

## Direct on-site tree planting on degraded lands, using pre-germinated seeds

### *The example of acacia mangium on the tanety (deforested hills) at Madagascar*

#### **A WORD ON THE CONTEXT AND THE ISSUES**

Madagascar southeast gives a landscape characterised by vast desert hills on which burning and pastoral eco-burning succeeded one another. In many areas, these practices have resulted in an almost complete loss of trees and a drastic deterioration of the ground fertility, only covered by grassy savannas. This is an unexpected landscape in tropical wet climate, in an area where a dense and varied tree vegetation used to grow.

Paradoxically, demand for timber and wood fuel is constantly growing in Madagascar, supported by a high demographic growth and a reduction in the areas of natural woodland. Deforestation effects are also felt on springs which feed the irrigated rice fields, vital for families.



In this context where the essential of the agricultural activity has gradually become concentrated in the lowlands, the pilot action conducted by Inter Aide aims to boost the planting practices for the reforestation and the valorisation of unproductive hills. With several traditional groups (“tranobe”), Inter Aide is experimenting solutions in order to respond to environmental constraints and to households' concerns for their timber needs (mainly in softwood lumber). The search for these solutions takes into consideration different constraints (land tenure, organisation, technical aspects) in order to lay the foundations for a sustainable management of these new resources.

This note focuses on one of the technical aspects: the tree plantations. For significant and fairly quick quantitative results concerning planted trees and covered surfaces, it is necessary to find simple ways of plantation with a low cost and limited labour force required as well as species that manage to grow and develop in this particularly poor land. The achievement of tree plantations directly on site from pre-germinated seeds is an interesting option in this sense.

#### **PRACTICE DESCRIPTION, ADVANTAGES AND LIMITS**

This practice has mainly been used with *Acacia mangium*. The principle is actually quite easy since it consists in pre-germinating the seeds by keeping them in a warm and humid environment during a short time (around 5 to 7 days) in order to lift the dormancy and provoke a fairly homogeneous germination of the seeds before sowing. Carried out at the very beginning of the rainy season, this makes it possible to take advantage of the maximum duration of the rainy season to optimise the development of young plants, before the dry season begins. Without this pre-germination, acacia seeds might remain dormant during several months or even a year.

The technique also has the major advantage of avoiding the prerequisite production of plants in a nursery, and therefore the need of transplanting young plants, which are burdensome and heavy operations that makes very complicated to reforest important areas. However, it requires previously to think about land preparation to be able to sow the pre-germinated seeds at the very beginning of the rainy season, and seems appropriate only for a few species. Tests have been successfully carried out with a variety of *Corymbia* and with *Toona ciliata* (Australian red cedar).



### THE THREE STEPS OF THE PREPARATION

The process for seeds pre-germination takes place in three steps:

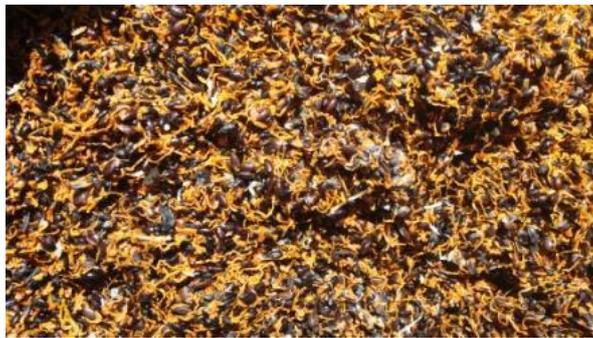
**1. The seeds cleaning, which mainly consists in the winnowing operation.**

**2. The soaking (24 hours)**

- Bring water to a boil;
- Remove the container containing the boiling water from the heat source;
- Pour the seeds into boiling water and leave them until it cools, continuing to soak for 24 hours.

**3. The pre-germination (5 to 7 days)**

- Wiping again the seeds for 1 hour to remove excess water
- Then wrapping them in a permeable packaging (here we use small woven baskets commonly found in south-east Madagascar)
- Putting the seeds in a warm place (preferably uncovered)
- Turning the package containing the seeds over if the heat source reaches only one side
- Checking the evolution of germination after three days
- Waiting until most of the seeds are pre-germinated before stopping the process.



### THE PLANTATION OF PRE-GERMINATED SEEDS

Plantations are directly made at the plot level after previous marking work, loosening of the soil (hole digging) and installation of a low sunshade. Marking is made using an equilateral triangle that is 'tumbled'(titled) to identify the locations of the holes to be made for planting. In the case of Acacia mangium, the triangular support is around 2.3m per side, which guarantees the desired spacing (here a density of 2000 plants per hectare).



This practice gave great results with the use of 3 seeds per hole, which gives the opportunity to use the duplicated plants to replace any missing items in the 2nd year.

