



Quantification of soil erosion on abandoned vineyards

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Long term observations showed that soil erosion is generally low on the vineyards of the Rhenish Slate Mountains near Trier. But it may increase in several orders of magnitude with the occurrence of extreme rainfall events or under the influence of soil and vineyard management. Climatic and economical changes are supposed to cause an increment of high magnitude events and to induce substantial changes into the cultivation of wine in Central Europe. One effect that could be observed during the last decade was the abandonment of large vineyard areas. To prevent the spread of diseases, stubbing of the old grapevines is obliged.

The main questions that have to be addressed are: how does stubbing of vineyards influence soil erosion and in which order of magnitude? How long does the effect last? Which are the characteristics of the soil that changed? For addressing this questions, we compared two adjacent parcels on a SSW exposed slope (steepness 35 %). One of the lots was managed in traditional way, whilst the other lot had been stubbed for terracing of the slope. Directly after stubbing in march 2008, 2 runoff and sediment traps were installed in each of the lots. In addition, 4 rainfall collectors were installed on soil surface. The traps and the collectors were cleaned out after every large rainfall event.

In addition soil loss and runoff were also estimated by means of 17 rainfall simulations: 4 in the vineyard-parcel and 11 on the stubbed parcel.

The runoff collected in the runoff and sediment traps installed in the stubbed parcel was 10 to 15 times higher than in the traditionally managed vineyard. Soil loss was up to 6 times higher. There could be observed also a clear reduction of runoff and soil loss during summer.

The rainfall simulations reflect the different process intensities on the lots, but do not reach to clarify the orders on magnitude: on the traditionally managed vineyard the maximum runoff coefficient (RC) reached 15 %, the stubbed parcel generated a RC between 20 and 50 %. Soil loss was in average up to 3 times higher (21 g m²) in the stubbed lot, reaching extreme values of 375 g m². The rainfall simulations showed a large influence of vegetation density on runoff and erosion.

It is shown, that vineyard abandonment affects dramatically soil erosion and runoff generation processes. But they may decrease rapidly with growing revegetation.