

Early Assessment: Trial Plot Study of *Leucaena leucocephala*

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ABSTRACT

Forest plantations also provide additional non-wood forest products and benefit, from the trees planted or from other elements of ecosystem such as environmental, social and economic benefits. Fast growing and high yielding tree plantations are becoming an important source of wood in tropical countries. *Leucaena leucocephala* is widely used as a shade tree because of its fast growth (lead tree) compared to the other commercial tropical tree. Base on daily observations in nursery, a positive growth rates for both of tree height and tree diameter. The result shows that *Leucaena* has the potential to become a super fast growing forest plantation species. However, from the early study it is shown that it is prone to sagging if planted far apart.

Keywords: *Leucaena leucocephala*, forest plantation

Introduction

Fast growing and high yielding tree plantations are becoming an important source of wood in tropical countries. According to FAO (2001), forest plantations are defined as those forests stands established by planting or seeding in the process of reforestation. Forest plantations are becoming an increasingly important resource worldwide, a global trend that is expected to persist and dominate. The future supply of wood will be met from these planted forests as opposed to managed natural forests. Seibel (2004) stated that, the possibility of using timber from low commercial value and the local supply of fast growing wood species from planted sustainable forests are the main reasons to establish information and studies on the properties and utilization of wood species from planted forest for the wood composite production.

In wood industry, the use of fast-growing species may be an alternative way to not only extend the wood supply, but also to preserve natural resources from over-exploitation. *Leucaena* is a fast-growing species from leguminous shrub. According to Hughes and Harris (1994) *Leucaena* is a small genus of around 17 species belonging to the tribe Mimoseae. In Malaysia it is locally known as "petai belalang". *Leucaena* is widely used as livestock forage, fuelwood, reforestation material, and green manure consumption. Its uses have also been expanded to gum production, furniture and construction timber, pole wood, pulpwood, shade and support plants in agroforestry systems. In Southeast Asia, large growing trees are used to shade coffee and cocoa plantations (NAS, 1979; Brewbaker, 1987; Diaz et al., 2007).

Objectives

The main objectives of the study are to develop and determine the potential of *Leucaena leucocephala* as a forest plantation species. The specific objectives of this study are:

- a) To set-up trial plot of *Leucaena leucocephala*
- b) To evaluate the growth performance of *Leucaena leucocephala* under Sabah Softwoods Berhad (SSB) condition
- c) To determine effect of tree spacing

Current progress

A one ha trial plot was set up in February 2010 in a root rot disease incidence area (buffer) of *A. mangium* in the Sabah Softwoods Sdn. Bhd research area, Brumas, Sabah. Brumas is located at longitude 117° 43' E and latitude of 4° 35' N. It is approximately 75km from Tawau town and 244 m above sea level. The climate is typically warm and wet with a mean minimum temperature of 22°C and maximum temperature of 33°C. The trial made use of a randomized complete block design. The trees were planted at a spacing of 3m x 3m. The growth performance of the trees was assessed by measuring two selected traits listed below:

- a) Diameter at 1 foot above ground level.
- b) Height- measured from the ground to shoot tip.

Growth performance is analyzed based on quantitative height and diameter measurement made at age 1 month, 2 months and 4 months.

Preliminary Results and Discussion

Nursery Stage

This preliminary study used 77 cells per tray. Seedling germination was done under shade for 3 to 4 weeks prior to expose to the sunlight. *Leucaena leucocephala* seedling grows quickly and has thin branches. The leaves are small. Plate 1 shows the seedling after 1 month from germination.

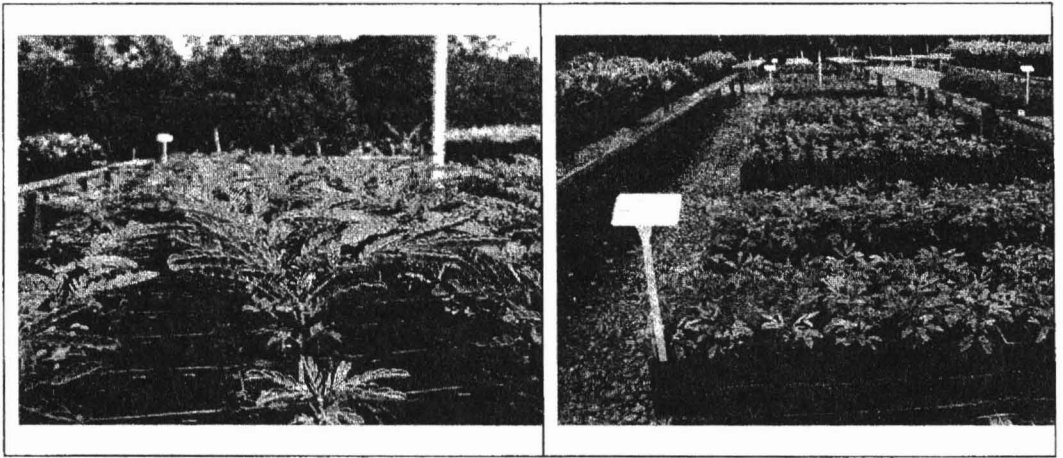


Plate 1: Seedling at Nursery

Based on daily observations in nursery, Figure 1 shows a positive growth rates for both of tree height and tree diameter. Seedling number T3 (1) shows the highest performance of tree height with average of 7.83cm and the lowest was from seedling number T2 (1) with 6.20cm. For tree diameter, seedling number T1 (2) form the biggest diameter with 4.31mm and the smallest was from seedling number T2 (1) with 3.14mm.

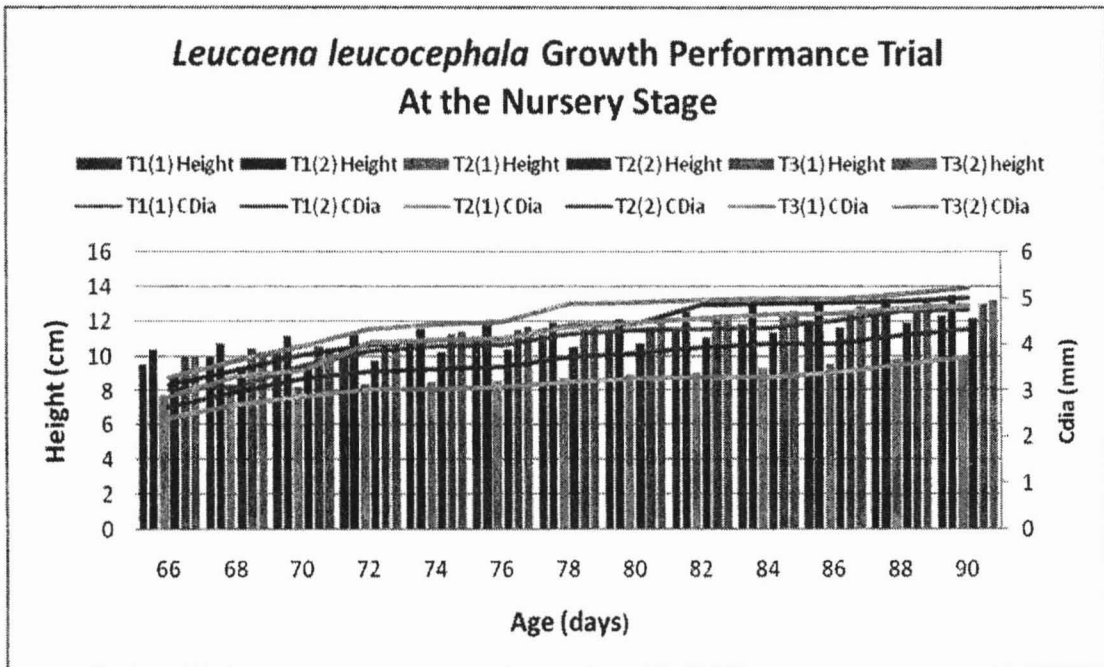


Figure 1: Growth Performance Trial at the Nursery Stage

Growth is the biological phenomenon of increase in size with time. The relationships of tree size to age and increment to age are important to the researcher particularly in predicting future growth. The means for all trees assessed for tree height according to age are given in Figure 2. Generally, the performances preliminary study indicates that *Leucaena* trees

are growing at 44% from the first month of planting to the fourth month. However, it is expected that the tree height will increase higher if the planting distance from at 3m x 3m used during the trial is reduced such as 1m x 1m or less. It was observed that at planting distance of 3m x 3m, the *Leucaena* plants planted in the field then go sag and grows directionally according to the wind direction, indicating that when young they need to be supported until they are bigger in size. The species has a potential because of its better growth rate and hopefully can produce more woody material at maturity stage.

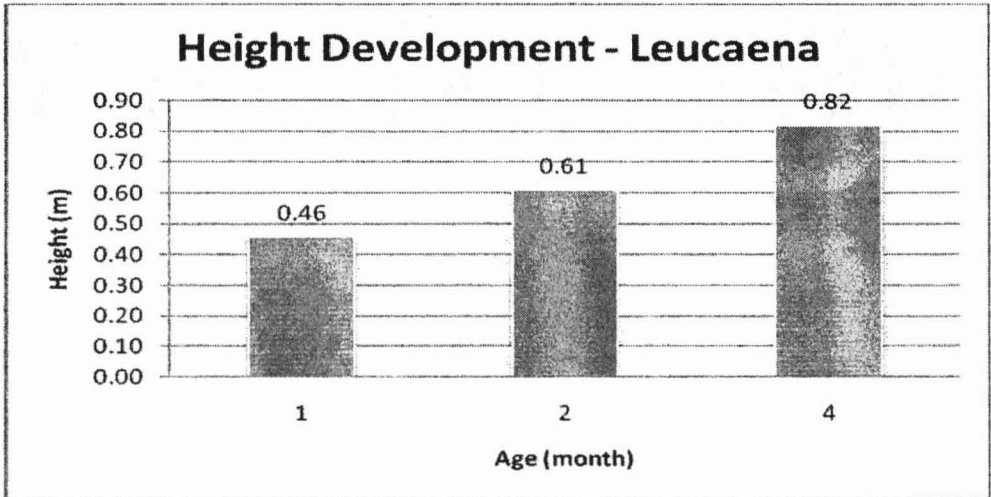


Figure 2: Height Development of *Leucaena*

The seedlings were transfer to the trial plot at 3 months old. The plant shows immediate height growth after 4 months showing its potential as a fast growing plantation species. After 5 months 5 the tree has towered reaching at height of more than 6 ft.

Future Planning

These results show that *Leucaena* has the potential to become a super fast growing forest plantation species. However, from the early study it is shown that it is prone to sagging if planted far apart. Further study is required to investigate the effect of planting spacing on the tree growth. Preparation is under way to plant *Leucaena* in a 10 ha. trial plot in Sabah Softwoods Berhad area.

Conclusion

In the initial stage of growth *Leucaena* has shown it potential to be a very fast growing plantation species. Further studies will need to focus on planting spacing and addition of fertilizer. It is hope that the results obtained at this early stage can provide an insight of *Leucaena* development potential in becoming a fast growing plantation species.

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