



High Density Planting in Fruit Crops

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High Density Planting: Definition & Introduction

“The growing of more number of plants in per unit area with closer distance is known as High Density Planting (HDP).”

It is also known as Close Distance Planting or High Density Orchardling. HDP was 1st started in apple in England (1960) but in India, it was 1st time started in the crop of mango and then after in guava.

Nowadays, HDP is most commercialized on apple, peach, mango, guava, papaya, sapota, citrus and pineapple.

Objectives/Principles/Advantages of HDP

- ✓ To obtain more numbers of plant in per unit area than normal planting of systems.
- ✓ More production and productivity in per unit area.
- ✓ To obtain better quality of fruits.
- ✓ Manipulation of size.

Limitations of HDP

- ✓ HDP cannot be adopted in very deep, steep, unfertile, shallow, undulated and drought prone areas.
- ✓ HDP may invites diseases and or pests due to high RH and temperature in closing planting.
- ✓ Lack of awareness/knowledge and required skilled persons.
- ✓ It may be costly.

Need of HDP/Why HDP?

- ✓ For better utilization of land/space (horizontal/vertical space used).
- ✓ For facilitates of various cultural practices.
- ✓ For increasing capture sunlight in per unit area.
- ✓ For maintain optimum canopy of plants.

Components of HDP

- ✓ Planting distances and planting systems
- ✓ Canopy management
- ✓ Using dwarfing rootstocks
- ✓ Training and Pruning
- ✓ Uses of PGRs

Planting distances and planting systems and or Strategies for HDP in different fruit crops

S.No.	Fruit Crops	Varieties	Spacing/distances	No. of plants (Approx)	Planting systems
1.	Mango	Amrapali	2.5m×2.5m or 4m×2m	1600	Triangular
		Arka Aruna/Alphonso	3m×2m	1666	Rectangular
		Mallika	3m×2.5m	1333	Rectangular
2.	Banana	Robusta and Dwarf Cavendish	1.5m×1.5m	4400	Square
3.	Papaya	Pusa Nanha	1.25m×1.25m	6400	Square
4.	Sapota	PKM-3, CO-3 and Pilipatti	5m×5m	400	Square
5.	Peach	Red Heaven	3m×3m	1111	Square
6.	Guava	Allahabad Safeda	6m×3m	500	Square
7.	Citrus	Kinnow Mandarin	1.8m×1.8m	3000	Square
8.	Apple	Golden Delicious	5m×5m	400	Square

Canopy management

Canopy management is the development and maintenance of tree structure in relation to the size and shape for maximum yield, productivity and quality.

Using dwarfing rootstocks

S.No.	Fruit Crops	Dwarf rootstocks
1.	Mango	Vellaikolamban for Alphonso and Olour for Himsagar and Langra
2.	Guava	Pusa Srijan & Psidium friedrichsthalianum
3.	Citrus	Troyer Citrange for Kinnow Mandarin & Flying Dragon
4.	Ber	Zizyphus nummularia
5.	Apple	M-9 & M-27
6.	Pear	Quince-C
7.	Cherry	Colt, Charger & Rubira
8.	Plum	Pixy
9.	Avocado	Mt-4

Training and Pruning

“Training is a new practice in which tree growth is directed into desired shape and form.” The main objective of training is shaping of young fruit trees. Commonly various types of training method is adopted under HDP, they are following:

- ✓ Spindle bush
- ✓ Dwarf pyramid
- ✓ Cordon
- ✓ Espalier
- ✓ Tatura Trellis

“Pruning is the removal of a portion of a tree to maintain or correct tree structure.” Heading back, Topping and Hedging methods of pruning are most commercialized on HDP. The main advantages of pruning are regulation of shape and growth of tree and enhance the production and quality of fruits.

Uses of PGRs

“PGRs are not nutrients but chemicals that in small amounts to promote and influence the growth, development and differentiation of cells and tissues.” Following type of PGRs are used under HDP program:

- ✓ Paclobutrazol
- ✓ ABA
- ✓ Ethylene
- ✓ CCC
- ✓ Daminozide

Meadow orcharding/Ultra High Density Planting

It is a modern method of fruit cultivation using small or dwarf tree with modified canopy. Meadow orchard system is originally from Israel. Meadow Orchard system originally developed by J.P. Hudson (1979) in apple crop. Sometimes it is also known as super high density planting.

Main objective

- ✓ Mechanization of all orchard activities.

UHDP in fruit crops

- ✓ Peach- planting distance is $5\text{m} \times 1\text{m} = 2000$ plants/ha, using tatura trellis system of training.
- ✓ Guava- planting distance is $2\text{m} \times 1\text{m} = 5000$ plants/ha. Tree size managed by regular topping and hedging.
- ✓ Even in apple you can accommodated almost 20000-100000 plants per ha by UHDP similarly in pineapple 63400 plants can be accommodated in 1 ha of land.

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