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Quantitative analysis of soil erosion in ecologically and conventionally cultivated vineyards

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Long term observations of soil erosion in vineyards showed that they are generally stable. But the soil erosion rates reach very varying dimensions by the increased occurrence of extreme rainfall events or under the influence of different soil and vineyard management. To identify the differences between an ecologically (with natural vegetation cover under and around the vines) and conventionally cultivated vineyard, in 2014 six sediment traps were installed on a south-west exposed slope of the Rhenish Slate Mountains, West Germany. The research area is part of Saar terrace (around 180 meter high above sea level), a tributary of the Moselle, so the substrate is made of clay stone and gravel sand.
Sediment traps allow in-situ measurements during a natural rainfall event. By dint of them the overland flow and sediment can be collected. The sediment traps were placed in a row in the middle of the slope, in the steepest part (averaged 23°). They were emptied weekly. Runoff and sediments were divided by the gravimetric filtering method.
The results show more collected runoff and sediment in the conventional vineyard than in the ecological. The sum of the runoffs amounts to 75 liter in the conventional vineyard, 29 liter for the ecological old and 0.73 liter for the ecological young vineyard. The amount of sediment of conventional vineyard (403 g) was five times higher than in the ecological one (79 g). The causes lay in the low vegetation cover and existing traffic lines in the conventional vineyard. But the highest sediment concentration has been detected in the ecological young vineyard.