



## Canopy Management in Custard Apple Fruit Crop

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Canopy management in fruit crops deals with the development and maintenance of their structure in relation to the size, shape for maximum productivity with fruit quality. Tree canopy management, especially size control, has become a priority for reducing production cost and increasing fruit yield and quality. Canopy dosing and shape influences light interception with assured higher monetary returns to fruit growers. Therefore early height control and tree canopy management are important techniques which should be practiced in fruit crops for higher returns to growers.

### Introduction

It is well known that the diversity in soil and climatic conditions in India permits growing of a large variety of tropical, sub-tropical and temperate fruit crops in different regions, due to which India is regarded as a horticultural paradise. Sustainable development of Horticulture is the biggest challenge before developing countries like India. There is need to formulate appropriate strategies for the management to developed state of art technologies for harnessing these resource to meet the growing demand of the society. Existence of unproductive senile orchards has a telling impact on the socio-economic as well as livelihood status of the farmers. The traders and consumers are equally affected with low production and poor quality of produce. Uprooting such orchards and new plantation may not be a prudent option considering the long gestation period of establishment and resulting impact on livelihood of farm families, environmental concerns as well as the investment cost. The productivity of fruit crops depend on several factors, poor management of canopy architecture being the most important one. In fact, fruiting potential of trees is largely governed by their architecture, canopy density and photosynthetic efficiency.

### What is Canopy Management?

Canopy managements of the fruit trees deals with the development and maintenance of the structure in relation to the size and shape, orientation of branches and light interception for the maximum productivity and quality.

### Essential Features of Ideal Canopy

- It should have adequate number of fruiting units
- It allow sufficient light and ventilation in to canopy
- It should support adequate foliage and protect the fruits from sunburn
- It avoid overlapping of foliage to minimize parasitic leaves
- It offers scope for effective coverage of sprays
- It should avoid the buildup of microclimate congenial for pest and diseases development

### Objectives of Canopy Management

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

### Principles of Canopy Management

#### 1) Light Interception

Light interception ranged from 57 to 81% of available light varied with orchard site due to tree size and cultivar differences and was reduced by summer pruning.

#### 2) Light Penetration

An optimum light level of near 70% full sun may be necessary to maximize the most sensitive quality criterion and fruit colour. Canopy height and width affect economic yield of tree, which could be managed according to ambient maximum irradiance and latitude of the orchard location.

#### 3) Photosynthetic Response

In an orchard the light saturation point for photosynthesis of mature trees is determined at a photosynthetic photo flux (PPF) of  $1110 \mu\text{mol quanta m}^{-2} \text{s}^{-1}$ . Photosynthetic rates may be significantly affected by slight fluctuations in temperature. Temperature range for photosynthesis is  $20-24^\circ$ . It varies with species to species.

#### 4) Flowering and Fruit Set

Position of the fruit buds has a relationship with the growth habit of a tree. Knowledge of kinds of buds, their location and time fruit bud differentiation is of considerable importance for (1) Undertaking profitable pruning, and (2) Adoption or manipulation of suitable cultural practices for profitable flower bud initiation.

#### 5) Fruit Quality

Poor light intensity leading to development of poor colour. In general best colour in apple develops with light exposure of more than 70% of full sun, adequate colour from 40-70%, and inadequate colour with less than 40% full sun.

### Tools for Canopy Management

- 1) Training
- 2) Pruning

### Canopy Management through Training

A process by which a plant is tied, pruned, fastened or stacked to give a proper shape is called as 'training'.

### Objectives of Training

- To control and regulate shape of tree.
- To develop strong framework of tree.
- To have a better crotch angle between scaffold branches.
- To develop a balance between vegetative and reproductive growth of tree.
- To facilitate interception of sunrays to each and every part of tree.

**Types of Training**

- 1) Central leader training
- 2) Open center system
- 3) Modified leader system

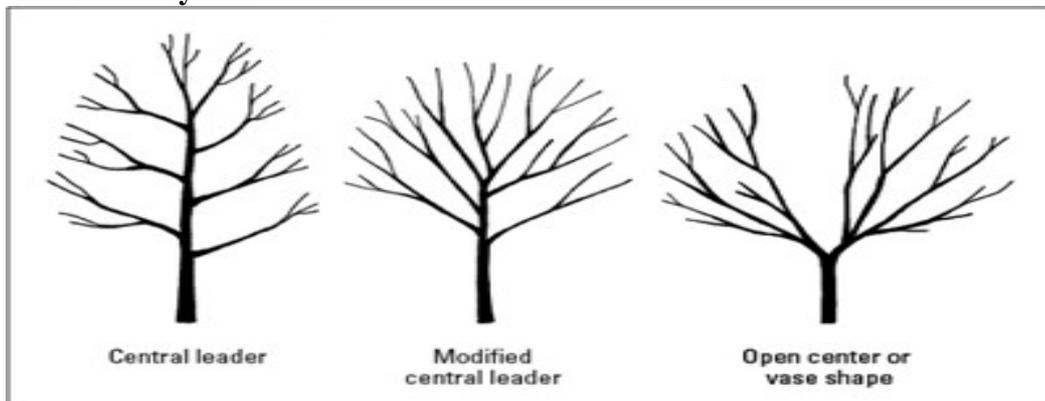


Fig. Different types of Training

**Canopy Management through Pruning**

It refers to the removal of plant's parts such as buds, developed shoots and roots to maintain a desirable form by controlling the direction and amount of growth.

**Objectives of Pruning**

- Remove crossing and interfering branches.
- Remove water sprouts / suckers.
- Regulate growth, vigor and direction of shoots.
- Regulate growth and fruiting.
- Induce regular bearing.
- Control size of plants for high-density planting.
- Regulate exposure to sunlight.
- Increase the age of trees.
- Rejuvenate old and senile orchards.
- Control diseases and pests.

**Canopy Management Practices in Custard Apple**

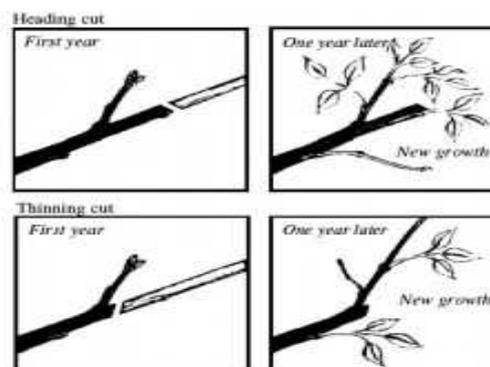
Custard apple requires more corrective pruning. Initially, it is essential to develop a good growth and better yield over a long period of time. Without pruning, its plants become bushy and bearing efficiency comes down.

Severe pruning is detrimental for the plant growth. Yellowing of leaves starts as the harvesting season of the fruits ends. The leaves begin to drop with the onset of winter and fresh growth occurs in spring. Flowering singly or, rarely, in small clusters mostly on current season's growth and, occasionally, on old wood. Training to a single stem is the only option when rootstock is employed.

- Young plants need training for the development of framework. Keep the main stem clean up to 50-60 cm height from the ground level.
- Timely removal of misplaced limbs is necessary to build a strong framework.

**Types of Pruning**

1. Heading back
2. Thinning out



Heading and thinning cuts

Heading and thinning cuts have different effects on subsequent growth.

- Four to five scaffold branches with wide crotch angle are encouraged to grow in different directions during early years of orchard establishment.
- Pruning during March-April is done to encourage new growth on which flower buds are generally formed. Tree height is generally maintained up to 3 m. Pruning is also done to remove dead wood and old branches which bear fewer fruits.

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