Comparison of teak wood properties according to forest management: short versus long rotation

ABSTRACT

Key message: Teak (Tectona grandis L.f.) is one of the most important tropical hardwood tree species, which is widely planted in Indonesia. Wood properties are strongly influenced by forest management conditioning further utilization of wood. Context: In Indonesia, teak wood has been supplied from the state forests (Perhutani) for long rotation teak and from community teak plantations for short rotation teak. Short rotation teak has been harvested at 7–10 years and long rotation teak at 40–60 years. Aims: This paper discusses the characterization of technical properties of short and long rotation teak wood based on the chemical, anatomical, physical, and mechanical properties. Methods: The properties of short rotation and long rotation teak woods were characterized by measuring their density, extractive contents, chemical composition, swelling, wettability, water sorption isotherm, decay resistance, anatomical properties, bending strength (modulus of rupture (MOR), modulus of elasticity (MOE)), and hardness. Results: The results indicate that short rotation teak was not particularly different in swelling, MOE and MOR, and Brinell hardness compared to long rotation teak, although it was less dense and less durable due to lower heartwood and extractive contents. Therefore, careful attention should be given to the use of short rotation teak in some wood-processing technologies. Conclusion: Lower wood density and durability of the short rotation compared to the long rotation teak will restrict its utilization to some extent for both indoor and outdoor applications. Fast-growing teak from community cannot be used as usual heartwood teak from Perhutani because of the very low proportion of useful heartwood in the stem.

Keyword: Extractives; Durability; Forest management; Rotation; Tectona grandis; Wood properties