

MANAGED FORESTS IN FUTURE LANDSCAPES

IMPLICATIONS FOR WATER AND CARBON CYCLES

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BOOK OF ABSTRACTS



INTERNATIONAL YEAR
OF FORESTS • 2011

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CHANGES OF CARBON STORAGE AS AFFECTED BY DIFFERENT SOIL PREPARATION TECHNIQUES TWO YEARS AFTER A FOREST MIXED-STAND INSTALLATION

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ABSTRACT

Taking into account the importance of carbon sequestration on forest systems, and its relation to stand management practices, aboveground and belowground biomass (herbaceous vegetation and forest species) was sampled, together with soil, on a mixed stand of *Pseudotsuga menziesii* (PM) and *Castanea sativa* (CS), with two years old, in order to evaluate the impact of soil mechanical operations prior to plantation on carbon storage and distribution. The experimental field was established near Macedo de Cavaleiros, Northern Portugal, at 700 m elevation, mean annual temperature 12°C and mean annual rainfall 678 mm, with a typically Mediterranean seasonal distribution. The experimental layout included 3 blocks in different topographic situations (flat plateau, steep slope and gentle slope) where the different treatments corresponding to different tillage intensities were randomly distributed (high, moderate and light intensity), in plots with an area of 375 m² each. The results obtained showed that: (i) more than 90% of the total carbon stored in the system is located in the soil, increasing with depth with tillage intensity; (ii) the contribution of herbaceous vegetation and related roots to the carbon storage is very low; (iii) the amount of carbon per tree was higher in CS than in PM; (iv) the global carbon storage was affected by soil tillage, generally decreasing with the increase of tillage intensity.

KEYWORDS: Soil preparation, Forest species, Herbaceous vegetation, Carbon stock, Mineral soil