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## **Growth and root architecture of several species, provenances and varieties grown in a sandy spodosol in an Atlantic mild climate, after two years in the field.**

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The Landes forest is located South-West France and produces 20% of french wood, it is mainly composed of intensively managed even-aged stands of *Pinus pinaster* (Ait). This one million hectare forest was hit by two major storms in 1999 and 2009, destroying half of the standing volume. Most of the reforestation are made with genetically improved varieties originating from a population breeding program with a selection at 10 years on height and butt stem lean. In the coming years, other species, provenances or varieties of *P. pinaster* will certainly be used for reforestation to improve biodiversity, to specialise production e.g. biomass, or resistance to biotic or abiotic stresses, e.g. drought. Root system architecture is a key component in mechanical stability of trees. Therefore species, provenances and varieties which could be potentially used in the Landes forest were planted for 10 years in three locations to gain information about the dynamics of root architecture in young trees. Each year ca. 150 trees are uprooted and the root system is measured using 3D digitizing. An in-depth phenotyping of root architecture is made by “architectural analysis”.

*Robinia Pseudoacacia* and *Quercus Rubra* showed an overall small growth in the three experimental plots after two years in the field. Conversely, the two *Eucalyptus* clones were two and three times higher than the *P. pinaster* in the medium-wet location, but did not grow well in the most humid locations with *Molinia Caerulea* understory. *Pinus taeda* was slightly higher than *P. pinaster* in the best location. The 12 *P. pinaster* provenances, or varieties did not differ for stem dimensions, except the Moroccan provenance which has significantly lower height, but a similar collar diameter than the other *P. pinaster*. Root architecture and biomass measurements are just finished, and will be analysed in the coming weeks.

**Keywords:** root architecture, *Pinus pinaster*, *Eucalyptus*, provenances, breeding