



PERFORMANCE OF GROWTH AND PRODUCTIVITY OF *TECTONA GRANDIS* IN PLANTATIONS AND FARMLANDS IN EASTERN PLAIN ZONE OF UTTARA KANNADA DISTRICT OF KARNATAKA (INDIA)

GIRISH B. SHAHAPURMATH^{1*}, M. HANUMANTHA¹, V. RASHMI² AND A.G. KOPPAD¹

¹College of Forestry, UASD, Sirsi-581 401, Uttara Kannada (Karnataka), INDIA²

²Raita Samparka Kendra, Sirsi-581 401, Uttara Kannada (Karnataka), INDIA

*Corresponding author: girishbshahapur@gmail.com

ABSTRACT: The present investigation was carried out to understand the performance of growth and productivity potential of *Tectona grandis* grown in plantation as well as in the farmlands at Uttara Kannada district of Karnataka. The growth of teak tree grown in farmland was significantly higher than tree grown in pure plantation. For instance, the overall height (12.24 m), diameter (28.04 cm), clear bole height (7.38 m), tree volume (0.925 m³) and timber volume (0.596 m³) were higher in farmland than trees grown in pure plantation (12.09 m, 25.73 cm, 6.52 m, 0.727 m³ and 0.413 m³, respectively). However, crown parameters did not show significant difference among trees grown in pure plantations and farmlands. There was a strong influence of age on growth of teak trees grown in both farmland and pure plantation. For instance, tree height (15.71 m) and diameter (35.75 cm) of higher age class (A₄: 21-25 years) were maximum as compared lower age class (A₁: 5-10 years) with values of 8.33 m and 18.83 cm, respectively. Similar trend was also recorded for volume, clear bole height, crown height, crown length and crown diameter in teak. It is concluded that teak grown in farmland produce higher growth and volume as compared to pure plantation, since management practices and cultural operations are regularly undertaken in the farmlands; however, regular management is scanty in pure plantation which is need to be tackled to get more productivity.

Keywords: Pure plantation, Farmland, Tree and Timber volume, Silvicultural management.

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Teak (*Tectona grandis* Linn. f.) is an important world tropical timber species (Family: Lamiaceae), growing naturally in India, Burma, Thailand, Indonesia and Philippines. Teak is one of the most valuable and widely planted species of south India. It has a long history as plantation species due to its valuable timber which is considered as king of timber species. The earliest record of commercial teak plantation, which is known, dates back to 1844, when the British established a plantation in Malabar. The total area under teak in India is about 104 m ha. In Karnataka, teak forests cover an area of 77, 900 ha with an annual production of 7,080 m³. The growth of teak is influenced by several biotic and abiotic factors. According to India State of Forest Report, the growing stock of India's forests is estimated to be 6047.16 million m³ (ISFR, 2013). Significantly, out of this volume, 1550 million m³ or 26% is found outside the actual forest area and mainly managed by smallholder farmers. Of the total growing stock, 4.6% consists of teak, which is the most common species in forest plantations in the country. The

total area of teak plantations is reported as 1.7 million ha (Gilbert, 2012).

It is clearly recognized in India that farmers and communities are in key position for fulfilling the national goal of 33% forest cover stated in the National Forest Policy, 1988. There is already a rapid rise in tree cover in agroforestry systems in India, and this gives new opportunities for growing teak by smallholder farmers (GOI, 2009). The systematic management of teak forests started in colonial British India and has continued to the present day all over the tropical world by commonly applying agroforestry practices in plantation establishment (the taungya system and similar approaches elsewhere). However, a distinct disadvantage in this system was the exclusion of farmers from the benefits brought about by trees (Evans and Turbull, 2004).

Long rotations are commonly seen as a problem in growing teak, especially in farm forestry. In a study comparing the profitability of fast-growing plantation species with that of teak in Thailand, Niskanen *et al.* (1993) suggested several ways to overcome this constraint. The most efficient way would be to use a