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Cover crop effect on soil conservation in olive orchards.

Gómez, J.A. (1), Giráldez, J.V. (1,2), Fereres, E. (1,2)

(1) Instituto de Agricultura Sostenible, C.S.I.C.

Apartado 4084, 14080 Cordoba Spain.

Ph: +34-957-499210; e-mail: ag2gocaj@uco.es

(2) Dpt. of Agronomy. University of Cordoba

Olive is the most extended crop in Andalusia, the Southern region of Spain, with 1.48 Mha (Consejería de Agricultura y Pesca, 2003), or 17% of the extension of Andalusia. There is widespread concern about the magnitude of water erosion in olive growing areas in Andalusia. The subsequent degradation of the soils in the olive producing areas, and off-site effects of erosion, such as contamination of water courses, are threats to the sustainability of olive production in many areas in medium terms. An average soil loss rate for these areas of 80 t ha^{-1} yr^{-1} is commonly mentioned (e.g. Pastor et al., 1998, López-Cuervo, 1990).

That situation results in a combination of cultivation on sloping areas without terracing, Mediterranean type of climate, limited ground cover by the crop, and inappropriate soil management. Traditionally soil management has been based on tillage aimed to maintain the soil weed free, avoiding then competition for water with the olive tree that is grown mostly under rain fed conditions.

In the last decade it has been an increase in the use of cover crops as an alternative to cultivation as the soil management method in olive orchards. This presentation is aimed to provide a revision of experimental results obtained in recent studies in Andalusia. Two of the experiments presented, are based on the use of runoff plots comparing soil, runoff and nutrient losses between a soil management based on cover crop and one based on tillage at two different locations in Andalusia (Lane et al., 2005). Comparison of soil properties three years after establishing the cover crop is also presented. The results of an on-going study on soil quality of organic olive orchards under different soil management methods (Alvarez et al., 2005), including cover crops and

tillage, are also presented, as well as preliminary results of on-going studies about the management of the cover crop to reduce the risk of competition fopr soil water with the olive tree (Castro et al., 2006).

The results provided by the studies mentioned above, as well as their comparison with those presented by other teams, indicate the extent of the cover crops in reducing soil, runoff and nutrient losses in olive orchards, as well as the extent of the preservation of desirable soil properties in the olive orchard. They also provide indications about areas where further research on soil conservation in olive orchards should be concentrated.

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