



PLANTING & BEATING UP

Plantation Guideline Series No. 25 Sept. 2006



Successful planting is not just about sticking the tree into the ground and hoping for the best. It is the result of careful planning and having detailed knowledge of the planting site. The key issues to get right are seedling quality, land preparation, timing and training.

1. Seedling Quality.



First of all you must know what a good quality seedling looks like. For pines and eucalypts alike, we recommend that a seedling should have the following characteristics:

- That they come from an SPGS approved seed source.
- Healthy (i.e. no obvious signs of disease or pests and a good colour).
- The ideal size is 20 cm – measured from the root collar (15-25 cm is acceptable).
- A shoot:root ratio of 2:1 is ideal.
- Good root development (i.e. well distributed around the pot and sufficiently developed to hold the soil in the pot together).
- No root coiling (a sign of being kept too long in the nursery).

Thus when buying one's seedlings from a nursery (whether your own or not), you must ensure that the seedlings comply with the above

standards. In addition, you should ensure that they have been well watered and that they have not been damaged in transit. Common problems in transporting seedlings to a planting site are as follows:

- Exposed to strong winds whilst been transported on open vehicles.
- Dried out leaves, desiccated from the sun and hot air on the back of vehicles.
- The soil shaken out of the tubes leaving the fine roots exposed.
- They are often roughly handled during off-loading causing further damage.
- The pots are often piled high on their sides in the back of vehicles.

We strongly recommend that –

- There is a strict policy of culling - i.e. rejecting any inferior or damaged seedlings.
- Transport seedlings at the cooler times of the day and minimize the exposure to full sun and strong winds.
- Use appropriately sized boxes or trays to protect seedlings during transport.
- Give the seedlings time to recover from a journey if transporting long distances.
- Whilst waiting to be planted they should be shaded and well watered.
- Use appropriate means of carrying seedlings to the actual planting site.
- Get hold of a copy of (and read!) SPGS Guideline No. 7 – *Nursery Issues*.

2. Land Preparation.

The quality of land preparation has a major impact on planting. Provided the land has been well cleared and the pits prepared well, planting is more likely to be successful. The key issues for productivity and quality of planting are having a clean site and pits cultivated well (NB. For more details refer to SPGS Plantation Guideline No. 14 – *Land Preparation*).

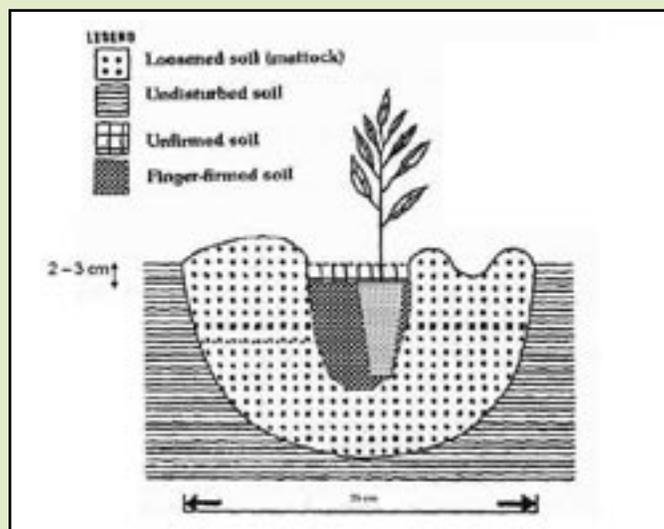


3. Timing.

To survive and grow well, tree seedlings must be planted at the optimum time of the year. Generally this means planning to plant into the early rains. The site should be moist enough (to a minimum 25cm depth) and there should be a good possibility of further rains. This requires detailed knowledge of the prevailing weather conditions in the region one is planting: this can be gained from meteorological records and from local experience. Many parts of Uganda have a bimodal rainfall but one of the two rainy seasons will usually be more reliable than the other, depending on the location. Thus one should plan to plant mainly early in the best rainy season (refer SPGS Plantation Guideline No. 3 – *Planning for Successful Plantation Establishment*).

4. How to Plant, Training & Supervision.

Planting is a critical operation: even with the best seedlings and excellent land preparation, bad planting will still result in a poor crop. It is essential to spend time prior to the rains training one's workers how to plant properly, especially since when the rains eventually arrive, there is usually a mad rush to plant as fast as possible.



We recommend the following techniques for successful planting:

1. Firstly, with a planting trowel dig a small hole into the centre of the planting pit. The hole must be deep enough to accommodate the whole root plug and part of the stem of the seedling.
2. Now remove the plastic sleeve from the seedling, keeping it so that you can dispose of it correctly later on.

3. Place the seedling, upright in the hole, but deep enough to cover the root plug and some of the stem (up to 2 cm is fine).
4. Replace the soil into the hole around the roots, making sure that the seedling and roots remain in a vertical position.
5. Firm the soil with your fingertips, pushing down and in but not with too much force. (NB. 'heeling-in' with one's boots is not recommended as can easily damage the small roots).

Notes to remember:

- What you are doing now is going to stay with you for many years, so it is important to do it properly.
- For the same reason it is no use putting poor quality seedlings into the ground. This not only means poor in genetic terms but also small, damaged or overgrown seedlings.
- Often the consequence of poor planting is not noticed for several years, until the young tree starts to draw on ever greater amounts of water and nutrients to grow.

5. Beating Up.

Beating up - also referred to as blanking and infilling - is the operation carried out to replace any seedlings that may have died (or are struggling) immediately after planting. Beating up has to be done as soon after planting as possible so that these seedlings are not overpowered by those planted earlier. With *E. grandis* this means beating up no later than 2 weeks after initial planting; with pines, no more than 4 weeks after planting. Beating up later than this will result in a plantation with variable seedling heights.

Because the operation is expensive, it is recommended that beating up is only done when the survival percentage is less than 90%.

How to work out the survival %

Find a random row away from the road in the planting site. Walk along the row (usually for 50 or 100 planting pits) and count each planting pit, recording how many of the seedlings planted into those pits have survived. Then calculate the survival percentage:

$$\text{No. live trees} \div \text{total. no. of planting pits counted} \times 100$$

It is advisable to do this sampling over a number of lines (e.g. every 10th line) throughout the site to obtain a better reflection of the survival percentage.

6. Planting with a Super Absorbent Polymer (such as Aqua-Soil or Terra-Sorb)

Aqua-soil is a super absorbent polymer, similar to the gel found in babies' nappies but whereas that gel just holds on to moisture, Aqua-soil after absorbing moisture, slowly releases it as the plant needs it. It eventually breaks down into organic parts.

Aqua-soil can absorb 300 times its own volume, that means a kilogram of Aqua-soil can absorb 300 litres of water. It also continues to reabsorb moisture after it has released some and thus it carries on working under ground for a long time.

The Aqua soil powder is mixed into water and allowed to stand for two hours: 1 kg into 200 litres of water. At planting, half a litre of the Aqua-soil solution is mixed into the soil where the tree is to be planted: the tree is planted into this 'mud' and the hole filled with soil as per the normal planting method.



Why do we want to use Aqua soil?

- To extend our planting 'window' (i.e. the period where conditions are suitable for planting) – especially to enable planting to start before the anticipated rains.
- To improve the survival % after first planting, thereby eliminating the need to beat up.
- To help the seedling get off to a fast start and colonize the area quickly, thereby suppressing weed growth.

Although this product is not readily available in Uganda at the moment it can be purchased from an agent in Kenya.