cm apart, or by broadcasting onto the bed. Cover the seeds with a thin layer of soil followed by watering. If sown in rows, seedlings should be thinned three weeks after sowing when they have 3-4 true leaves. Allow 10-15 cm between plants. If seed was broadcast, allow up to 5 cm spacing between plants.

Short-term harvest by plant uprooting is the quickest and easiest way to grow amaranth. Harvesting is usually done within 3-5 weeks of sowing, depending on the species. Pests and diseases are rarely a problem with such a quick crop. Weeds should be removed within the first two weeks to avoid competing with the crop and contamination of the harvest. Harvesting leaves is done every 4-5 weeks and can continue for 4 months. Once plants are older than 4 months leaf production falls and the quality of leaves deteriorates. In this case, the old established plants can also be chopped at the base to produce new edible sprouts.

2. Spider Plant (Cleome gynandra L.)

Cleome (spider plant, cats whiskers, palmbossie, lude, ulude, ulube, amazonde, leroth, murudi) is a traditional African crop that grows well in a range of environments. It



Land preparation:

Plough well and mix in compost, cattle or chicken manure at the rate of up to 2 kg/m² before sowing. Spider plant can be grown alone, or intercropped with nightshade or amaranth. Sowing: Sow seed by broadcasting or in rows 30-50 cm apart after watering or soon after rain. Cover with a thin layer of soil about 1 cm deep and water if more rain is not immediately expected. Thin plants when they have four to five leaves or a month after sowing. Allow 15-20 cm between plants in rows, or about 5 cm between plants if they are broadcast. Weeding: Weeds need to be controlled particularly in the first month, but after that crop shading can control most weeds if a thick stand is maintained.

Watering:

Good moisture is important during the whole growing season and it is advisable to water at least twice a week during the dry season. Spider plant requires much less water than tomatoes, and is relatively more tolerant of dry conditions than amaranth, but it is important to prevent the plants from wilting. Harvesting: The whole young plant can be uprooted after 5-6 weeks and re-sowing can be done straight away or young leaves and stems can be regularly harvested as the plant grows so that new leaves are produced. If only part of the plant is harvested each time it will keep producing edible leaves for up to 4 months after sowing. If plants are older than 4 months and the leaves are becoming small and hard the whole plant can be cut at the base. If cut during the warm season it will re-sprout (ratoon) and produce a new lot of soft young leaves which can be harvested within 4 weeks. Such a plant can continue to produce edible leaves for up to 4 months. Ratooning should be carried out during the warm and humid season. Ratooning and continuous picking of the leaves are recommended growing strategies when seed and labour are scarce or unaffordable.

3. Jew's Mallow (Corchorus spp.)

Jew's mallow, Wilde jute; ligusha; delele. Corchorus is an erect annual herb that varies from 20 cm to approximately 1.5 m in height. Corchorus seed shows a

is also harvested from the wild in many areas. Spider plant prefers warm sunny conditions and will grow on a wide range of soils, including sandy loams. It does not cope with water-logging, very cold weather or shading from trees. An area of 1-2 m² will provide enough for a family's needs for 4 months.

high degree of dormancy which can be broken by means of hot water treatment

Corchorus prefers warm, humid conditions and performs well in areas with high rainfall (600 to 2 000 mm) and high temperature (30°C during the day and 25°C at night).

Growth of Corchorus slows down considerably when the temperature drops below 15°C or when the plants are subjected to a prolonged period of water deficit. Corchorus prefers rich, well-drained, medium-textured soils but will also grow in coarse and fine textured soils. In South Africa Corchorus is harvested from the wild.

But it has potential for development as a crop, especially in the low and middelveld areas of Mpumalanga.



Production:

Seeds can broadcast in beds or in rows 15-20cm apart. Closely planted seedlings are susceptible to diseases. Seedlings are thinned to 1-2cm apart and transplanted when they are 7-10cm tall at 10cm apart in 20cm rows. Alternate plants can be uprooted during the first harvest. Plants respond well to manure. Apply 1.5 -2kg dried kraal manure and 100gm ash per m² bed. Plant Corchorus at two-week interval to spread the marketing period. Plants can be topped to give stronger side shoots. First harvest consists of thinned plants. This is followed by harvesting the tops from 15cm from ground level. Picking can be repeated for 3-4 times.

4. Okra (Abelmoschus esculentus)

Okra, also called lady's fingers, is mainly grown for its young immature pods, which are consumed as a vegetable, raw, cooked or fried. It is a common ingredient of soups and sauces. The pods can be conserved by drying or pickling. The leaves are sometimes used as spinach or cattle feed, the fibres from the stem for cord, the plant mucilage (thick gluey substance) for medical and industrial purposes, and the seeds as a substitute for coffee. Okra seeds contain a considerable amount of good quality oil and protein. It is grown mainly in the Lowveld areas of Mpumalanga. Okra is grown at elevations ranging from sea level to 1600m. The optimum temperatures for growth and production of high quality pods range between 24 and 30°C. The crop is sensitive to frost and temperatures below 12°C. Okra will grow on a wide range of soils, but it prefers soils

