

Exercise

Planting of fruit crops.

Objectives

- To learn about planting of fruit crops.
- To know planting distance and operation during planting of fruit crops.
- To know about important steps in planting of fruit crops.

Delivery schedule: 02 periods

Student expectations/learning objectives

- To know about planting procedures of fruit crops.
- To know about planting distance and time of planting in fruit crops.

Handouts/material/equipment's & tools required: Practical note book, pen, and pencil to note down the important points on planting procedures, secateurs, gloves, spade etc.

Pre-learning required: Pre-requisite knowledge about cultivation of fruit crops.

Introduction

Orchard establishment is a long term investment and mistakes committed at initial stage of establishment have long effect on the productivity of the orchard and income from the orchard. Therefore, utmost care should be taken to select type of fruit crops, varieties suitable for the locality and planting of fruit trees. There are other operations before actual planting of fruit trees is started, which are no less important for survivability of the individual sapling as well as the whole orchard like, methods of digging the planting pits, season and direction of planting. It is important for the students to have knowledge about planting procedures of fruit trees like papaya, citrus and mango.

Principle

Soil preparation: The soil of the area destined for growing fruit trees needs thorough preparation. If the selected land is under regular cultivation, it is logical that less effort is required to prepare the soil. A virgin soil requires a deep ploughing and harrowing. Ploughing the land repeatedly with mould board plough followed by crosswise harrowing will bring the soil to a fine tilth and pulverize the weeds or other undesirable herbs under the soil. However, the deep subsoil having less fertility should not be disturbed or brought on the surface unnecessarily. The land if undulated should be leveled with an appreciable gradient for drainage of surplus water. In hilly areas, the leveling is done along the contour in various terraces.

Layout: The layout of the orchard is one of the important operations prior to establishment of the same. The layout is broadly aimed at i) to provide adequate space to the plants for proper growth and production without any crowdedness in future, ii) to avoid misuse of land space and to accommodate more number of plants per unit area for economic viability, iii) to help proper utilization of natural resources and inputs respectively by the plants and iv) to allow free movement of machinery for easy intercultural operations. There should be provision of paths, farmstead building, irrigation channels, fencing, wind breaks in fruit orchards. Some popular systems of planting in vogue are square, rectangular, triangular, diagonal, contour and hedgerow systems.

Time of planting: Season of planting of fruit trees is different. The deciduous fruit trees such as apple, pear, peach, apricot, plum etc. should be planted during their dormancy. It would be wise if, if the operation could be done well before the dormancy is over and the plant start growth afresh during the subsequent period. Most of the deciduous fruit trees go under dormancy during winter. In that case, the time of planting

season should be adjusted accordingly, so that minimum shock is experienced by the seedling. In contrast, most of the tropical and sub-tropical evergreen fruit trees are suitably transplanted in the rainy season when the atmospheric humidity is high and ample supply of soil moisture is obtained. The plants, during this period of their active growth, easily penetrate their roots in soil and get established. In case of easy availability of appreciable quality of irrigation water, then sapling of fruit trees may also be planted during the onset of spring.

Plant spacing: Proper spacing regulates the proper utilization of solar energy, avoid competition for uptake of nutrients caused by the collision of root system, facilitates irrigation, perfectly accommodates the leaf canopy of the individual tree and on the whole adds to the decency of the plantation area. Recommended tree spacing for some important fruit trees are mentioned in Table 1.

For teachers...

- Practically, show the students, how to layout a fruit orchard?
- Ask the students to note down the steps in planting of fruit trees.

Table 1. Recommended spacing for important fruit trees.

S. No.	Fruit crop	Spacing (m)
1	Apple on M9 rootstock	3 X 2
2	Apple on M26 rootstock	3 X 3
3	Apple on MM106 roostock	5 X 5
4	Mango	10 X 10
5	Amrapali mango under high density	2.5 X 2.5
6	Banana	2.3-3.0 X 2.3-3.0
7	Pineapple	0.45-0.60 X 0.30-0.45
8	Jack fruit	12 X 12
9	Guava, cashewnut, mulberry	6.8 X 6.8
10	Sapota, loquat, avocado	8.0 X 8.0
11	Mandarin, mosambi, lemon	7.0 X 7.0
12	Papaya	2.0 X 2.0

Important steps in planting of mango

Field Preparation And Layout

- Selected fields should be deeply ploughed followed by harrowing.
- Proper levelling of land and a gentle slope is provided in one direction.
- The soils which have drainage problems, should be provided with adequate trenching.
- After field preparation one should go for layout. The main systems of layout are (I) Square, (ii) Rectangular, (iii) Quincunx, (iv) Hexagonal and (v) Contour.

Digging and filling of pits

- Before digging the pits, two outer pegs are fixed with the help of planting board.
- Already fixed peg is kept in the central notch to mark the right point to plant each tree.
- During digging of actual pit, the central peg is removed and two outer pegs remain undisturbed. These outer pegs help in locating the point where the plant is to be put in.
- The pit dimension size would be 1m x 1m x 1m dimension.
- The soil from upper half is kept on one side and from lower half on other side.
- This soil is allowed to weather for 2-4 weeks during summer months so that any type of infection in soil may be destroyed by sunlight.
- Before filling the pit, a mixture of well-decomposed FYM (40-50 kg), superphosphate (100 g), murate of potash (100 g) and fipronil dust (50 g) is prepared and mixed with upper as well as lower soil of the pit.
- The mixture of upper soil is filled first followed by lower soil mixture.
- During filling of pits soil is pressed well so that there is no air pocket inside the pit. The upper level of pit is kept 15 cm above from the field level.
- After filling, the pits are irrigated to settle down the soil of the pit.
- The purpose of digging and filling the pit is to provide congenial conditions for plant growth and development, specially to young plants.

Time of planting

- Mango planting is done during rainy season (July to August) and spring season (February to March) in North India.
- The planting is done in evening when the high humidity prevails in the atmosphere, while planting, one should be careful that the earth ball does not break during pressing the soil and the graft union remains well above the ground level. The plants should be irrigated just after planting. During first week of planting one should rectify the defects like sinking of soil and leveling of plants etc.

Selection of grafts for planting

- Mango grafts of desired cultivar should be procured from genuine sources. Normally, healthy grafts with smooth union give good performance in the field. Six-month to one year old grafts having upright scion growth with 3-4 scion branches are desirable for planting. Only those grafts should be procured which have been already shifted in the nursery bed to avoid the mortality in the field.

Planting of grafts

- At the time of planting, a slightly bigger hole than the size of earth ball is dug at the marked point. The wrapping material is removed from the ball and unrapped earth ball is put in the hole in such a manner that the plant remains straight and collar portion of plant is kept in the level or slightly higher than the ground level.
- After placing the plant in the hole, the soil taken out from hole previously is pressed firmly around it so that the plant is set firmly in the field. During pressing of soil, the earth ball should not be broken.
- Immediately after planting irrigation is done, the frequency of irrigation depends on the weather. Sufficient moisture should be maintained till the plants do not set or start new growth in the field.
- Regular checking of plants is essential to detect the faults like sinking of soil, tilting of plant and cracks in basin of plant after planting the grafts.

Important steps in planting of papaya

Season of planting

- Papaya can be planted year round.
- The time of planting papaya depends on several factors like climatic conditions of the place availability of irrigation facilities and consumer demands in the area.
- The best time to plant papaya in most parts of India is the beginning of the South-West monsoon in the light rainfall areas and after monsoon in the heavy rainfall areas.

Size of seedlings for transplanting

- Young seedlings are best transplanted because they tend to produce a better root system and do better after field planting.
- Under normal growing conditions, in about two months' time seedlings reach to a height of 15-25 cm. Such seedlings establish successfully.
- Provide shade to the newly transplanted seedlings which can cut sun-light by 50%. This protects the seedlings from wilting before they are established.

Planting

- For papaya cultivation select a plot having good drainage and well protected from high winds. Before planting, clear off all the vegetation in the land and level the surface.
- Dig the pits of 45 x 45 x 45 cm³ at a spacing of 2.0 m X 2.0 m which can accommodate 2500 plants/hectare. Plant at 1.25 x 1.25 m, if dwarf varieties are available.
- Allow weathering for one or two weeks and then fill with top soil mix with farmyard manure or compost at the rate of 20-25 kg/pit.
- Make a small hole with a hand trowel of 15-23 cm diameter to receive the seedlings.
- As a precautionary measure, after filling the pits with pit mixture, water well in order to allow the soil to settle thoroughly before transplanting.

Sowing of seeds

- The most common method of propagation of papaya is from seed. Seeds germinate readily in 10 to 15 days and uniformly. Raise papaya using only good quality seed of desired variety.

Raising of papaya seedlings

- Different methods of raising seedlings are practiced viz., in the nursery beds, in germination trays or seed flats.
- Use polythene bags of 150 gauge for raising papaya seedlings which have been found quite satisfactory.
- Sow 250 g of seeds in the polybags to plant one hectare at a spacing of 2.0 metres either.



- In case of pot or bag sowing method, sow only 2-3 seeds per pot to compensate for poor germination and removal of male plants at the time of flowering.

- Prepare the nursery about two months prior to the scheduled date of planting. This will allow enough time for the seedlings to be ready for transplanting with a height of about 15-25 cm.
- Sow the seeds in raised beds whose surface is well pulverized and heavily manured with farmyard manure, 1-2 cm deep and 2-3 cm apart within rows spaced at 15 cm. Water the seed beds daily with a rosecan. Avoid waterlogging situations as this leads to a fungal disease called "damping off" which kills the seedlings.



Students Activities

1. Prepare a list of activities during planting of other fruit trees in your locality.
2. Visit nearby places where fruit tree planting is scheduled during rainy season and winter season in case of deciduous fruit trees, and practically carry out planting of fruit saplings.
3. Dig pits of desired size in your school farm and carry out all operations till planting of mango, papaya and citrus.

Study Material

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