

Connectivity of rainfall and human activity impacts on soil erosion processes in Mediterranean vineyards

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Soils are recognized as one of the most important components characterizing a terroir (Vaudour et al., 2015). However, the soils of vineyards are one of the most degraded in comparison to other cultivated context due to traditional tillage management (Prosdocimi et al., 2016). The key factor to understand the connectivity between topsoil redistribution and overland flow is the human activity as the management, who can reduce or increase these geomorphological interchanges (sediment and runoff) and changes the soil properties such it was found in different regions and under different crops (Parras-Alcántara et al., 2016).

In order to assess this topsoil redistribution in vineyards, the Stock Unearthing Method (SUM) has been accepted to be a reliable method to assess erosion rates and spatial evolution and interchanging of the topsoil, sediments and water flux directions at long-term time scales in vineyards (Brenot et al., 2008; Paroissien et al., 2010; Rodrigo Comino et al., 2016). The SUM is based on the measurement of the distance from the topsoil to the grafted vine stock, confirmed as a passive indicator of topsoil movements since the initial planting of vine stocks. Therefore, the aims of this work are: i) to quantify the soil erosion rates by means of Stock Unearthing Method; ii) to measure the impact of plantation of new vineyards; iii) to compare sediment transport, water flux directions and topsoil redistributions between different soil types, land management (bare soil, amendments, straw mulch...) and soil tillage practices; iv) to assess sediment budgets and water flux direction conditioned by the micro-topographical variations; and, v) to detect key factors and impact on the surface features within the detected connectivity processes (rills and inter-rills...) using cartography.

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