

## **High Density Planting in Apple**

The traditional systems of planting have long juvenile period, are labour intensive and low yielding with poor quality fruits. Whereas high density is easily manageable, has higher yield potential, with better quality fruits and higher returns/unit area. But it cannot be adopted in steep, unfertile, shallow & drought prone places.

There are 4 categories of high density planting which are:

- Low (less than 250 plants/ha)
- Moderate (250-500 plants/ha)
- High (500-1250 plants/ha)
- Ultra high density (more than 1250 plants/ha)

With the increase in planting density, the yield may increase, but beyond a threshold density, quality is deteriorated & may not be profitable in terms of economical returns. The trees should have maximum number of fruiting branches & minimum number of structural branches.

Tree size control: A key to successful high density planting depends upon control over tree size.

Following methods can be adopted:

- Use of size controlling rootstocks
- Use of spur type scions
- Training & pruning methods to induce dwarfing and spreading habits of tree
- Mechanical devices like branch bending to control size
- Use of chemicals
- But the most convenient method of tree size control is the use of size controlling clonal rootstocks.
- Principles of High Density Apple Production

- High early yields = high tree density
- Balance vegetative and fruiting
- Excessive vigor- Small yield, Larger fruit, Poor fruit color development
- Excessive Fruit Load- Large yields, Small apples, Weak trees Grow fruit, not trees!

With the advent of spur type cultivars and vigour controlling rootstocks, this system of planting is becoming popular especially in case of apple. High density orchards are precocious, easily manageable, has higher yield potential, with better quality fruits and higher returns/unit area. The high density planting cannot be adopted in very steep, unfertile, shallow and drought prone areas. The planting distance depends upon nature/vigour of the variety and the rootstock used.

### **High Density Planting System in mango**

Recently, mango orchards are being established at closer than conventional spacing in many parts of India. After 10-11 years,  $\frac{3}{4}$  of the canopy of trees in the high density orchard needs to be dehorned to prevent interlocking of branches. Under North Indian conditions, Dashehari was planted at a spacing of 3.0 x 2.5 m accommodating 1333 plants ha<sup>-1</sup> where the yield was 10-14 times higher than normal spacing. In the case of cv. Amrapali, a close spacing of 2.5 x 2.5 m is recommended under North Indian condition. Field experiments conducted at TNAU to study the different systems of planting in mango cv. Kalepad revealed that the double hedge row system of planting with a spacing of 10 m between double hedges, 5 m within double hedge and 5 m between plants in double hedge (200 plants ha<sup>-1</sup>) is the best planting system for obtaining maximum number of fruits and the highest yield per unit area. (Jasmine *et al.* 2009). However,

State Department has started recommending HDP with 5 x 5 m spacing for all commercial varieties. In South India, under tropical condition, the following spacings have been practiced.

### **Ultra High Density Planting System**

Recently, experiment conducted by TNAU in collaboration with Jain Irrigation Systems Ltd (JISL), Udumalpet revealed that we can go for still closer spacing of 3 x 2 m called Ultra High Density Planting System (UHDP). The varieties that can be grown successfully under UHDP in different states are shown in Table 2. As the Cultivation Practices are very intensive, high value varieties are recommended.

Under UHDP, Mango is planted at 3 m x 2 m which accommodates 674 plants acre-1 (Fig. 1). Pits should be marked at 3 m x 2 m before pit digging and pits of 1 x 1 x 1 m are to be dug at marked places.