

Effects of inter row management intensity on soil physical properties in European vineyards.

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Successful viticulture is mainly depending on soil, climate and management capabilities of vine growers. These factors influence on the availability of water during the growing season which in turn impacts on wine quality and quantity. To protect soil from being eroded many winegrowers try to keep the inter row zones of the vineyards green for as much time as possible. Greening also helps to provide water-stress to the grapes for harvesting high quality wines. However, the management strategies concerning the intensity of inter row management are widely different across Europe. They differ within regions, between regions and between countries and are mainly based on personal experience of the winegrowers. To measure possible effects of inter row management in vineyards on soil physical parameters we selected vineyards with different inter row management intensities in Austria, Romania, France and Spain. In total more than 700 undisturbed core samples (from 3 to 8 cm depth) out of 50 individual vineyards were analysed for saturated and unsaturated hydraulic conductivity, soil water retention, aggregate stability, total organic carbon, soil texture and bulk density.

The comparison between high intensity management with at least one soil disturbance per year, medium intensity with less frequent soil disturbance and low intensity management with no soil disturbance since at least 5 years indicates that investigated soil physical properties did not necessarily improve for the upper soil layer in every region.

The results indicate that the influence of long term and high frequency mechanical stress imposed on soil by use of agricultural machinery in inter rows as well as different fertilization strategies may in some cases exhibit higher impacts on soil physical properties than the different tillage strategies.