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Center for Smart Agriculture

Hi Tech Fruit Culture



Module 3: Canopy Management
Session 4: Canopy management in Mango



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- **CANOPY MANAGEMENT IN MANGO**
- Canopy in a fruit tree refers to its physical composition comprising of stem, branches, shoots and leaves.
- The canopy density is determined by the number and size of the leaves, architecture of stem, branches and shoots
- Canopy management of the fruit tree deals with the development and maintenance of their structure in relation to the size and shape for the maximum productivity and quality



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- **Reasons for low productivity in mango**
- There are several reasons that can be attributed for low productivity but among them, the major causes are given below.
- I. Predominant existing orchards are of seedling progenies
- II. Cultivation of location specific mango varieties
- III. Long gestation period in mango
- IV. Alternate bearing habit of mango
- V. Dominance of vegetative phase over reproductive Phase
- VI. Conventional spacing (wider spacing) followed in many parts of the country
- VII. Pest and disease problems
- VIII. Physiological disorders associated with mango



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- **Ways to improve the mango productivity**
- Adoption of latest technologies are of paramount importance in achieving higher productivity. The technologies are:
 - 1. Adopting a fitting planting system (High Density or Ultra High Density)
 - 2. Micro irrigation and fertigation system
 - 3. Better canopy management in mango
 - 4. Mechanization in crop cultivation
 - 5. Pre and post harvest handling including bagging of fruits, harvesting with pedicel, desapping, plastic crates etc.,
 - 6. Top working and rejuvenation
 - 7. Use of growth regulators on flower induction and setting



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- There are several operations involved in improving the yield and the quality of mango fruits.
- Among them, canopy management is one of the most important factors to sustain the yield and quality of fruits in mango.
- In many fruit crops, increase in production with enhanced fruit quality is achieved by managing canopies.



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- Capturing and conversion of sunlight into the fruit biomass (dry matter content) is an important process in fruit production.
- In general, compact and small trees capture and convert sunlight into fruit production in a better way than the larger ones.
- The main controlling factors are the extent of incoming radiation and percentage radiation intercepted by tree canopies.
- It can be enhanced by proper canopy management practices.



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- For commercial fruit cultivation, the natural form and shape of fruit trees are to be modified through the practice of pruning to achieve the targeted yield by scientific approach.
- Appropriate pruning practices keep the plant in such shape and condition as to yield fruits of desired quality.
- Canopy management depends on the nature and growth pattern of plant, number of plants per hectare and pruning techniques.



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- **Principles of Canopy Management in mango**
- Tree shape determines the exposure of leaf area to incoming radiation.
- An ideal training strategy centers around the arrangement of plant parts, especially, to develop a better plant architecture that optimizes the utilization of sunlight and promotes productivity.
- Light is critical for growth and development of trees and fruits.
- The green leaves harvest the sunlight to produce carbohydrates and sugars which are translocated to the sites where they are needed *viz., buds, flowers and fruits.*
- Better light penetration into the tree canopy improves tree growth, productivity, yield and fruit quality.
- The density and orientation of planting also impact the light penetration in an orchard.



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- **The canopy management should aim for**
- 1. Maximum utilization of light by regulating the growth
- 2. Avoidance of built – up microclimate congenial for diseases and pest infestation
- 3. Convenience in carrying out the cultural practices
- 4. Maximizing the productivity with quality fruit production
- 5. Economy in obtaining the required canopy architecture



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- **The canopy management should broadly aim at**
- 1. Formation of strong frame work having branches on all directions with near equidistance between branches.
- 2. Developing the canopy with centre opened so that it gets better exposure to sun light.
- 3. Controlling the stature/size of the plant to harness the maximum productivity.



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- **CANOPY MANAGEMENT IN YOUNG TREES**

Allow the grafts to grow to a height of one metre from ground
(single stem)

Head back the graft at 60-70 cm from the ground during October-
November to induce primary branches
(make a smooth cut with sharp secateur)

Heading back results in the formation of new primary branches (3-7)
during March-April. Prune the excess branches and allow 3 to 4 in all the
directions

Prune primary branches at 60-70 cm height to induce new secondary
shoots

(7-10 month after the first cut preferably during October-November)

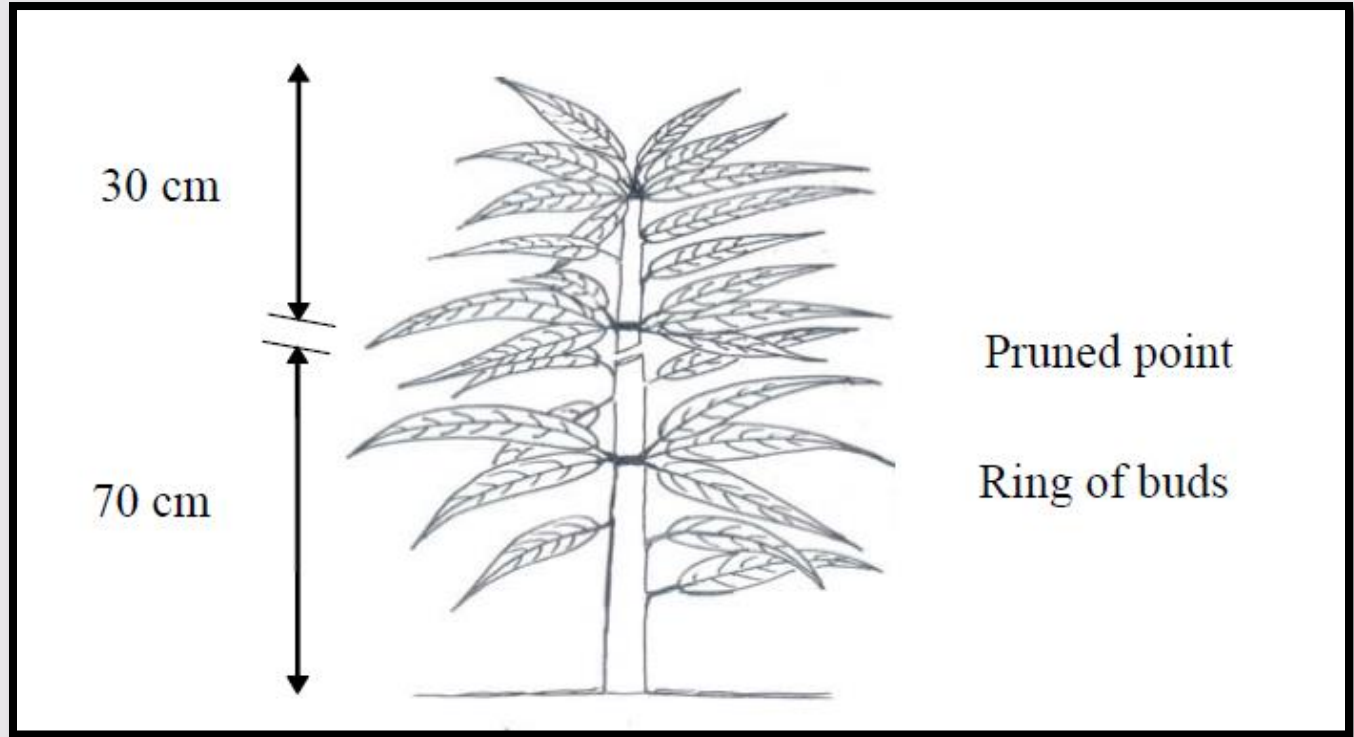
Thin the excessive secondary shoots retaining 2-3 shoots per primary
branch

Tertiary branches (2 to 3) can be obtained by pruning the secondary
branches at 60-70 cm height



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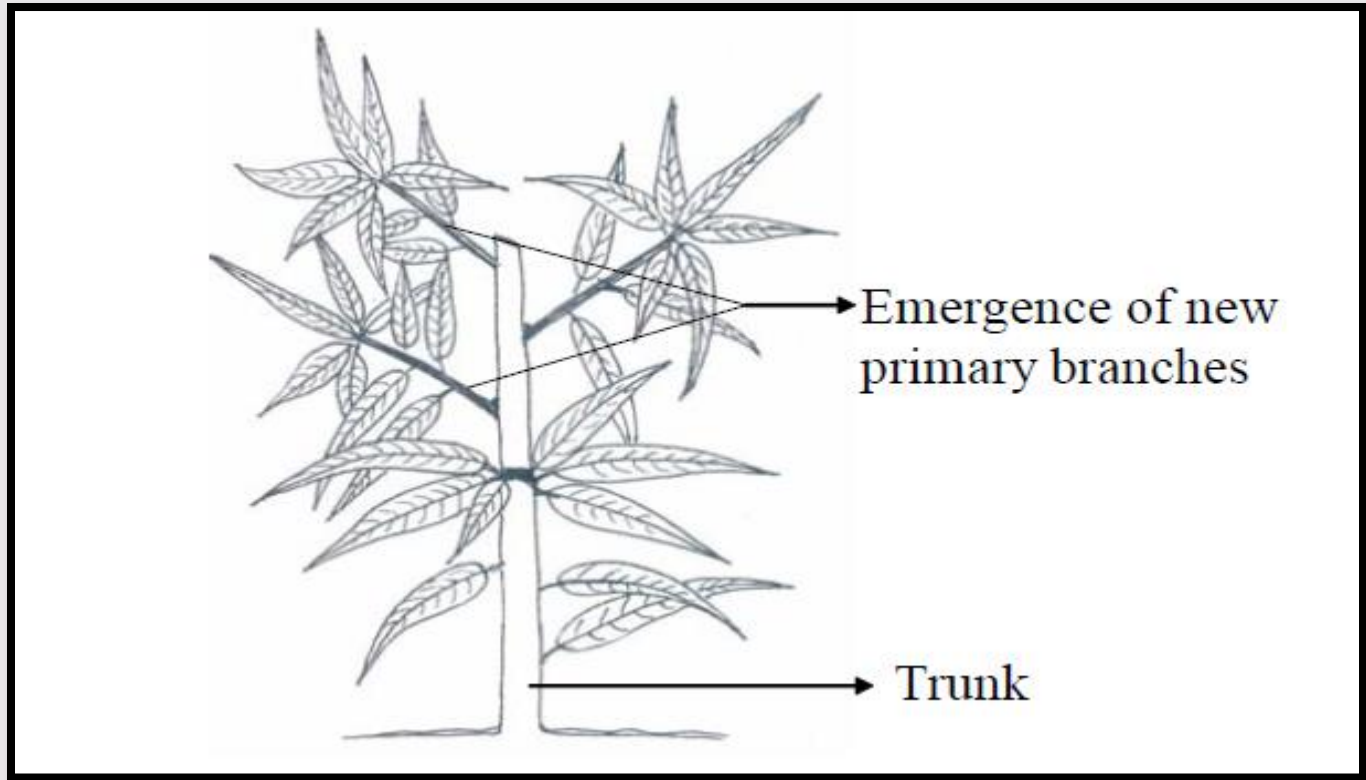


**Young seedling of 1 M height with cut given below
ring of buds**



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Emergence of new shoots below cut end



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First stage



Second stage



Fourth and final stage



Third stage

Canopy management in young mango trees



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- **CANOPY MANAGEMENT IN BEARING TREES**
- **A. First pruning after harvest**
- First pruning should be done immediately after harvest and should be completed by the end of June/July.
- It includes
- **i. Skirting**
- Removal of low hanging branches is known as skirting. It facilitates the operations such as fertilizer application and controlling of weed.



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First pruning after harvest



Skirting



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- **ii. Opening up**
- Removal of branches inside the tree which cross over or clutter up the centre of the tree restricting the penetration of sprays.
- One or two uprightly growing branches from center of tree are to be removed to reduce tree height significantly and to increase the availability of light inside the canopy for better photosynthesis.
- During removal of branches, first cut should be given on the lower side of branch, so that a smooth cut is possible which avoids bark splitting.



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- **iii. Hygiene**
- It involves the removal of any diseased or dead branches in the tree, which could be a source of infection.
- **B. Second pruning – pre flowering**
- Second pruning may be taken up in the middle of December and, if the timing is right, it is to be followed by a floral flush rather than a vegetative flush.
- Second pruning should be completed in a short period not exceeding one to two weeks.



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- **i. Skirting:**
 - Low hanging branches which could cause fruit to drag on the ground are to be removed.
- **ii. Opening up:**
 - Twigs and disorderly branches inside the tree are to be removed to have a open canopy.
 - This not only facilitates spray penetration for better insect and disease control but also allows light into the tree, improving fruit colour.



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- **iii. Tip pruning:**
- It is a useful practice where the trees have had a vegetative flush just prior to flowering.
- The young flushes are cut back to mature wood; the resulting flush may result into a floral one.
- Tip pruning will also reduce tree size.
- **iv. Hygiene:**
- It is essential to reduce the source of flower and fruit infection.
- Any diseased or dead branches should be removed before flowering.



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*Thank
you*

