

Protection from Grazing Animals

Each year we get a number of reports from project leaders telling us that livestock, mostly goats, cattle, and horses, destroy many of the seedlings they work so hard to This is especially true in the dry season when forage is generally coarse and dry - and in short supply. It extends into the early part of the rainy season when grass still hasn't started to grow in sufficient amounts. Through all this time, hungry animals wander about, sometimes pushing through fences, to get at green, succulent forage.

We can readily sympathize: a lot of hard work and a whole planting season lost. Here are some ideas on how to increase seedling survival rate while keeping out-of-pocket costs to a minimum. We quickly discuss protection at the nursery level and then explain a variety of methods to protect newly planted seedlings.



Protection at the Nursery Stage

We recognize that metal fencing, as sold in most developing countries, is high-priced, so we suggest utilizing thorny bushes or dead fences made of thorny branches; anything to protect the seedlings. One can plant a living fence around the nursery area (see the technical sheet titled **Living Fences**), or if you are just getting started, collect a bunch of thorny branches and build a dead fence. Placing thorny branches around the perimeter of the nursery - leaving one as a retractable gate - is extremely effective against livestock and wildlife.

We recommend starting trees in a seedbed nursery. A seedbed can produce more than 300 seedlings in a square meter by planting seeds 2-3 cm (1-1.5 in.) apart. The compact size of a bareroot bed minimizes water requirements and reduces the length of the required protective fence.



Outplanting Techniques

Unless planted within an enclosed area, seedlings are most vulnerable to grazing animals during their first dry season. Protection for seedlings can come from outplanting techniques, weed management, and low-cost barriers and deterrents.

Seedlings outplanted from **bareroot beds** in the beginning of the rainy season are less likely to be grazed than those outplanted from plastic sacks (called “poly-pots” or “bolsas”). Bareroot seedlings can often be much, much taller with more elaborate root structures, and more importantly, they can be planted after removing most of their leaves - a barestem seedling. When planting the barestem seedling, all leaves except for the terminal leaves are removed to allow the seedling to go dormant rather than to desiccate and die in the event of a dry spell. Removing the leaves not only makes it harder to spot the seedling, but also the remaining ‘stick’ presents little interest to the grazing animal. This is especially important if trees are outplanted at the very beginning of the rainy season when rain is erratic and the land is still bare of the grasses livestock prefer. As the rains continue and new leaves form, so will the grasses and weeds in the immediate vicinity. Having stated the possible benefits of planting barestem seedlings (i.e. they are taller and less attractive), it is *always* best never to think that just because a seedling is taller than a goat's mouth that it is safe. It is always best to find some type of protection for seedlings.

In comparison to barestem seedlings started in a bareroot nursery bed, seedlings produced in polypots are shorter since they must be planted before the roots get rootbound in the plastic sack.





Weed Management

One must also consider **weed management**. Do not eliminate every weed in a given diameter around the seedling. Though strong weeds can suffocate a seedling, they also provide protection from grazing animals. While weeding trees in open lands, only eliminate the strongest weeds that may hinder the seedling's development. The remaining weeds will serve as camouflage.



Local Materials

There are numerous low cost barriers and deterrents to use. The most important thing is to **use local materials creatively**. We have seen people use old straw mats, bricks, and even old tires to protect seedlings. Some of the most successful methods are described below.

For new fruit tree plantations, individual trees, which are often spaced 8-12 meters apart, can be covered with rice sacks, onions sacks, or any other similar bag that allows for some sun and air circulation. These sacks, which can be easily bought at most local stores or markets throughout the developing world, are plastic mesh and can easily protect a seedling for the entire dry season. Sacks are best used to cover seedlings by building a teepee structure whose width and length are determined by the size of the sack. Just impale three sticks in the ground around the seedling and fit the sack on top like a glove. Make sure the sticks are sunk deep into the ground, so that passing cows and goats don't knock it over if they use the teepee to scratch their head with. The base of the teepee should be no wider than the sack to be sure that the sack fits all the way to the bottom, and the length of the sticks should be just shorter than the length of the sack (accounting for the five inches which should be driven into the ground). Just a few inches of wire to bind the sack to the stakes will hold the sack in place until next rainy season. Sacks also provide shade from devastating dry season sun and winds, as well as protection from many large insects (grasshoppers, locusts, beetles). Best of all, these sacks are easily available throughout the developing world and are rather inexpensive.

The teepee method can also be used to protect other individual trees, such as those used for intercropping in farmer's field or for village reforestation projects along the main road. If wire or sacks are not available or are too expensive, thorny branches can also be woven in between the teepee's sticks -- starting at the base and weaving your way around and up the teepee until one reaches the top. Keep adding new thorny branches until not even a goat's nose can get through.



Farmers have also claimed success in sprinkling hot pepper, rotten milk, and livestock urine on seedlings to send an instant message to grazing animals.

There are also numerous products on the market such as repellents and plastic mesh seedling covers, many of which can be expensive. We recommend trying some of the sustainable methods mentioned above; the most important thing is to use local resources creatively.

The crucial step is to help seedlings survive their first dry season. By the end of the second rainy season, trees are usually tall and strong enough that animals can only cause minimal damage.

We are always looking for new ideas on seedling protection. E-mail them to info@treesff.org

