



## **Effect of soil water erosion and cultivation on the carbon stock in a semiarid area of Southeast Spain.**

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Conversion of forest to cropland influences a number of soil properties. One of the most pronounced and widespread changes that occur is the decline in soil C, which is attributed to a number of factors. Due to the importance of soil carbon content as a key factor in the soil erosion processes in semiarid areas, the decrease in soil C with land use change can intensify the effect of water erosion and increase the emission of CO<sub>2</sub> to the atmosphere, with important repercussion in the global change. The results of an experiment developed in a semiarid area of South East Spain under three different land uses (non-irrigated olive grove, natural vegetation and abandoned agricultural field) to evaluate the impact of water erosion and cultivation on the soil carbon dynamic and carbon stock is presented.

After 100 years of cultivation a reduction on the soil carbon stock (at the first 5cm) of about 37% was observed when the total SOC on the cultivated area was compared to the natural non-disturbed one with a rate of soil carbon loss of about 0,0405 T ha<sup>-1</sup> y<sup>-1</sup>. On the other hand, the soil carbon stock after 25 years of abandonment was similar to the olive area showing the difficult of these fragile ecosystems in recovering the soil carbon stock after being disturbed. The change from forest to olive grove was an important factor controlling sediment production and export of sediment-associated C. Thus, in a 15 months monitoring period the olive cropland soil loss was between 2 and 7 times higher than in the forest area, depending on the event. These values were equivalent to the mobilized soil organic carbon, which was about 6-fold higher in olive compared to the forest plot. Furthermore, the mobilized soil organic carbon by erosion represented about 50% of the SOC lost on the cultivated area suggesting the crucial role of the water erosion on the carbon dynamic. More detailed studies will be carried out to know the final fate of the OC mobilized by erosion in this area.