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## Experimental detection of subsurface particle transport in coarse steep vineyard soils

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The Mosel wine region (Rhineland-Palatinate, Germany) is the largest steep vineyard region in the world. Due to extreme slopes ( $>17^\circ$ ), tillage with heavy machinery, increase in extreme precipitation events and new planting of vines, these vineyards are among the agricultural systems most affected by soil erosion.

Due to viticulture since the Roman period and their special characteristics, almost all vineyard soils in the Mosel region are classified as Terric Anthrosols. Soils are characterized by a very high rock fragment content (schists and fluvial sediments) and a loose surface layer over a compact layer due to tillage or weathered parent material. This structure enables subsurface flows between these two layers, especially in periods of very high soil moisture.

There is a knowledge gap in the identification and quantification of transported soil particles in this subsurface flow. If these soil particles reach relevant amounts, superficial protective measures may be partially ineffective and the soil degrades despite the existing protection. In consequence, there is a need to develop a method to determine this subsurface particle transport in situ.

Here, we present a first experimental approach for assessing the occurrence of sub surface erosion of fine-grained soil particles within soils. With this, it is possible to prove this process and the development of a sediment trap prototype, based on a drainage pipe, for in situ measurements of subsurface soil erosion.