



Development of a virtual tool for the quantification and the analysis of soil erosion in olive orchards based on RUSLE

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Erosion rates above $30 \text{ t ha}^{-1} \text{ yr}^{-1}$ have been measured in hilly agricultural regions such as Andalusia in Southern Spain, associated to orchard crops (Gómez et al., 2008). In this region, there are 1.48 Mha of olive groves (CAP, 2007), which are essential in terms of income, employment and landscape. The acquisition of training and experience in modelling soil erosion is difficult by the conventional system teaching for students as well as specific technicians.

This paper presents a telematic training/analysis tool, CREO (Calculator of Rates of Erosion in Olive crops/ Calculadora RUSLE para Erosión en Olivar), to quantify erosion rates in olive grove areas based on the Revised Universal Soil Loss Equation (RUSLE; Renard et al., 1997) and on specific information published on soil losses and soil characteristics in olive orchards in Southern Spain. The tool has been programmed with Matlab R2008a from MathWorks Inc. (USA), although it could be used as an executable program in Spanish and English language by interested users. It consists of seven menus with visual material where different sources, databases and methodologies are presented to quantify soil rates ($A = R.K.LS.C.P$) by the calculation of six factors. A is computed in $\text{t ha}^{-1} \text{ yr}^{-1}$; R is the rainfall erosivity factor ($\text{MJ mm ha}^{-1} \text{ h}^{-1} \text{ yr}^{-1}$); K represents the soil erodibility ($\text{t ha h ha}^{-1} \text{ MJ}^{-1} \text{ mm}^{-1}$); L is the slope length factor and S is the slope gradient factor (dimensionless); C is a cover management factor (dimensionless) and P is a support practice factor (dimensionless). Different equations and methodologies can be selected by the user for the calculation of each factor while recommendations and advice can be showed for the suitable use of the tool.

It is expected that CREO was a valuable helpful tool in environmental studies associated to olive orchard land use and its further use allows a better understanding of the interaction among the different factors involved, and better access to available information and its relevance for autonomous students.

References

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