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## Planning and Planting a Mango Orchard

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Mango (*Mangifera indica* L.) is the leading fruit crop of India and considered to be the king of fruits. Besides delicious taste, excellent flavour and attractive fragrance, it is rich in vitamin A&C. The tree is hardy in nature and requires comparatively low maintenance costs. Mango occupies 22% of the total under fruits comprising of 1.2 million hectares, with a total production of 11 million tonnes. Uttar Pradesh and Andhra Pradesh are having the largest area under mango each with around 25% of the total area followed by Bihar, Karnataka, Kerala and Tamil Nadu.



➤ **Botanical Name** - *Mangifera Indica* L.

➤ **Chromosome No.** -  $2n=4x=40$  (Autotetraploid or Amphidiploid)

➤ **Family** - Anacardiaceae

➤ **Origin** - Indo-Burma region

➤ **Others Name** - King of fruits, Bathroom fruit, Choicest Fruit of Hindustan, National Fruit of India, Pride of the garden, Symbol of love.

➤ **Inflorescence** - Panicle

➤ **Propagation** - Veneer grafting, Epicotyl grafting, Inarching

➤ **Growth Curve** - Single Sigmond

**Site Selection:** Because the quality of the soil directly impacts the growth and productivity of fruit trees, choosing a site is essential. In spite of the rough or sloping soil, the trees can never the less yield

**Orchard Layout and Design:** A mango orchard's layout has a big impact on the health, growth, and potential output of the plants. In addition, it has the potential to help with or hinder a number of field activities and cultivation techniques, including fertilization, watering, pruning, harvesting, and managing weeds and pests. From disease control to harvesting, every facet of orchard design is interrelated. Depending on the type and variety of crop, different tree spacing and training.

## Nutritional Benefits

### Rich in Vitamins and Minerals

- **Vitamin C:** Mangoes are an excellent source of Vitamin C, which supports the immune system, promotes skin health, and aids in wound healing.
- **Vitamin A:** They are rich in beta-carotene, which the body converts into Vitamin A 4800 IU, essential for vision, immune function, and skin health.
- **Minerals:** Mangoes provide important minerals like potassium and magnesium, which are vital for heart health and muscle function.

## Land Preparation

**Site Selection and Soil Requirements:** Choosing the right site is crucial for mango cultivation. Mango trees thrive in tropical and subtropical climates, requiring warm temperatures and plenty of sunlight. Ideal soil conditions include well-drained, loamy to sandy soils with a pH range of 6.0 to 7.5. Avoid heavy clay soils or areas prone to waterlogging, at Madhav University, Abu Road, Pindwara, Rajasthan Pin Code - 307026

### Land Preparation Techniques

1. **Dry Period:** A dry season lasting 3 to 4 months is crucial for proper mango flowering. Mango trees require a period of water stress to induce flowering, which is why the dry period is important.
2. **Light:** Adequate sunlight is essential to trigger flowering and ensure healthy fruit production.

When it comes to planting mango trees, spacing is influenced by the variety and the environmental conditions:

**In dry zones:** Mango trees are spaced at **10 m x 10 m**, as vegetative growth is typically limited due to water scarcity.

**In wet and fertile soils:** Trees are spaced **12 m x 12 m** to accommodate the abundant vegetative growth encouraged by the favourable growing conditions.

**Dimensions:** 1 meter in depth, width, and length (1m x 1m x 1m).

**Spacing Considerations:** The distance between holes should be based on the tree canopy size and the soil's fertility. This ensures the trees have enough room to grow and access nutrients.

**Planting the seedling:** If ready to plant, re-fill the planting holes with a ¼ of the top soil from around the hole or with the soils removed when preparing the hole(s). Where necessary, mix this soil with recommended amounts of farm yard manure or tree fertilizers thoroughly at the ratio of respectively.

## Transplanting Mango Trees

**Selecting Mango Varieties:** Choose mango varieties that are well-suited to your region's climate and soil conditions. Grafted trees are preferred over seedlings as they offer better disease resistance and higher yields. Some popular varieties include Amrapali, Dashehari, Chausa.

### Specific Features of Different Varieties

- **Chausa** – Sweetest variety, Creeper variety.
- **Dashehari** – Most popular in North India.
- **Amrapali** – Dwarf mango cultivar and high carotenoids content.

**Timing of Transplanting:** The best time to transplant mango trees is during the early rainy season or late winter. This timing allows the trees to establish their roots before the harsher weather conditions of summer or winter.

**Plantation:** The plants shall be planted in the month of July as during this month sufficient water is available and this moisture is helpful in the plant's growth. After 10-15 days of pit filling with the help of hoe or shovel plant the tree in the middle of the pit. After planting the trees, the nearby soil shall be sufficiently compressed in a premedical shape. In absence of sufficient moisture, irrigate the plant after plantation.

## Planting

**Time of planting:** Spring (Feb-March) and Monsoon (Aug-Sept).

## Management of fruit tree after planting

### Irrigation

1. Immediately after planting: Water the mango tree to help it establish its roots properly.
2. During flowering: Once the mango tree starts producing flowers, water it at intervals of 8 to 12 days until maturity. This helps in improving yield.
3. Avoid watering 2-3 months before flowering: Watering during this period can encourage excessive branching and leaf development, which is not desirable before flowering.



**Protection:** Fencing against livestock: In open fields, particularly where animals are grazing, protect the mango tree from damage by livestock, especially goats, by constructing a fence or net around it.

**Manure and Fertilizer Application:** Fertilization: After 3-6 months, begin applying nitrogenous fertilizers to promote healthy growth of fruit trees like mango, pawpaw, and oranges. It's important to apply fertilizers at varied intervals to prevent nutrient leaching. Alternative to chemical fertilizers: If you prefer, farm yard manure, compost, or even kitchen ash can be used as natural alternatives to fertilizers. Mulching is also an effective method to retain moisture and provide nutrients.

### Other important practices

**Staking:** Mango staking refers to the practice of using stakes to support young mango trees. This is a critical step in the early stages of mango cultivation to ensure proper growth and development. Proper staking helps young trees establish strong trunks and roots, leading to healthier, more productive mango plants in the long run. Here's a detailed look at mango staking.

#### Purpose of Staking

**Preventing Tilting:** Young mango trees, especially those that are newly planted, may be susceptible to leaning or tilting due to wind, rain, or weak root systems. Staking provides the necessary support to keep the tree upright.

**Encouraging Straight Growth:** Staking helps guide the tree to grow in a straight and stable manner, which is crucial for developing a strong, structurally sound trunk.

#### Staking Techniques

##### Choosing the Right Stakes

**Material:** Stakes can be made from wood, bamboo, or metal. Wooden stakes are commonly used for their availability and ease of use, while metal stakes may offer more durability.

**Size:** The stakes should be long enough to provide support without interfering with the tree's growth. Generally, stakes should be about 1.5 to 2 meters (5 to 6.5 feet) tall.



**Physiological Disorder**

Disorder	Causes	Control Measures /Remark
<b>Black tip</b>	Due to effect of brick kilns fumes with contain SO <sub>2</sub> acetylene, and Co + Boran deficiency	Borax 0.6% spray The mango orchard should be established 1 km ahead from the brick kilns Cultivars with more lenticels/ unit are susceptible
<b>Malformation</b>	Caused by <i>Fusarium moniliforme</i> spp. Subglutinans + due to low temperature	Bombay green Highly susceptible Resistant Verities – Bahaduran, Illaichi, Mangeera and Alib
<b>Alternate Bearing</b>	Alphonso highly susceptible	Cultar (PBZ) / Paclobutrzone application
<b>Spongy Tissue</b>	High temperature, soil moisture, and excessive rainfall are conducive of Spongy Tissue Due to heat convection	Sod culture and Mulching lowers the spongy tissue by reducing converting heat Major Problems in Alphonso Resistant Varieties – Patna, Arka Aruna, Arka Puneet and Arka anmol.
<b>Internal necrosis</b>	Due to Boran deficiency Highly susceptible variety – Dashehari	Free from internal necrosis Neelum and Langra

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