



Chapter 10: Tree Care



Beyond water, the most important factor affecting tree survival is protection. In the first phase of the Forest Garden Approach, when establishing your living fence around the perimeter, it may be necessary to create a dead fence about one meter beyond where you will establish the outer row of your living fence. This is necessary in places where the seedlings are at risk from grazing animals, as they can easily ruin months of work in a very short amount of time by eating your rows of newly planted seedlings. A dead fence is best made from branches of thorny trees, piled about one meter high, around the perimeter of your Forest Garden site.

After planting your seedlings, be sure that the dead fence remains intact for the first year, or until the seedlings are well established and can withstand browsing. In the Forest Garden Approach, you will not be planting higher value seedlings (e.g. fruit, nut, and timber trees) until after the living fence is established. In this case, those seedlings should be protected from grazing livestock and wind by the living fence. If this is not the case, then you should build protective barriers around each seedling (using thorny branches or sticks posted around the seedling to prevent browsing by animals).

As you will generally plant the majority of your seedlings at the beginning of the rainy season, hopefully the rains will continue for some time, allowing the trees to take root and grow strong in preparation for the upcoming dry season. At times you may plant higher value trees outside of the rainy season. In this case, you will need to water your tree once a week for the first few months, until the roots are established. About 3 liters of water per seedling should suffice if the seedling is fairly small (about 1 meter high). After a few months, you can reduce the watering to every two weeks, with slightly more water (about 5 liters). Keep a close eye on the seedlings over the first year, and if you see excessive wilting in dry soil, or if there is still wilting after watering, then increase the watering. If there are signs of wilting long after watering and the soil is still saturated with water you may be overwatering, in which case you should decrease the amount of water and continue with careful observation.

Direct-seeding

Though you generally get the best results by raising seedlings in nurseries before outplanting them into your Forest Garden, it is possible to plant them directly in your Forest Garden by direct seeding. Though this is a cheaper method, it is much more difficult to give the seedlings the care they require, which often leads to higher rates of stunting or mortality than those cultivated in nurseries.

The establishment of plants by this method is largely controlled by climatic conditions, soil type and weed competition. These factors have a significant bearing on soil moisture, which is vitally important to germination and early survival of seedlings in the field. Seedlings must be protected from grazing by vermin and livestock until they are beyond browsing height.

Other factors that play an important part in determining the success of direct seeding include:

- Correct choice of species;
- Ground preparation to provide a suitable seedbed;
- Use of good quality, viable seed;
- Correct seeding rates to ensure the required density of seedlings—too little will lead to disappointment and too much will necessitate extra work for thinning;
- Sowing when soil moisture is favorable for seedling germination and establishment—be sure to sow after the rainy season begins to be sure the seeds receive plenty of water to germinate and establish their root systems;
- Weeding, to ensure the seedlings do not have to compete for water, sunlight, and nutrients.

Cuvettes for Fruit Trees

An aspect involved in out-planting seedling fruit trees that also carries over into the maintenance of adult trees and controlling pests is building and maintaining “cuvettes” or basins around the base of seedlings and adult trees. A “cuvette” is a flat, marked off circular area around a tree which is delimited by a small wall or ridge of soil forming a basin. A single “cuvette” is made around newly planted seedling trees while double cuvettes are made around adult trees. Some of the benefits of making and maintaining “cuvettes” are:

- To conserve and concentrate water at the root level. The walls of the “cuvettes” hold the water around the roots so that runoff is avoided.
- To help stabilize adult trees by promoting lateral root growth.
- To aid in the prevention of disease, especially fungus disease, by not concentrating water at the base of the trunk.
- Pest control, especially termite, by keeping mulch and fertilizer away from the trunk.

Young trees and newly planted seedlings

A single “cuvettes” of 0.6 meter diameter is sufficient for newly planted seedlings and 1 meter for young trees. A small mound of dirt is placed at the base of the main stem to protect it from large concentrations of standing water and also to keep mulch from touching the base of the trunk which may harbor insects or termites (Figure 1).

The dirt needed to form the wall of the “cuvettes” should always be taken from outside the 1 meter diameter surrounding the young tree. If it is taken from inside the diameter, this will remove good and rich soil, there is the potential of exposing and damaging roots growing just below the ground surface. The area within the “cuvettes” should be as flat as possible, again to avoid water from concentrating at the base of the main stem or trunk. This is very important for seedlings and young trees. Mulch should also be put in the cuvette but not right near the trunk.

Adult trees

Double “cuvettes” are recommended for adult trees. This consists of a small inner “cuvette” near the base of the trunk and a larger, outer “cuvette” which encompasses the diameter of the crown. All additions of mulch, water, manure, and fertilizers should be confined to the outer “cuvette”.

The purpose of a double “cuvette” is threefold:

- The “drinking” (capillary) roots are located farther away from the trunk. These are found in the outer “cuvette” whereas the “woody” roots are found closer to the trunk. This concentrates the water in the area where its uptake is most efficient and beneficial to the tree.
- For the same reason, all manure and fertilizer are placed in the outer “cuvette”. This also helps avoid burning the root hair of the tree.
- The “cuvette” helps to stabilize the tree.

To make a double “cuvette”, stand at the edge of the tree under the outer most branches and leaves. Mark off one step towards the trunk and one step away from the tree. This will be the distance of the outside “cuvette” and should measure approximately 0.8 to 1 meter (Figure 2). The area from the inner wall of this “cuvette” to the trunk is the inner “cuvette”.

Again, do not “dig up” the top soil to form the walls of either “cuvette”. It is better to get dirt from elsewhere to make the walls than to expose and damage the roots located just below the surface. Add hay, peanut shells or palm leaves as mulch to the outer “cuvettes” only. Absolutely nothing should be added to the inner “cuvette”.



Figure 1: Procedure for making cuvettes for young trees and newly planted seedlings

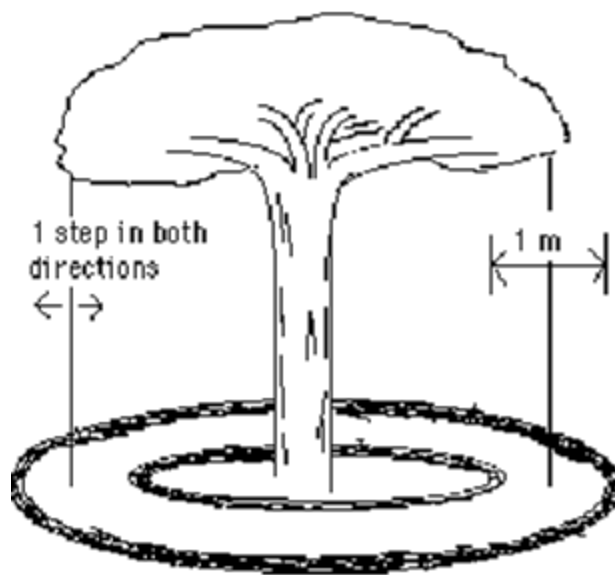


Figure 2: Procedure for making cuvettes for adult trees

Dry Season Seedling Care

There are a lot more threats to trees planted in the field than there are in the more controlled environment of your nursery. The first year after outplanting your trees is the most critical in terms of maintaining good health and protection. If they make it through the first dry season in good health, there is a good chance they will survive to maturity. Though it is important to observe the trees in your Forest Garden routinely to identify and respond to risks and potential issues. Follow the recommendations below to ensure your seedlings receive the care they need to grow healthy and productive.

- **Weeding** – Weed growth, especially during the rainy season, can easily overtake and shade out newly-outplanted seedlings in a matter of weeks. Keep weeds cleared to a distance of .5 to 1 meter around the stems of your trees.
- **Fire protection** – Fire risk is a major concern in excessively dry areas, as they can spread quickly and destroy all of your trees and any other crops on your Forest Garden site. You can reduce the risk of fire by raking a one meter fire break around the outside of your living fence, cutting down all growth (weeds, dry grasses, etc), which can be added to your compost. You should also clear dry and dead growth from the interior of your Forest Garden site.
- **Protection** – The biggest threat to your young trees is likely to be livestock. It is very important to protect outplanted seedlings from the many types of livestock that wander around open fields, as browsers and grazers can quickly defoliate and kill newly-outplanted trees. Here are several possible ways to protect your newly-outplanted trees from livestock:

- o Dead fences – To protect living fences from livestock until the time that the trees can withstand browsing, create a dry fence barrier from thorny branches piled 1 meter high, and at least one meter from your newly-planted living fence.
- o Anchored rice or onion sacks – Preferable for unprotected, higher-value trees, you can post 3 or 4 sticks or small posts in a triangle or rectangle around each seedling, tightly lining the sides with rice or onion sacks to form a protective barrier.
- **Watering** – In ideal situations, the rainy season that continues after you planted your trees will be sufficient for the trees to establish their root systems and survive the oncoming dry season. In reality this is often not the case, or the dry season may be longer than expected. If your trees show signs of excessive wilting in the dry season it may be necessary to irrigate them. If the rains do not extend after initially planting your seedlings it is good practice to water them about 3 times per week for the first few months so they can establish their root systems. After that, you can water them once per week.
- **Mulch and compost** – To control weeds and decrease evaporation it is important to place a layer of mulch around your trees after planting them (see mulch section). Leave about 5 cm clear of mulch around the stem of your seedlings to avoid burning the young stems as the mulch decomposes. If you did not have fully decomposed compost or manure to line the planting holes and mix with the soil, then you can add compost or manure to the surface, under the layer of mulch.

CHAPTER 10: REFERENCES

1. This section was adapted from Peace Corps Senegal's *Fruit Tree Manual*. Dakar: 1993.