

# Production Technology for Successful Cultivation of Manila tamarind (*Pithecellobium dulce* (Roxb. Benth))

Udhayakumar K<sup>1\*</sup>, Muthulakshmi S<sup>2</sup>, Aneesha<sup>3</sup>, Sangeeth Shyam Sundar<sup>4</sup> and C. S. China Samy<sup>5</sup>

<sup>1,4&5</sup>Research Scholar, Department of Fruit Science, Horticulture College and Research Institute, Periyakulam, TNAU

<sup>2</sup>Professor, Department of Fruit Science, Horticulture College and Research Institute, Periyakulam, TNAU

<sup>3</sup>Research Scholar, Department of Vegetable Science, Horticulture College and Research Institute, Periyakulam, TNAU

\*Corresponding Author: [udhayakumar1077@gmail.com](mailto:udhayakumar1077@gmail.com)

Manila tamarind (*Pithecellobium dulce* (Roxb. Benth)) comes under family of Fabaceae (2n = 26). It's a very hardy and robust thorny tree. It is basically a forest species which is also recommended for plantation as border plant or wind break around the orchard. It produces edible fruits and therefore can be planted in the back yards. Plants of jungle jalebi growing naturally on the waste lands or being planted at community lands were main source of edible fruits. The fruits are relished by children and local habitats as fresh. It can also be used for developing some value-added products.

## Nutrient composition

The fruits of jungle jalebi were rich in various nutrients and anti-oxidant properties. The various chemical constituents of fruits have been observed due to location, genotype and maturity stage. The aril (Outer covering of the seed) was the only edible portion of fruit which constitutes about 60 per cent of the fruit weight. It contains approx. 22° Brix TSS at full maturity.

Constituent	Amount (per 100g edible pulp)
Calories	78.00
Moisture(g)	77.80
Protein(g)	3.0
Fat(g)	0.40
Total carbohydrate(g)	18.20
Fibre(g)	1.20
Ash(g)	0.60
Calcium(g)	13.00
Phosphorus(g)	42.00
Iron(g)	0.50
Sodium(g)	19.00
Potassium(g)	222.00
Thiamine(mg)	0.24
Riboflavin(mg)	0.10
Niacin(mg)	0.66
Ascorbic acid(mg)	133.00

## Uses

- Manila tamarind contains a rich source of Vitamin C.
- Manila tamarind is used in various traditional medicines ranging from bronchitis, hemorrhage, sores and liver problems.
- Manila tamarind fruit exhibited strong antiulcer activity comparable to the standard drug, omeprazole.
- Its high thiamine content promotes the body converts sugars into energy, which stabilize stress levels.
- Works as an antiseptic.
- Boost the immune system and reduces phlegm.

## Origin and distribution

It is native to Mexico, South America, and Central America. It is common in India, Malaysia and Thailand. In India, it widely grown in different parts of India i.e. Andhra Pradesh, Bihar, Chhattisgarh, Gujarat, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Telangana, Uttar Pradesh, West Bengal, Delhi, Goa, and Andaman Island

## Soil and Climate

The plants can resist nutritionally poor and harsh sites, and can grow in sandy, loamy, clay, acid, neutral, alkaline and saline soils. It can grow at altitudes up to 1550 m. Wide adaptability it grows well dry hot tropical and subtropical climates. Maximum temperature tolerance limit of 48 °C. It can grow well with annual rainfall of 700-1800 mm and survive in as low as 250 mm. It can tolerate shade and drought conditions but susceptible to severe frost.

## Botanical description

It is a very hardy and thorny tree and is small to medium sized semi evergreen tree which can be grown up to 20 m height. The crown is spreading but

irregular and trunk is short (about 1 m height) with crooked branches and somewhat shiny branchlets. Bark exudes reddish brown gum when injured. Leaves are bipinnately compound with a pair of pinnae, each with two leaflets that are kidney shaped and dark green in colour. Spines are present in pairs at the base of the leaf.

### Flowering

Flowers whitish, raceme like panicles 10 to 20 cm in length. Each branch has around 15 - 20 white flower in round heads. Each flower is 0.3 to 0.5 cm long with hairy corolla and calyx. Fruit is a pod, 10 to 15 cm long, 1 to 1.5 cm wide, curled up tightly and reddish brown in colour. Each pod has five to ten shiny black coloured seeds, which are surrounded by thick, spongy, dry pulp. Sweet tamarind may first produce flowers when trees are 2 years of age. Some workers suggested that seedling plant starts bearing six year after planting. Flowering generally occurs between December to May and fruits can be obtained on tree from February to August.



### Varieties

Importance of varietal selection in jungle jalebi at Southern parts of our country mentioned that attempts were being made to identify and select the promising genotypes on the basis of bearing potential, fruit colour and pulp content. Mainly two types of jungle jalebi i.e., red aril and creamy aril types were common in most parts of the country.



### PKM 1

It is an open pollinated seedling selection from Soolakkarai at Virudhunagar district. The best season was June - September and can tolerate saline and alkaline soils. It is a regular bearer. The spirally twisted fruits with clear constrictions, pale yellow pods and white attractive aril were found in clusters (2-3). The skin of fruits turns yellow at maturity and seeds turn black. It yields about 79 kg/tree/year which is 30.0% increase over local type. The highest yield obtained from this variety is 125 kg / tree / year (11.85 t/ha).

### PKM 2

It is a clonal selection from local collection, Horticultural College and Research Institute, Periyakulam. It is an ever-green tree with semi branching and spreading growth habit. It is a regular bearer with cluster bearing (3-4 fruits /cluster) type. The individual fruit weight is 40.25 g with fruits yield of 90 kg/tree/year (13.50 t/ha).

### Planting

For hedge, seed are sown in 2 - 3 rows at 15 cm distance which develops an impenetrable fence after regular training and pruning. To develop a shelter belt, seedlings are transplanted at 3 - 4 m spacing around the orchard. For fruit production seedlings of Inga are planted in square system at 8 x 8 m spacing. Vegetative multiplied plants are planted at 6 x 6 m spacing. July - August is the best time for planting when the saplings are planted in the well prepared and filled pits of 60 x 60 x 60 cm. In problematic soil, pits size can be enhanced as per need.

### Propagation and Rootstock

It is commonly propagated by seed. Freshly harvested seed germinate easily in 1 to 2 days after

sowing while dried seeds take 30 - 35 days for germination. Seed remains viable in storage for approximately 6 months. Replanting after 4 - 6 months.

### Propagation by vegetative method

It can be propagated through hardwood cuttings. The best time for taking cutting is in July - August and treatment with 1000 ppm IBA improves rooting. Budding, grafting and layering are also successful at limited scale.

### Training and Pruning

Training is essential at initial stage to provide better frame work to jungle jalebi tree. As avenue plant, the tree trunk was kept clean up to 3-4 m height and then branches were allowed in all the directions. *Pithecellobium* tree has fast growth rate and vigorous coppicing capacity and therefore can withstand any amount of pruning, lopping or browsing by animals. For hedge, regular pruning is necessary.

### Water Management

Jungle jalebi was a hardy tree and grows well even without irrigation. At initial stage irrigation is required to establish the young plants. Irrigation during summer improves fruit size and yield.

### Mulching

Sweet or manilla tamarind is hardy and drought tolerant plants, however, paddy straw, dry banana leaf etc. can be used as mulch beneath the tree canopy. Black polythene mulch is very effective to conserve soil moisture.

### Intercropping

Inter crops such as coffee, tea, cacao, cardamom can be taken under humid tropical conditions and other seasonal inter crops like cow pea, brinjal, can be grown at initial stage of manila tamarind.

### Nutrient Management

To a bearing tree, application of 50kg FYM during monsoon improves fruit set, fruit size and yield. Application of 40-50 kg FYM and 500g phosphatic fertilizer per tree has been found beneficial. Fertilizers should be applied during February- March and July-August.

### Flowering, fruiting and yield

A seedling plant of jungle jalebi starts bearing six years after planting. Small, white flowers of 1 cm diameter having dense globular heads appear on one year old twigs during February. The fruit matures about 3-4 months after flowering. *P. dulce* (Akasa Kainan) matures by April-June in Orissa and most of the Northern states. Immature green pods are astringent while the ripe fruits are sweet. Ripening of fruit does not have any association with the colour of aril. Similarly, colour of aril does not have definite relation with astringency. On an average, a well-developed tree produces 40 to 50 kg fruits per year.

### Harvesting and

Ripe fruits are manually harvested when peel colour turns from green to pink or when pulp becomes pinkish in colour. However, climbing on the tree is a risk because tree has thorny stem and branches. To harvest the fruits from a tall (10 - 15 m) tree, thin and long bamboo poles having a sharp pruning knife (skeel) fixed at the top of it, is used for harvesting.

### Post-harvest management

Harvested pods are packed in bamboo baskets and wooden basket for marketing. Fruit can be stored for a few days at room temperature. The pulp is extracted from the pods by removing the peel and seeds. The fruits are used for making paste, mixed fruit jam, beverage, etc. Coloured varieties are used for making jam and squashes.

### Future research needs

Jungle jalebi was a hardy fruit yielding species which has not been exploited commercially. Owing to its high nutritive value, antioxidant property and multipurpose nature of the tree, this species need special research attention in National Agricultural Research System of the country. The full potential of the species can only be exploited after,

1. Development of high yielding, dwarf statured, probably thorn less variety with high quality and palatability of fruits.
2. Development of commercial protocol for production of quality and true-to-type plant material.

3. Standardization of complete agronomical practices for fruit production under various ecological regions.
4. Development of various value-added products and diversification of its present use pattern.
5. Popularization of this fruit from neglected fruits to health food in the society.

### Conclusion

The Manila tamarind have highly commercial as well as nutritional value. It can be grown successfully in backyard and at large scale that give high economic return. Manila tamarind can be used as a fresh table purpose as well as in processed form. Manila tamarind was used for weight loss and as a healthy light snack.

\* \* \* \* \*