

## **Effects of changes in soil properties derived from land levelling on grape quality and yield in the Priorat (Spain)**

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Soil characteristics together with topography and climate influence on the suitability of the environment for grapevine growing and wine production grapevine growth and fruit qualities. Thus, changes in soil properties derived from field works and agricultural activities may influence grape production and quality. This work focuses on the effects of land terracing on soil properties, and the changes in grape quality and production. The study was conducted in the Priorat region, where old vineyards planted in steep slopes have been adapted for the labour mechanization with the construction of terraces. Changes in soil properties, such as organic matter, infiltration, water retention capacity were analysed in both old and transformed vineyards. Grape yield, pH, acidity and the likely alcohol content were evaluated in a sample of 80 plots planted with Grenache and Carignan. The soil surface alterations produced by the terrace construction affected some hydrological properties, such as texture and bulk density, and they also gave rise to lower soil organic matter content (up to 40%), lower available water capacity (up to 25%) and hydraulic (up to 55%). For the evaluated varieties, there were differences in yield between both new and old vineyards: 2.18 vs 0.68 kg/vine for Carignan and 2.34 vs 1.64 kg/vine for Grenache. For Carignan, pH was on average lower in the new than in the old vineyards (3.46 vs. and 3.51) and higher differences were observed in the acidity (5.29 vs. 4.22). Similarly for Grenache, pH values were 3.3 vs 3.24 and acidity 5.18 vs 4.69. Smaller differences were found in the likely alcohol content although it was always higher in the old vineyards (14.5 and 14.9 for Carignan and Grenache, respectively) than in the new vineyards (13.7 and 14.5 for Carignan and Grenache, respectively).