Rai Technology University

ENGINEERING MINDS

Layout systems in Orchard Planting

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Study of Layout systems in Orchard Planting

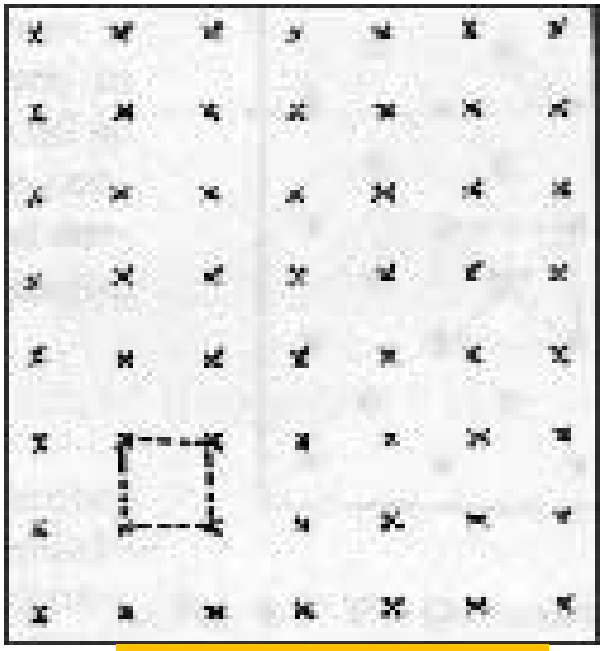
The plan showing the arrangement of plants in an orchard is known as the “orchard layout”.

There are several systems of planting, among them following are the important ones-

A. **Square System**
B. **Rectangular System**
C. **Quincunx System**
D. **Hexagonal System or Triangular**
E. **Contour System or strip cropping**

A. Square System

- It is most easy and popular method of planting fruit plant. In this system row to row and plant to plant distances are kept similar. The plants are planted exactly at right angle at each corner. Thus, every four plats make one square. Intercultural operations can be done in both directions as the distances between trees and rows are similar (5 X 5 m).
- e.g. Mango, Banana and citrus crops.
- Adequate space is there to go for inter-cultivation of remunerative crops like vegetables
- Trees are planted equidistant from each other, at the recommended spacing for mature trees
- The distance from plant to plant and row to row remains the same
- The four adjacent plants of two rows form a square



Square planting

Advantages

1.Irrigation channels and paths can be made straight.

2.Operations like ploughing, harrowing, cultivation, spraying and harvesting becomes easy.

3.Better supervision of the orchard is possible as one gets a view of the orchard from one end to the other.

Disadvantages

1.Comparatively less number of trees are accommodated in given area.

2. A lot of space in the centre of each square is wasted i.e, certain amount of space in the middle of four trees is wasted.

Lay out procedures for different systems

The following are the basic procedures for laying out various systems of orchid.

1. Square system

a) Establish a base line/row.

b) Mark position of trees on this line using the wooden stakes leaving half of plat to plant distance (actual or adjusted) on both sides of the base lines.

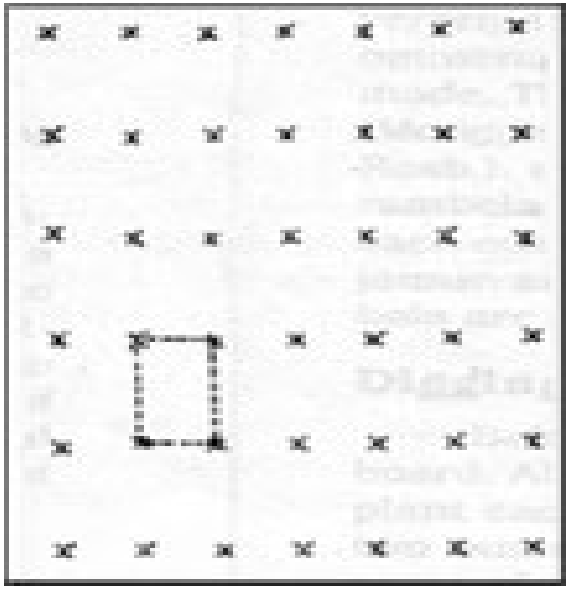
c) Using right angle shaft, extend lines perpendicular to the base line from every position of the trees marked.

d) stakes are fixed on these lines at plant to plant distance

These are the basic procedures for laying out a square system. One can introduce a number of modifications in the procedure and in the tools to increase the efficiency.

B. Rectangular System

- This system is similar to that of the square in its layout except for the difference that the spacing between the rows and between the plants in a row are not equal.
- Thus, rectangular system accommodates more plants in rows.
- Inter-cultural operations can be carried out through both ways.
- The plants get proper space and sunlight for their grow th and development.
- E.g Grape (3 X 2 m)



Rectangular planting

Advantages

1.Intercultural operations can be carried out easily.
2.Irrigation channel can be made length and breadth wise
3.Light can penetrate into the orchard through the large inter spaces between rows.
4.Better supervision is possible.
5.Intercropping is possible.

Disadvantages

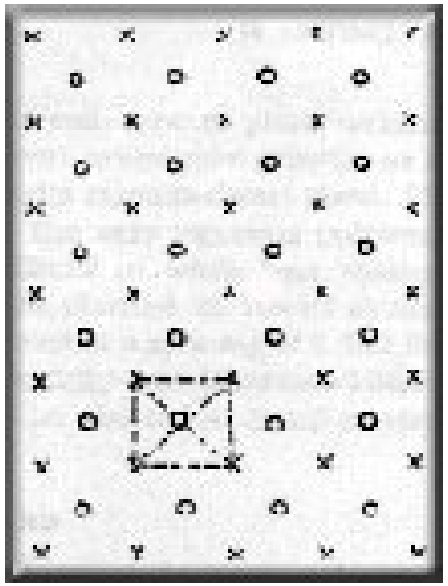
1.A large area of the orchard between rows is wasted if intercropping is not practiced.
2.Less number of trees are planted.

Lay out procedures

The procedure is the same as for the square system. The row to row distance is more than the plant to plant distance and the row to row distance forms the length of the rectangle.

C. Quincunx system/Diamond pattern

- This system is also known as filler or diagonal system.
- This is a modification over Square system of layout.
- To make use of the empty space in the center of each square by planting another plant.
- The plants that are planted in the centre of each square along with tall growing plants at the corners of squares are termed as "***filler*** " plants.
- Generally, filler trees will be of short duration and not be of the same kind as those planted on the corners of the square.
- When main plants of the orchard resume their proper shape, the filler plants are uprooted.
- Guava, Peaches, Papaya etc. are important filler plants.
- In this layout population becomes double than square system of mango+ papaya, mango+ fig.



Quincunx planting

Advantages

1.Additonal income can be earned from the filler crop till the main crop comes into bearing.

2.Copared to square to square and rectangular systems, almost double the number of trees can be planted initially.

3.maximum utilization of the land is possible. Approximately 10% more plants than the square method

Disadvantages

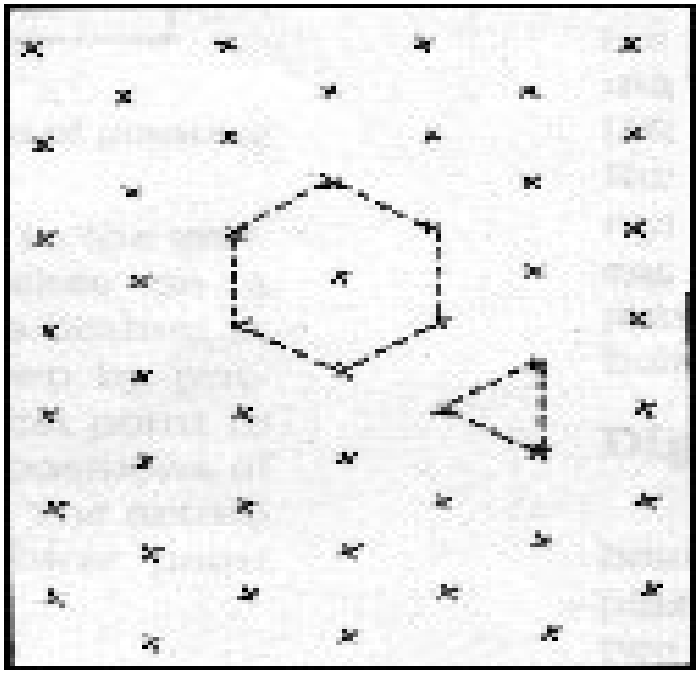
1.Skill is required to layout the orchard.
2.Inter/filler crop can interfere with the growth of the main crop.
3.Intercultural operations become difficult.
4.Spacing of the main crop0 is reduced if the filler crop is allowed to continue after the growth of the main crop.

Layout procedures

Follow the procedure for the layout of a square system. In addition to this mark with Stakes at the centers of each square for the filler plants by drawing the diagonals.

D. Hexagonal / Triangular System

- This system accommodates 15% more plants tha n square system.
- The plants are planted at the corner of equilateral triangle. Thus, six trees are planted making a hexagon.
- Seventh tree is planted in the centre. This is very intense method of planting and hence requires fertile land. In the suburb of cities where land is costly, this system is worth adoption. However, the laying out of system is hard and cumbersome.



Hexagonal planting

Advantages

1.Compared to square system 15% more trees can be planted.
2.It is an ideal system for the fertile and well irrigated land.
3.Plant to plant distance can be maintained the same.
4.More income can be obtained.

Disadvantages

1.Intercultural operations become difficult.

2.Skill is required to layout the orchard.

Layout procedures

- Establish a base line on one side of the field as in the square system.
- Mark the position of trees on the base line at the desired distance and fix the Stakes. Make equilateral triangles on the base line maintaining the sides of the triangles equal to plant to plant distance.
- Mark all the triangles with stakes and join them into a line to form the second line of trees. Similarly, make equilateral triangles on the second line and cover the whole land.

E. Contour system

- It is adopted in hilly areas for planting fruit plants where land is undulated and soil erosion is a great threat.
- The layout is started from the lowest level and the tree rows are planted along a uniform slopes at right angle to the slope with a view to reduce loss of top-soil due to erosion.
- The width of contour terrace varies according to the slope of the hill.

Advantages

1.This system can be adopted in hilly regions, can control the soil erosion and helps simultaneously in the conservation of water.
2.Preservation of plant nutrients which are supplied as manures and fertilizers.

Disadvantages

1.Laying out of contour lines is difficult and time consuming.
2.Special skill is required to layout this system.
3.Special instruments are required for making contour lines.
4.The row to row distance will not be equal and adjustments may be required in the plant to plat distance.
5.Rows are broken in to bits and pieces.

Layout planning:

Contour system is a little more complicated than any other system of layout since planting has to be done on slopes. For the procedure mark contours at a distance equal to row to row distance on each contour lines. The contours may be of full length or less than full length depending on variations in the degree of slope.


THANK YOU