

Perennial vegetables

Moringa

Botanical Name : *Moringa oleifera*

Family: Moringaceae

Origin: India

In India, it is grown for its tender pods and also for its leaves and flowers. The pods of moringa are used for preparation of many cuisines in South India and are valued for distinct flavour. It has a lot of medicinal value. It is fast growing and drought tolerant crop which can be grown under varied agro-climatic conditions. The cultivation of moringa in India is done mainly in the southern states of Tamil Nadu, Karnataka, Kerala, and Andhra Pradesh.

Varieties: There are two types of moringa cultivated in India

Perennial: Jaffna (yazhpanam), Chavakacheri murungai, Chemmurungai, Palmurungai and Puna murungai

Annual moringa: PKM-1, PKM-2, GKVK-1, GKVK-2, GKVK-3, Dhanaraj

Climate: It can grow from sea level to 1800 amsl. Dry, warm and semi-arid conditions are congenial for its growth. It performs best at 26-36°C. It is highly susceptible to frost and high temperature exceeding 40°C.

Soil: Sandy loam soils are most suitable for its

cultivation with pH around 6.5 and good drainage. Water logging and heavy clay soils are not suitable.

Sowing: Perennial moringa is propagated by stem cuttings (limb cutting). Limb cuttings 100-150cm in length with a diameter of 14-16 cm are planted *in situ* during the rainy season. Elite trees are cut down, leaving a stump with a 90cm head from which 2 to 3 branches are allowed to grow. From these shoots, cuttings 100 cm long and 4 to 5 cm in diameter are selected and used as planting material. The limb cuttings are planted in pits of 60×60×60 cm at a spacing of 5x5 m, during the months of June to August.

Annual moringa is a transplanted crop. It is raised through seed. Seed rate is 600g/ha is sown in nursery. Seedlings of 15-20 cm height are ready for planting in 6-8 weeks of sowing. The seedlings are transplanted in pits of 45×45×45cm at a spacing of 2.5×2.5 m, during the months of June to July, giving a plant population of 1600 plants/ha. The seeds of annual moringa may be directly dibbled in the pit to ensure accelerated and faster growth of the seedlings. The best suited season for sowing the seeds is September under Southern Indian conditions.

Manures and fertilizers: Moringa trees are generally grown successfully without fertilizers. FYM 12-15t/ha (8-10 kg/plant), crop requires 44 : 16 : 30 g NPK/ tree at the time of pinching (75 days after sowing). Nitrogen @ 44g / tree must be top dressed at first flowering (150-160 days after sowing) stage.

After care: Pinching the terminal bud on the central leader stem is necessary when it attains a height of 75cm (two months after sowing). This promotes the growth of many lateral branches and reduces the height of the tree. In addition, pinching reduces the damage due to heavy winds and makes harvesting much easier.

Irrigation: It is hardy and drought tolerant crop. Irrigation is required only in hot summers.

Ratooning/Pollarding: Cutting down the plant to a height of one meter from the ground level can be practised after one year to allow ratooning of the crop. Pollarding or pruning following harvesting is recommended to promote branching, increased pod production and easy harvesting. This is done during winters (November-December) when no fruit production is seen and start bearing four or five months after ratooning. Crop can be retained for 3-4 years with regular pruning once in a year. During each ratooning operation, the plants are supplied with the recommended level of N, P and K nutrients along with 20-35 kg of FYM. Perennial types are also pollarded back to a height of 0.3-0.45m from ground level during October-November, followed by manuring with organic matter (25kg) and the recommended input of fertilizers.

Harvesting and yield: The pods are harvested mainly between March and June. A second crop is normally harvested from September to October. Perennial types raised through cuttings take nearly a year to bear fruit. In general, the yield during the first two years of fruit-bearing is low (80-90fruit/year) and gradually increases to 500-600 fruit/tree/ year by fourth to fifth years. The annual moringa tree bears 250-400 fruit depending on the type.

Insect-pests and diseases: Fruit fly *Gitona distigmata* is a major pest while no major disease in India has been reported

Ivy gourd (*Coccinia grandis*)

- It is grown for its young and tender green fruits which are used as salad or cooked. It requires warm and humid climate with an ideal temperature of 20-30°C.
- It produces fruits through out the year in South India but plants remain dormant during winter in Northern India. It can be grown on well drained light, medium (loam).
- Important varieties are Indira Kundru 5 and Indira Kundru 35
- It is propagated by stem cutting. Stem cutting should be 12-15 cm long with pencil thickness having 5-6 leaves.
- It is planted in basins which are 60 cm in diameter and are dug 3 m apart. Add 5 kg farmyard manure in each pit.
- Planting is done in June-July or February- March
- Plant population should have atleast 10% male plants.
- Vines are often trained on bower or bamboo structures.
- The recommended dose of fertilizer is 60:40:40 kg NPK/ha, respectively. Half dose of N plus full P and K are applied at planting time and rest of N in four equal splits.
- It requires good quantity of water but cannot withstand water logging conditions.
- Pruning of vines is most important. Repeated pruning of vines must be done when the plant seems to be weak and leaves turn yellow *i.e.* after every 3 to 4 months to maximise yield (newly developing vines produce more flowers and yield).
- Flowering starts after 50-60 days of planting and average yield is 10-15 t/ha.
- Harvesting of fruits is determined by change of colour from dark green to bright or light green.