Selection of Site, Fencing and Wind Breaks
Site

• Refers to
  – topography,
  – elevation,
  – nearness to the source of water and
  – such other factors,

which have something to do with the life of the tree
to be planted.
Location

• Geographical position of place, where an orchard is to be located.

• Generally in relation to a city, town, road, or some other convenient point of distinction.

• Does not influence the behaviour of the trees in any way but has certain other economic advantages.
Selection of location depends on:

1. Climate of the region
   - Temp., Humidity, rainfall, wind, hail etc.
2. Distance from fruit market
3. Transportation facilities
4. Co-operative societies
Why selection of site and location is important?

- Most of the fruits are perishable - their quick transport to the consumers' market should be near a market selected location should be connected by a good road or rail.

- Adequate irrigation facilities should be connected by a good road or rail.

  the cost of production is likely to go up.
• Availability of cheap labour to keep down the production cost.
• Select a site close to established, successful and healthy orchards for co-operative marketing of the produce.
• For effective supervision of the orchard, owner should have his home on or near his orchard.
Hence, while selecting site and location for orchard establishment,

- proper emphasis should be given to factors like
  
  - climate,
  
  - soil,
  
  - market and
  
  - transport facilities,
  
  - availability of trained labour,
  
  - other inputs like fertilizers, insecticides, pesticides, etc.
While establishing an orchard - two alternatives.

– choose the locality and site of his orchard to suit the fruits he wishes to grow

or

– choose the type and variability of fruits suited for his land.
Factors to keep in mind when selecting a site for an orchard

• Elevation :-
• Gently sloping
• Well drained
• Without low spots or frost pockets

– The ideal site is on rolling or elevated land so that cold air can drain during spring frosts
– A gentle slope is most desirable.
Slope gradient

• While uphill or rolling land is the most desirable, the degree of slope can also limit its suitability.
• The ideal site has a 4 to 8 percent slope.
• It may be difficult to operate machinery on slopes of more than 10 percent.
• Steep slopes make orchard activities more difficult and are susceptible to soil erosion.
Slope exposure

- It is considered for its effect on fruit trees as they come out of dormancy.

- A southern facing slope warms up faster
  - crops get earlier start
  - flower earlier
  - late spring frost may damage

* Northern facing slope warms up slower - tend to result in delayed bud development in the spring.

* Eastern-facing slopes are intermediate.

- Wind exposed slopes can cause spraying problems during the growing season.
Site A is a warm location that receives more sun, not affected by late spring frosts.
Site B misses late spring frosts, but the top may be too cold in winter.
Site C is similar to site A but colder, warming up later in the spring.
• Site **D** is the most susceptible to spring frosts because cold air drains into it from elevated areas.

• Site **E** can still be frosty, but the trees act as a windbreak, sheltering this site from prevailing winds.

• Site **F** is not desirable because of the dense trees at the base of the hill, which can trap cold air and prevent it from draining to lower-lying areas.

• Site **G** is similar to site **B**.
Windy sites should be avoided because

- Strong winds can reduce the growth rate of trees,
- increase fruit bruising and fruit drop at harvest,
- reduce bee activity during pollination and make effective spraying more difficult.
- Windbreaks can help but excessive snow build up, increased shading and slower drying in the orchard resulting in an increase in fruit and leaf diseases
• Topography :-
  – Fruit plants can be grown profitably on less expensive steep land which is not adapted to other intensive agriculture crops.
  – However, an orchard on a steep land will require more labour to produce a crop than would be required on more level sites.
  – Also the problem of controlling soil erosion may be much more difficult.
  – With the increase in cost of labour, the cost of production also increases
  – hence more level the soil , lesser will be the cost of production.
HEDGES AND FENCES

• To protect the orchards against cattle, wild animals, monkeys or trespassers advisable to raise an effective hedge or a fence around the orchard, preferably before planting the fruit trees.
Temporary fences

- Made of bush and thorns, not satisfactory - they need constant repair and replacements.

- Mud walls around the orchard are also quite effective against cattle and trespassers but heavy rains may greatly reduce their life.
A strong-woven wire fence, with two or three layers of barbed-wire at the top, is used to protect the orchards.

- Such fences are very effective against wild animals and trespassers.
- Their life is quite long and they do not need large repairs or replacements.
- Their initial cost is very high.
• Hedges are less expensive and most effective provided properly trimmed and maintained.
  – not only provide beauty to the orchard but also protect it against wild animals.

• Only strong and thorny hedges desirable.

• Those which are not strong or thorny do not afford adequate protection and should not, therefore, be preferred.
• The best protection is:
  – a combination of wire fence and a hedge (fence towards the outside).
  – In case, only a hedge is used, gaps are likely to occur due to death or destruction of some hedge plants through which cattle, or trespassers can enter.
Useful Hedges
Characteristics of a good fence plant

- Drought resistant
- Easy to raise from seed
- Quick growing
- Should have dense foliage
- Should stand severe pruning
- Should be preferably thorny
1. *Inga dulcis*

2. *Parkinsonia aculeata*

3. *Prosopis juliflora*

4. *Carissa carandas*

5. *Casuarina equisetifolia*
• 6. Zizyphus sp.
   
   i) Z. Jujuba

   (ii) Z. mauritiana

   (iii) Z. nummularia

7. Duranta plumeri

8. Cactus and some Agave Sp,

9. Sesbania egyptiaca
10. *Acacia modesta*

*Acacia longifolia, A. latronum, A. pennata, A. concinnao, A. tortuosa, A. arabica* and *A. farnesian.*
II. *Commiphora berryi*

12. *Ipomea carnea.*

13. *Punica granatum*

14. *Thevetia nerifolia*
• The windbreaks –
  – rows of tall trees planted close together around the orchard,
    • towards the direction of the wind or
    • at intervals in the orchard,
  – in order to give effective protection to the fruit trees and the crop that they bear, against strong windstorms.
• Exposure to strong winds –
  – detrimental -results in considerable loss of fruit,
  – decreased yield and grade and increased decay of the fruit.
• Often strong windstorms cause
  – the breakage of limbs, which devitalize the trees,
  – thus reducing their capacity to set a new crop.
• Exposes the limbs and the fruit to sunburn and frost injuries.
• Hot winds also desiccate leaves without blowing them from the tree.
Advantages

• very effective in reducing the wind velocity and
• minimizing the damage to fruit trees and the crop.
• have a moderating effect on extremes of temperatures
Disadvantages

- Occupy land
- Cause shading
- Interfere with the orchard operations.
- Their roots compete for moisture and nutrients
- Areas where frost is of common occurrence:
  - In this area, freezing or frost damage
  - Use somewhat open type of windbreak trees in these areas.
Characteristics of wind break

- fast growing
- easily establishable
- able to acclimatize to the environment
- dense canopy
- should not harbour pests and diseases
- frost resistant
- drought resistant
- can be propagated by various methods
- Planting material should be easily available and cheap
- multipurpose uses like fuel wood, fodder etc.
- with stand periodical pruning.
Characteristics of windbreaks

• Height is more important than thickness but
  – a tree with a dense head is more effective than one of the same height with few branches.
• Maximum effectiveness - about 4 times of its height but over twice that distance.
• Should be planted at intervals in the orchard as well as along the windward side.
• For high velocity winds - windbreaks after about 90 m.
• Most effective windbreak - double row of tall trees alternately placed.
• In areas, where hot winds blow - windbreak should be on the western border of the orchard.
• should be planted at the same time or preferably a couple of years before the orchard is planted.
Spacing

• Keep much space between the windbreaks and the first row of the fruit trees
• To prevent competition between trees
  – a trench may be dug about 90 cm. deep,
  – at a distance of not more than 3 m. from the windbreak and
  – all the roots coming into this trench pruned off.
  – This trench is filled in after the root-pruning.
  – This process is repeated after every 3 to 4 years.
Planting Distance

• If a single row of trees of one variety:
  – 1.5 m to 2 m apart.

• If a tall-growing type interplanted with a shorter but dense type
  – planted as alternate trees.

• In case double row of trees:
  – distance between rows is kept from 1.5 m to 2 m with the trees in the first row opposite to the space in the second row.
## Important Windbreak Trees

1. **Shisham** *Dalbergia sissoo*
2. **Mulberry or shahtoot** *Morus sp.*
3. **Mango (seedlings)** *Mangifera indica*
4. **Jaman (cultivated)** *Syzygium cuminii*
5. **Jaman (wild)** *Syzygium fruticosum*
6. **Jujube (Chinese)** *Zizyphus jujuba*
7. **Jujube (Indian)** *Zizyphus mauritiana*
8. **Eucalyptus (Blue gum)** *Eucalyptus globulus*
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