VARIASI AKSIAL dan RADIAL SIFAT FISIKA dan MEKANIKA KAYU GMELINA (*Gmelina arborea* Roxb.) UMUR 16 TAHUN DARI KPH TELAWA KABUPATEN BOYOLALI

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INTISARI

Untuk memenuhi kebutuhan bahan baku industri, maka dilakukan beberapa upaya pengelolaan hutan lestari diantaranya adalah pengembangan Hutan Tanaman Industri (HTI). Salah satu jenis tanaman yang dikembangkan di area HTI adalah gmelina (*Gmelina arborea* Roxb.). Agar pemanfaatan kayu dapat optimal, perlu diketahui sifat fisika dan mekanikanya, yang mana sampel pada penelitian ini berasal dari KPH Telawa RPH Soroweyo, BKPH Karangrayung, Kabupaten Boyolali, Jawa Tengah.

Penelitian ini menggunakan rancangan acak lengkap dengan dua faktor dan 3 ulangan yaitu letak aksial batang (pangkal, tengah, dan ujung batang bebas cabang) serta letak radial batang (dekat hati, tengah, dan dekat kulit). Pembuatan contoh uji dan pengujiannya mengikuti British Standard Method nomor 373 tahun 1957.

Nilai rerata untuk kadar air segar dan kering udara kayu sebesar 106,15 % dan 14,37 %. Berat jenis segar, kering udara dan kering tanur kayu sebesar 0,434; 0,459 dan 0,472. Penyusutan longitudinal, tangensial dan radial dari kondisi segar ke kering udara berturut-turut sebesar 0,17%; 2,38% dan 1,17% serta dari kondisi segar ke kering tanur berturut-turut sebesar 0,39%; 5,96% dan 2,85%. Pengembangan longitudinal, tangensial dan radial dari kondisi kering tanur ke basah berturut-turut sebesar 0,32%; 5,05% dan 2,57%. Keteguhan lengkung statik sampai BP, MoE dan MoR berturut-turut sebesar 361,06 kg/cm^2; 73,74 (x10^3 kg/cm^2) dan 548,48 kg/cm^2. Keteguhan geser sejajar serat 100,43 kg/cm^2; Keteguhan belah 14,51 kg/cm^2; serta Kekerasan kayu arah radial dan tangensial sebesar 128,23 kg/cm^2 dan 153,01 kg/cm^2. Interaksi kedudukan aksial dan radial berpengaruh nyata terhadap pengembangan dimensi tangensial. Faktor kedudukan aksial berpengaruh sangat nyata terhadap berat jenis kering tanur dan keteguhan belah sejajar serat dan berpengaruh nyata terhadap berat jenis segar, berat jenis kering udara, penyusutan longitudinal dari kondisi segar ke kering udara dan penyusutan longitudinal dari kondisi segar ke kering tanur. Sedangkan kedudukan radial berpengaruh sangat nyata terhadap berat jenis segar, berat jenis kering udara, berat jenis berat kering tanur, pengembangan radial, keteguhan lengkung statik pada batas proporsi, MoE dan MoR serta berpengaruh nyata terhadap penyusutan dimensi radial dari kondisi segar ke kering udara, pengembangan dimensi tangensial, keteguhan geser sejajar serat dan keteguhan belah sejajar serat.

Kata kunci : gmelina, sifat fisika kayu, sifat mekanika kayu, letak aksial, letak radial, longitudinal, tangensial, radial, BP, MoE, MoR

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AXIAL and RADIAL VARIATION OF THE PHYSICHAL and MECHANICAL PROPERTIES OF GMELINA (Gmelina arborea Roxb.) 16th YEARS OLD FROM KPH TELAWA KABUPATEN BOYOLALI

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ABSTRACT

In order to meet the requirement of industry raw material, it's applied some sustainable forest management efforts such as Industrial Plantation Forest development. One of plantation which developed in Industrial Forest Plantation area is gmelina (*Gmelina arborea* Roxb.). To optimized the used of wood, it needs to know the phisical and mechanical properties, which is the sample of this research coming from KPH Telawa, RPH Soroweyo, BKPH Karangrayung, Kabupaten Boyolali, Central Java.

This study was carried out by using Completely Randomized Design (CRD) of two potition factor that is axial potition (bottom, middle of height, and top of the tree) and radial positions (nearby pith, middle, and nearby bark). All the wood samples used for the measurement were prepared according British Standard of Method BS 373.

Gmelina wood has an average green and air-dry Moisture Content (MC) of 106,15 % and 14,37 % respectively. Specific gravity (SG) in green wood, air dry and oven-dry are 0,434; 0,459 and 0,472. The average longitudinal, tangential and radial shrinkage of the wood from green to air-dry condition are 0,17%; 2,38% and 1,17% and also from green to oven-dry condition successively are 0,39%; 5,96% and 2,85%. The average longitudinal, tangential and radial swells of wood from oven-dry to wet condition successively equal to 0,32%; 5,05% and 2,57%. The Static Bending Strength in Proportion Point (PP), MoE and MoR successively equal to 361,06 kg/cm^2; 73,74 (x10^3 kg/cm^2) and 548,48 kg/cm^2. The shearing strength value is 100,43 kg/cm^2; the resistance to cleavage value is 14,51 kg/cm^2; and also wood hardness in the radial and tangential side are 128,23 kg/cm^2 and153,01 kg/cm^2. The interaction of axial position and radial position is significantly affect to the tangential swells. The axial position factor is very significant to SG in oven-dry and resistance to cleavage and significant to SG in green wood, SG in air-dry, longitudinal shrinkage from green to air-dry condition and longitudinal shrinkage from green to oven-dry condition. The radial position is very significantly affect to SG in green wood, SG in air-dry, SG in oven-dry, radial swells, Static Bending Strength in Proportion Point (PP), MoE and MoR, and significant to radial shrinkage from green to air-dry condition, tangential swells, the shearing strength and resistance to cleavage.

Keyword: gmelina, wood physical properties, wood mechanical properties, axial position, radial position, longitudinal, tangential, radial, PP, MoE, MoR

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