



Ants affect the erosion processes on agricultural fields under dry-summer conditions in the western Mediterranean

A. Cerdà

Department of Geography. University of Valencia. Blasco Ibáñez, 28, 46010-Valencia, Spain.
artemio.cerda@uv.es.

Soil erosion is high on agricultural soils subject to tillage, herbicides and weed removal. Ants burrow into the soil and transfer the soil particles removed from pipes and nests onto the surface. These activities encourage the preferential flow of water and thereby increase infiltration rates. However, the new soil surface made by the ants can increase erosion rates, as the exposed soil from deeper horizons with less organic matter and more clay and silt can trigger increased soil loss.

Sixty simulated rainfall experiments were carried out on surface soils affected by ants, and on soils with no burrowing activity. Soils were selected in Eastern Spain under orange orchards where rainfall reaches 500 mm year⁻¹ with very dry summers. Simulated rainfall was applied at 55 mm h⁻¹ on 0.25 m² plots during one hour on agricultural soils during summer 2006. Twenty experiments (10 on plots where ants had affected the surface and 10 where they had not) were carried out on organically farmed plots where catch crops are applied yearly; 20 (again 10 + 10) on tilled plots; and 20 (again 10 + 10) on plots where herbicide had been applied. As a general view, the results show lower runoff rates and an increase in the runoff sediment concentration on the ant-affected surfaces. However the results are highly affected by agricultural treatments. No erosion was found on the organic farming sites, very little on the tilled plots and very high erosion on the plots treated by herbicide, where ants increased sediment availability and therefore runoff sediment concentration.

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