

# Effect of Management System on the Physico-Chemical Properties of Soil in an Organic Pedro Ximenez Vineyard

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## Abstract

Soil management by traditional tillage has been commonly used over the years as a cultivation practice, combined with herbicides. This is the case of the Montilla-Moriles wine protected designation of origin (PDO) in southern Spain. Since the use of this practice can lead to decreases in the physical and chemical stability of the soil, more sustainable management is being considered, to minimise these problems. One of these practices is no-tillage with vegetation cover which could improve the physical structure of the soil by decreasing the mineralisation of organic matter and erosion, among other advantages. This is why this strategy is gaining more and more popularity in Spanish and world viticulture, as it is also perfectly adapted to the measures taken by European governments to improve environmental quality. The aim of this work was to evaluate the effect of management system on grapes yield and physical and chemical properties of the soil in a white grape vineyard (var. Pedro Ximenez). The treatments studied were traditional tillage and no-tillage with vegetation cover at different soil depths. The experiment was carried out in an experimental vineyard of the Andalusian Institute for Research and Training in Agriculture, Fisheries, Food and Organic Production located at Cabra (IFAPA, Cordoba, Spain). It was found that some physical properties were not affected, such as texture and humidity. However, improvements were observed in the concentration of organic carbon, nitrogen and phosphorus in the soil with a no-tillage management system with cover crop. In addition, significant differences were found in the content of some macronutrients with the depth of the soil profile studied. Finally, regarding vineyard yield, grape production was higher in the traditional tillage system, which could lead to a future study on improving production in vineyards that use cover crops.

## Keywords

Tillage, Cover Crop, Soil, Vineyard

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