Geophysical Research Abstracts
Vol. 16, EGU2014-13334-1, 2014
EGU General Assembly 2014

Vegetative filter strips efficiency controlling soil loss and trapping herbicides in two olive orchards at the short-term

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The optimization of water use in a semi-arid climate is based on an optimal use of rainwater adopting management practices that prevent and/or control runoff. This is a key point for increasing the economic and environmental sustainability of agriculture due to the minimization of diffuse pollution associated to runoff and to sediment and chemical transport. One strategy is the establishment of vegetative filters strips that prevent pesticides (Stehle et al. 2011), herbicides (Vianello et al. 2005), fertilizers (Withers et al. 2009) and runoff-sediment (Campo-Bescós et al. 2013) from entering streams or surface water reservoirs.

To evaluate the short-term risks associated with the use of herbicides a trial was designed in two olive groves located in Benacazón (Sevilla) and Cabra (Córdoba) both with an average steepness of 11%. Two different management systems were evaluated, bare soil and bare soil with vegetative filter strips. Pre-emergence herbicides were applied and analysed at the beginning of the trial by chromatography GC-MS and after each rainfall event both in soil and sediment. Runoff and soil losses were measured, as well.

The results obtained from this study show that soil management practices such as, the use of vegetative filter strips results in a reduction of soil losses and runoff. This it is translated in the improvement of soil quality and a reduction of water pollution caused by the use of herbicides. This information will improve the understanding of insufficiently known aspects and it will help to increase the knowledge for a better implementation of sustainable management practices at a farm scale and at larger temporal scale.

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