VARIASI RADIAL TERHADAP SIFAT DIMENSI SERAT, FISIKA DAN MEKANIKA KAYU JATI (Tectona grandis L.f) HASIL PENJARANGAN PADA BERBAGAI UMUR DARI KPH KENDAL

Oleh:
Rama Andre Nugroho[1] dan Joko Sulistyo[2]

INTISARI

Peningkatan jumlah penduduk berbanding lurus terhadap jumlah kebutuhan kayu nasional. Pemanfaatan kayu secara optimal diperlukan sebagai solusi permasalahan pemenuhan kebutuhan kayu nasional. Kayu jati penjarangan merupakan salah satu potensi dengan terlebih dahulu perlu diketahui sifat-sifatnya meliputi sifat dimensi serat, fisika dan mekanika agar didapatkan pengolahan secara tepat.

Penelitian menggunakan rancangan acak lengkap dengan dua faktor dan tiga ulangan, yaitu umur (12, 15, 20 dan 25 tahun) serta letak radial batang (dekat hati dan dekat kulit). Pembuatan contoh uji dimensi serat mengikuti Standar TAPPI tahun 1957 dan contoh uji fisika mekanika mengikuti British Standard Method 373 tahun 1957.

Kayu jati hasil penjarangan di KPH Kendal mempunyai kecenderungan sifat fisika, mekanika dan dimensi serat yang sama. Nilai kisaran dimensi serat meliputi panjang serat, diameter serat, diameter lumen dan tebal dinding serat sebesar 0,91-1,39mm; 23,11-26,5µm; 10,83-13,46µm dan 5,45-7,18µm. Nilai kisaran fisika berupa kadar air pada kondisi basah dan kering udara kayu sebesar 21,99-43,63% dan 14,85-17,44%. Berat jenis dalam kondisi basah, kering udara dan kering tanur sebesar 0,46-0,56; 0,47-0,58 dan 0,50-0,63. Penyusutan longitudinal, tangensial dan radial dari kondisi basah ke kering udara sebesar 0,1-1,9%; 2,02-3,62% dan 1,56-2,9% serta dari kondisi basah ke kering tanur sebesar 0,2-1,1%; 3,68-6,47% dan 2,18-3,68%. Pengembangan longitudinal, tangensial dan radial dari kondisi kering tanur ke basah sebesar 0,31-1,16%; 4,87-7,26%, dan 3,42-4,4%. Nilai kisaran mekanika berupa keteguhan lengkung statik pada batas proporsi (BP), modulus elastis (MoE) dan modulus patah (MoR) sebesar 352,71-694,99 kg/cm^2; 67,7x10^3-110,36x10^3 kg/cm^2 dan 597,09-951,48 kg/cm^2. Keteguhan geser sejajar serat, keteguhan tekan sejajar serat dan keteguhan tekan tegak lurus serat sebesar 122,7-150,02 kg/cm^2; 283,7-458,74 kg/cm^2 dan 127,11-263,49 kg/cm^2. Hasil penelitian tidak dijumpai interaksi antara umur dan kedudukan radial terhadap sifat dimensi serat, fisika dan mekanika. Faktor kedudukan radial memiliki kecenderungan nilai meningkat dari bagian dekat hati menuju dekat kulit, sedangkan pada variasi umur tidak memiliki kecenderungan nilai tertentu.

Kata kunci : jati, sifat fisika, sifat mekanika, sifat dimensi serat, perbedaan umur, kedudukan radial

[1] Mahasiswa Jurusan Teknologi Hasil Hutan Fakultas Kehutanan UGM

[2] Pembimbing skripsi, Staf Pengajar Bagian Teknologi Hasil Hutan Fakultas Kehutanan UGM

RADIAL VARIATION ON FIBER DIMENSION, PHYSICAL AND MECHANICAL PROPERTIES OF TEAKWOOD (Tectona grandis L.f.) OBTAINED FROM THINNING IN VARIOUS AGES FROM KPH KENDAL

By:
Rama Andre Nugroho[1] and Joko Sulistyo[2]

ABSTRACT

The increasing of population directly affected to the increasing timber demand nationaly. Optimum timber utilization is requires to solve those problem. Teakwood obtained from thinning is a huge potency which is need to be research from its properties including fiber dimension, physicals and mechanicals to obtain a proper processing.

This study used completely randomized design with two factors including tree ages (12, 15, 20 and 25 years) and radial position (near pith and near bark). The samples of fiber dimensions evaluated according TAPPI Standard 1957 and physicals mechanicals were evaluated according to British Standard Method 373 1957.

Teak obtained from KPH Kendal thinning had similar fiber dimensions, physical and mechanical properties. The value of fiber dimensions including fiber length, fiber diameter, lumen diameter and fiber wall thickness were 0.91-1.39mm, 23.11-26.5µm, 10.83-13.46µm and 5.45-7.18µm, respectively. Physical value including moisture content (MC) on wet and dry condition were 21.99-43.63% and 14.85-17.44%. Specific gravity of wood in wet, air-dry and oven-dry condition were 0.46-0.56; 0.47-0.58 and 0.50-0.63. The longitudinal, tangential and radial shrinkages of wood from wet to air-dry condition were 0.1-1.9%, 2.02-3.62% and 1.56-2.9% as well as from wet to oven-dry condition were 0.21-1.1%, 3.68-6.47% and 2.18-3.68%. The longitudinal, tangential and radial swealling of wood from oven-dry to wet condition were 0.31-1.16%, 4.87-7.26%, and 3.42-4.4%. Mechanicals properties covering Static Bending Strength Proportion Limit, Modulus of Elasticity (MoE) and Modulus of Rupture (MoR) were 352.71-694.99 kg/cm^2, 67.7x10^3-110.36x10^3 kg/cm^2 and 597.09-951.48 kg/cm^2, respectively. The shear strength, shear strength parallel to grain and shear strength perpendicular to grain were 122,7-150,02 kg/cm^2; 283,7-458,74 kg/cm^2 and 127,11-263,49 kg/cm^2. The results showed no interaction between age and radial position on fiber dimensions, physicals and mechanicals properties. Factor of radial position has an increasing value tendency from near pith to near bark, while variation of age have no certain influence.

Keywords: teak, physical properties, mechanical properties, fiber dimension properties, differences in age, radial position

[1] Student Department of Forest Products Technology, Faculty of Forestry UGM

[2] Supervisor and Lecturer of Forest Products Technology, Faculty of Forestry UGM