SCOTS PINE *(Pinus sylvestris* L.) BREEDING SRATEGIES IN SPAIN

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Abstract. Scots pine covers the largest natural area of the genus *Pinus,* from 8 W to 141 E degrees of longitude and from 37 S to 70 N degrees of latitude. In Spain it reaches the southern limit of the species, on the main mountain ranges of the country and living in many different ecological conditions. It occupies around one million of hectares and half of them came from artificial afforestation.

Adopted strategies are extensive because the obtained propagation material (seed) will be used in a great variety of ecological conditions in time (long rotation) and space (high site variability).

The first step to plan a improvement program for the species was to define the provenance regions as a set of territories with high ecological and genetic homogenity. So 17 provenance regions were established based on taxonomic, climatic and pedologic previous information. These regions were afterwards identified as breeding zones for operative proposes.

Adaptation, growth and gene conservation are the main objectives of the program. Depending of the provenance region, the importance of each of these three objectives is different.

Genetic variability studies allow us to select a set of populations to be used in a wide range of conditions. The results indicate the non significance of genotype-environment interaction for growth and phenology. It can be assumed Spanish provenances have a lower vigor than mid-european ones, but they are best adapted to extreme drought conditions and to typically Mediterranean erratic fluctuations of climate. It seems that Spanish provenances have a more "conservative" growth startegy.

On the strength of phytoclimatic similarity, importance of the provenance and seed demand, all the provenances have been classified into three categories with different strategies adopted. In the most demanded provenances, seed orchards and seed stands have been conducted. Some seed orchards have been monitored from their begining till nowadays. The provenances which have only local interest or whose seed demand is low, only seed stands selections have bee4n conducted. Up to date 20 seed stands have been selected from 4 provenance regions and 4 seed orchards (11,8 ha) from 3 provenance regions have been established. All of them (stands and orchards) make the National Catalogue of Forestry Reproduction Material for the species.

Finally there are a subset of preservation populations were protection and regeneration measures have to be adopted in order to preservce their genetic resources for future generations.

Keywords: *Pinus sylvestris,* breeding strategies, provenance trial, seed orchard, variability.