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I International
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for Sustainable Development
in Mountain Regions

Book of Abstracts



**I International Conference on Research for Sustainable
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Erosional response of steep slope vineyards to wind driven rainfalls: a case study in the Douro Region, Portugal

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In permanent row crops, wind direction affects the rainfall that hit the ground, with consequences to runoff and soil loss, because rows may intercept a large or a negligible part of the wind driven rains, according to the relative directions of wind and plant row. This study aims at identifying and discussing the effects of wind direction during rainfalls on soil loss from vineyard plots with different slope aspect. Data from 5 erosion plots (32m long x 5m wide), installed in the Douro valley (Portugal), in 45% slope row-planted vineyard, with slope aspect from NW to SW, consisted in long term data series of continuous rainfall records, daily wind direction, and soil loss, were explored separating events only with water loss (NER, 67 non-erosive events) from the others (ERO, 100 erosive events), and assuming for each event wind direction at peak rainfall intensity. Calm atmosphere prevailed but with lower frequency in ERO (65%) than in NER (72%). Most frequent winds were NW (13%) and S (12%) in ERO, and SE (12%) and NW (7%) in NER. Wind direction affected the differences between plots in event soil loss (expressed by the CV of the 5 plots soil loss in each event), with a CV 100% for NW winds, 49% for S, and 63% for Calm. NW winds blow parallel to vine rows in some plots and almost perpendicular in the others. This effect was most evident during the larger erosion events (1:50 ratio in event soil loss in SW plot and NW plot, during a NW driven rainfall). In permanent row crops, the effect of wind direction during erosive rainfalls should be taken into account when analyzing plot soil loss data, especially in the most significant events.