EFFECT OF STUMP DIAMETER OF TEAK ON POST PLANTING SURVIVAL AND SUBSEQUENT GROWTH OF HEIGHT AND DIAMETER

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Stump planting is the usual practice for raising Teak plantations in Bangladesh. An experiment was conducted to find the effect of stump diameter of Teak on post planting survival and subsequent growth of height and diameter. Stumps of 1.01 to 2.00 cm diameter were found to be the optimum for raising successful Teak plantations.

INTRODUCTION

Teak (*Tectona grandis* L.) is the premier species both in terms of properties, and appearance and is the top demanded species in Bangladesh. In recent years, heavy demand of timbers in the industries has led the Forest Department to choose fast growing species on short rotations. Still the demand of Teak for constructional and cabinet manufacturing purposes and also for export is very high. It is, therefore, being planted only under the long rotation cycle.

Stump planting is the usual practice for raising Teak plantations. Seedlings are raised in the nursery, one year ahead, for stump-planting during May–June in the following year. Standard stumps constitute about 15.0 cm of root and 4.0 cm of shoot (Anon. 1974, Choudhury 1975). It has been indicated by previous workers that stumps of 1.0 to 2.0 cm diameter (Griffith 1939, Anon. 1944, Anon. 1945, Anon. 1947) were most suitable for planting. However, in Bangladesh, the suggested diameter was 1.0 to 2.5 cm (Anon. 1959). But this suggestion is not followed in the field and the variations in the stump size are often wide. Even the very thin ones which should be discarded right away, are generally planted. Partial failures of Teak plantation and suppression of plantation by weeds are often reported. An experiment was, therefore, conducted to find the effect of stump

size on post planting survival and subsequent diameter and height growth of Teak.

EXPERIMENTAL DESIGN

The experiment was set up at the Forest Research Institute in a randomized complete block design with five treatment (stump diameter) plots in four blocks (replicates). Twenty five stumps of a single treatment were planted in each of the treatment plots at 0.46 m x 0.46 m spacing. The plots were randomly allocated to each block. The treatments were :

Treatment No.	Stump dia, in cm
1	0.50 and under (T_1)
2	0.51 to 1.00 (T_2)
3	1.01 to 1.50 (T_3)
4	1.51 to 2.00 (T_4)
5	Over 2.00 (T_5)

Before planting the stumps the soil was worked properly. Each stump had 3.0 cm of shoot and 15.0 cm tap root. The initial diameter of the stumps was measured at the collar before planting. No replacement was done in case of mortality. Three post planting weedings were done. Subsequently, survival, collar diameters and heights were recorded at monthly intervals for eleven consecutive months.

RESULTS AND DISCUSSIONS

It was found that the mean value of the treatments varied from 34.05 cm to 55.93 cm and 1.03 cm to 1.35 cm for height and diameter growth respectively ; whereas the percentage of survival varied from 67 to 93 at the end of the observation period of eleven months. Analysis of variance and regression analysis (Figs. 1 & 2) were, therefore, carried out to assess the significance of differences and the trends of diameter and height growth.

It seems that the treatments 3 and 4 varied significantly from other treatments (critical difference 15.81 at 5% level) in respect of survival. The same also differed significantly from others in respect of diameter and height growth (critical differences 0.095 and 6.009 respectively at 5% level).

The linear regressions of height and diameter growth on age also reveal that the growth response and trend were definitely better in the stumps of treatments 3 and 4 than the others. The slower response of the stumps of over 2.0 cm diameter is probably due to the shock received in the process of stump preparation resulting in slow development of root system and sometimes killing the stump altogether, as greater proportion of tap root is eliminated in higher diameter class seedlings than the lower ones.

It is, therefore, felt necessary to develop a nursery technique so that about 90 percent of the nursery stock become available in the desired diameter class at the time of stump preparation. In this regard, it is considered that by deebling pre-germinated seeds at regular spacing and also by reducing the photosynthetic surface it may be possible to obtain the seedlings witnin the desired diameter range.

CONCLUSION

The stumps of 1.0 to 2.0 cm diameter may be recommended as planting stock for successful plantation of Teak. An experiment

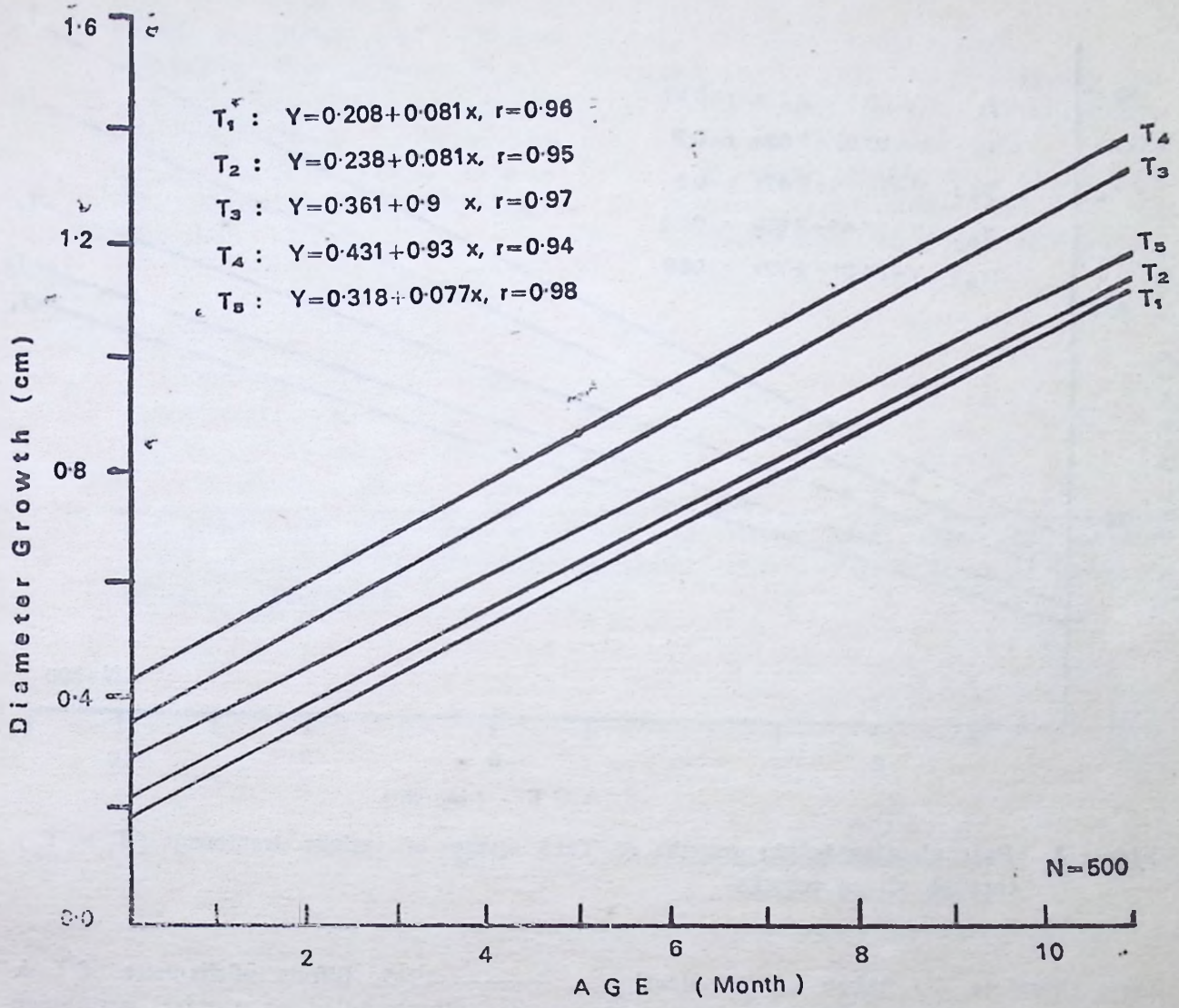

Figure 1. Post planting diameter growths of Teak stumps of various treatments (T_1 to T) through eleven months

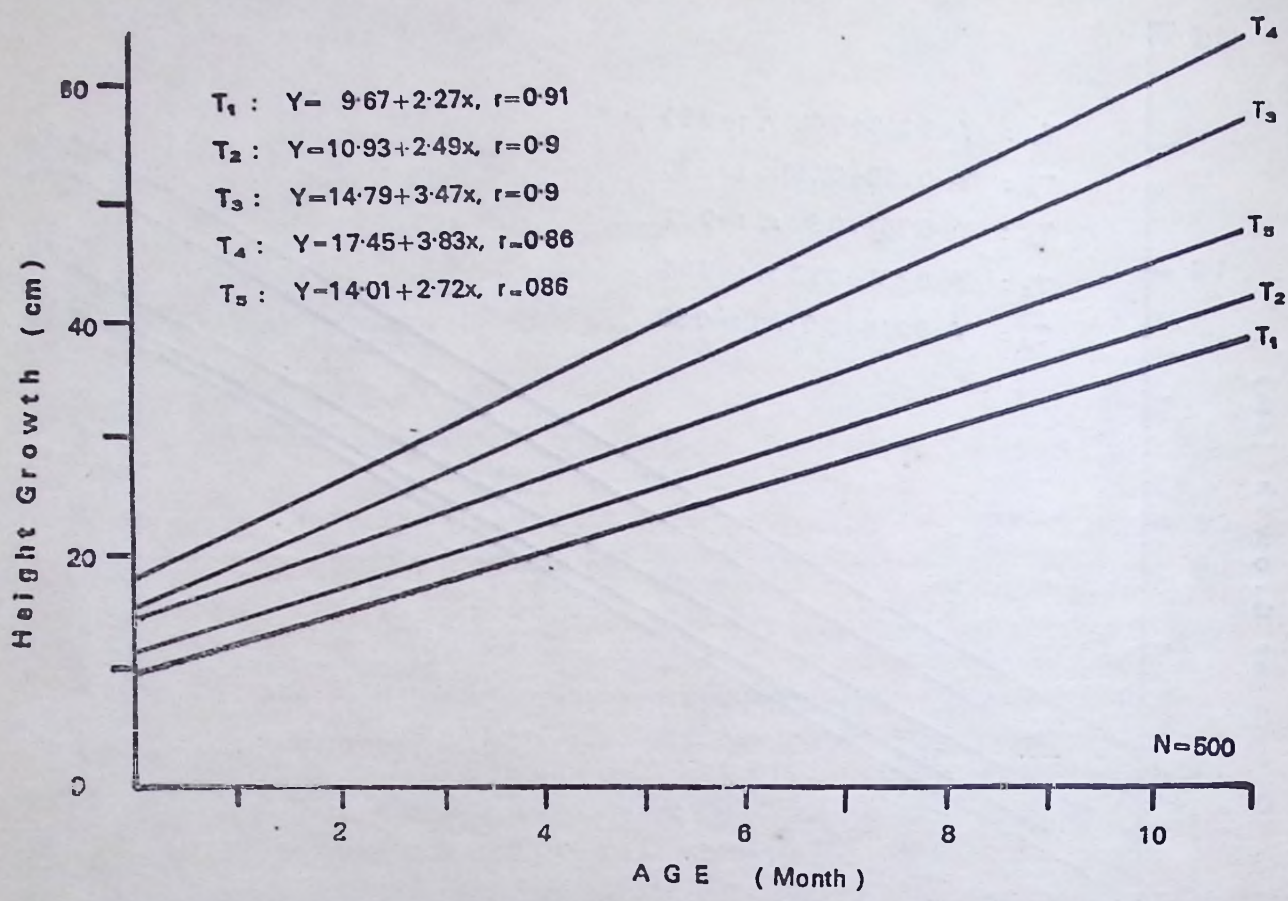

Figure 2. Post planting height growths of Teak stumps of various treatments (T_1 to T_5) through eleven months

may, therefore, be taken up to develop a suitable nursery technique so that adequate number of stumps become available in the desired diameter range.

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