BANANA

**Botanical name:** Musa spp.  
**Family:** Musaceae

**Origin:** Tropical regions of South East Asia (Assam, Burma, Indo-China region).

Banana is one of the oldest fruits known to mankind. Its antiquity can be traced back to Garden of paradise where Eve was said to have used its leaves to cover her modesty. It may be one of the reasons why banana is called “Apple of Paradise” and botanically named Musa paradisiaca. Banana plants refer to Biblical legend as —Tree of wisdom for good and evil in the Garden of Eden. The word Muza was derived from the Arabic term Muza, which probably came from the Sanskrit, word Moka and got its place in Koran as the —Tree of paradise, similar to that of —tree of wisdom in Bible.

**Nutritional Value:**  
Banana is a good source of vitamin A and a fair source of Vitamin C and B2. Banana fruits are rich source of minerals like magnesium, sodium, potassium and phosphorous and fair source of calcium and iron. Banana is the second largest produced fruit after mango in India accounting for 21.87 per cent of the total fruit production from 10.49 per cent of the area.

**Varieties:** In banana there are three types. They are table varieties, culinary types and hill bananas. There are several varieties in banana but the commercially important varies are- Table varieties - Poovan, dwarf Cavendish, Robusta, Grand nine, Rasthali, Gros Michel, Virupakshi, Nendran, Monthan.  
Culinary varieties: Monthan. There are also other varieties like Yenugu bontha and boodidha bontha belonging to this group. Hill Bananas: Virupakshi (Syn: Sirumalai, and Mala Vazhai.)

**Climate:** The banana is strictly a tropical crop. It grows luxuriantly in the warm, humid and rainy climate of tropical regions of the equator. It grows well in regions with a temperature range of 10-40OC and an average of 23OC. In cooler climate the duration is extended, sucker production is affected and bunches are small. Low temperature i.e. less than 10OC is unsuitable since, they lead to a condition called choke or impeded inflorescence and bunch development. Banana grows well under high rainfall areas. On an average 100 mm rainfall per month appears to be satisfactory for growth of banana. Hot winds blowing in high speed during the summer months shred and desiccate the leaves. Stagnation of water is injurious and may cause diseases like panama wilt. Banana comes up well up to an altitude of 1500m above sea level in the
tropics. The hill bananas in Tamilnadu are raised between elevations of 500-1500m mostly under rain fed conditions. Absence of strong winds and cyclones are important.

**Soils:** Banana is voracious feeder and requires a well-drained soil with plentiful organic matter. Even though banana requires heavy irrigation, it cannot withstand water stagnation. Therefore, the soil should be well drained and deep (At least 1m depth). It grows successfully in loamy soils, well drained clay soils of delta areas, irrigated medium soils. The production in lighter soils is good. Saline soils with salinity percentage exceeding 0.05 are unsuitable. Banana can grow well even under slightly alkaline soils. Such soils are found preferable for avoiding the wilt disease, which is known to be severe in acid soils.

**Propagation:** Banana is propagated vegetatively through suckers and rhizomes.

- **Suckers:** There are two types of suckers. 1) Water sucker 2) Sword sucker.
  - **Water sucker:** Have broad leaves and broad pseudostem and they don't produce a healthy banana clump and hence not suitable for planting.
  - **Sword sucker:** It has a strong large base, gradually tapering to a slender point with one or two narrow sword like leaves at the tip. The sword sucker is most vigorous, grows fast and comes in to bearing early. Hence, sword suckers are preferred for planting.

- **Rhizomes:** After harvest, a number of its suckers are encouraged to grow up to 1-2 feet. They are then dug out and their pseudostems are completely cut above the solid rhizome and roots removed. The rhizomes weighing about 450-900 grams are stored for two months in a dry place under shade. During storing the bottom remains cut off leaving the heart bud prominent at the top of the rhizome. The conical rhizomes, which have a sound heart, will be selected for planting. Sometimes the rhizomes are cut in bits of 1 kilogram and are used for planting.

- **Selection of sucker:** Select only 3-4 months old suckers from healthy vigorously growing and good yielding plants. The sword suckers should have 4-5 cm diameter at the base and 2-3 kg weight. Preparation of the sucker: The selected suckers should be separated from its mother plant along with a portion of a rhizome. Later, the stem of the suckers should be beheaded at 20-30 cm height in a slanting manner. This helps in producing new leaves quickly. The slanting cut also prevents the stagnation of water in the sucker. The old roots
should be removed and then dipped in 0.1% cereson @ 1 g.per litre of water for 5 minutes before planting.

**Land preparation:** The land should be deeply ploughed, harrowed and leveled and pits of 45cmx45cmx45cm should be dug at the required spacing. The pits should be exposed for weathering for about a week to control the presence of any grubs, ants, weevils etc. The soil from the pits should be mixed with the following thoroughly. 5-10 kg of FYM 0.5 kg of castor or neem cake 2 kg of wood ash or 50 grams of muriate of potash 200 grams of super phosphate. The pits are then filled with the above-manured soil thoroughly. While filling the pits with the manured soil apply to the pit 50 grams of lindane dust to control weevil which affects the rhizome or sucker in the soil. The sword suckers are later planted straight in the pit along with a portion of rhizome at a depth of 10-15cm.

**Planting:** The period of planting should be such that the active growth phase of the plant may continue un-hampered during the flower bud initiation stage or stage at which embryonic bunch is formed inside the pseudostem. This generally occurs between 4 and 5 months after planting. This stage determines the no. of hands / fingers in future bunch after planting. At this stage there should be any extreme cold or hot weather or lack of soil moisture or lack of nutrients in the soil. June-July (On set of monsoon) is the planting season.

In general the beginning of monsoon i.e. June is the best time for planting banana in most parts, as the rapid growth during first 4 months of monsoon is particularly helpful. In the heavy rainfall tracts like Malabar planting is done after the cessation of monsoon from September to October. This also makes the plants quite small during the expected periods of high winds, storms and cyclones etc. **Spacing:** The spacing varies greatly according to the variety and climate.

**Cultural operations in Banana:**

**Desuckering:** During the growth of the mother plant, the suckers arise from its rhizomes from time to time. If all these suckers are allowed to grow, the mother plant loses its vigour and normal development resulting in lower bunch weight and total yield. Therefore the suckers should not be allowed to grow near the parent plant till the mother plant commences flowering. At flowering (six months after planting), a vigorous growing sword sucker should be allowed to grow and one more sucker is encouraged to shoot out from the soil when the
parent plant matures its fruits. Thus the parent plant has completed its life, it has only two suckers. When the mother plant is harvested and removed, the first sucker which is 6 months old takes the lead and becomes the mother plant in the next generation and thus the successive generations of suckers arising one after the other at 6 months interval perpetuate. Removal of all suckers up to flowering of mother plant and maintaining only one follower afterwards is the best desuckering practice. Desuckering or pruning is the removal of unwanted suckers. It is done by either cutting off the sucker or the heart may be destroyed without detaching the sucker from the parent plant. Some times 3-5 drops of kerosene is poured into the cavity left after digging the sucker. In South India, crow bar with a chisel like end is used for damaging the sucker.

**Banana clump Trashing:** It is the removal of undesirable material from the banana field like dried, diseased and decayed leaves, pseudo stem after harvest, male bud, last end of inflorescence and withered floral parts.

**Mattocking:** After harvest of the bunch, the plant stem should be cut in stages at least after 30-45 days to facilitate mobilization of the nutrients from the mother to the developing ratoon plant. The pseudo stem should be cut leaving a stump of about 0.6m height.

**Wrapping of bunches:** It is covering of bunches with polythene or gunny cloth that protects the fruits from intense heat, hot wind etc. and improves the colour of the fruits.

**Removal of male buds (Denavelling):** Removal of male buds helps fruit development and increases bunch weight. Male buds are removed from the last 1-2 small hands with a clean cut keeping a single finger in the last hand. BunchSpray --Spray of monocrotophos (0.2%) after emergence of all hands takes care of the thrips. Thrips attack discolors the fruit skin and makes it unattractive.

**Bunch Covering** --Covering bunch using dried leaves of the plant is economical and prevents the bunch from direct exposure to sunlight. Bunch cover enhances quality of fruit. But in rainy season this practice should be avoided. Sleeving of bunch is done to protect fruits against dust, spray residue, insect and birds. For this blue plastic sleeves are preferred. This also increases temperature around developing bunch and helps in early maturity. Dehandling of false hands of bunch --In a bunch there are some incomplete hands which are not fit for quality produce. These hands should be removed soon after bloom.
This helps in improving the weight of other hands. Sometimes the hand just above the false hand is also removed. Propping -- Due to heavy weight of bunch the plant goes out of balance and the bearing plant may lodge and production and quality are adversely affected. Therefore they should be propped with the help of two bamboos forming a triangle by placing them against the stems on the leaning side. This also helps in uniform development of bunch.

**Denavelling**: It is the removal of male bud. The large heart shaped flower bud, contains infertile male flowers in reddish scale leaves. This heart flower bud persists even after the fertile flowers have developed and formed into a bunch. It should be cut soon after the bunch is formed, otherwise it is likely to use up some of the food, which would otherwise go to the development of fruits. It is a practice recommended for improving the appearance of the bunch as well as to ward off ‘fingertip‘disease.

**Removal of floral remnants**: The removal of dried and persistent floral remnants present at the apex of the fruit or finger helps in preventing the spread of fungal diseases. These floral remnants provide shelter to some of the fungal spores. Earthing up: It should be done during the rainy season to provide drainage and to avoid water logging at the base. It is to be done once in 2 or 3 months to prevent soil erosion from the basins and to avoid direct contact of water with pseudo stem. Due to earthing up there are fair chances of formation of good root system. It is better that whole rows of banana are strongly ridged up about 10‖ high. Weeding: In the first four months after planting, it is necessary to remove weeds. The stirring of the soil by the spade after every 6 or 7 irrigations is necessary to maintain its tilth and absorptive power. Weeds can also be checked by the use of herbicides. Diuron @ 4 kg per hectare and simazine @ 6 kg per hectare control grasses and broad leaved weeds when applied after planting and repeated 30 days after planting. Glyphosate @ 1 kg a.i. per hectare at the time of planting followed by 0.5 kg a.i. per hectare at 30 and 60 days after planting of suckers is recommended. Banana is sensitive to 2, 4-D and hence the phenoxy compounds are not used. Nutrient sprays: Spraying of a mixture containing 2% urea and potassium Dihydrogen phosphate immediately after the emergence of inflorescence stalk helps in increasing the size of the bunch and fruit content.
**Cropping:** Banana fruits develop parthenocarpically. Banana comes to flowering in about 9 months after planting. The dwarf bananas are ready for harvest within 11-14 months after planting, while tall cultivars take about 14-16 months to harvest. The fruits become ready in 3-4 months after flowering. Dwarf Cavendish variety takes about 11 months, Robusta 12 months and poovan about 13 months from planting to harvesting. Banana is categorized as climacteric fruit. Fruits don’t ripe early and uniformly on the plant. The maturity standards of banana fruit, although vary with the variety and the purpose of marketing, can be judged by physical characters as well as by chemical analysis. The physical characters like colour, shape, size and the ratio between consumable to non-consumable portions are taken in to consideration. The total period required from planting to first harvesting is also taken into consideration for harvesting of the bunch. In India the main banana season is from September to April.

**The indications of maturity for harvesting are:**

- The fruits are harvested when top leaves start drying.
- Change in colour of the fruit from deep green to light green.
- Tendency of floral ends of the fruits to shed with slightest touch of the hand.
- Fruits should be plump and their angles should have rounded off i.e.; after the attainment of ¾ th full stage before the bunch is harvested.

For export purpose, three fourths of the full maturity stage (recognized by the sharp angularities of the fingers) is considered to harvest. At this stage, the dwarf Cavendish shows a pulp-skin ratio of 35:1 or 40:1. The entire bunch is harvested with one-foot long stalk. After 15 minutes of harvest, when the latex flow ceases, the bunch should be packed properly and should not be allowed to come in contact with soil.

**Yield:** Yield of banana varies with variety, agro climatic situation and management practices adopted for production. Under Indian condition, varying yield between 15-40 tonnes per hectare has been reported. Tall cultivars usually yield 15-20 tonnes /ha. Dwarf varieties are 30-40 tonnes per hectare.