WOOD

NPARR 2(1), 2011-0117, **Optimum stand density of *Leucaena leucocephala* for wood production in Andhra Pradesh, Southern India**

Leucaena leucocephala is widely used as raw material for the manufacture of paper and packaging material and in biomass based power plants in the state of Andhra Pradesh, Southern India. Experiments were conducted to study the affect of tree density on the growth, biomass partitioning and wood productivity. Six treatments 1 × 1 m, 1.3 × 1.3 m, 3 × 0.75 m, 3 × 1 m, 5 × 0.8 m and 3 × 2 m corresponding to a tree density of 10,000, 6666, 4444, 3333, 2500 and 1666 were evaluated with leucaena variety K636. At 51 months after planting, spacings significantly influenced tree height, diameter at breast height (DBH), number of branches and biomass partitioning. Wider tree rows resulted in greater tree height and diameter growth resulting in higher per plant productivity. At harvest, 70% of trees in 3 × 2 m attained a diameter of more than 7.5 cm, while 35% of the trees attained the same DBH in 1 × 1 m spacing. Increased spacing levels decreased the relative amount of growth allocated to the bole of the tree. Marketable biomass yield was highest with 1 × 1 m spacing. Spacing of 3 × 0.75 m produced marketable biomass comparable to that of 1 × 1 m and greater proportion of stems with more than 5 cm diameter. Leucaena can be grown at 3 × 0.75 m spacing either for pulpwood or fuelwood depending on the prevailing market prices and demand [J.V.N.S. Prasad*˜ G.R. Korwar, K.V. Rao, U.K. Mandal, G.R.Rao, I. Srinivas, B. Venkateswarlu, S.N. Rao and H.D. Kulkarni (Central Research Institute for Dryland Agriculture, Santoshnagar, Hyderabad-500059, India), *Biomass and Bioenergy,* 2011, 35(1), 227-235].

NPARR 2(1), 2011-0118, **Calorific value of *Prosopis africana* and *Balanites aegyptiaca* wood: Relationships with tree growth, wood density and rainfall gradients in the West African Sahel**

Prosopis africana and *Balanites aegyptiaca* are native tree species in the West African Sahel and provide wood for fuel, construction and other essential products. A provenance/progeny test of each species was established at one relatively dry site in Niger, and evaluated at 13 years. Gross calorific value of the wood was determined for a random sample of trees in each test: gross CV and CVm^3 = gross calorific value in MJ kg^{-1} and MJ m^{-3}, respectively. The major objectives were to determine if gross CV was positively correlated with wood density and tree growth, and if gross CV and/or CVm^3 varied with rainfall gradients in the sample region. Provenances were grouped into a drier and more humid zone, and correlations were computed among all trees and separately in each zone. Results indicated that gross CV was not significantly correlated with density in either species. Gross CV was positively correlated with growth of *P. africana* (but not *B. aegyptiaca*) only in the drier zone. Gross CVm^3 was positively correlated with growth of both species, and the correlations were stronger in the drier zone. Multiple regressions with provenance latitude, longitude and elevation indicated that provenance means for gross CV increased, in general, from the drier to the more humid zones. Regressions with gross CVm^3 were not significant. Results are compared with earlier research reports from the provenance/progeny tests and with other tropical hardwood species; and practical implications are presented for tree improvement and conservation programs in the region [Carmen Sotelo Montes*, Dimas Agostinho da Silva, Rosilei A. Garcia, Graciela Inês Bolzón de Muñiz˙ and John C. Weber (World Agroforestry Centre (ICRAF), Sahel Office, B.P. E 5118 Bamako, Mali), *Biomass and Bioenergy,* 2011, **35**(1), 346-353].

NPARR 2(1), 2011-0119, **Extraction of condensed tannins from grape pomace for use as wood adhesives**

The extraction of condensed tannins from grape pomace was examined using a mixture water–sodium hydroxide at 120 °C. The extracts were characterized by solution ^{13}C NMR and have showed characteristic consistent with that of condensed tannins with dominant procyanidin units. The tannin fractions reactivity toward formaldehyde was studied by gel time analysis and thermomechanical analysis in bending. It has been demonstrated that the extracts obtained by using 10% of NaOH (w/w) displayed promising properties for adhesive applications [Lan Ping*, Nicolas Brosse˜ LaurentChrusciel, Paola Navarrete and Antonio Pizzi (College of Wood

Science and Technology, Nanjing Forestry University, Nanjing 210037, China), *Industrial Crops and Products,* 2011, **33**(1), 253-257].

NPARR 2(1), 2011-0120, **Effect of outdoor exposure on some properties of resin-treated plybamboo**

The objective of this investigation was to evaluate some of the physical and mechanical properties of resin-treated plywood type panels manufactured from bamboo strips (*Gigantochloa scortechinii*). Experimental plybamboo samples were made from low molecular weight phenol formaldehyde (LMwPF) treated bamboo strips. They were exposed to outdoor condition ranging from 1 to 12 months. Modulus of elasticity (MOE), modulus of rupture (MOR), compression strength, and surface roughness of treated and untreated samples were evaluated. Resin impregnated samples had the highest bending and compression strength properties. While the untreated samples failed after 3-month of outdoor exposure. Treated specimens exposed for 12-month had the MOE, MOR, and compression strength values of 14,253 N/mm^2, 101.3 N/mm^2, and 34.63 N/mm^2, respectively. Surface quality of both treated and untreated samples was adversely influenced as the function of outdoor exposure time, based on numerical values obtained from a stylus type equipment. Overall properties of treated samples tested in work resulted in higher values than those of untreated samples. It appears that resin impregnation could be considered as an alternative method to enhance the characteristics of plybamboo exposed to environmental conditions as can be concluded from the results of this study [U.M.K. Anwar*, Salim Hiziroglu, H. Hamdan, and M. Abd.Latif (Forest Products Division, Forest Research Institute Malaysia, 52109 Kepong, Malaysia), *Industrial Crops and Products***,** 2011, **33**(1), 140-145