Pinus pinaster Ait. is the conifer which major volume of wood is obtained in Spain. In this pine species the quality of the wood is low due to the lack of stem straightness. In addition, stem flexuosity produces an increase in the costs of transport and manufacturing of the row material.

Recently, an alternative method for early selection of the stem straightness has been proposed, based on the efficiency of reaction wood in the stem straightening process instead of the evaluation of stem form (Sierra de Grado et al., 2008). Biomechanical analysis showed in artificially tilted seedlings that differences in the secondary gravitropic and autotrop reactions in the stem straightening process are related to differences among provenances characterized by different straightness.

We studied the variability among progenies in the gravitropic and autotrop reactions, and the efficiency of compression wood in the stem straightening process, following the same method. Plants from 38 Pinus pinaster Ait. progenies from the Norwest Interior provenance and 6 different provenance commercial seeds controls were used. The progenies were phenotypically selected by Tragsa company in Galicia (Norwest of Spain).

The CW efficiency in the straightening process (α parameter) was calculated with Fournier’s biomechanical model (1994).

The changes in local curvature was integrated along the stem to estimate the final angle of A01 predicted by the model (Φ). α is half the difference in maturation strain between the upper and lower sides of the stem and β is the estimator of α.

\[ \Delta A_{01}(t) = \beta \cdot \varphi_{01}(t) + \varepsilon \]

The plants followed the pattern described in previous biomechanical analysis. The ANOVA analysis shows that the effect of the progenie is significant for ΔA01. The heritabilities were high (> 0.4).

Our results were used to make the ranking of the progenies according to the compression wood efficiency and the secondary gravitropic movements.

- Controls from twisted provenances
- Control from straight stemmed provenance (Gredos).
- Norwest Littoral Provenance (medium-high straightness).

REFERENCES:

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