**Growth performance and biomass accumulation of a Khaya ivorensis plantation in three soil series of Ultisols**


## Abstract

Problem statement: There was no information about the relationship between growth parameters, such as diameter and height and tree component biomass of Khaya ivorensis plantations with different soil types. The objectives of this study were, first, to determine and compare the growth of K. ivorensis in three different (Padang Besar, Durian and Rengam) soil series of Ultisols and, second, to develop an allometric equation that estimates the biomass accumulation of the K. ivorensis plantation in three different soil series five years after planting. Approach: This study was conducted at a K. ivorensis plantation in the Forest Research Institute Malaysia (FRIM) Research Station in Segamat, Johor, Malaysia. The tree height (H) and Diameter at Breast Height (DBH) were measured to evaluate the growth performance of the K. ivorensis plantation. Five sampled or trees stand of K. ivorensis in each soil series were destructively analyzed. Results: The highest growth rates in terms of MAI diameter and height, and basal area were found for the Padang Besar soil series, which was followed by the Durian and Rengam soil series. The best fit regression of site-specific equations developed from the independent variable D are recommended for estimating tree component biomass and stem volume in each site. A single allometric equation using D was applicable for the estimation of biomass and stem volume however, in Padang Besar, stem biomass and stem volume were estimated with an equation using D 2H. The highest stem volume and biomass accumulation value were recorded at Padang Besar (77.99 m 3 $h^{-1}$ and 63.16 t $ha^{-1}$, respectively), which was followed by the Durian (53.10 m 3 $h^{-1}$ and 46.33t $ha^{-1}$, respectively) and Rengam soil series (43.13 m 3 $h^{-1}$ and 40.96 t $ha^{-1}$, respectively). Conclusion: Differences in the growth and biomass accumulation data indicate that forest productivity of K. ivorensis was affected by different site conditions. The higher growth performance and productivity of K. ivorensis in terms of the stem volume and biomass accumulation in Padang Besar

compared those in the Durian and Rengam soil series shows that the species was able to adapt to the soil characteristics of the Padang Besar soil series.