



Evaluation of the WEPP model to analyze the erosion risk on hillslope olive orchards under different soil managements

Licciardello F. (1), Gómez J.A. (2), Zimbone S.M. (3)

(1) Department of Agricultural Engineering, University of Catania (Italy); email: flicciar@unict.it; tel: +390957147551; fax: +390957147600

(2) Instituto de Agricultura Sostenible, CSIC, Cordoba (Spain)

(3) Dipartimento di Scienze e Tecnologie Agro-Forestali ed Ambientali, Mediterranean University of Reggio Calabria (Italy)

Instituto de Agricultura Sostenible, CSIC, Cordoba (Spain)

The Water Erosion Prediction Project, WEPP, was used to analyse the impact of three different soil management practices for soils and weather representative of olive orchards in Cordoba (Southern Spain). The model was calibrated and validated using a three-year database collected in an olive grove on a Vertic soil. The results show that WEPP was able to reproduce the observed impact of the considered soil management practices with a decreasing trend for both runoff and soil loss from no-tillage with bare soil with herbicide compared to conventional-tillage and strips of cover crop. Among the most relevant features observed in our evaluation of the WEPP model were: the limitation of the simulations to short hillslopes when the spatially complex pattern of soil properties observed in olive orchards is introduced; the poor understanding of the values of the soil parameters needed in calibration to reflect the differences among non-tillage and conventional tillage; difficulty in completely understanding the processes represented by the model and their calibration; the user friendly environment provided by the windows interface, and the utility of CLIGEN to simulate long-term scenario from easily available weather data. The study also highlights the scarcity of systematic experimental results not only to validate the results of simulation analysis,

but also, in a general perspective, to increase the understanding of erosion processes in olive orchards.

Additional experimental information is need it to provide appropriate monitoring of soil losses, and evaluating the effectiveness of erosion control techniques under these conditions in Southern Spain.