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Genetic parameters of maritime pine radial growth during a specific drought event

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Abstract: Main selection criteria of French maritime pine (*Pinus pinaster*) breeding program are growth at 12 years old and stem straightness. Scenarios of climate changes forecast an increase in frequency and intensity of droughts in southwestern France where maritime pine plantations are currently established. In that context, a key issue for breeding is thus to be able to evaluate growth in the future climatic conditions characterized by low precipitations during the growth period.

A maritime pine genetic trial was established 19 years ago on two contrasting sites (humid and dry sites) with half-sib families. 150 high resolution dendrometers have been installed on 25 families selected to represent a large range of growth performance (based on growth data collected at 12 years old). Radial growth was measured every hour during two successive years. The two years considered (2015 and 2016) were characterized by contrasting climate (dry spring in 2015 and wet spring in 2016). Soil humidity and climatic data were also recorded on this trial during the same period.

Genetic analyses (estimation of genetic parameters and GxE interactions) were carried out on radial growth data related to short periods of time (few weeks) selected either for low or for high precipitation level. This methodology allows to estimate the genetic variability for growth in dry versus wet conditions and to identify the genotypes best adapted to the future climate.

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