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Actual geomorphological processes on hillslope viticulture from Axarquía in the Montes de Málaga (Spain).

Jesús Rodrigo Comino (1,2), José María Senciales González (2), Manuel Seeger (1), José Damián Ruiz Sinoga (2), and Johannes B. Ries (1)

(1) Physical Geography, University of Trier, Trier, Germany, (2) Physical Geography & Land Management Research Group, Department of Geography, University of Málaga, Málaga, Spain.

Hillslope viticulture is one of the agricultural activities affecting the eco-geomorphological system. Specifically, in the vineyards of the Axarquía on the Montes de Málaga (Spain), where the popular Moscatel and Pedro Ximénez grapes are produced, several problems of degradation of the chemical and physical properties of the soils have been reported by several authors, but not real quantifications of sediment losses.
Soils have developed mainly on Palaeozoic schists and slates with different degrees of metamorphism, but also include marbles, limestone, quartz and gneiss. On steep slopes (36-76%), surface rock fragment cover (45 to 75%) and occasional generation of rills and gullies characterize the principal geomorphological processes. Degradation processes are due to two causes: i) the concentrated heavy rainfall events during a few hours within no more than 30 days per year; ii) soil tillage of the vine-workers, removing vegetation cover under and around the vines. Anyhow, farmers take measures against soil erosion, such as building rills to canalize the surface flow (called "sangrías") and small walls of stones ("albarradas") to reduce soil loss. Actual soil degradation as a consequence of intensive agricultural activities starting with Muslim ages (s. VIII-XV).
The objective of this work is to show the geomorphological processes during summer, autumn and winter (2014-2015) on experimental plots along a hillslope in the south of Spain (Almáchar, Málaga). Six sediment traps (50 liters) with their respective collectors (60 liters) were installed in three different points along a hillslope exposed to south-west. After each rainfall, all sediments were collected and analyzed to calculate soil losses (g), surface flow (l) and the sediment concentration (g l^{-1}). Furthermore, a meteorological station (rainfall, temperature, wind and air humidity) was installed close to the plot. Final results show elevated soil loss and surface flow rates with different intensities along the hillslope during the extreme rainfall events.