



Does selecting for improved growth affect wood quality of *Pinus pinaster* in Portugal?

Maria João Gaspar^{a,*}, José Luís Lousada^b, José Carlos Rodrigues^c, Alexandre Aguiar^d,
Maria Helena Almeida^e

^a Universidade Trás-os-Montes e Alto Douro, Dep. Florestal, Centro de Estudos Florestais, 5001-801 Vila Real, Portugal

^b Centro de Investigação e de Tecnologias Agro-Ambientais e Biológicas, Dpto Florestal, Universidade Trás-os-Montes e Alto Douro (UTAD), Portugal

^c Instituto Investigação Científica Tropical (IICT) Tapada da Ajuda 1349-01, Portugal

^d INIA - Instituto Nacional de Recursos Biológicos, Quinta do Marquês, Portugal

^e Universidade Técnica de Lisboa, Instituto Superior de Agronomia, Centro de Estudos Florestais, Portugal

ARTICLE INFO

Article history:

Received 1 February 2009

Received in revised form 24 March 2009

Accepted 26 March 2009

Keywords:

Pinus pinaster

Genetics

Growth

Wood quality

ABSTRACT

The selection criteria for the first generations in the Portuguese *Pinus pinaster* improvement program have been the growth rate and form traits. In this work we study the consequences of this selection on wood quality traits. This study assesses genetic and phenotypic correlation between growth, wood density components, lignin content and mechanical traits (radial modulus of elasticity and radial modulus of rupture) of 46 half sib families from a progeny trial located in Leiria, Portugal, originated from seed collected in a clonal seed orchard. A total of 552 seventeen-years-old trees (about half of full rotation age) were sampled at 2 m height. Height measured at 12 years old presented a higher genetic control ($h^2 = 0.34$) relatively to DBH, measured at 12 and 17 years old respectively ($h^2 = 0.17$ and $h^2 = 0.15$). The results of this study also showed that DBH growth is more dependent on latewood components than earlywood components and that higher growth in Mediterranean regions can be due to an increase of the period of latewood formation. Further, we can conclude genetic selection based on growth will not result in a decrease of wood density, will not affect the occurrence of spiral grain, and is possible to obtain an increase in the radial modulus of elasticity. The present study also showed that it is possible to select for increased growth with lower lignin proportion. Results also suggest that selection for growth at 12 years will probably not affect negatively the wood properties at 17 years.

© 2009 Elsevier B.V. All rights reserved.

* Corresponding author. Tel.: +351 259350883; fax: +351 259350859.
E-mail address: mjgaspar@utad.pt (M.J. Gaspar).