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Center for Smart Agriculture Applied Hi-Tech Horticulture



Module 2: Innovative Technologies in Hi-Tech Horticulture

Session 14: Canopy management and Rejuvenation in fruit crops



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What is Canopy?



Canopy is the above ground portion of a plant community or crop formed by the collection of individual plant crowns.



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Introduction

Trunk: The leader is the vertical stem at the top

Scaffold branches: Primary limbs that form a tree's canopy.

Secondary branches: That emerge from scaffold branches

Terminal bud: at the tips of branches

Lateral branch: Growth comes from along branch sides



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Canopy management in fruit crops

Principles

- ❖ 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
-
- ❖ The fruit crops grown in India: Tropical, Subtropical and Temperate fruit.
 - ❖ Need for training and pruning: Depending on the type of plant and specific objectives of fruit growers.



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Canopy management in Mango

Importance of canopy management in mango

- ❖ Size control
- ❖ Reduction of production cost
- ❖ Increase fruit yield and quality





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Pruning in mango plant

Heading back of plants when they attain the age of one year.

- ❖ Heading back should be done with a sharp secateur to give a sharp and smooth cut during October-December.
- ❖ Height of heading back should be 60-70 cm from the ground.
- ❖ Heading back results in emergence of new shoots during March - April (spring season).
- ❖ For development of ideal open canopy, thinning of excessive shoots is needed during May.
- ❖ Such well manner 4 branch should be selected.
- ❖ If crotch angle is small then bending done.
- ❖ 2nd cutting is done after shoot mature colour change green to brown.



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❖ Thus, second cutting of primary branches is done in October-November.

❖ This cutting also induces new growth during ensuing spring season.

❖ Again, thinning of excessive shoots should be done to ensure 2-3 shoots per primary branch.

❖ These shoots develop as secondary branches.





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Rejuvenation in Mango tree

- ❖ Identification of senile orchard
- ❖ 1st mark in the branch
- ❖ For future canopy management
- ❖ mark the branch 2.5-3m above
- ❖ the ground
- ❖ Heading back operation should
- ❖ be done in November – December.
- ❖ Cut should be sharp and slant.
- ❖ Pruned banchs are removed for fertilizer management.
- ❖ Fertilizer should be completed by January. February is time for fertilizer application in headed back trees. (2.5kg urea, 3kg SSP and 1.5 Potash)
- ❖ The remaining half dose of urea is applied during June end.
- ❖ B⁸asin irrigation is followed at an interval of 15 days from April to onset of monsoon





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Canopy management in Ber

- ❖ Give vertical support during its growing period
- ❖ No shoot is allowed to grow up to 80-90 cm.
- ❖ 4 - 5 side shoots which are properly placed
- ❖ During first 2-3 years after planting, ber trees are trained to develop a strong framework.
- ❖ Main trunk, 3 or 4 well spaced and favourably located main branches





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Canopy management in Guava

- ❖ Trees are topped to a uniform height of 60-70 cm, 2 - 3 months after planting.
- ❖ New shoots emerge after pruning of shoots during January-February





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Canopy Management in Aonla

- ❖ Training system:
Modified central leader system
- ❖ Determinate branch should be trained to encourage new shoot
- ❖ In initial time height of the plant 0.75-1 m from ground level.
- ❖ Rejuvenation of plant from 2.5-3 m height.





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Canopy Management in Grape

Problem in grape:

- uneven berry and bunch size
- low fruitfulness
- uneven ripening
- Sunburn

Manage by Training,
pruning and leaf removal

Trunk height: Depend upon
variety and type of trellis
System (60 cm for wine
grape and 1.3 m for table
grape)





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For medium young
vine:
In February for
framework
development.

Growing shoots are
cut back at the first
wire and the side
shoots arising are tied
with the help of a jute
rope





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Canopy management in Apple

- ❖ Topped: 50-60cm above the ground level at the time of planting
- ❖ Pinching: unwanted shoots is depressed 3-5cm of shoot tips from mid April to mid May
- ❖ Primary scaffold branches should have the crotch angle of 45 degree





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Canopy Management in Peach

Canopy architecture can be manipulated through various means like-

- ❖ Training
- ❖ Pruning
- ❖ Rootstocks
- ❖ PGR's
- ❖ Moisture stress
- ❖ Nutrition





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Type of training system in Peach

- Espalier
- Hedge Row system
- V Trellis system
- Y shaped system
- Quad – V
- Tri – V
- Perpendicular- V
- Fusetto
- Supported systems- Tatura,
16 Palmette



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Second leaf peach tree after
major pruning to the
perpendicular v system



Maintain young
bearing wood on the
primary scaffolds



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Canopy Management in Plum

❖ Plum plants are slower than that of peach

❖ **Training system:**

modified

❖ **Headed back:** At the time of planting from 60-80cm and summer 3-4 scaffold branch selected and first dormant pruning, central leader is headed back.

❖ **Thinning:** 25-30% thinning along with one third to half heading back of shoots because 25-30cm growth requires for proper fruiting.



Source: Singh, Gorakh (2010).



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Pruning of bearing trees in Plum

- ❖ Light heading back and removing of water sprouts, dead disease branches are practiced.
- ❖ Heavy heading back of branches should be avoided because it produce long water sprouts.
- ❖ Plum bears on spur and one year old shoots life span of spur is 5-6 years pruning is necessary for spur renewal and 75% - 80% of new growth is removal of new growth in each season.





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Canopy Management in Pear

- ❖ Remove broken or diseased branches
- ❖ Crossing limbs
- ❖ Weak stems
- ❖ Any growing vertically or straight down
- ❖ Thin out enough new growth to allow light to filter into the canopy when the tree has leafed out so the fruit can ripen and colour properly
- ❖ Shorten any branches that are too long to avoid leggy growth
- ❖ Shape tree evenly and remember applies flower and fruit on wood, so head back new growth to direct energy back into flowers and fruits.



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THANK YOU

