



## **Influence of soil management on water erosion in a Mediterranean semiarid climate**

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In Europe, in the Mediterranean area, water erosion is very severe, moderately to seriously affecting 50% to 70% of the agricultural land. However, it is remarkable the lack of field-data of water erosion rates for agricultural areas of semiarid Mediterranean climate. This paper describes an experimental field station (La Higuera Station) for the continuous monitoring of water erosion that was set up in 1992 in Central Spain (Toledo, Castilla-La Mancha). In the study area, the annual precipitation is around 450 mm with a very irregular inter-annual and seasonal distribution, which includes a strong drought in summer. The geology is characterised by non-consolidated Miocene materials, mostly arcotics. The area presents a low relief and gentle slopes, generally less than 15%. At the experimental field, the soil is a Typic Haploxeralf (USDA, 1990). The land-uses are rainfed crops mainly herbaceous crops, vineyard and olive trees. The hydrological response and soil losses by water erosion under natural rainfall conditions are monitored in a total of 10 experimental plots of the USLE type. The plots have a total area of 67.5 m<sup>2</sup>, (22.5 m long downslope and 3 m wide) and presented a slope gradient of 9%. Detailed descriptions of the experimental field facilities and the automatic station for monitoring runoff and sediment productions, as well as of the meteorological station, are presented. The land uses and treatments applied on the experimental plots are for different soil management systems for cereals crops (barley): 1) Conventional tillage, b) Minimum tillage of moderate tillage intensity, c) Minimum tillage of low tillage intensity; and d) No-tillage; five alternatives of fallow: a) Traditional fallow (white fallow) with conventional tillage, b) Traditional fallow (white fallow) with minimum tillage, c) Green fallow, d) Delayed fallow, and e) Chemical fallow with a no-tillage management. Additionally, there is an experimental plot pre-

senting a simulation of abandonment and natural re-vegetation. This paper presents a summary of the main results, regarding to the following research objectives: 1) Monitoring the hydrological and erosive responses of the different management systems; 2) Study of the role of key factors in soil erodibility affected by the management as soil physics and chemistry, surface cover and roughness, and soil and surface initial conditions (soil water content, surface roughness. . . ); and, 3) Characterizing the seasonal variability of the rainfall erosivity.

**Keywords: Water erosion, monitoring, erosion plots, agricultural fields, soil management, semiarid climate**