

Pulping characteristics of Acacia melanoxylon wood as an exotic species in Portugal

António SANTOS^{1,2}, Rogério SIMÕES², Helena PEREIRA¹ and Ofélia ANJOS^{3,4}

¹Forestry research centre, Instituto Superior de Agronomia, Universidade Técnica de Lisboa, Lisboa, Portugal.

²Unit of Textile and Paper Materials, University of Beira Interior, Covilhã, Portugal.

³Instituto Politécnico de Castelo Branco, Escola Superior Agrária (IPCB/ESA), Castelo Branco, Portugal

⁴Centro de Estudos de Recursos Naturais, Ambiente e Sociedade (CERNAS), Coimbra, Portugal

Abstract

Acacia melanoxylon is one of the main wattle species that have disseminated in Portugal since introduction through plantations in the dry and poor sandy soils along the coast in the beginning of the XX century. Blackwood is one important timber tree and the potential as pulpwood of *A. melanoxylon* grown in Portugal has been recently studied (Santos et al, 2006; Lorenço et al, 2008).

The importance of wood density and pulp yield are key parameters in the evaluation of tree productivity and quality for pulping and their relationships are of high practical importance.

The influence of wood density on pulp yield and other pulp quality parameters using as a case study *Acacia melanoxylon* and its natural within and between tree variability were investigated. Twenty trees were harvested (five trees in each of four sites in Portugal), and wood discs were taken at different height levels, from the base to the top of the tree, providing 85 wood samples covering the natural variability of wood density ranging 449 kg.m⁻³ to 649 kg.m⁻³.

Under the same experimental conditions, pulp yield ranged 47.9-55.6%, kappa number 11.1-16.6, ISO brightness 19.9-45.0, fibre length 0.66-0.82 mm and fibre width 17.2-20.8 µm. The pulp yield and kappa number were not correlated with wood density. Higher pulp yields were associated with lower kappa numbers and alkali consumption, suggesting the important role of chemical composition of wood on kraft cooking.

The results show the pulping quality of *Acacia melanoxylon* trees grown in Portugal expressed by high pulp yields, low residual lignin and favourable brightness. The influence of sites, trees and within the tress is not significant in the pulp measured parameters. The pulp yield and kappa number were not correlated with wood density. Moreover, the results suggest the possibility for tree selection as both wood density and pulp yield change independently.

Key words: *Acacia melanoxylon*; wood density; pulp yield, fibre length and width

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