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Soil and water losses on citrus orchards under Mediterranean Type Ecosystems. Organic against chemical farming

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Soil erosion in Mediterranean Type Ecosystems is highly dependent on the land use and land management (Cerdà et al., 2010). This is due mainly to the impact of agriculture (Cerdà et al., 2009) as a consequence of tillage and the use of herbicides. Both strategies contribute to a reduction in the vegetation cover and the soil biological activities (García-Orenes et al., 2009).

The impact of soil erosion on agronomic productivity and environmental quality is widely known (Lal, 1998), although little has been researched in the Mediterranean. The impact of agriculture on soil erosion and water losses in the Mediterranean basin has been studied in olive orchards (Gómez, 2004); vineyards (Ramos and Martínez Casasnovas, 2004), citrus (Cerdà et al., 2009), cereals (De Santisteban et al., (2005), and the high erosion rates were found to be related to the land management and land use (García Ruiz, 2010).

The current Mediterranean agriculture is based on tillage and herbicides, which contribute to high soil and water losses. The development of sustainable agriculture practices is a challenge for farmers, technicians and politicians. Organic farming use strategies to reduce the soil losses and develop new strategies of soil conservation. Moreover organic farming recover the soil fertility and biodiversity (Maeder et al., 2002). Organic farming is growing in the Mediterranean but little is know about his effect on soil conservation. There is a lack in the knowledge of how organic farming affect the soil properties and, there is no information on his effect on soil and water losses.

This paper aims to measure the impact of organic farming on soil and water losses. 10 plots of 1 x 0,5 m were selected in a chemically managed farm in Montesa (Eastern Spain) and 10 plots in a nearby organic farming managed farm. Both of them were cultivated with citrus. The ten paired plots were monitored. After earch rainfall event the sediment and water collected were measured and analized (more data of the experimental setup in (Giménez Morera et al., 2010).

The measurements of the rainfall (0,2 mm accuracy), runoff and sediment concentration during 2009 demonstrate that the water losses are 3 times lower and the soil erosion 19 times lower than in the chemically managed farm. It was found an reduction in the soil and water losses along the year. After 10 month the soil and water losses were almost negligible on organic managed citrus orchards.

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