

Physical and mechanical properties of low quality cultivated canes modified with vinyl thermoplastics.

ABSTRACT

Physical and mechanical properties of vinyl thermoplastic-modified Calamus manan aged 10 and 13 years grown under rubber tree canopy were investigated. Canes from diameters of 25-29mm, 35-39mm and 40-44 mm were selected and impregnated with polystyrene (PS) and polymethyl methacrylate (PMMA) solution. Three different concentrations of 5%, 15% and 25% solutions were prepared by dilution process with methyl ethyl ketone (MEK). Impregnation by vacuum and pressure was applied. Modified canes with PS had greater polymer loading, thicker coat and higher water resistance but showed lower dimensional stability than those of PMMA. Canes modified with 25% concentration had greater coats, density, water resistance, dimensional stability but had lower water absorption and diameter swelling than those from lower concentrations. Mechanical properties of modified canes of either age or thermoplastic were improved over the untreated control, where the compression strength increased with increasing polymer concentration. Overall, all the mechanical properties of modified cane at 5% concentration were found to be higher than untreated cultivated canes and commercial canes of unknown age.

Keyword: Modification; Impregnation; Cultivated cane; Thermoplastic; Properties.