

## **Tree breeding and mycorrhizal symbiosis as important tools in forestation processes**

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### **Abstract**

Higher growth rate and morphological traits have been the major criteria for selecting trees classified as improved in breeding programs. The symbiotic associations between *P. pinaster* and ectomycorrhizal fungi can be an effective approach to enhance plant development. The aim of this work was to assess whether the establishment of mycorrhizal symbiosis at nursery stage was affected by tree breeding.

*P. pinaster* improved and non-improved seedlings were inoculated with compatible ectomycorrhizal fungi: *Suillus bovinus*, *Pisolithus tinctorius* or *Rhizopogon roseolus*, and grown in individual cells containing forest soil, in a commercial forest nursery. Growth and nutritional traits, colonisation parameters and the fungal community established were assessed. *R. roseolus* and *P. tinctorius* were the most efficient isolates in promoting plant development. Inoculated improved saplings had an overall superior development than their non-improved counterparts, with up to a 4.9-fold in root dry weight and a 13.6-fold increase in the total number of ectomycorrhizal root tips. Differences in fungal community were revealed through the denaturing gradient gel electrophoresis profile of each treatment. The results from our study suggest that improved seedlings benefit more from the mycorrhizal association and therefore this could be a valuable biotechnological tool for the nursery production of improved *P. pinaster*.

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