

EFFECTS OF WEATHER AND GENETICS ON INTRA-ANNUAL STEM GROWTH OF *EUCALYPTUS BENTHAMII* MAIDEN ET CABBAGE

Antonio Riroyei Higa¹, Luciana Duque Silva¹, Paulo Afonso Floss²,
Dorli Mario da Crosse², Gabriel Berenhauser Leite², Jens Günther³,
Hans-Peter Kahle³, Heinrich Spiecker³

¹Departamento de Ciências Florestais / UFPR

²Santa Catarina Agricultural Research Organization / EPAGRI

³Institute for Forest Growth, University Freiburg / IWW

Higa@ufpr.br

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Eucalyptus benthamii Maiden et Cabbage is being considered one of the most suitable eucalypt species for the establishment of fast growing plantation forests in frost prone areas of southern Brazil. This species is also performing well in Argentina, South Africa and China. *E. benthamii* naturally occurs in three populations in a small area located west of Sydney, Australia. Seeds collected in this region, were used to establish progeny tests in Santa Catarina State, Brazil. The field tests were planted in September 2002 following a randomized block design. Genetic differences at family level were detected for survival rate, tree height, diameter at breast height, volume and stem form, evaluated at the age of three years. This paper discusses the daily courses of stem radial displacement measured by electronic point dendrometers and how these are affected by changes in air temperature, relative air humidity, and soil water potential.

During sunny days tree stems show a distinct diurnal rhythm of expansion during the night and contraction during the day time. Diameter growth mainly occurs during cloudy days. In the period 31/10/-05/12/2006 daily average radial growth rate was ~2.5µm and ~3.3µm for the slowest and fastest growing family respectively. The average “radial growth path” is 18, *i.e.* in order to grow one unit in diameter the tree stems oscillate 18 units between radial expansion and contraction. On sunny days stem radial displacement is significantly related to changes in air humidity (+) and temperature (-), on cloudy days to changes in soil moisture potential (-).

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