

## Abstract

# Establishment and Competition of Native Forest Species in *Araucaria angustifolia* Stands with Different Coverage Degrees in Misiones, Argentina †

Flavia Y. Olguin <sup>1,\*</sup>, Ana P. Moretti <sup>2</sup>, Martín A. Pinazo <sup>3</sup>, Fermín Gortari <sup>4</sup>, Marcelo Gauna <sup>1</sup> and Corina Graciano <sup>1,2</sup>

<sup>1</sup> Instituto de Fisiología Vegetal (INFIVE, Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET) y Universidad Nacional de La Plata, B1900 La Plata, Argentina; marsgauna@gmail.com (M.G.); corinagraciano@agro.unlp.edu.ar (C.G.)

<sup>2</sup> Facultad de Ciencias Agrarias y Forestales, Universidad Nacional de La Plata, B1900 La Plata, Argentina; anapaulamoretti7@gmail.com

<sup>3</sup> Instituto Nacional de Tecnología Agropecuaria (INTA) EEA Montecarlo, N3384 Montecarlo, Argentina; pinazo.martin@inta.gob.ar

<sup>4</sup> Facultad de Ciencias Forestales, Universidad Nacional de Misiones, N3380 Eldorado, Argentina; fergortari@yahoo.es

\* Correspondence: flavia.olguin@agro.unlp.edu.ar

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Mixed plantations with native species are a viable tool to meet current wood production and conservation demands and can contribute to the restoration of degraded forests. In Misiones, Argentina, 30,000 ha of land are used for mono-specific plantations of the native *Araucaria angustifolia* (Bertol.) Kuntze for timber purposes. Mixtures with other native timber species in uneven-aged plantations have ecological advantages over monospecific stands because they have increased biodiversity and complexity. In mixed plantations, competition depends on the availability of resources, but also on the requirements and ages of the trees. Trees of different ages in *A. angustifolia* plantations have different coverage intensities, environmental conditions, and understory structures, and can be used to protect the seedlings of coverage-demanding species during their establishment. Six *A. angustifolia* stands of different ages, from 2 y (1200 trees/ha) to 25 y (220 trees/ha), were enriched with native forest species. In each stand, one 100 m<sup>2</sup> plot for each species was installed. Fifty seedlings of *Cabralea canjerana*, *Peltoforum dubium*, *Bastardiopsis densiflora*, or *Cordia trichotoma* were planted per plot within the planting rows. One year after planting, the survival was higher than 70% in all the species and mortality was not associated with the age of the stand. Survival was not affected by frost, although the plants have been classified as frost-susceptible. However, growth was lower in the stand where lower temperatures in winter were recorded. In the older stand, competition did not affect the survival and growth of the species with a higher phenotypic plasticity, while it affected the growth of those that had a lower plasticity. The results suggest that it is possible to enrich mono-specific stands of different ages with native timber trees. Therefore, mixed plantations of *A. angustifolia* with other native species can be considered for wood production and conservation purposes in their natural area of distribution, as they increase the connectivity between the remaining rainforest.

**Supplementary Materials:** The following are available online at <https://www.mdpi.com/2673-4931/3/1/67/s1>.