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Managing  
*Eucalyptus* plantations  
under global changes



Abstracts Book

# Differences in leaf traits among sixteen *Eucalyptus* genotypes suggest contrasting strategies to cope with climatic conditions

Raoni Nogueira <sup>1</sup>, Tatiane Rodrigues <sup>2</sup>, Otávio Camargo Campoe <sup>1,3</sup>,  
Yann Nouvellon <sup>4,5</sup>, Jean-Paul Laclau <sup>4,6</sup>, Gueric Le Maire <sup>4,7</sup>, José Luiz  
Stape <sup>\* 6,8</sup>

<sup>1</sup> Department of Forest Science, São Paulo State University (UNESP) – Botucatu-SP, Brazil

<sup>2</sup> Institute of Biosciences, São Paulo State University (IB-UNESP) – Botucatu-SP, Brazil

<sup>3</sup> Department of Agriculture, Biodiversity and Forests (UFSC) – Curitibanos-SC, Brazil

<sup>4</sup> UMR EcoSols (Univ Montpellier, Cirad, Inra, IRD, Montpellier SupAgro) – CIRAD – 34060  
Montpellier, France

<sup>5</sup> Universidade de São Paulo (ESALQ) – Piracicaba, Brazil

<sup>6</sup> São Paulo State University (School of Agricultural Sciences) – Botucatu, SP, Brazil

<sup>7</sup> UNICAMP (NIPE) – Campinas, Brazil

<sup>8</sup> Suzano Forestry Technology (Suzano Forestry Technology) – Itapetininga, Brazil

*Eucalyptus* plantations in Brazil cover approximately 5,7 million hectares and are distributed from 00 to 32° S, covering a wide range of climatic conditions. To develop adapted genotypes to this climatic gradient, breeding programs use species with different leaf anatomic, morphologic and structural traits. We selected 16 highly planted *Eucalyptus* genotypes (*E. grandis*, *E. urophylla*, *E. camaldulensis*, *E. saligna*, pure and hybrids, clonal and seed-origin) across different regions in Brazil, and grew them at a single location to assess their genotypic variability in leaf structure, anatomy and morphology, and how these leaf traits may be related to strategies to cope with environmental conditions. Most genotypes exhibited similar leaf anatomy, with about 5% of leaf thickness constituted of cuticles, 11% of epidermis, 26% of palisade parenchyma, and 58% of spongy parenchyma. The only exception was the clone *E. grandis* x *E. camaldulensis*, with no spongy parenchyma and thick palisade parenchyma (84% of the leaf thickness). The clones had hypostomatic leaves, except two genotypes with amphistomatic leaves (*E. grandis* x *E. camaldulensis* and *E. grandis*). Significant relationships were found between leaf inclination angle (LIA) and shape, and stomatal density and size. Genotypes with lower leaf area per tree showed higher mean LIA ( $R^2=0.23$ ,  $p<0.05$ ). Negative correlations were also found across genotypes between stomatal density and stomatal size ( $R^2=0.67$ ,  $p<0.001$ ), and between LIA and stomatal density ( $R^2=0.61$ ,  $p<0.001$ ). Genotypes with higher LIA showed more narrow and long leaves ( $R^2=0.57$ ,  $p<0.001$ ). From wetter to drier conditions in the regions where the clones were selected, the main trend was a decrease in leaf area per tree and in stomatal density per area of leaf, as well as an increase in LIA, and stomatal size. Improving our understanding of the trade-offs among leaf traits can help tree breeding programs to select genotypes able to cope with specific climatic conditions.

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\*Speaker

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