The trees showed a relatively high heartwood proportion in the cross-sectional area: 35.0 % at tree base and 37.1 % at 1.30 m, and then decreasing to 11.3 % at 5.60 m of tree height. Sapwood width was relatively constant along the stem showing 47.6 mm at tree base and 37.2 mm at 5.6 m of height. The amount of heartwood was strongly correlated with stem cross-sectional area.

Tree ring width at 1.30 m increased 1.3 mm in the first 10 rings, decreasing gradually afterwards from 3.1 mm until an average of 1.3 mm at around 40 years of age. The between-tree variability of ring width was high. The differences were statistically significant during the first 30 years of cambial age but decreased with tree aging.

The wood showed distinct rings and ring-porosity. Earlywood vessels diameter increased from pith to periphery reaching in average 223 µm. Fibre length increased towards periphery from an average of 969 µm to 1195 µm. The fibre wall was thick maintaining relatively constant. Multiseriate ray size increased from pith to bark and showed high variability.

Basic density was in average 0.70 g/cm3 in heartwood and 0.58 g/cm3 in sapwood. Heart and sapwood density were significantly different and variability within tree and between trees was also observed.

The wood dimensional behaviour and water content were studied at 40ºC, 30ºC and 20ºC. The volumetric shrinkage varied between 14.7% and 16.1%. The shrinkage anisotropy measured by the T/R ratio varied between 2.2 and 2.4.

The wood chemical average composition was: ash 0.6%, total extractives 15.1%, total lignin 24.0% and polysaccharides 54.7%. Heartwood showed less ash content when compared to sapwood (0.5% and 1.0%, respectively) and a higher content of total extractives (19.3% and 10.8%, respectively). Lignin content and polysaccharides was quite similar in heart and sapwood.

Quercus faginea wood showed similar features to oaks in general which reinforce its capacity and potential as technological wood product.

Keywords: Quercus faginea, wood quality, growth, variability, heartwood

PP171

Physical Properties of Wood *Tectona grandis*

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Tectona grandis (teak) is an arboreal species of the family Verbenaceae, native to the wetlands of the Indian subcontinent and Southeast Asia, and today is cultived in almost all tropical regions. The importance and value of teak is due to the desirable physical and mechanical properties of wood, such as: durability, stability, ease of pre-treatment, natural resistence of fungi, insects, pests and borers. Besides these, important qualitative aspects makes it a most valuable hardwood species in the word. This paper presents a study on the physucal properties of the wood of T. grandis L. f. from three planting densities of plantings in Cárceres, Mato Grosso (Brazil).

Were used six trees, two of each planting density, randomly selected with good features and phytosanitary representative height and diameter of the settlement, from the pantation ehit three different spacings of 30 years in Cárceres. Was determined the following properties: basic and apparent density, volumetric contraction, thermal transfer and saturation point of the wood fibers.

The overall average for the basic density of the samples was 0,48 g/cm3 , and 0,55 g/cm3 for apparent density. The average volumetric contraction in the longitudinal direction of wood teak was 8,57%. With the decrease in wood moisture content is also a loss in volume and the effects of panting were not signigicant at 5% probability. The thermal transfer averaged 7,3h/cm and saturation point of the wood fibers was 17,25%, below the range found in literature and there was no influence of planting density for this property. According to our results, was concluded that the planting density significantly influenced the basic density of wood, the same effecr does not occur for the others physical properties and considering the thermal transfer, the wood was considered as a difficult drying.

Keywords: Wood material science; behavior of wood; Tectona grandis ; drying of wood.

PP172

Wood quality of eucalyptus plantation in Brazil

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The area of eucalyptus plantations in Brazil is 4,3 million ha, as a result of the fiscal incentives policies implanted in the 60's. That significant area concentrated mainly in the states of Minas Gerais, Sao Paulo and Bahia seeks to supply the demand of the Brazilian forest industries, with strong expansion to attend the national and international market. Actually, the possibility of a wood shortage in the next decade has been stimulating an inversion in the decreasing tendency in the annual reforestation rates.

Also, investments have been applied to genetic improvement, nutrition, soil preparation and, recently, with the experimental practice of fertilization associated with the irrigation. For example, the Project Brazil Eucalyptus Potential Productivity, initiated in 2000, demonstrated that the eucalyptus clone plantation presents a mean productivity of 49 m^3/ha/year applying the traditional technique, that includes the fertilization. Without the fertilization the wood productivity is reduced to 34 m^3 ha-1 year. The introduction of the irrigation increase the wood productivity to 63 m^3 ha-1 year and with the irrigation plus fertilization the productivity reaches 68 m^3 ha-1 year, representing an increase of 38% in relation to the usual silvicultural practices. While the irrigation and fertilization treatments increase the eucalyptus trees growth rate considerably, the information on the effects on the wood properties are scarce.

The knowledge of the wood property alterations due to the stimulus in the volumetric growth is essential to define the strategy for future research. According to the forest managers and wood technologists it is fundamental to consider the wood properties, even if the main objective is the increase of the wood volume of the eucalyptus trees on plantations. The lack of alterations in the wood characteristics, or even, the improvement of the quality for specific applications are considered desirable. This work has the aim to present the wood quality variation of the main eucalyptus tree species from fast-growing plantations established in Brazil.

Keywords: wood quality, fast-growing eucalyptus trees, wood properties.

PP173

Mass and carbon accumulation in trees of *Tectona grandis* L.F. by X-ray densitometry

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The CO2 removed from the atmosphere, along with the availability of light and water to produce sugar-rich substances that are vital to the development and growth of plants. Knowing how the CO2 builds up inside the tree, the amount that is embedded in the wood annually, and the carbon that is exported in the form of wood for paper production, pulp, furniture, which can be interpreted as carbon retained and stored biomass has been investigated and questions of many researchers. So based on that context, this research aims to quantify the stock of carbon in mass and radial sections of the trunk of trees of Tectona grandis from homogeneous stands located in the city of Cáceres / MT. Were selected 15 trees under different planting densities (6x2 m, 5x2m and 4x2m), in which of the base position were removed radial sections that were used to determine the accumulation of mass from the wood density data obtained by technique of X-ray densitometry and measured the area of each ring by Software "Cell ^ F" and thickness of the sample. The accumulated carbon for each growth ring was determined based on 50% of the accumulated mass. The results showed no significant differences at 5% significance level of carbon stocks and mass as a function of tree ring growth and spacing.

Keywords: wood density, carbon and mass quantification

PP174

Wood density and growth of several native open-pollinated *Eucalyptus globulus* families and some control seedlots from a progeny trial located central-coastal Portugal.

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Mean performances are given for wood density and stem volume over-bark at 9½ years for 138 native open-pollinated Eucalyptus globulus families and some control seedlots-Indicate which seedlots were used as control?? in a provenance trial located at Óbidos, central-coastal Portugal. This trial was planted in 1989 using 402 open-pollinated families collected as seed from native stands across the range of E. globulus in Australia. Of these 402 families originally planted, the faster growing 138 have been felled and measured at 9½ years. Stem dry weight has been estimated as the product of volume (cubic meters over-bark per stem) and basic density (kg/m3).

Jeeralang and St. Pauls River-Royal George had the highest wood basic density of the native E. globulus populations studied. The Henty River and Scamander populations had the lowest wood density. Portuguese landrace E. globulus as represented by the Altri Florestal improved full-sib families and the unimproved control had substantially higher mean densities than the Jeeralang and St. Pauls River-Royal George material.

Many of the best native open-pollinated families for stem dry weight are of Cape Otway origin; highlighting the importance of this source of E. globulus.

There is no serious negative genetic correlation between growth and density. It is clearly possible to simultaneously improve both growth and wood density.

Keywords: Eucalyptus globulus, native populations, progeny trial, growth, density, dry weight.

PP175

The anatomical characteristics and physical properties of *Cordia dodecandra* wood from commercial plantations

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In this study, we determined the anatomical characteristics, and the mechanical and other physical properties of siricote (Cordia dodecandra A. DC) wood in 10-year old trees from a commercial plantation in southeast Mexico.

Five trees were collected from Campeche, Mexico, and cut to 0.30 m-long discs for transportation. Macroscopic anatomical characteristic were obtained from 7 x 15 x 1 cm wood specimens, while the microscopic anatomical characteristics were determined from microtomed fixed sections and from macerated wood, following standard methods of the Wood Anatomy Laboratory of Chapingo University. Lateral and transversal Janka hardness and the next physical properties were determined according to ASTM standards: green moisture content; normal and basic densities; and linear and volumetric shrinkage.

Siricote wood has pale yellow sapwood, while the heartwood is redish-brown; it has diffuse -porous. Vessel elements are classified as medium and short, with simple perforation plate. Predominant axial parenchyma is paratracheal aliform confluent in bands, although there is scanty paratraqueal vasicentric parenchyma. Rays are heterogeneous, multiseriate, and classified as very numerous, high, and moderately broad. Fibers are slender, with thin walls and medium length. Based on the Runkel Ratio, the quality index for pulp production was deemed as fair. The proportion of xylem elements can be broken down into 10.0% vessel elements, 48.3% of fibers, 32.8% of rays, and 8.8% of axial parenchyma.

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