

## For more information contact:

Ethiopian National Tree Seed Centre  
P.O. Box 5580, Addis Ababa, Ethiopia

Ethiopian Institute of Agricultural Research, Information and Communication Department  
P.O. Box 2003, Addis Ababa, Ethiopia  
Tel: +251-11-6462633-41; Fax: +251-11-6461294  
Website: [www.eiar.gov.et](http://www.eiar.gov.et)

Kenya Forestry Seed Centre, Kenya Forestry Research Institute (KEFRI)  
P.O. Box 20412-00200, Nairobi, Kenya  
Tel: +254-(0)66-32891/2/3, Fax: +254-(0)66-32844  
Email: [seed@kefri.org](mailto:seed@kefri.org); Website: [www.kefri.org](http://www.kefri.org)

World Agroforestry Centre (ICRAF)  
United Nations Avenue, Gigiri  
P.O. Box 30677-00100 GPO, Nairobi, Kenya  
Tel: +254-20-722-4000, Fax: +254-20-722-4001  
Email: [ICRAF@cgiar.org](mailto:ICRAF@cgiar.org), www: <http://www.worldagroforestrycentre.org>

National Tree Seed Programme  
P.O. Box 373, Morogoro, Tanzania  
Tel: +255-(0)23-2603192; Fax: +255-(0)23-2603275  
Email: [ttsa@morogoro.net](mailto:ttsa@morogoro.net); [ttsa@ttsa.co.tz](mailto:ttsa@ttsa.co.tz)

National Tree Seed Centre  
P.O. Box 23889, Kampala, Uganda  
Tel: +256-41-286049; Fax: +256-41-285326  
Email: [treeseed@africaonline.co.ug](mailto:treeseed@africaonline.co.ug); [treeseed@swiftuganda.com](mailto:treeseed@swiftuganda.com)



partageons les connaissances au profit des communautés rurales  
sharing knowledge, improving rural livelihoods

The ACP-EU Technical Centre for Agricultural and Rural Cooperation (CTA)  
P.O. Box 380, 6700 AJ Wageningen, The Netherlands  
Tel: +31(0)317-467100, Fax: +31(0)317-460067  
E-mail: [cta@cta.int](mailto:cta@cta.int), Website: [www.cta.int](http://www.cta.int)

CTA is financed by the European Union

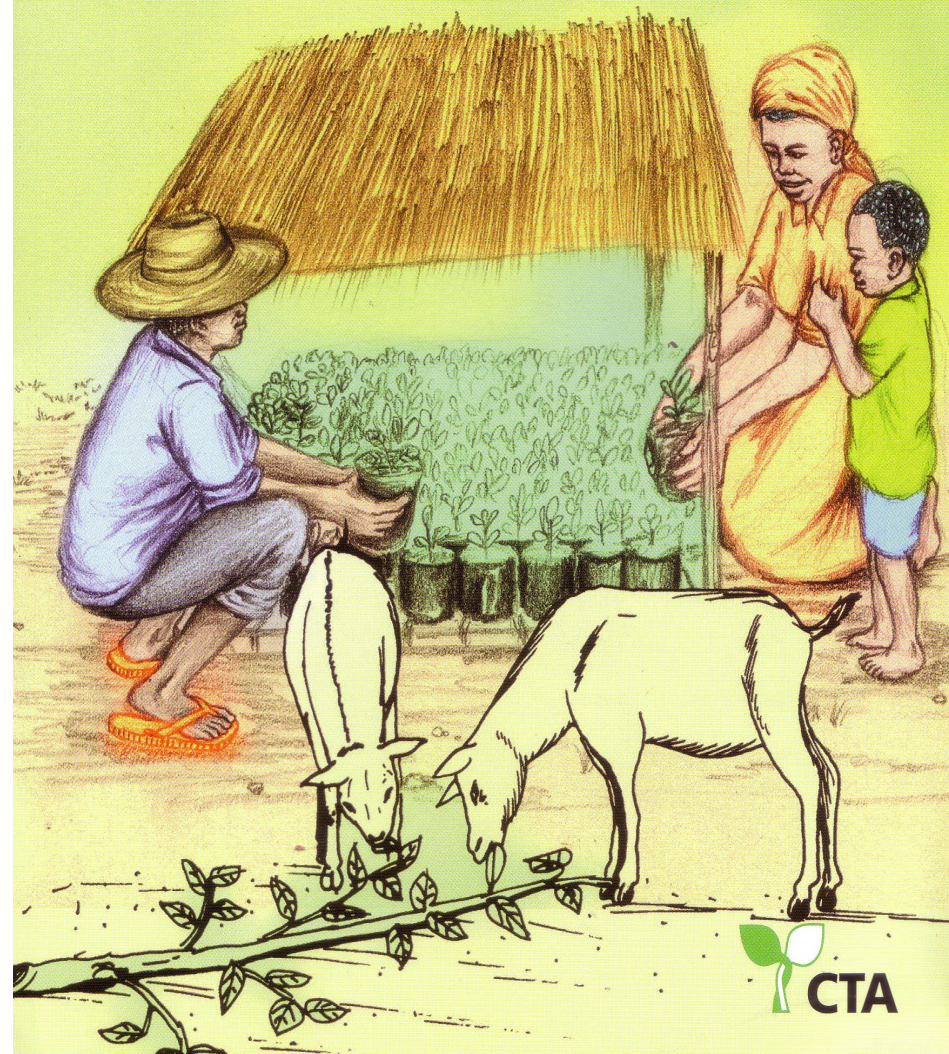


© CTA 2007 - ISSN 1873-8192

The information in this guide can be freely reproduced for non-commercial use, if credited as coming from CTA.  
Reproduction for commercial use requires prior authorization from CTA.

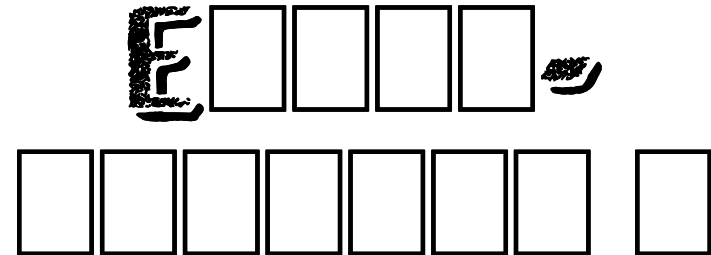
CTA Practical Guide Series, No. 10

# Establishing a Tree Nursery





# NOTES





## Establishing a Tree Nursery

### Why tree nurseries?

Many people in Eastern Africa depend on forests and trees to meet various needs. With growing populations, these resources are being rapidly depleted. Many farmers want to plant trees but cannot readily obtain high-quality tree seedlings. Establishing a tree nursery can help to meet this demand and provide you with extra income.

### Benefits of tree nurseries

- Income generation through the sale of seedlings
- Production of uniform-sized seedlings leading to even plantation stands
- Availability of seedlings when you and your customers need them
- Production of disease-free planting stock
- May be established on small pieces of land
- Can make good use of land unsuitable for crop production
- Inexpensive to establish

Planting trees provides many benefits

- Increases availability of products like firewood, charcoal, fruits, timber, poles, fodder, and ornaments
- Provides wind breaks
- Improves the environment by preventing soil erosion and increasing soil fertility

### How to establish a tree nursery

#### Site selection

A good site for a tree nursery should have the following features:

- Reliable, nearby water supply
- Source of soil
- Access to market for seedlings.

In addition it is desirable to have:

- A well-drained soil with a gentle slope
- A natural shelter, such as tree cover, to provide shade for nursery workers.

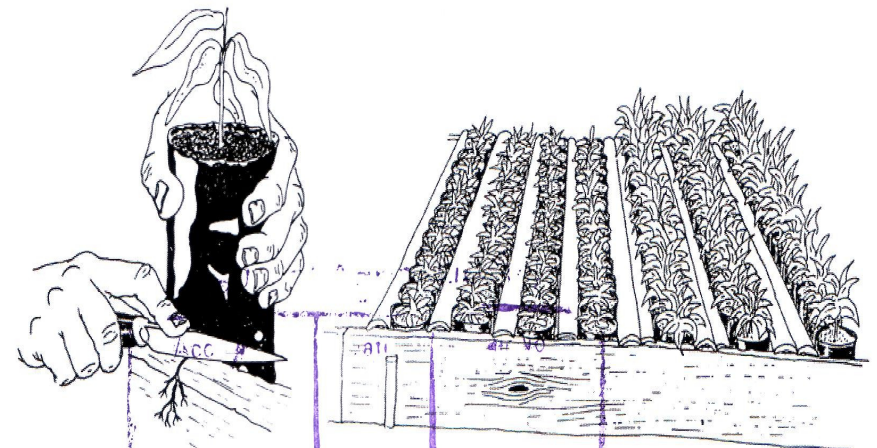
- Weed regularly to prevent weeds competing with seedlings for water and soil nutrients.
- Fence off the tree nursery to prevent damage from animals and chickens.
- Control insects and diseases like damping-off that could destroy seedlings. Damping-off is mainly caused by overcrowding the seedlings. It may be controlled by thinning the seedlings to facilitate movement of air among them. Spray the seedlings with appropriate pesticide in case of pest problems.
- Harden-off seedlings by gradually reducing the shade and frequency of watering. This allows them to get used to field conditions before transplanting. Most seedlings will be ready to plant out between two and six months, depending on the type of trees.
- After hardening-off, seedlings can be planted in well-prepared sites, preferably at the beginning of the rainy season. Take care to protect them from grazing animals such as goats.

---

#### Tip:

---

The same procedure for establishing a tree nursery can also apply to any other type of the nursery, for example one producing vegetables or decorative plants for sale.

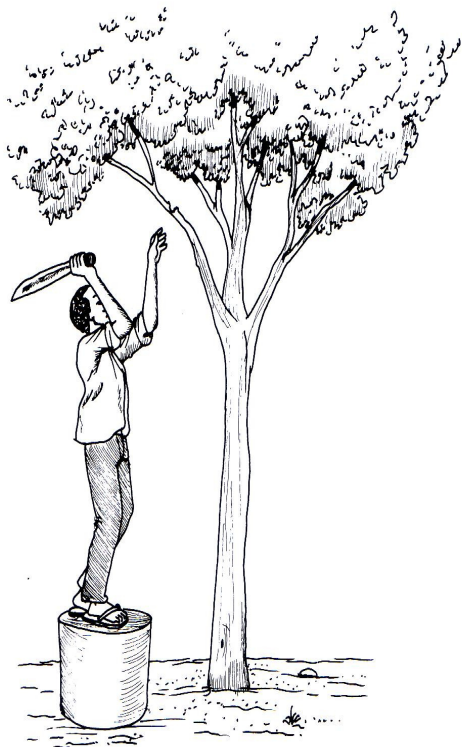




### Taking cuttings

Cuttings allow farmers to produce seedlings for trees for which it is difficult to get seeds. Examples of trees that should be propagated by cuttings include tea, euphorbia and breadfruit.

- Take cuttings from woody branches in the lower crown near to the main stem. Do not cut the main stem.
- The cuttings should be about 15-25 cm long and 10-20 mm thick.
- Cuttings should have at least two bud scars but preferably three or four
- Remove leaves from cuttings.
- Insert the cuttings in a slanting position, into the nursery bed or a pot. See illustration below.



### Taking good care of your seedlings

To ensure good performance of the seedlings, the following measures are recommended:

- Construct the nursery shade in an east to west direction to protect seedlings from hot sun. The shade will also protect seedlings from strong winds and heavy rain.
- Do not overcrowd seedlings in the nursery bed to minimize competition for resources like nutrients and water.
- Water twice daily during hot dry days to protect seedlings from wilting.
- Prune roots that grow out of the pots to prevent roots breaking when pots are lifted for planting out.

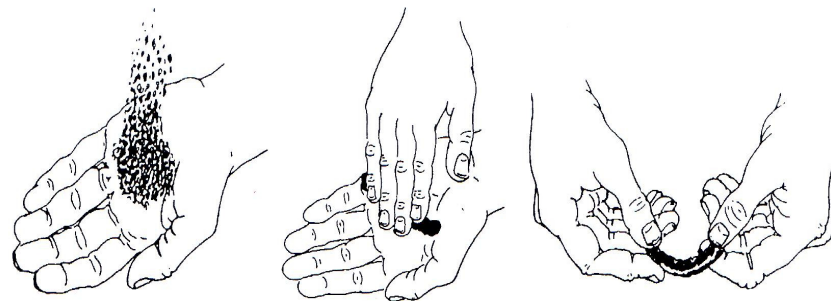


### Soil

A good soil for use in tree nurseries can be made by mixing:

- 3 basins of soil collected from under vegetation cover, such as in forests or under large trees
- 2 basins of clay soil
- 1 basin of sand.

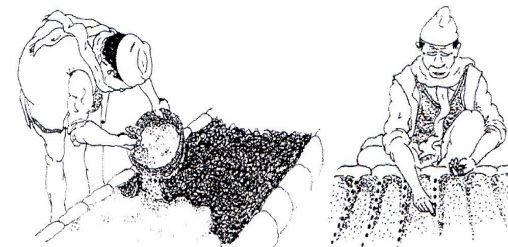
To test the mixture, roll a damp sample in your hand. A good mixture should roll and hold its shape but break if the roll is bent.



- If it does not break, then it has too much clay.
- If it crumbles before you can roll it, then it has too much sand.
- To ensure adequate fertility of the soil, add one basin of sieved manure or compost to every three or four basins of the standard mixture.

### Seedbed preparation

- Ideally, establish the seedbed on a gentle slope.
- The seedbed should not be wider than one metre to make working on the bed easy. The bed can be of any length.
- Dig a trench about 10 cm deep all around the seedbed.
- Set large pieces of timber, bamboo or flat stones into the trench to a height of at least 15 cm above the ground.
- Put a 5-cm layer of coarse gravel or small stones at the



bottom of the bed to improve drainage.

- Add a 5-cm layer of standard nursery soil mixture on top of the coarse gravel.

### Sowing seeds

- Large seeds, about the size of maize seeds, should be sown in drills running across the beds, 5-10 cm apart.
- Smaller seeds, about the size of pigeon peas, should be broadcast onto the bed and pressed into the soil with a flat board.
- Very small seeds, about the size of simsim, should be first mixed with fine sand or soil before sowing to allow adequate spacing on germination.
- Cover the seeds with a thin layer of fine soil or sand to a depth of about 5 mm.
- Water twice daily (morning and late afternoon) in hot, dry weather.

### Pricking-out seedlings

Pricking-out is the transfer of seedlings from the seedbed to pots.

Pricking-out should be done when the seedlings develop three or four true leaves.

- Choose a cloudy day or late in the afternoon to avoid seedlings wilting in the sun.
- Water the seedlings well before pricking-out.
- Remove the seedlings by inserting a small flat stick beneath them and gently lifting them from the seedbed. Take care not to break the small roots.
- Put the seedlings in a tray of water immediately to prevent them from wilting.



- Pot the pricked-out seedlings in containers made from locally available materials, such as banana leaves or bamboo stems, or specially made black polythene bags.
- Fill pots with the soil mixture and make a hole with a stick about the size of a pencil in the middle of the pot, just a little deeper than the roots of the seedlings.
- Carefully lower the seedlings into the hole and refill so that there is no empty space around the roots. Gently press down the soil.
- Put the potted seedlings into a nursery bed under shade.

