

DISCUSSION

Benefit value

The results showed that REX trays resulted in the highest benefit values which are agreement with Zangkum (1998). Zangkum also reported that seedlings grown in REX trays were of significantly higher quality than those grown in other containers. This contrasts with my results which showed that, plastic bags 3 x 7 in had higher quality seedlings. Zangkum did not use plastic bags of this size.

There was no relationship between seedling quality and benefit value. Treatments resulting in seedlings of high quality often had low benefit values because of the high price of some of the equipment necessary, such as wire grid tables. Using wire grid tables improves seedling quality, but results in low benefit values. Reducing the cost of the wire grid tables could significantly increase the benefit value of air pruning.

Containers

For the same container type e.g. plastic bags, large containers produce higher quality seedling than smaller ones. This agrees with the results of Boudoux (1972) who note that root growth is more affected by container diameter than by container height. Tinus (1974) also reported similar results using *Pinus ponderosa*. Hocking and Mitchell (1975) showed that growth of seedlings in containers with bigger diameters was better than in smaller diameter containers although all containers had similar volumes (Romero *et al.*, 1986)

The most suitable container for *Artocarpus lakoocha* Roxb., *Balakata baccata* (Roxb) Ess., and *Horsfieldia thorelii* Lec. is plastic bags 3x7in which produced higher quality seedlings than in other container types. This is in agreement with the results of Thapa *et al* (1990) who reported that *Artocarpus lakoocha* Roxb. had a significantly better quality in this sized bag. But bigger container size used more space in the nursery and transport.

Fertilizer

Most seedlings failed to grow to a plantable height within one year after germination with the exception of *Balakata baccata* (Roxb) Ess.. The average height of seedlings planted by FORRU is usually 50-60 cm or not less than 30 cm for fast – growing pioneers (Elliott *et al*, 1998) For *Artocarpus lakoocha* Roxb. and *Horsfieldia thorelii* Lec. growth accelerated by increasing the amount of fertilizer or target fertilizer application to the period of maximum growth rate for *Artocarpus lakoocha* Roxb. of 120-240 days after transplanting and *Horsfieldia thorelii* Lec. 60-120 days or 180-240 days after transplanting (Appendix IV).

Root pruning

A wire grid table is not necessary when using plastic bags. Although roots can grow through the hole in the bottom of the plastic, the tap root often tends to coil around the bottom of a plastic bag.

Root pruning by air may cause problems if watering is not carried out frequently enough. Containers on the ground can get moisture from the soil, so if root pruning by air is used, watering should be increased.

Balakata baccata had a low percent of survival because the seedlings were infected by bacteria causing damping off (Figure 36) starting at the base of the stem, which wide spread to other seedlings. Caterpillars (Figure 37) were also a serious pest. They lived hid under the leaves and ate the leaves and shoots, but seedlings produced new leaves after 10-14 days. Damping off could be solved by using chemicals or by pricking out earlier and move isolate from other seedlings. For the problem of caterpillars, is not necessary to use chemicals, since they can be removed by hand. Seedlings should be frequently inspected for signs of caterpillar damage.



Figure 36. Damping off in *Balakata baccata* (Roxb.) Ess.

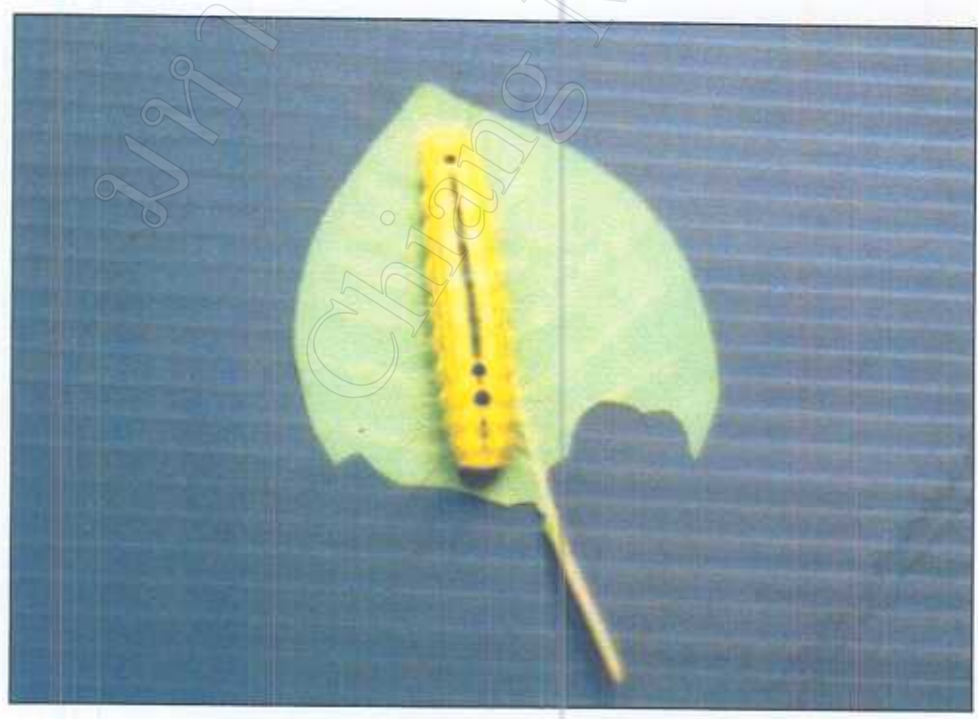


Figure 37. Caterpillar in *Balakata baccata* (Roxb.) Ess.