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Carbon losses by water erosion in two small agricultural Mediterranean catchments.

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Erosion processes play a major role in carbon cycle (Van Oost et al., 2007). The understanding of the interaction of the different processes and their intensity is key to understand if the soil of a given area is a net carbon source or sink (Freibauer et al., 2004, Julian et al., 2007). However, there is relative few experimental information form some areas, such as agricultural areas in Mediterranean soils.

This communications presents a preliminary evaluation of the organic carbon losses, in sediment and dissolved in runoff, of three small, 8 and 7.1 ha catchments in Southern Spain (Taguas et al., 2010) covered by olive trees. This evaluation is made on the runoff, sediment and rainfall records measured at catchment scale from September 2009 to August 2011.

The results indicate that in years of relatively high rainfall losses of organic carbon in the sediment exported outside of the catchment can be high. For instance, in the 8 ha catchment of La Conchuela, covered by olive trees, organic carbon losses were 2.45 t. This can be explained by the high soil losses measured in the whole catchment, 418 t, and the relatively higher enrichment compared to the organic content of the top soil (0.58% in sediment against 0.51 in top soil). Losses of organic carbon dissolved in the sediment were much lower although also significant, 170 kg, with an average concentration of 5.76 ppm.

The results of the communication will explore and discusses the differences among the different catchments and suggest guidelines for further studies exploring the variability among different areas and climatic conditions using model analysis and further experiments.

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