



Herbicide versus Tillage. Soil and water losses at the El Teularet soil erosion experimental station

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Non-tolerable and non-sustainable erosion rates were measured in rain-watered orchards in eastern Spain. Olive, almond, and fruit-tree orchards and vineyards have the greatest measured erosion rates on agricultural land in the world. The assessment of soil loss rates on agricultural land will provide information for the development of strategies to reduce agriculture's environmental problems. Weed control under Mediterranean rainfed conditions is mainly implemented by intensive ploughing or the massive use of herbicides. These two methods were reproduced from 2003 to 2006 at the El Teularet Soil Erosion Experimental Station on four 16 m² plots: tillage (1 plot) and herbicides (3 plots). Sediment and runoff from the 8x2m plots were collected in 500 litre tanks. Rainfall was automatically recorded by 0,2 mm tipping-bucket raingauge. The results show high inter-annual variability due to the extreme rainfall variability (eg 715,8 mm in 2004 and 247,4 mm in 2005), and demonstrate the significance of rainfall intensity to the initiation of runoff and the mass of sediment collected. Runoff was 1 order of magnitude greater for the herbicide plots than for the tillage plot. Soil losses were greater by 2-3 orders of magnitude on the herbicide than on the tillage plots. From 2003 till 2004 the low rainfall intensity and increased infiltration due to the ploughing roughness gave rise to a reduced runoff rate for the Tillage plot. Rainfall intensities greater than 60 mm day⁻¹ were not registered during the study period, and only these can trigger the erosion process on ploughed fields.

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