

Method of seed treatment & nursery time per specie

Tree Species	Seed Treatment	Seeds /tube	Planting depth	Nursery time
Faidherbia albida (Msangu)	Nicking	2	1.5-2 cm	5-12 weeks
Gliricidia sepium	Nicking	2	1.5-2 cm	8-12 weeks
Melia azedarach (India)	Break the seed coat	3	3 cm	10-16 weeks
Senna siamea (Keysha)	Nicking or soak 24 hrs in cold water	3	1.5-2 cm	8-12 weeks
Senna spectabilis (Keysha wa maluwa)	Nicking or soak 24 hrs in cold water	3	1 cm	8-12 weeks
Acacia polycantha (Mthete)	Nicking	3	1.5-2 cm	8-12 weeks
Bauhinia thonningii (Chitimbe)	Nicking	3	1.5-2 cm	10-16 weeks
Terminalia sericea (Napiri)	Trim wings and nicking	5	1.5-2 cm	10-16 weeks
Albizia Lebeck	Soak 12 hrs	3	1 cm	8-12 weeks
Pawpaw	No treatment	2	1 cm	8 - 12 weeks
Guava*	Soak 72 hrs	2	1 cm	10-16 weeks
Sweet apple*			1.5-2 cm	56 weeks
Mango*	No treatment	1	3-4 cm	56 weeks

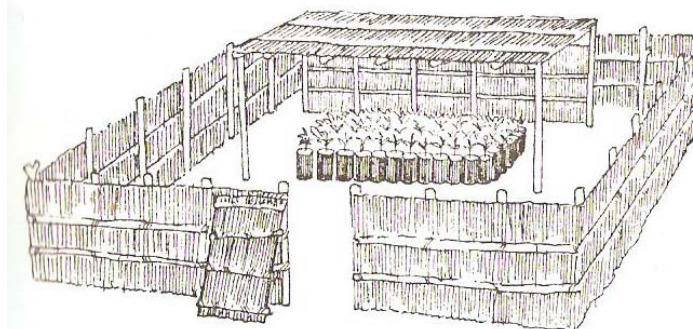
* For guavas, sweet apples and mangos, the trees will have to be grafted before transplanting.

Sources: International Center for Research in Agroforestry (ICRAF),
Department of forestry (Government of Malawi)



How to establish and manage your own tree nursery

ENGLISH



October 2009

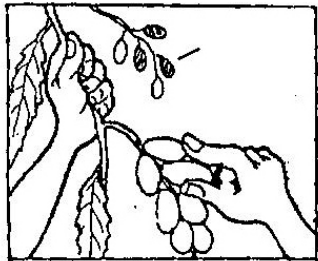
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How to collect the seeds

The first step in establishing a tree nursery is to collect seeds.

Collect seeds yourself by picking them from your own trees or from trees near your farm.



Pick mature seeds that are free from pests and diseases only. Extract and open a few seeds. They should be well developed and firm inside, and should fill the seed coat.

Dry in the shade and turn seeds several times so that they don't begin to rot.

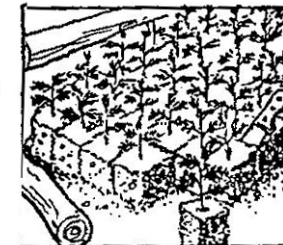


When and how to outplant the seedlings

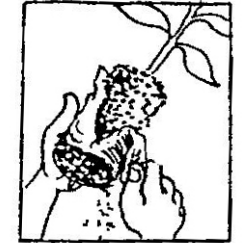
A good time to start transplanting seedlings is when reliable rains have set in.



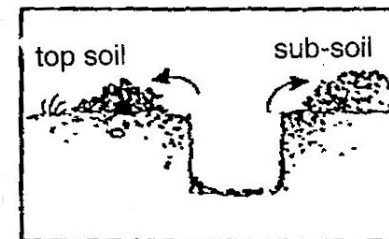
Water the nursery to wet the soil before uprooting the seedlings



Use a sharp knife to dig between the lines and seedlings on all sides.

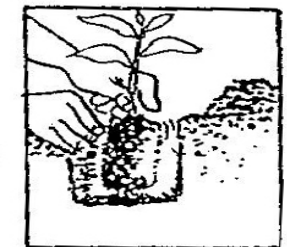


If the seedling is in a polythene tube, remove it safely.



Dig a hole and separate top soil and sub-soil. The hole should be one foot deep and one foot wide.

Very soon after removing the seedlings from the nursery, put them in the holes and cover them with top soil. Press down the soil nicely. You can water for few weeks if the rains are not enough.



Fence the seedling to protect it from animals and children.



There are some other works that have to be done during the stay of the seedlings in the nursery :

- Thinning :

One to two weeks after germination, leave only one plant per station and remove the others.

If it's done late (more than 2 pairs of leaves), don't uproot but cut plants.

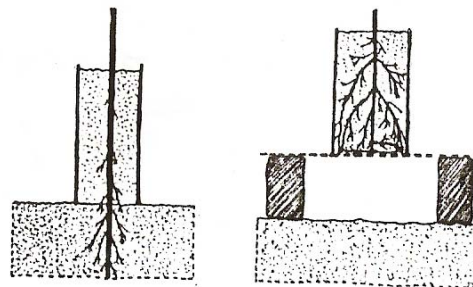
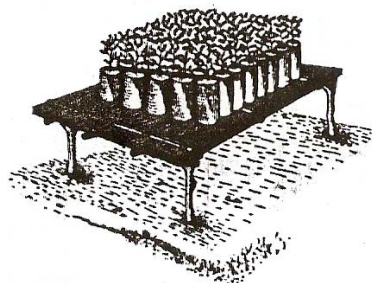


- Hardening off :

Hardening off prepares seedlings before transplanting
Water: reduce watering from twice to once a day four weeks after germination.
Shade: remove half of it 4 weeks after germination; remove full shade 3 weeks later.

- When *Faidherbia albida* is sown in the nursery:

As *Faidherbia albida* has got a fast growing root system, it is recommended to raise the seedlings on a rack.

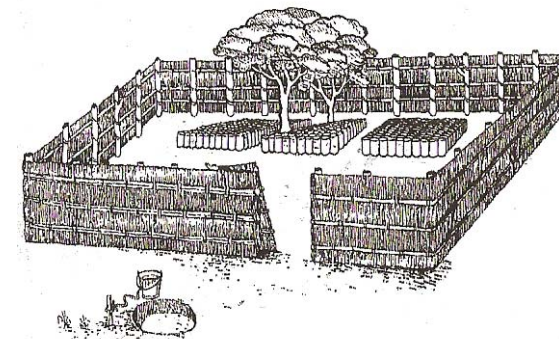


Where to establish a tree nursery

The area has to be close to a reliable water source as seedlings need to be watered every day.



The area should be on flat or gentle sloping land to avoid water-logging.

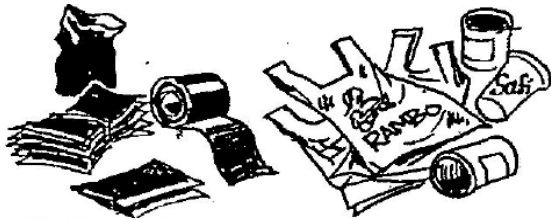


The nursery should be well fenced to protect the seedlings from livestock and theft. A shade should be constructed to preserve moisture.

Where to sow the seeds

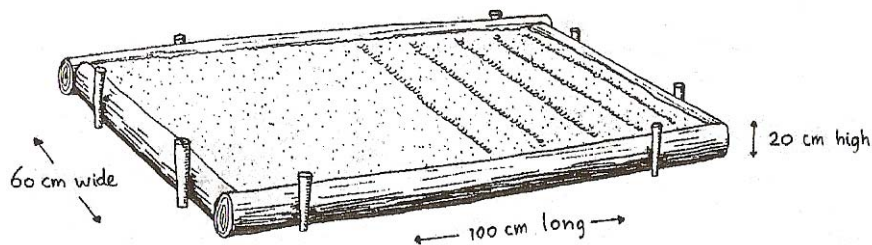
You can choose to plant the seeds directly in the field. But some species need to grow first in nurseries to be protected when they are young. In the nursery, two main methods can be used :

- The polythene tubes : Most farmers are using them but they can be expensive.



If polythene are not accessible to you, used empty tins or plastic bags can replace them.

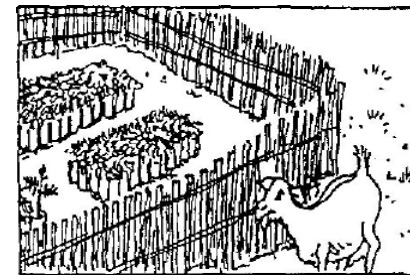
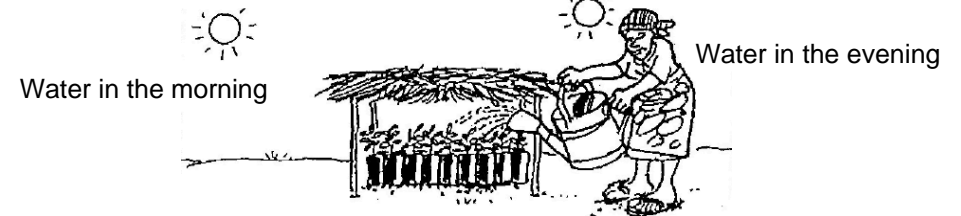
- The seed beds : This is a good and simple method as you don't need polythene or tins.



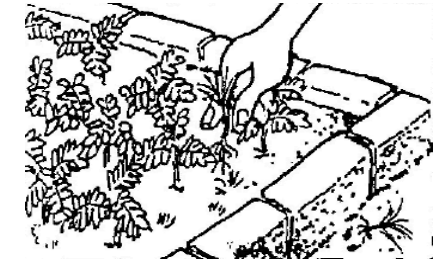
1. Clear and level the area
2. Build a square of 60cm wide, 100cm long, 20cm high, using wood, thatching grasses or bricks.
3. Fill the seed bed with the appropriate soil you have prepared.

How to manage the nursery

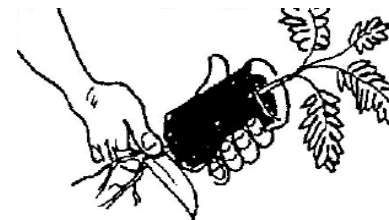
Soon after the sowing, water the seedlings every morning and evening consecutively for the first 4 weeks. Do not water during the day!



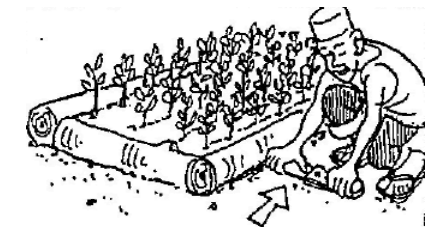
The nursery needs fencing to protect the seedlings from wind, animals damage and thieves.



Remove weeds and apply water slowly to avoid damage to the seedlings.

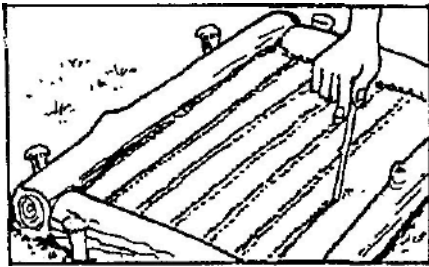


Prune the roots with a pair of scissors or a knife when seedlings are the height the span of your palm and when its roots have started to penetrate into the undersurface.

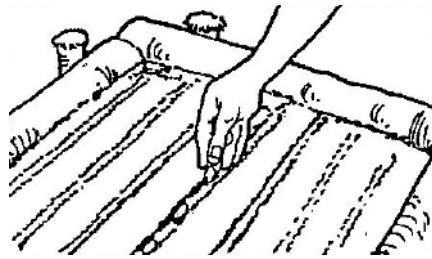


If it's in a raised bed, prune the roots by using a panga knife or wire underneath the bed, soon after watering.

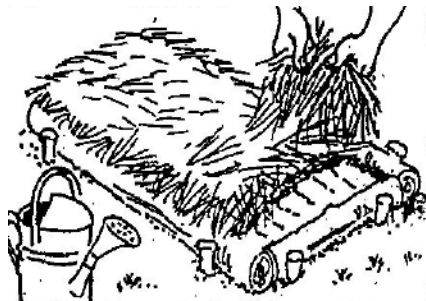
- In seed beds :



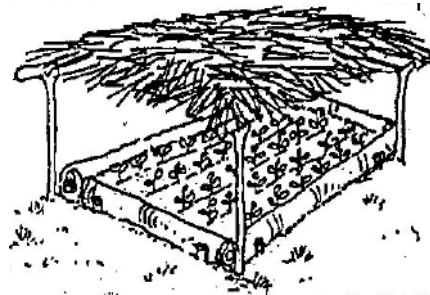
1. Draw lines 4 inches apart or the width of your palm.



2. Sow at the spacing of 5 inches between seeds



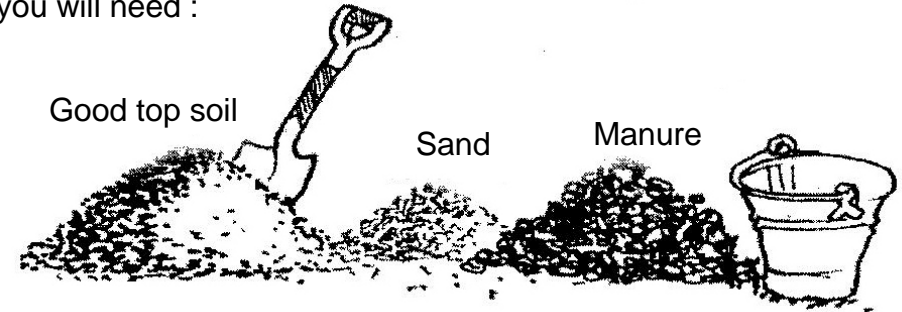
3. Cover the nursery with dry grass or maize stalk then water.



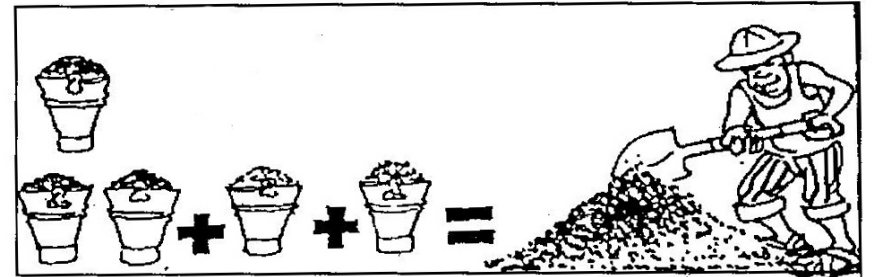
4. Remove the grass cover after the seedlings have germinated and raise the shade to allow seedlings to grow.

How to prepare a good soil to fill the tubes and the seed beds

In order to prepare yourself a good soil for your nursery, you will need :



Mix 3 buckets of soil, 1 bucket of sand and 1 bucket of manure.



Then fill the tubes and the seed beds with that soil, press the soil slightly. Leave one inch along the top of the tubes or the beds.



Water the soil slightly before sowing

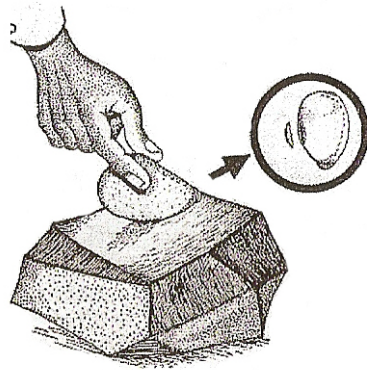


Remember : if you use tins or plastic bags make some hole at the bottom to allow water drainage.

How to prepare the seeds before sowing

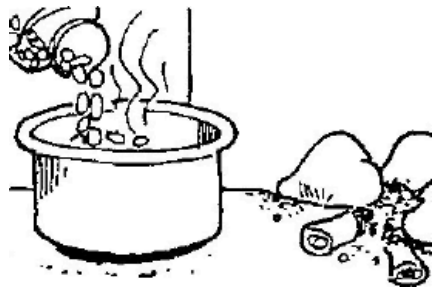
Some seeds can not be sown direct in the nursery, they need to have a special treatment to ease their germination.

For seeds with hard coat, Scarify the rough seed coat by nicking one side away from the micropyle, rubbing the seed against a rough stone



Some other seeds need to be soaked in water :

- seeds with soft coat like neem, sesbania, glyricidia can be soaked in cold water for 12-24 hours,



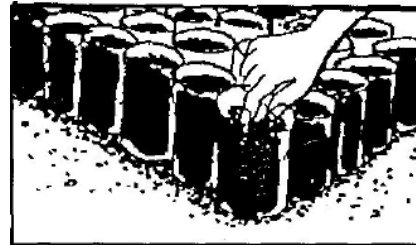
- seeds like leucaena, albizia, acacia can be soaked in warm (but not too hot) water for 24 hours.

You can have more information about the treatments required for each species in the table at the end of the booklet.

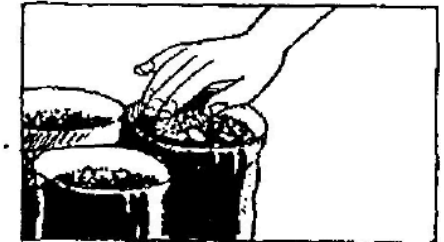
How to sow the seeds

After preparing seeds you need to sow them immediately in polythene tubes or in the beds.

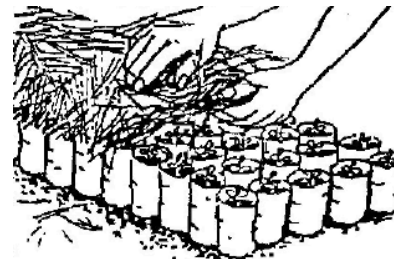
In Polythene tubes :



1. Sow the seeds in polythene tubes or tins



2. Cover the seeds with soil



3. Cover the polythene tubes using dry grass to limit direct exposure to the sun.



4. Remove grass cover after seeds have germinated.