
EXPERIMENT 2 RAISING OF NURSERY

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2.1 INTRODUCTION

Nursery is prepared to raise saplings / seedlings as a pre-requisite for establishment of a mulberry garden. Recall what you have learnt in Block 1; Unit 1. You have already learnt that nursery operations are specific and needs lot of care. A well-prepared nursery can help in production of good saplings through stem cuttings or raising of seedlings through sowing of seeds. Nursery raised in rich soils can help in better growth of the saplings / seedlings.

Objective

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

- grow mulberry saplings/seedlings with well-developed root system using cuttings/seeds.

2.2 EXPERIMENT

2.2.1 Principle

Stem cuttings / seeds have specific requirements for developing into saplings / seedlings. The advantage of raising saplings / seedlings in a nursery is that it is possible to develop rooted plants for taking up new plantation and also to raise grafts. More attention is required to grow saplings / seedlings in a nursery to get better survival and growth.

2.2.2 Requirements (Machinery/Instrument and Chemical/ Material)

- Bill hook / secateur / garden implements / Measuring tape
- Sand
- Well decomposed Farm Yard Manure (FYM)
- Rope
- Bavistin
- DDVP
- Gunny cloth

2.2.3 Procedure

- Select a land which is flat and near to the source of irrigation.
 - Dig the land to a depth of 30 cm thoroughly and remove the weeds/ stone pebbles/old roots etc.
 - Prepare raised beds of dimension 3 m (Length) x 1 m (Width) x 10 cm (Height) or any convenient size (Fig. 2.1).
 - Apply about 20 kg sand and 10 kg FYM per bed and mix them with the soil thoroughly.
 - Prepare irrigation channels with a spade.
 - Irrigate the nursery beds to facilitate the germination of seeds and weeds in the beds.
 - Dig the beds lightly and remove weeds.
 - Level the nursery beds with a piece of wood and make them ready for planting.
- a) **For Raising Saplings in the Nursery Beds**
- Prepare cuttings selected from 6 to 8 months old shoots free from disease and pests.
 - Cuttings should be prepared with the help of a sharp bill hook / secateur without damaging the bark or buds.
 - Treat the cuttings in 1% Dithane M- 45 solution for about 30 minutes to avoid fungal diseases.
 - Mark the nursery bed with thin ropes at row to row distance of 20 cm (Fig. 2.1).
 - Plant the cuttings on each row marked by the ropes at a distance of 10 cm.
 - Plant the cuttings straight exposing only one bud above the soil.
- b) **For Raising Seedlings in the Nursery Beds**
- In case seedlings are to be raised by sowing seeds, a line of 1 cm deep is drawn at 20 cm apart in the nursery bed and seeds are sown in the line at 3 cm spacing.
 - Seeds can also be broadcasted in the nursery and covered with a thin layer of soil and sand mixture and later on thinning operation can be done to reduce the plant density.



Fig.2.1: Preparation of Nursery Beds Fig.2.2: Uniform & healthy saplings raised in nursery

c) Maintenance

- Irrigate the nursery beds immediately after planting the cutting or sowing the seeds and subsequently as and when required.
- Remove weeds from the nursery beds 30-45 days after planting of cuttings or sowing of seeds without disturbing the cuttings/ seedlings.

- Apply Urea as booster dose after 35-45 days of planting at the rate of 10 grams/sq. m after weeding and mix properly with the soil.
- Spray 0.1% Bavistin solution for controlling fungal diseases in the nursery.
- Spray 0.2 % DDVP for controlling the pests.
- Maintain the saplings by removing the weak shoots using secateur and keep only one shoot.
- The saplings shall be ready for transplanting after a period of 4 months under South Indian conditions and after one year in North Indian conditions (Fig.2.2).
- Uproot the saplings carefully without damaging saplings. Irrigate the nursery before uprooting the saplings.
- Plant the saplings immediately in field after uprooting.
- If not planted immediately, keep uprooted saplings under shade and cover them with wet gunny cloth.

2.2.4 Observations

Select 10 cuttings and record the observations on sprouting after planting them in nursery.

Cutting No.	Sprouting % After				Height (cm) of the Saplings After			
	30 days	60 days	90 days	120 days	30 days	60 days	90 days	120 days
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

Select ten saplings at the time of transplanting and record the following observations:

Sapling No.	No. of Primary Roots	Length of the Primary Roots (cm)	Wt. of Roots (g)	Wt. of Shoots (g)	Root-shoot Ratio by Weight (Root wt. /shoot wt.)
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

2.2.5 Calculations

Count the number of cuttings planted and saplings available. Calculate the percentage of survivability as under:

$$\text{Survivability} = \frac{\text{No. of cuttings planted}}{\text{Total No. of saplings available}} \times 100$$

2.2.6 Results

This experiment will allow you to know the number of cuttings that have survived from the total number of cuttings used to get saplings. It will also allow you to know the number of well developed saplings produced out of cuttings which will finally allow you to calculate the extent of area you can take up for new mulberry plantation.

$$\text{Survivability \%} = \underline{\hspace{10em}} \%$$

2.3 PRECAUTIONS

- Prepare the nursery with assured irrigation or in rainy season.
- Avoid using nitrogenous fertilizers at the time of planting of cuttings.
- Do not disturb the cuttings while removing weeds.
- While uprooting of saplings, ensure that the roots are not damaged.
- Cover the saplings under wet gunny cloth. Avoid driage since dried saplings once planted, can fail to survive after transplanting. This can leave gaps in plantation which will have to be filled up by putting in extra labour afterwards.