

## Testing the Runoff Tool in Sicilian vineyards: adopting best management practices to prevent agricultural surface runoff

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Over the last decades rainfall has become more intense in Sicily, making large proportions of steeply sloping agricultural land more vulnerable to soil erosion, mainly orchards and vineyards (Diodato and Bellocchi 2010). The prevention of soil degradation is indirectly addressed in the European Union's Water Framework Directive (2000/60/EC) and Sustainable Use Directive (2009/128/EC). As a consequence, new EU compliance conditions for food producers requires them to have tools and solutions for on-farm implementation of sustainable practices (Singh et al. 2014). The Agricultural Runoff and Best Management Practice Tool has been developed by Syngenta to help farm advisers and managers diagnose the runoff potential from fields with visible signs of soil erosion. The tool consists of 4 steps including the assessment of three key landscape factors (slope, topsoil permeability and depth to restrictive horizon) and 9 mainly soil and crop management factors influencing the runoff potential. Based on the runoff potential score (ranging from 0 to 10), which is linked to a runoff potential class, the Runoff Tool uses in-field and edge-of-the-field Best Management Practices (BMPs) to mitigate runoff (aligned with advice from ECPA's TOPPS-prowadis project).

The Runoff tool needs testing in different regions and crops to create a number of use scenarios with regional/crop specific advice on BMPs. For this purpose the Tool has been tested in vineyards of the Tasca d'Almerita and Planeta wineries, which are large family-owned estates with long-standing tradition in viticulture in Sicily. In addition to runoff potential scores, Visual Soil Assessment (VSA) scores have been calculated to allow for a comparison between different diagnostic tools. VSA allows for immediate diagnosis of soil quality (a higher score means a better soil quality) including many indicators of runoff (Shepherd 2008).

Runoff potentials were moderate to high in all tested fields. Slopes were classified as steep (>5%, with measured slopes of more than 22%) and soil textures were predominantly sandy loam and sandy silt loam with medium topsoil permeability. Subsurface traffic pans were observed in almost all tested fields from 20 to 40 cm depth. Where VSA scores were low, runoff potential scores were high, which shows a positive relation between both diagnostic tools.

Lessons taken from field diagnosis are that farm managers cannot always implement "good" soil, water and input management practices. For example, grape quality may be adversely impacted which creates a reluctance to change (White 2003). In our paper, we review current advisory practices to mitigate runoff in Sicilian vineyards, such as residue management, continuous soil cover and no-till (Novara et al. 2011, 2013, Leys et al. 2010, Arneaz et al. 2007), against our observations and discussions with farm managers. Our findings, especially in the Regaleali vineyards, indicate that the focus for change should not only be at the edge of the field, but also in the field (Sabbagh et al. 2009). Runoff should be stopped at source first and discussion with farm managers is critical before advising on BMP plans for runoff mitigation, especially in viticulture since wine production is a multidisciplinary profession.

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