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Effects of soil surface treatments on wind erosion rates

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This experimental investigation was conducted at Marìa de Huerva which is situated near Zaragoza in the northeast of Spain. A small portable wind tunnel was used in three field surveys to achieve a better understanding about the processes and wind erosion rates on different soil surfaces. To represent the typically applied dry farming system of this semi-arid region the soil surface treatments ploughing, harrowing and rolling were chosen. For reference additional tests were carried out on undisturbed crusted soil surfaces which are very common on fallow and abandoned fields in this region. An important treatment was the simulation of sheep grazing. The results of 88 test runs confirm that, although this portable wind tunnel has aerodynamic limitations, it is possible to gain accurate data.

Results of these experimental wind erosion measurements indicate that the sediment output on undisturbed, crusted soil is negligible compared to that of disturbed soil surfaces. When sheep trampling was applied before the actual wind erosion simulation, the sediment loss was surprisingly low. Remarkably, the simulation of sheep trampling during test runs increased erosion rates up to 8 times the one measured on crusted soil. As well, low sediment outputs were measured in test runs on ploughed and harrowed surfaces. Corresponding to the very low surface roughness the highest output rates were reached on rolled surfaces with maximum values about 50 g*m^{-2}*10 min.