



## Canopy Management in Fruit Crops

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Canopy management is the manipulation of tree canopies to optimize the production of quality fruits. The canopy management, particularly its components like tree training and pruning, affects the quantity of sunlight intercepted by trees, as tree shape determines the presentation 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 to growth and development of trees and their fruits. The green leaves harvest the sunlight to produce carbohydrates and sugars which are transported to the sites where they are needed – 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 light penetration in an orchard. Generally, in close planting, quicker shading becomes a problem. An east-west row orientation results in more shading as compared to the western and southern orientation of trees. Strong bearing branches tend to produce larger fruits. The problem of a fruit grower is initially to build up a strong and balanced framework of the trees, then equip them with appropriate fruiting. Obviously, pruning in the early years has to be of a training type to provide strong and stocky framework with well spaced limbs or any other desired shape.

### The main objectives of canopy management are given below:

- To get the higher yield with good quality
- To formation of strong crotches / crotch angle.
- To proper utilize air, light and temperature efficient.
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- To make accessibility to machinery between rows
- To maintain a good balance between root and shoot growth
- To facilitate the management practices like spraying, harvesting etc
- To remove unwanted, overcrowding, dead disease and pest affected shoots.
- To regulate the tree architecture or form desire shape for high density planting system

### Principles of Canopy Management:

- Maximum utilization of light.
- Avoidance of built-up microclimate congenial for diseases and pest infestation.
- Convenience in carrying out the cultural practices.

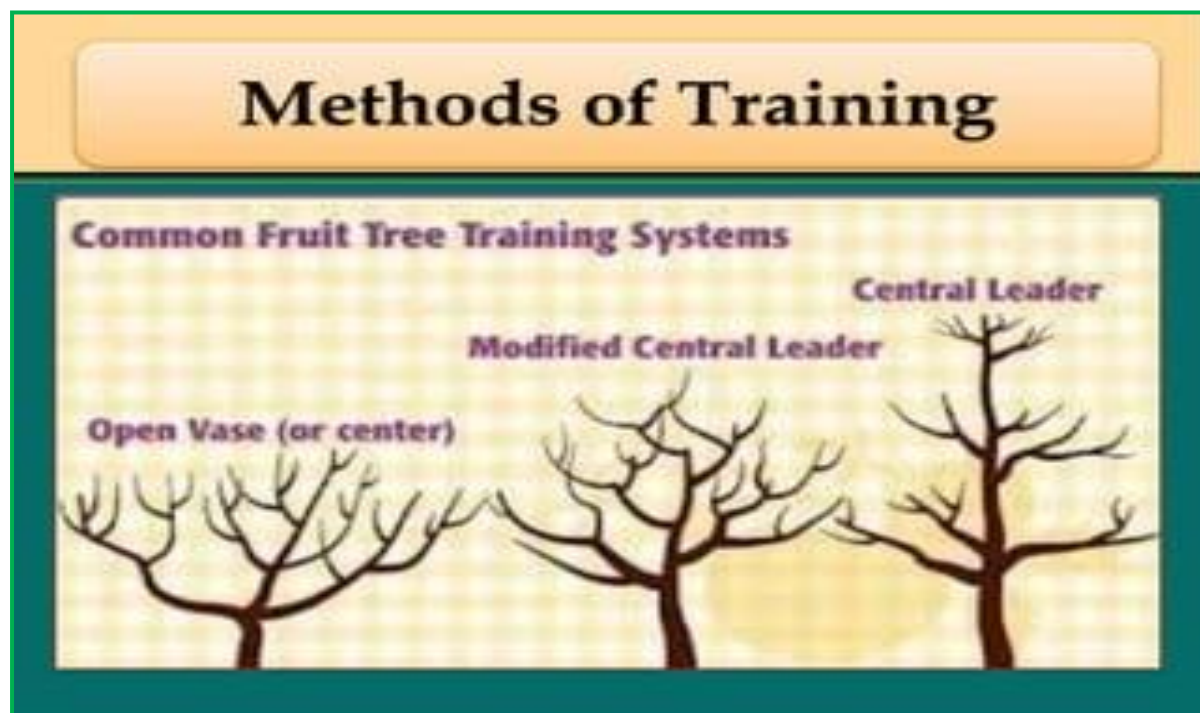
- Maximizing productivity with quality fruit production.
- Economy in obtaining the required canopy architecture.
- In many fruit crops, improved production and fruit quality has come from producing more fruit from smaller trees.
- Rejuvenation of declining in productivity and fruit quality in large over grown orchards.
- Small trees are better in capturing and converting sunlight in to fruit then large trees.
- Reduction in extra expense in harvesting at large trees.
- Safety risk for the harvest of bigger trees.

### There are three primary methods for managing fruit tree canopies:

**Pruning:** The removal of limbs or branches from the tree. This is what most of us think of as canopy management, but it is only one part of a larger process.

**Training:** Positioning limbs in specific ways to manage growth, rather than removing them. Train rather than prune when possible!

**Horticultural Practice:** Addition of nutrients, water, etc. E.g. Rather than cutting limbs, cut back on water and nitrogen to stop excessive tree growth.



### Canopy management in some fruit crops

**Bael:** During first year after planting, its plants are headed back at 0.90cm – 1.0m from the ground level, for emergence of new growth below the cut points. Three to four equally spaced shoots are retained around the stems to form the main scaffold of the trees. These shoots are allowed to grow approximately for 6-7 months then these selected shoots are further pruned to 50% of their total length for emergence of new shoots below the cut point. As a result, new shoots emerge which are allowed to develop further.

**Banana:** In most banana growing regions, solar radiation is abundant and productivity of banana largely depends upon the efficient utilization of this resource. In multistorey cropping system, banana is grown to harness maximum light, land and nutrient availability. Light interception, soil fertility, climatic conditions, soil moisture etc. are important points to be considered for laying out of high density plantation. Pruning of surplus leaves is a common operation in banana cultivation. Leaf pruning improves light penetration and reduces disease

spreading through old and senescent leaves. The micro climate, especially availability of light and heat is improved by removal of leave. For optimum crop production, minimum of 12 leaves are required to be retained.

**Lime:** Acid lime plants may be trained to modified central leader system, with a smooth trunk up to 75-100cm height from the ground level and 4-5 well spaced and well spread branches, as scaffolding branches. All sprouts appearing on the trunk up to a height of 75-100 cm should be removed. Similarly on grown up trees, the water suckers appearing on main trunk and scaffolding branches should be removed promptly. Once a young plant is trained to a desired shape, it requires very little pruning. Light pruning may be given during later years. Lightly pruned young trees make more development of roots and shoots, producing fruits earlier than those pruned heavily. Pruning of bearing trees though differs with variety, chiefly consists of removal of dead, dried, diseased, broken and criss cross branches, whose existence is detrimental to the health of trees. Removal of water suckers is also essential. Pruning may be done just after harvesting. Soon after pruning, the cut ends may be smeared with Bordeaux paste or Blitox.

**Guava:** Untrained or unpruned guava trees become huge and unmanageable after a few years of growth. The bearing area is reduced and the interior of plants become entirely without fruits. Trees are topped to a uniform height of 60-70 cm from the ground level, 2-3 months after planting to induce the emergence of new growth below the cut points. Three to four equally spaced shoots are retained around the stem to form the main scaffold limbs of tree. These shoots are allowed to grow for 4-5 months after topping until they attain a length of 40-50 cm. The selected shoots are further pruned to 50% of their length for inducing multiple shoots from the buds below the cut end. Newly emerged shoots are allowed to grow up to 40-50 cm and pruned once again for emergence of new shoots. This is chiefly done to obtain the desired shape. The pruning operations continue during the second year after planting. After two years, short branches within the tree canopy produce a compact and strong structure. All the plants are confirmed to a hedge shape of 2m inter row width and 2.5m height for which pruning is performed in January and May-June every year.

## References

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