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Impact of cover crops on soil coservation in olive orchards under different agroecological conditions combing a conceptual soil water balance model (WABOL) and RUSLE.

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The effect of cover crops on soil conservation in olive orchards is evaluated based on a limited set of experiments based on runoff plots and model analysis on erosion models. However, the development of cover crops in olive growing areas is strongly controlled by the climate and soil conditions. These conditions are not completely represented in the empirical approach based on runoff plots, while in the modelling analysis approach (e.g. Gómez at Giráldez, 2009) it is usually necessary to make assumptions on the development of the cover crops to calibrate the erosion models that are poorly understood, such as for instance growing ob biomass and ground cover in areas significant colder or driers that those found in the literature, or its impact on the soil water balance.

This communications presents a preliminary evaluation of the impact of cover crops in soil conservation in olive growing areas of Andalusia characterized y different soil, and climate conditions. The basic information has been taken from a recent study at national level (Hrnández, M.P., 2011) from which eight different growing areas characterized by different pluviometric and thermic regimes and soil conditions were selected. For those eight areas annual simulations of soil water content for an standard olive grove at 10x10 m under two different soil management techniques: cover crops with two option of cover crop killing in early or late spring; and conventional tillage, were simulated for a 8 to 10 year period based on a recently developed soil water balance model (WABOL, Abazi et al., 2012) which includes development of the cover crop. These results were used to calibrate RUSLE using the methodology proposed by Gómez et al. (2003) including the effect of different ground cover varying according to the conditions of different zones or climate of a particular year.

The results of the simulations were used to compare the impact of the cover crop used in different areas on overall erosion risk and in soil water balance when the soil and climate variability (spatial and inter-annual) is included. The provide guidelines to adaption of cover crop management to the local conditions, although further analysis need to be made to include a broader range of conditions and the impact of irrigation.

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