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Runoff and water erosion during a heavy rainy seasons on agricultural lands from northwestern Spain

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In northwestern Spain references about runoff and water erosion in agricultural lands has received little attention. Natural factors such as climate, topography, soil type and vegetation have a direct influence on these parameters. In adittion, agricultural activity had a significant influence on the soil losses where there was lack of surface runoff control. In Galicia, a region with a temperate-humid climate conditions, the rainy season corresponds to the autumn-winter, which in some cases can be extremely wet. The aim of this study was to assess erosion rates in agricultural plots in which the concentrated flow by surface runoff gave rise to rills and ephemeral gullies. Changes over time of rills and ephemeral gullies also was analyzed. The field survey was conducted at the small catchment scale, during highly erosive periods corresponding to seasons where there were recorded unusual amounts of rain. The main land-use of the agricultural catchment was: permanent grassland (40%), recent prairie sowed at the beginning of the autumn (35%) and winter cereal/fallow/harvested maize fields (25%). Of all these, in the surfaces subjected to soil erosion (unprotected surfaces), the soil losses were severe during an extreme event erosion in the winter, ranging from 10 m3ha-1 to 45 m3ha-1. By contrast, in the areas covered by vegetation despite runoff generated during heavy raining incision was not observed in the field. No-till is proposed as an effective conservation measure. Gully development was significantly affect by agricultural practices. Main ephemeral rills and gullies tended to reappear at the same position, but the magnitude of soil losses are different for each rainfall event.