Geophysical Research Abstracts
Vol. 14, EGU2012-10966, 2012
EGU General Assembly 2012

Interpretation of the impact of different managements and the rainfall variability on the soil erosion in a Mediterranean olive orchard microcatchment

E.V. Taguas (1), M. Burguet (2), R. Pérez (1), J.L. Ayuso (1), and J.A. Gómez (2)

(1) University of Córdoba, Rural Engineering Department, Cordoba, Spain (E-mail: evtaguas@uco.es, rperez@uco.es, ir1aymuj@uco.es), (2) Institute for Sustainable Agriculture, Alameda del Obispo s/n, 14004, Córdoba, Spain (joseagomez@ias.csic.es; marieta.burguet@gmail.com)

The microcatchment is a spatial scale which allows to evaluate and to quantify the erosive processes under conditions close to those perceived by farmers. In this work, soil erosion and runoff over six hydrological years (2005 and 2011) were monitored in an olive orchard microcatchment of 6.4 ha, where different management types were applied. The aim was to evaluate the impact of the management and the rainfall regime variability. Non-tillage was applied during the years 2005-2007, tillage operations were carried in April in the period 2007-2010 while in the year 2010-2011, the tillage was applied in January and mulches (olives leaves and branches) were established for reducing the soil losses, mainly generated from rills.

At the annual scale, the variation ranges of the cumulative rainfall depth and of the erosivity were between 600 and 1000 mm and between 600 and 1500 MJ mm ha-1 h-1, respectively. Although there are some gaps in the data series, the annual runoff coefficients calculated were smaller than 5% and the total sediment load range was between less than 1 t ha-1 year-1and more than 20 t ha-1 year-1. During these years olive yield also showed a high degree of variability, between 5000 kg ha-1 year-1and 10000 kg ha-1 year-1, typical of the alternate bearing of this crop, without correlation with annual rainfall.

The annual rainfall depth explained significantly the sediment load and the runoff in spite of the different managements applied. At the event scale, rainfall depth was correlated with runoff, however, sediment load was very sensible to management. The high variability of the hydrological regime (inter and intra-annual) and the importance of the precedent hydrological years determine complex interpretations of the impact of the management on the soil losses and the olive yield by the farmers, so the continuity of the data analysis is essential for supporting the suitable taking decisions about the overall farm management.