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The effect of land use changes on water repellency and aggregate stability of soils in the viticulture district of Modra (SW Slovakia)

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This work focuses on the effect of soil management on soil properties in the viticulture region where the soils are influenced by management practices such as deep ploughing before vineyard establishment and the long-term cultivation of grapevines and forestry. The obtained results showed marked differences in physical and chemical soil properties between the four study sites. In particular, the soil pH values and the contents of organic carbon and clay-fraction differed significantly. Although soils at both vineyard sites were wettable, soils at afforested vineyard and original forest sites were strongly water repellent on average. The comparison of the aggregate stability values determined for the various soil management systems indicated differences between the vineyard and forest sites. Soil aggregate stability decreases approximately according to the order where comparable original forest soil and afforested vineyard soil have greater stability than vineyard soil which is more stable than deeply ploughed vineyard soil. From all the soil properties studied, the soil organic matter content and soil water repellency appear to be the main determining factor controlling aggregate stability.