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**FASAI**

## DRUMSTICK

(*Moringa olerifra* Lam.) (2n = 22)

(Hindi : Seeng, Sahgan) Family : Moringaceae

Drumstick is grown for its nutrient rich tender, but full grown pods, leaves and flowers which are used for culinary preparations. Fruits are rich in vitamin C (120 mg/100g), carotene (110 mg), phosphorus (110 mg) and minerals like magnesium (28 mg), potassium (259 mg), sulphur (137 mg), chlorine (423 mg) etc. The crop is grown in homesteads for family uses or cultivated commercially for market. Tender leaves and flowers are comparable to that of colocasia in vitamins and minerals and have great role for combating malnutrition of urban and rural masses. Certain morigna types principally grown for its foliage are reported from West Indies. Drumstick roots are good substitute for horse radish. Root, bark and seed have many industrial uses also.

### Origin and distribution

Originated in South West India, drumstick became a popular vegetable in South Indian states. The crop is widely distributed in India, Sri Lanka, Pakistan, Singapore, Malaysia, Cuba, Jamaica and Egypt.

### Botany

Drumstick is a small or medium sized perennial tree of about 10 m height with fragile and corky stem. The leaves are usually tri-pinnate with elliptic leaflets. Pods are pendulous and length ranges from 20 cm to 100 cm. Seeds are trigonous with wings on angles.

Flowers are produced on current season growth on large and erect panicles or monocladiad cyme. Flowers were yellowish creamy white and sweet smelling. Individual flowers are bisexual, zygomorphic and pedicellate.

Calyx and corolla consist of five sepals and petals. Androecium also has five stamens alternating with five stamindodes. Gynoecium has a superior, one celled and three carpelled ovary containing many ovules on parietal placentation. Stigma is truncate.

Flowering in drumstick varies from place to place and is greatly influenced by

rain, temperature, humidity, wind, soil temperature, soil moisture etc. Under South Indian condition, one or two distinct peak periods of flowering noticed. Peak period of flowering in central parts of Kerala is December-January while in southern part it is February-March and July-August with maximum flowering in February-March. Under Coimbatore and Bangalore conditions, flowering seasons are March-May and July-September respectively. Anthesis continues throughout the day. Two anthesis peaks i.e., 2.00 p.m and 4.00 a.m. are noticed at Thiruvannthapuram. In most parts of Tamil Nadu, flowering is from 4.30 a.m. to 6.30 p.m.

In southern part of Kerala, stigma becomes receptive one day prior to flower opening and continues with maximum receptivity on the day of opening and a sudden decline thereafter.

## **Varieties / cultivars**

A number of local cultivars are known by the place of their cultivation. Details of local cultivars are given:

- Jaffna moringa - a perennial type which bears 60-90 cm long pods with soft flesh and good taste.
- Chavakacheri moringa - a perennial type producing 90-120 cm long pods.
- Chemmuringa- This perennial type flowers throughout year and bears red tipped fruits.
- Yazhpanam moringa – same as Jaffna type
- Pal moringai – Pods having thicker pulp and better taste
- Puna moringa– Thinner fruits.
- Kodikal moringa– produces short pods of 15-20 cm long and is used as support for betel vine plants. Propagated by seeds.

There are only a few named varieties and the details are given below:

KM-1 (Kudumianmalai 1)– Bushy variety propagated through seeds. Plants come to bear 6 months after planting and can be rationed for 2-3 years. Productivity 400-500 fruits / year. Developed at Anna Pannai, Kudumianmalai of Pudukottai.

PKM – 1 – This “seed moringa”, propagated through seeds is developed at Horticultural Research Station, TNAU, Periyakulam. Plants grow to a height of 4-6 m and come to

flower in 90-100 days after planting. The first harvest starts 160-170 days after planting and on an average each tree bears 200-225 fruits / year. Pods are 65-70 cm long with 6.3 cm girth and 150 g weight. Fruits are green coloured and highly pulpy.

PKM 2– This “seed moringa”, propagated through seeds, is also developed at Horticultural Research Station, TNAU, Periyakulam. Pods are extra long (125-130 cm), pulpy and suitable for homestreads.

Dhanraj– This is also an annual drumstick propagated through seeds and is evolved at KRC College of agriculture, UAS, Arabhavi, Karnataka.

Crop improvement programmes in the Department of Olericulture, Kerala Agricultural University, Vellanikkara resulted in the development of three promising perennial drumstick clones viz., MO 70, MO 95 and MO 44 and one annual seed drumstick, AD 4.

## **Climate and soil**

Drumstick is predominantly a crop of dry and arid tracts. However intensive cultivation with good irrigation and systematic cultural practices will give good yield especially for annual type. The plant put forth luxuriant growth at 25-30°C. Higher temperature results in heavy flower shedding. Crop is also injured severely by frost. Though the crop comes up well in all types of soil, performance is better in sandy loam rich in organic matter. A pH range of 6.0 – 6.72 is most ideal.

## **Propagation**

Perennial types are propagated through limb cutting of 90-100 cm length and 5-8 cm diameter. Annual types are propagated by seeds. Average seed weight is 0.288 g and 10 g contain 35 seeds. Seeds @ 625 g/ ha can be either sown in pits or transplanted after raising seedlings in polythene bags. Transplanting of seedlings can be made one month after sowing. It is always advisable to raise a few plants additionally in polythene bags for purpose of gap filling. Time of sowing of seeds for annual seed drumstick or planting of limb cuttings varies from region to region depending on receipt of monsoon.

## **Land preparation**

Field is ploughed 3-4 times. Apply FYM @ 20 t ha<sup>-1</sup> at last ploughing. Take pits of size 45 x 45 x 45 cm at a spacing of 6.0 x 6.0 m for perennial types and 2.5 x 2.5 m for annual types, apply 10 kg FYM and fill up pits.

## **Interculture and manuring**

To facilitate side branches, shoot may be nipped off when the seedlings are at 75 cm height. Apply 100 g Urea, 100 g Super phosphate and 50 gm MOP and irrigate heavily. Top dress plants with 100 g Urea again 3 months after first application. Provide light irrigation for early emergence of seedlings for annual type.

After harvest of main crop, annual types are cut back one meter height from ground level for rationing. These rationed plants develop new shoots and start bearing four to five months after rationing. Likewise about three ratoon crops can be taken. At each and every ratoon crop, plants are supplied with N, P and K nutrients as already mentioned along with 20-35 kg of FYM and irrigate.