

Lecture 9

HIGH DENSITY PLANTING

Accommodation of the maximum possible number of plants per unit area to get the maximum possible profit per unit of the tree volume without impairing the soil fertility status is called the **High Density Planting**. Basically the availability of a dwarf plant is the first and foremost pre requisite for establishing any high density orchard. It may be achieved by different approaches like use of dwarf cultivar, dwarfing rootstock/interstock and with the use of the growth retardants like daminozide, ethephon, chlormaquat and paclobutrazal. However closer spacing, growth regulation by the training and pruning, use of mechanical devices etc may also be tried either singly or coupled with other crop management practices for a successful adaptation of this concept. This concept has been successfully developed in a number of fruit crops by using various techniques in India.

High density planting is one of the improved production technologies to achieve the objective of enhanced productivity of Indian fruit industry. Yield and quality of the produce are two essential components of the productivity. High density planting aims to achieve the twin requisites of productivity by maintaining a balance between vegetative and reproductive load without impairing the plant health.

Based on plant population, HDP is termed as low HDP with less than 250 trees/ha, higher HDP with 500-1250 trees/ha and ultra HDP with more than 1250 trees/ha. Recently, super high density planting system has been also established in apple orchards with a plant population of 20,000 trees/ha. Still dense population of about 70,000 trees/ha is followed in certain orchards and this system of planting is referred as meadow orcharding as practiced in apple. The term '**meadow orchard**' which amounts to growing fruits without trees was coined by Hudson (1970) to describe an ultra high density apple orchard meant for mechanical harvesting by mowing the tress with their fruits as grass in a meadow. In the experimental meadow orchard of Luckwill (1978) the budded apple on clonal dwarfing rootstock were planted at a spacing of 30×45 cm (70,000 trees/ha).

Characteristics of HDP

- The trees of HDP should have maximum number of fruiting branches and minimum number of structural branches.
- These branches should be so arranged and trained in such a way that each branch casts a minimum amount of shade on other branches
- The height should be one and half its diameter at the base. A key to successful HDP depends upon the control of tree size

Advantages of High Density Planting:

- It induces precocity hence earlier production and higher return per hectare.
- Best utilization of land and resources.
- Increase in yield per unit area.
- Quality production of fruit crops.
- More efficient use of fertilizers and irrigation water due to greater root densities per ground area.
- Efficient pesticidal application due to better spray interception.
- Easy for other intercultural operation like training and pruning, harvesting since dwarf rootstocks are used.
- To obtain export quality of the harvest.

Disadvantages:

- Higher costs for planting and orchard care due to greater number of trees per hectare
- Lack of promising dwarfing rootstocks in mango, guava, sapota, peach, sweet cherry etc
- HD results in overcrowding, over lapping not only in the tops, but also in the root system and heavy competition for space, nutrient and water.
- More important is build up of high humidity, lack of cross ventilation in the orchard, which is more conducive for buildup of pests and diseases.
- Less life span of the fruit trees, reduction in yield in the long run after 15 years of age.
- Difficult to manage the tree canopy.
- Require high techniques for the maintenance of fruit trees.