



Innovative silvicultural treatments to enhance soil biodiversity in artificial black pine stands

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The decay of forest cover and soil erosion is a consequence of continual intensive forest exploitation, such as grazing and wildfires over the centuries. From the end of the eighteenth century up to the mid-1900s, black pine plantations were established throughout the Apennines' range in Italy, to improve forest soil quality. The main aim of this reforestation was to re-establish the pine as a first cover, pioneer species. This was a preparatory step to the reintroduction of broadleaf trees, such as oaks and beech trees, and thus the reestablishment of mixed forest. A series of thinning activities were planned by foresters when these plantations were designed. Many stands, however, remain unthinned, which over time, has weakened the trees in the plantations. Alternative forms of regeneration have been and are being tested to improve the natural and artificial establishment of indigenous species. Thinning, however, remains the most common and one of the most successful regeneration methods used in pine forests.

The project's main objective is to demonstrate the potential of an innovative silvicultural treatment to enhance the level of biodiversity in the soil of black pine stands. In particular, the project aims to evaluate the effects of selective thinning on soil biodiversity on young black pine stands. These effects will be compared to traditional thinning methods (selecting trees from below leaving well-spaced, highest-quality trees) and to areas of forest where silvicultural treatments (e.g. weeding, cleaning, liberation cutting) are not carried out.