Geophysical Research Abstracts, Vol. 9, 11651, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-11651

Testing of AnnAGNPS (Annualized Agricultural Non Point Source) on olive orchards at microcatchment scale

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Although there are several studies about soil loss in olive orchards, most field measurements and modelling efforts have been concentrated on runoff and water erosion operating at the plot scale, despite their limitations for hydrologic predictions. In this study, a mountainous microcatchment of 6 ha, supporting non-tillage farming with natural vegetation cover was instrumented to record runoff and sediment. The continuous model AnnAGNPS (Bingner and Theurer, 2003) has been fitted to the data. The model was calibrated with 16 observed events during the period 2005-2006. The validation considered 7 events measured in 2006-2007. In the case of the calibration, the coefficients of efficiency of Nash-Sutcliffe to evaluate the model performance for runoff, peak flow and sediment loads were 0,85, 0,98 and 0,92, while in the validation were 0,99, 0,04 y 0,90. These results show the ability of the model for the prediction of runoff and sediment yield and the problems for calculating peak flows. Finally, the model has been applied to the analysis of these soil management practices under different environmental conditions.

Key words: erosion; olive orchard; AnnAGNPS; microcatchment scale.