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Agri-spillways as soil erosion protection tools in conventional sloping vineyards (Montes de Málaga, Spain)

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Rainfall causes soil erosion on Mediterranean sloping vineyards (>25˚ of slope inclination), however, little is known about information related to cheap, effective and suitable soil erosion protection measures. In the vineyards of the Montes de Málaga (southern Spain), a concrete land management practice against soil erosion is actually conducted by building tilled rills to down-slope direction to canalize water and sediments. We decided to call them agri-spillways. In this study, by carrying out runoff experiments, we assessed two agri-spillways (from 10 m to 15 m length) under extreme conditions. A motor driven pump mobilizes a constant water inflow about of 1.33 L s^{-1}during between 12 and 15 minutes (≈1000 litres). Finally, we observed: i) a high capacity of these agri-spillways to canalize a large volume of water and sediments; and, ii) higher speed of water flow (from 0.16 m $s^{-1}$to 0.28 m s^{-1}) and sediment concentration (SC) rates with ratios up to 1538.6 g l^{-1}). By comparing among them, the speed of water flow and the SC were much higher in one of tested rills, which was 5 meters length less and 7 degrees more of inclination. So, we concluded that these agri-spillways, after correctly planning and long term maintenance from contribution area to down-slope direction, can be function as a potential tool for designing suitable and cheap plans to protect the soil in Mediterranean sloping vineyards.

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