

Effect of the lateral growth rate on wood properties in fast-growing hardwood species

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Abstract

We investigated the feasibility of using several fast-growing tropical or subtropical hardwood species for timber production by measuring key wood qualities in relationship to the high rates of lateral growth. The trees tested were sampled from even-aged plantations of *Acacia mangium*, *A. auriculiformis*, hybrid *Acacia* (*A. mangium* × *A. auriculiformis*), *Eucalyptus grandis*, *E. globulus*, and *Paraserianthes falcataria* (Solomon and Java origin) that had already reached commercial harvesting age. The released strain of the surface growth stress (*RS*), xylem density (*XD*), microfibril angle (*MFA*), and fiber length (*FL*) were measured at the outermost part of the xylem at breast height in each tree. Results were then compared to the lateral growth rate (radius/age) at breast height, which provides a relative indicator of the amount of tree growth per year. Our findings indicated that *RS* was constant, regardless of lateral growth rate in each species. Similar results were observed for *XD*, *MFA*, and *FL*, with a few exceptions, suggesting that high growth rates do not intrinsically affect the wood properties of fast-growing tropical or subtropical species that have reached harvesting age. However, special attention must be paid to patterns of xylem maturation when developing plantations of such species.

Key words *Paraserianthes falcataria* - *Eucalyptus* - *Acacia* - Growth stress - Tropical - Plantation