

Effect of initial planting density and tree features on growth, wood density, and anatomical properties from a *Hevea brasiliensis* trial plantation

ABSTRACT

The effect of initial planting density (500, 1,000, 1,500, and 2,000 trees per ha) on tree growth, wood density, and wood anatomical properties was studied in a 9-year-old *Hevea brasiliensis* plantation in Malaysia. Results showed that effects of initial planting density on tree radial growth, wood density, fiber length, fiber wall thickness, and ray density were more visible in trees planted at 500 trees per ha compared with the other planting densities. Bole length was significantly increased with higher planting densities. However, vessel density showed an infinite pattern with increasing planting density. For vessel and ray areas, no significant effect of initial planting density was detected. A negative relationship was observed between wood density, fiber length, and fiber wall thickness with planting density, bole length, and height-to-diameter ratio. The ray density was significantly and positively correlated with stand/tree features with the exception of a negative correlation with radial growth increment. The regression models with various degrees of goodness of fit indicated that wood density followed by fiber wall thickness was successfully quantified due to selected stand/tree features. According to the results of this study, it is recommended that a low planting density of 500 trees per ha is ideal for rubberwood plantation development.

Keyword: Initial planting density; Tree growth; Wood density; Wood anatomical properties; *Hevea brasiliensis*