

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

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.

Keyword: *Paraserianthes falcataria*; *Eucalyptus*; *Acacia*; Growth stress; Tropical; Plantation