



Organic matter, aggregate stability and soil erosion after one year of applications of different agricultural and rangeland managements.

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Agricultural transformed areas in the Mediterranean region are a mayor environmental problem with respect to soil losses by erosion and soil quality. The soils are submitted to arid conditions and torrential rainfalls. The different types of management practices can be a key factor for soil conservation. A long-term experiment was designed to evaluate the relationships between land management practices with soil erosion and soil quality by analyzing different physical, chemical and biological soil properties. In this work we show preliminary results of two soil parameters (organic matter and aggregate stability) and soil erosion rates after one year of the application of different treatments in the plots.

Different treatments were carried on in an agricultural terrace in “El Teularet experimental station” in the Sierra of Enguera (Valencia, southeast of Spain). The different treatment applied to soil were done in 13 plots: 1-contact herbicide; 2-systemic herbicide, 3-plough, 4-oats, 5-oats with plough, 6-leguminous plants, 7-control (without treatment), 8-straw of rice, 9-rest of pruning, 10-residual herbicide, 11-geotextil, 12 and 13 natural covers (shrubs). Plots 12 and 13 are different respect parent material (marls and limestone respectively). Each one of the plots includes closed erosion plots to quantify the soil losses and destructive plots to take the soil samples for laboratory analyses.

The results of individual plot evolution show that aggregate stability decreases in the plots where treatments comprises plough (plots 3 and 5), and also in the plot 10, treated with residual herbicide. The plot treated with leguminous has increased the soil organic matter content and the aggregate stability. In the plot 5 (oats) has also increased the organic matter content in the soil. No significant changes have been detected in the other plots with respect to their temporal evolution. Comparing the values between plots after one year, not significant statistical differences have been found, except for the plots with natural covers (12 and 13) which have significant higher values of organic matter and aggregate stability than the rest of plots. Although the differences between the treated plots remain not statistically significant, we expect that they will be in a medium and long-term.

Soil erosion measured by means of 13 plots (x 5 subplots) during the year 2004 demonstrate that vegetation cover as mulch, geo-textil, shrub cover, catch crops or herbs results in negligible erosion. Herbicides increase the erosion rates in three orders of magnitude; meanwhile the ploughed field had a lower erosion rate due to the low intensities of the rainfall events. More years of research are needed to explore the effects of the different treatments on organic matter and aggregate stability, and also to determine the temporal variability of the erosion processes.

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