

# MORINGA

*(Moringa oleifera Lam)*

**Family:** Moringaceae

**Origin:** India





Pods



Moringa leaves at  
edible stage



Flowers



Products

## Nutrient Composition of Moringa: A complete Mineral Package

<b>Nutrient</b>	<b>Leaves</b>	<b>Pods</b>
Iron content (mg/100g)	7.0	5.3
Calcium (mg/100g)	440.0	30.0
Magnesium (mg/100g)	147.0	45.0
Potassium (mg/100g)	337.0	461.0
Phosphorous (mg/100g)	112.0	50.0
Sodium (mg/100g)	9.0	42.0
Vitamin A (g/100g)	19690.0	110.0
Vitamin C (mg/100g)	220.0	120.0

- **In India cultivated mainly in the south (Tamil Nadu, Karnataka, Kerala, and Andhra Pradesh)**
- **Generally raised as a backyard tree for daily use.**
- **Fast growing, drought tolerant and easily adapted to varied climatic conditions**
- **Pods are consumed as a popular vegetables in South Indian cuisines and valued for their distinct flavour.**
- **Grown for its tender pods, leaves and flowers.**

# CULTIVARS

## Perennial:

- **Jaffna (Yazhpanam)**
- **Chavakacheri murungai** producing fruits 90-120 cm long.
- **Chemmurungai** (red tipped fruits), flower throughout year and heavy yielding.
- **Palmurungai** and
- **Puna Murungai**

## ANNUAL MORINGA VARIETIES

- **KM-1**
- **PKM-1**
- **PKM-2**
- **GKVK-1**
- **GKVK-2**
- **GKVK-3**
- **Dhanaraj**
- **Konkan**

## Climate

- Grown from sea level to 1800 a.m.s.l.
- Dry, warm and semi-arid conditions are congenial.
- Performs best at 25-35°C.
- Highly susceptible to frost and high temperature exceeding 40°C.

## Soil

- Sandy loam soils
- Most suitable pH around 6.5
- Good drainage
- Water logging and heavy clay soils are not suitable.

## Propagation/Sowing

- Perennial Moringa - stem cuttings (limb cutting)(100-150cm with 14-16cm dia)
- Annual Moringa - seed.
- Seed rate: 500g/ha is sown in nursery.
- Seedlings of height 15-20 cm are ready for planting in 6-8 weeks of sowing.

## Planting season

- Perennial : 5m x 5m (400trees/ha)
- Annual: 2m x 2m (2500plants/ha)
- High density planting: 6666 plants/ha@1.5 x 1.0m

## Manures and fertilizers

- ❖ Moringa trees are generally grown successfully without fertilizers.
- ❖ FYM 12-15t/ha (10-15 kg/plant)
- ❖ 135:23:45g g NPK/ pit at the time of sowing. After pinching 45:15:30g/ha NPK/plant + 25kg FYM or compost is applied within a week after cutting back every year.

## Pinching

Annual: 60<sup>th</sup> day after sowing or 75cm height  
Perennial: medium pruning at 70cm from the tip.

# After care

## Annual Moringa

- Pinching terminal bud on central leader stem at 75cm height (2 months after sowing).
- **Promote growth of many lateral branches and reduce tree height.**
- Pinching reduces the damage due to heavy wind and makes harvesting much easier.

## Perennial Moringa

- Pollarding or cutting down plant to a height of 1m from the ground level can be practised after one year to allow ratooning of crop.
- Pollarding or pinching following harvesting is recommended to promote branching, increase pod production and facilitate harvesting.
- **It is done during winter (Nov-Dec) when no fruit production is seen.**
- Crop can be retained for 3-4 years with regular pruning once in a year.

# Irrigation

- Hardy and drought tolerant crop
- **Require irrigation only in hot summers once in a week.**
- Annual moringa responds well to irrigation and yield can be doubled.



**First harvesting:** 180 Days After Sowing

**Harvesting Period:**

- ✓ Annual: six months from sowing. Peak flowering & fruiting. Jan-May; June-Sep
- ✓ Perennial: March-June and Sep-Oct

**Yield:**

- ✓ Perennial: 500-600pods/tree/year(4-5 years after planting)
- ✓ Annual: 250-400 pods/tree/year
- ✓ Fruit available for harvest in 7-8 months.

**Ratooning:** Trees are cut back 90cm from ground level

**Ratoon crop duration:** 3 years

**Industrial byproducts:** Moringa leaf powder, seed oil and cake

# Ivy Gourd (*Coccinia grandis*)

Origin-

India



- Tropical vine grown for its small edible fruits

- Herbaceous perennial climber

## Uses:

- Young leaves and long slender stem tops are cooked and eaten as a pot herb or added to soups.

- Young and tender green fruits are used as raw in salad or cooked.

- Juice of roots and leaves , and Red ripe fruit are useful treatment for diabetes.

- Particularly of significance when “Hidden Hunger” is of concern- a rich source of carotene, folic acid, iron and Protein.

## Climate and soil

- Needs warm and humid climate with an ideal temperature of 20-30° C

- Produces fruits through out the year in South India but plant remain dormant during winter in Northern India.

- Grown in light, medium (loam) and heavy soils and require well drained soils



E-Flore of Keralkal District, India



- Important varieties are Indira Kundru 5, Indira Kundru 35, Arka Neelachal Kunkhi, Arka Neelachal Kirti, Arka Neelachal Sabuja, kasha Suphal
- Propagated by stem cutting.
- Stem cutting with 12-15 cm long, pencil thickness having 5-6 leaves are taken.
- Planted in basins of 60 cm diameter dug 3 m apart and put 5 kg FYM.
- Planting in June-July or February-March
- Plant population should have at least 10% male plants.
- Vines are often trained on Bower or Bamboo structures.
- 60:40:40 kg NPK/ha. Half N + Full P and K at planting time and rest of N in 4 equal splits.
- Requires good quantity of water, but cannot tolerate stagnation
- Pruning of vines is most important.
- Repeated pruning of vines must be done when look a bit weak and leaves turn yellow i.e. every 3 to 4 months to maximize yield (newly developing vines produce more flowers & yield).
- Flowering start after 50-60 days of planting and average yield is 10-15 t/ha.







**Pruned stump**



**Newly developing vines, 2 to 3 weeks after pruning**







## Curry Plant/Leaf

**Botanical Name:** *Murraya koenigii* (L.)

**Family:** Rutaceae

**Habitat:** India



- Although found in the wild, also widely cultivated for its aromatic leaves and as an ornamental.
- Used for culinary and medicinal properties.
- An important ingredient in South Indian and Sri Lankan cuisine
- Spicy leaves of plants are used extensively for seasoning and flavouring dishes.
- Leaves are rich source of Ca but its nutritional availability is affected due to presence of oxalic acid in high concentration.
- Important varieties are Sen Kaampu, DWD-1 and DWD-2
- Red sandy loam with good drainage is the ideal soil though can be grown in wide range of soils.
- Tolerate maximum temperature 26-37° C
- Propagation through small suckers from base of tree or by root cutting or by seed.

- Seed should be pulped within 3-4 days of fruit collection and is sown in nursery.
- FYM 20t/ha.
- Planting at 1.2-1.5m in 30cm<sup>3</sup> pit while for low fertile soil spacing is 90 cm X 90 cm.
- Planting is done in May-June.
- Terminal bud is allowed to grow up to 1m height and later cut off to encourage basal branching to maintain plant in a bushy state (Topping) and to encourage maximum leaf production.
- Pruning or topping is also a part of harvesting of leaves.
- Leaf quality decreased if the plant is allowed to flower and fruit.
- First harvest starts 10-12 months after planting and yield is 250-400 kg leaves/ha
- After 5years, yield is 5000 kg/ha once in 3 months.