Agrociencia Uruguay 2023 | Volume 27 | Number NE2 | Article e1270
DOI: 10.31285/AGRO.27.1270
ISSN 2730-5066

IUFRO Conference 2023

Conservation, domestication and breeding of *Eucalyptus benthamii*, a threatened, cold-tolerant subtropical species with a restricted genetic base and lot of potential

Bush, D.[1]; Andrejow, G. M. P.[2]; England, N.[1]; Estopa, R. A.[3]; Gore, P.[4]; Grattapaglia, D.[5]; Heberling, M.[6]; Tambarussi, E. V.[7]; Vaughan, B.[4]

[1] *CSIRO, Canberra, Australia*
[2] *Westrock Brasil, Três Barras, SC, Brasil*
[3] *Klabin Forestal, Telêmaco Borba, PR, Brasil*
[4] *SeedEnergy Pty Ltd, Cambridge, Tasmania, Australia*
[5] *EMBRAPA, Brasilia, DF, Brasil*
[6] *Montes del Plata, Colonia, Uruguay*
[7] *Universidade Estadual Paulista, São Paulo, SP, Brasil*

Received *16 Aug 2023*
Accepted *09 Sep 2023*
Published *20 Nov 2023*

Correspondence
David Bush,
david.bush@csiro.au

Eucalyptus benthamii is a fast-growing eucalypt with excellent potential as a pulp and biomass crop in subtropical areas that are subject to occasional cold snaps. It is among the most frost-tolerant of fast-growing eucalypts and has been deployed commercially in selected regions of North and South America. Several relatively low-input domestication and breeding programs are underway. The species has a restricted natural range along the Nepean River system to the west of Sydney, Australia, and is facing ongoing threat due to fragmentation caused by agricultural developments, urban sprawl and dam construction. Two main subpopulations have been delineated (Nepean and Kedumba), with most of the world's breeding populations predominantly based on a restricted sample of open-pollinated families from Kedumba. Two challenges are discussed. Firstly, conservation of the species is a high priority, made difficult in the less-sampled Nepean subpopulation by poor seed set, inbreeding and interspecific hybridization. Secondly, for ongoing genetic gain to be made, broadening the genetic base in breeding programs is a high priority. To tackle the first challenge, *ex situ* and *circa situm* conservation interventions are underway. Though technically challenging, this should eventually lead to more breeding material becoming available. International collaboration will be a key determinant of future success in meeting these challenges.

Keywords: conservation, domestication, breeding strategy, genomics

Bush D, Andrejow GMP, England N, Estopa RA, Gore P, Grattapaglia D, Heberling M, Tambarussi EV, Vaughan B. Conservation, domestication and breeding of *Eucalyptus benthamii*, a threatened, cold-tolerant subtropical species with a restricted genetic base and lot of potential. Agrociencia Uruguay [Internet]. 2023 [cited dd mmm yyyy];27(NE2):e1270. Doi: 10.31285/AGRO.27.1270.