

DESIGN, CONSTRUCTION & MANAGEMENT OF A TREE NURSERY

PHASE I: LOCATION AND DESIGN OF A TREE NURSERY

What are the requirements of a tree nursery?

- Site identification – near community
- Seeds
- Fencing
- Water Source
- Manure
- Shed
- Nursery tools
- Human resources
- Insecticides

Site Location of the Nursery

- There must be enough water available nearby throughout the year.
- The soil must be reasonably fertile, rich, deep and well drained.
- The terrain should be such that the ground is fairly flat with a gentle slope of 1-2% so that water runs off.
- A partial shelter (shade) is needed to protect plants from wind and sun or to prevent overheating.
- A live or dead fence is needed around the perimeter to keep out animals/ people.

How should a nursery be designed?

- Partition according to species
- Plan the nursery according to area available and what kind of beds, containers you will use
- Tires as nursery beds
- Hanging troughs
- Beds are planted east to west to get full sun
- Good drainage system
- Placed in a central area in the community
- Easy movement within the nursery
- Type of soil in the nursery
- Fencing

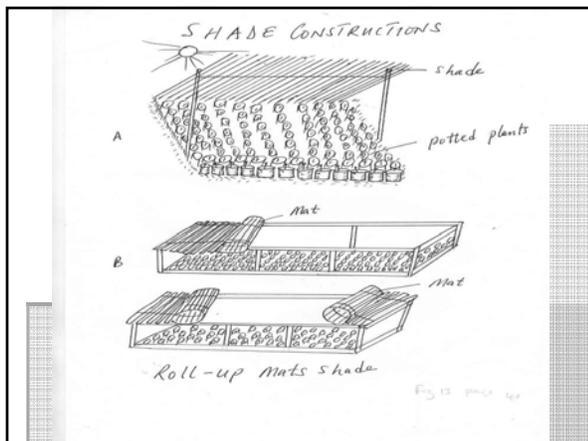
Design of a Nursery

- Make nursery beds to raise seedlings and include compost.
- Beds need to be about 1m wide but can vary in length from 1 to 5m.
- Beds should be constructed in an east-west orientation to ensure that plants are evenly exposed to sunlight.
- Size and shape of bed must enable easy watering and weeding. Channels should be dug around them to allow drainage.



Shade Construction

- This is built to prevent seedlings from drying out in the first few weeks in the nursery.
- The shade must be built to allow the penetration of sunlight and rain to reach the seedlings.
- Structures consist of poles with a grass mat covering or palm fronds.



PHASE II: SEED BED PREPARATION

Types of Seedbeds

- Raised beds: used in areas with high rainfall and poor drainage.
- Sunken beds: used in dry areas to prevent drying out.
- Cutting beds: Cuttings root best in a soil mixture of sand and well decayed compost (ratio of 2:1 or 1:1). If necessary spreading out compost to dry in the sun, preferably under black plastic.
- Pot beds: Make sure the bottom of the bed is flat and even. Build a frame round the beds to keep pots upright (from stones, bamboo, poles, wood, rope, etc).

Seedbed Construction

- The top layer of the seedbed should consist of fine textured, fertile soil since this is the layer in which the young trees will root. Use sieved fertile soil or a mixture of soil and sand (1:1)
- Trample the beds down so that they are well consolidated
- Seedbeds require that the soil be reasonably fertile, light and free of lime as most seeds germinate best in a slightly acidic soil.

PHASE III: SOWING THE NURSERY

Aspects of Sowing to Consider

- Density (spacing): depends on plant type, size of seeds and survival chances.
- Depth: usually twice the diameter of the seed.
- Covering: to prevent seed from being blown away.

Sowing Methods

- Row-seeding: the best way to sow agroforestry seeds in a seedbed.
- Board-sowing: where a board is used to make holes the correct distance apart in the correct pattern both for large and small seeds.
- Broadcast-sowing: when very small seeds are thrown over a field that has been weeded. They may sometimes be transferred to pots later e.g. *Crotalaria sp*
- Pit-sowing: planting each seed separately - this is suitable for large seeds like fruit seeds.

PHASE IV: NURSERY MAINTANENCE

- Maintenance**
- Check drainage channels, paths and terraces regularly for damage or wear.
 - Carry out any repairs immediately, especially during the rainy season or if the nursery is built on a slope.
 - Check fences regularly for holes.
 - Regularly thin the seedlings to allow for equal growth.
 - After planting out, replace the soil in the beds or pots to prevent spread of disease and pests.

PHASE V: TRANSPLANTING

How is the transplant done

- Prepare planting site
- Remove plants with soil
- Done in morning or evening or cold periods
- Seedling size (at least six leaves)
- Reduce # leaves and/or roots to reduce transpiration
- Top tap roots if they are too long with a scissor, knife, blade that are disease free
- Water profusely before transplanting

The following points are important when transplanting:

- Seedling size: most seedlings are large enough for transplant about 3 months after germination.
- Drying out: Only transfer a few seedlings at a time and work in a shade or shelter out of wind.
- The time of day: Transplant is best done late in the afternoon or early mornings to reduce the danger of drying out.

Selection of Seedlings to Transplant

- Remove sick and damaged seedlings
- Remove seedlings too small or have weak root development
- Plants between 25 and 40cm in length with a woody root collar have a better chance of survival than smaller plants

Care of Seedlings

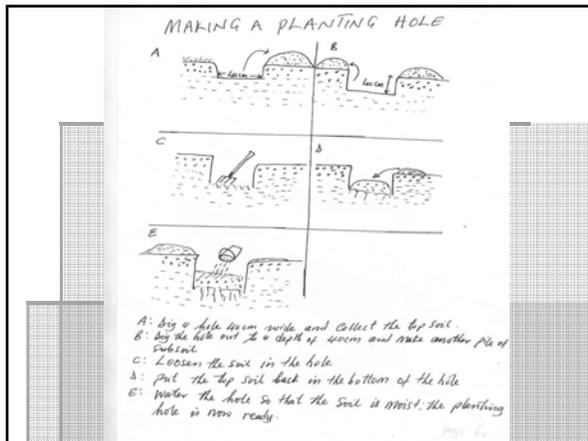
- Prune the roots of the seedlings before transplanting to encourage growth of secondary roots.
- Remove leaves on shoots to encourage even growth.
- Water regularly for the first week and thoroughly such that the lower soil stays moist for a few days even when the top layer is dry.
- Weeding must be done regularly for the first month to avoid weeds competing with seedling.
- Organic manure should be used when transplanting.

Note

- Gradually stop watering from about 5-6 weeks before the date you plan to transplant so that they get use to the conditions where they will be planted.
- Water the seedlings thoroughly once more on the day before transplanting so that the soil is moist and soft to allow the seedlings to come out of the soil easily.

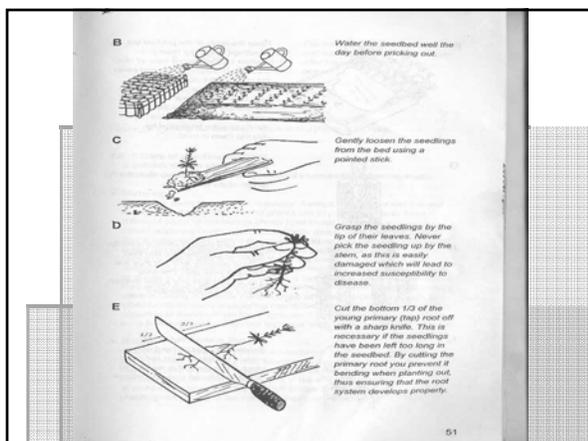
Preparing the Planting Site

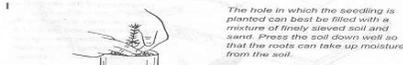
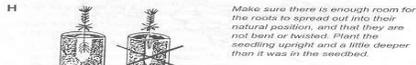
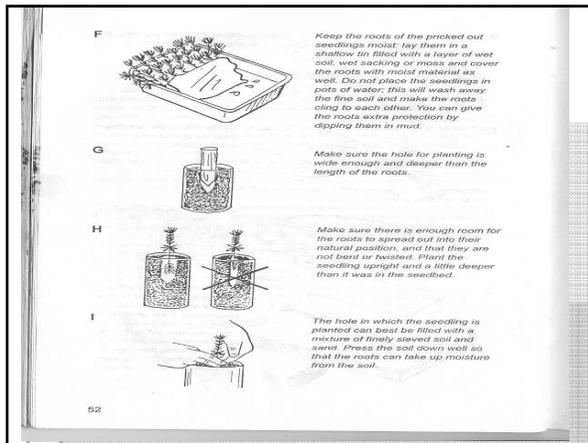
- Scarify the soil by gently loosening the uppermost layer of the soil to improve the uptake of water and reduce the competition from grass.
- Make planting holes and fill with fertile topsoil first before planting.
- Mulch to reduce evaporation of water from the soil and to keep soil temperature constant



Transplanting

- The best conditions for planting is when the earth is moist, sky cloudy and air humid and preferably in the late afternoon/evenings.
- During transplant, provide young trees with extra nutrients by putting compost, animal manure or artificial fertilizer in the bottom of the planting hole.
- Planting distance depends on the function, tree type and environmental conditions but planting distances vary from 1 x 1m to 10 x 10m.





52

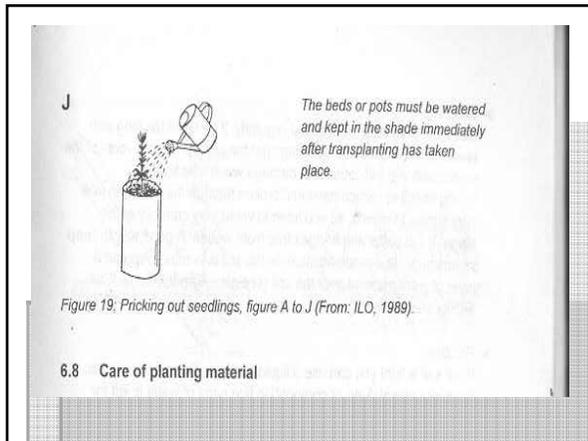


Figure 19; Pricking out seedlings, figure A to J (From: ILO, 1989).

6.8 Care of planting material
