



The relative efficiency of vegetation cover in reducing concentrated flow erosion: evidence from agricultural fields in NW Spain

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Studies have shown that erosion generally decreases with increased vegetation cover. Vegetation also had an effect on sediment deposition. This paper presents results of a survey conducted to study erosion rates due to rills and ephemeral gullies in an agroforestry catchment representative of NW Spain. Land cover consists of a mixture of forest (65%) and agricultural fields (mainly grassland, pasture, winter cereal and maize). The cultivated land occupied only 3.8%. The tillage is conventional. Assessment of soil erosion rates some controlling factors was carried out between October 2007 and September 2009. Within the catchment visual surveys were conducted after each rainfall event, especially in cultivated areas, to obtain information on land-use, vegetation cover percentage, soil surface characteristics and erosion features.

The results showed that concentrated flow erosion was highly discontinuous within the catchment, both spatially and temporally. Concentrated flow erosion varied from year to year. Rills and ephemeral gullies are concentrated in cropland. None was seen in the second year (October 2008-September 2009), while in the first year (October 2007- September 2008) erosion occurs during (i) autumn-winter 07/08 on wheat sown fields and primary tillage fields, (ii) in spring on maize sown fields. In all these cases rills and ephemeral gully erosion occurred on fields with vegetation cover < 20%. None was seen in forest, pasture or stubble. The autumn-winter erosion rates are 1.5 times larger than the spring erosion rates (88 and 60 m³, respectively). Most soil losses took place in only one or two rainfall events each season. The lack of rill and ephemeral gully erosion during the second year is primarily due to the absence of bare ground when mainly rainfall events occurred. It was observed that the presence of crop residues together with weeds during intercrops were an effective barrier against concentrated flow erosion in our cultivated soils. In this catchment, the maintenance of a vegetation cover not only prevents soil surface incision and channel formation but also has an effect on sediment deposition.