



Managed Scots pine forests in Central Spain: First results on soil carbon dynamics

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Scots pine forests in Sierra de Guadarrama (Central Spain) cover thousands of hectares, and constitute the southern-western limit of the Scots pine's world distribution. It is worth noting that site and climate characteristics of Spanish Scots pine stands greatly vary from Scots pine areas in Central Europe. Specific forest management strategies may help to increase soil carbon sink strength, since further afforestation is constrained in mountain areas in Central Spain. In order to find and develop the most appropriate forest measures to optimize soil carbon sequestration, deeper understanding of forest management effects on soil carbon stocks and fluxes is needed. It is specially desirable in Mediterranean environments, where there is a important lack of information. Further relationships between soil carbon dynamics and different cutting regimes and length of rotation period would improve this understanding. Results found up to now are contradictory, and clearly vary depending on site and climatic conditions.

Here, we present preliminary results focused on soil carbon dynamics from two managed Scots pine forests in Central Spain (Valsaín and Navafría), which differ in the cutting-regime intensity (Valsaín: group shelterwood; Navafría uniform shelterwood) and their rotation period length (Valsaín: 120 years; Navafría: 100 years). In each forest, we established one chronosequence, covering the whole stand ages along the rotation period (20 years interval). We estimated soil carbon stocks in the first 20 cm of the mineral soil, in order to detect long-term carbon sequestration, rather than carbon accumulation in the forest floor, which can be directly related to recent harvesting operations. In addition, we present our first results of soil respiration rates, covering the period May-December 2009.