EXPERIMENT 4 PREPARATION OF CUTTINGS AND GRAFTING

Structure

4.1 INTRODUCTION

Mulberry is mostly propagated either through planting cuttings in most of the regions in India and by root grafts in Kashmir. The propagation through cuttings is easy, less time consuming and less expensive. Also, the characters of the parent mulberry variety are retained in the young saplings if propagated through stem cuttings. Multiplication of mulberry is an essential aspect in raising mulberry garden. Some of the mulberry varieties cannot be propagated by cuttings and therefore, are raised through grafts. However, this method is time consuming, expensive and needs skilled labour. In this method, mulberry variety which is to be propagated is used as a scion and a well adapted variety in a particular region is used as stock.

Objectives

After studying and performing this experiment, you should be able to:

- select and determine the best method of mulberry propagation; and
- multiply mulberry by the best selected method.

4.2 EXPERIMENT

4.2.1 Principle

During the process of propagation through cuttings, vegetative cells differentiate and develop into roots and shoots. In grafting, union of stock and scion takes places by multiplication of cells at the place of union and the two get fused and grow as an individual plant.

4.2.2 Requirements

- Secateur/Pruning saw
- Bill hook/cutting machine
- Gunny cloth
- Mulberry garden meant for supply of shoots of improved variety for raising saplings (Seed garden)

- Grafting cum budding knife
- Stock of mulberry raised through seed/seedlings.
- Scion of improved mulberry variety which is to be multiplied.

4.2.3 Procedure

a) Cuttings

- Harvest the shoots (well grown for 6-8 months) from a mulberry garden (seed garden) with a secateur / pruning saw.
- Cover the shoots with wet gunny cloth.
- Avoid thin upper portion and thick lower portion of the shoots.
- After selecting the shoots, prepare the cuttings by a secateur / bill hook without damaging the bark.
- Cuttings can also be prepared with the help of cutting machine.
- Prepare cuttings of 12-15 cm length and 10-15 mm diameter with 3-4 active buds.

b) Grafts

- Give a slanting cut to the stem which is to be used as scion.
- Take a seedling and prepare the stock out of it.
- Scion should be of lesser diameter than the stock to facilitate union of the two.
- The stock can be prepared by giving a slanting cut out of the roots of the seedling. The stock is mostly prepared from a well adapted variety to the local conditions.
- Insert the scion into stock carefully in between the bark and woody portion of the stem.
- Ensure that a minimum gap is left while inserting a scion into a stock.
- Bandage the portion of the newly prepared graft at the place of union of stock and scion.
- Plant the graft in the well prepared nursery bed.
- Irrigate the nursery immediately and as and when required.
- Uproot the grafts same as of saplings raised through stem cuttings.

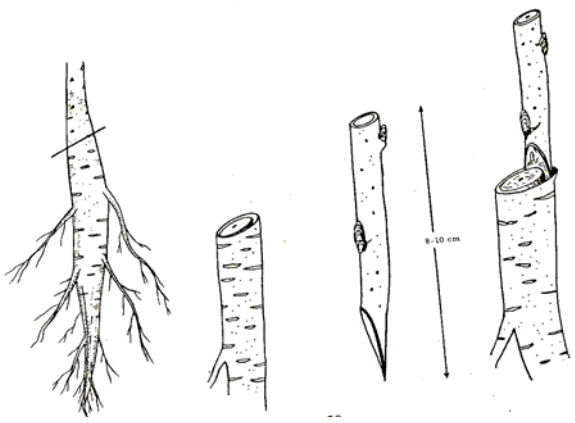

Fig.4.1: Root grafting technique

4.2.4 Observations

(i) Plant 10 cuttings each with one, two, three, four and five buds and record the final survivability.

No. of Buds	No. of Cuttings Planted	Survival %
1	10	
2	10	
3	10	
4	10	
5	10	

(ii) Plant ten cuttings each from upper, middle and lower portions of shoot. Find out the difference in their survivability.

Cuttings	No. of Cuttings Planted	Survival %
Upper	10	
Middle	10	
Lower	10	

(iii) Plant ten cuttings each with a slanting cut and a blunt cut. Find out the difference in their survivability.

Cuttings	No. of Cuttings Planted	Survival %
Slanting cut	10	
Blunt cut	10	

(iv) Plant ten cuttings each in a nursery bed with inverted position and with basal portion planted in soil and observe for their survivability.

Sl. No.	Position of Cuttings While Planting	No. of Cuttings Planted	Survival %
1	Inverted position	10	
2	With basal position planted in soil	10	

(v) Prepare a graft leaving more space and less space between stock and scion at the place of union.

Sl. No.	Method of Preparation of Grafts	No. of Grafts Planted	Survival %
1	More space at the place of union of stock and scion	10	
2	Less space at the place of union of stock and scion	10	

4.2.5 Calculations

$$\text{Survival (\%)} = \frac{\text{No. of saplings}}{\text{Total No. of cuttings planted}} \times 100$$

4.2.6 Results

This experiment will allow you to learn the way one has to take up nursery plantation, best method of mulberry propagation and the quality of cuttings required for getting maximum survivability in the nursery by using cuttings or grafts.

Survival (%) = _____%

4.3 PRECAUTIONS

- Give a sharp cut while preparing cuttings.
- While planting cuttings, keep one bud exposed.
- Press the soil after planting cuttings.
- While preparing grafts, ensure that scion is inserted into stock without leaving much gap.