BENEFITS

- ✓33% more plant population
- ✓44% reduction in labour cost
- ✓37.5% decrease in fertilizer cost
- ✓BCR=4.49:1

HDP FOR BANANA

- Spacing: 1.2X1.2 m (or) 2.1X2.1 m
- 3 Suckers per pit~ Pit size: 50X50X50 cm
- Pit spacing : 30-45 cm
- Cavendish: 1.8X3.6 m (4600 plants per ha)
- Nendran: 2X3 m (5000 plants per ha)
- Plant density: 4444 to 5555 plants per ha

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, ¾ of the canopy of trees in the high density orchard needs to be dehorned to present interlocking of branches. Under North Indian conditions, Dashehari was planted at a spacing of 3.0 x 2.5 m accommodating 1333 plants ha-1 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-1) 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 l x l x l m are to be dug at marked places.

High Density Planting in guava

Guava is an important fruit crop in tropical and subtropical regions of the country due to the hardy nature of its tree and prolific bearing even in marginal lands.Its cultivation requires little care and inputs. But, of late, this crop has exhibited a paradigm shift in the production system, from subsistence farming to commercial production. The traditional system of cultivation has often posed problems in attaining desired levels of productivity due to large tree canopy. Hence, a need arose to improve the existing production system, besides increasing its productivity. Currently, there is a worldwide trend to plant fruit trees at higher density or meadow orcharding to control tree size and maintain desired architecture for better light interception and ease in operations such as pruning, pest control and harvesting. The high density or meadow orcharding facilitates enhance production and quality offruits.

Variety

Allahabad Safeda

It is the most important variety of guava used for table as well as processing purposes. The tree is medium to tall in size, upright growth habit, heavy bearer, dense foliage and has a tendency to produce long shoots. Crown is broad and compact, often dome-shaped and rarely loose. Fruit is of medium size, round in shape with smooth skin and white flesh. The fruits are relatively soft with less seeds. Its keeping quality is good.

Sardar

Tree is vigorous, spreading and profuse bearer, heavy branching type with flat crown. Fruit is large, round to ovate in shape, primrose-yellow skin colour, white flesh and seeds are in plenty and harder than that of Allahabad Safeda.

Lalit

It is a high yielding pink fleshed guava variety released by Central Institute for Subtropical Horticulture, Lucknow for commercial cultivation in guava growing areas ofthe country. Fruits are of saffron yellow colour with red "blush weighing 185-200 g fruif1. Its flesh is firm and pink with a good blend of sugar and acid. It is suitable for both tabJe and processing purposes. The jelly made from this variety has better flavour and attractive appearance.

Shweta'

The variety recently developed by Central Institute for Subtropical Horticulture, Lucknow is suitable for commercial cultivation. Tree is semivigorous with medium height and is a prolific bearer. It is a variety with medium size globose fruits"creamy white skin with red spots or blush and snow-white flesh. Fruits are attractiveand have good nutritive value.

AllahabadSurkha

It is an outstanding variety oflarge uniform pink fruit with deep pink flesh. The plants produce up to 120 kg fruits in the sixth year of fruiting. Trees are vigorous, dome-shaped and compact. The fruit is sweet and strongly flavouredwith afew seeds.

Advantages of Dwarf Tree

- . Harvesting is easy and the cost of picking is reduced.
- . Theratio of fruiting shootsto supporting ones is higher.
- . Ease in sprayingof chemicals forpest and disease control.

- . Possible to plant moretrees per unit area leading to higher income.
- Concept of High Density and Meadow Orcharding

There is a shift in farmers' perception from production to productivity and profitability which can be achieved through high density planting. Recently, there is a trend to plant fruit trees at closer spacing leading to high density or meadow orchard. Higher and quality production is achieved from densely planted orchards through judicious canopy management and adoption of suitable tree training systems.) The Meadow Orchard is a modem method of fruit cultivation using S' . Ior dwarftree with modified canopy. Better light distribution within tree canopy increases the 1lumberof well illuminated leaves. It alsopromotes rate of photosynthesis that leads to high yield per unit area.Thissystem of guava planting is going to revolutionize the guava industry by enhancing productivity coupled with reduction in production costs. The meadow orchard system of guava accommodates 5000 plants ha-I,planted at 2.0 x 1.0m spacing and managed with regular topping and hedging, especially during initial stages.Toppingand hedging in guava arehelpful in controlling tree size and extending fruit availability.A comparison between meadow orchard system and the traditional system of fruit growing is necessary to evaluate the potentiality of this technique.