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Soil influence on Carignane wine quality in the AOC Priorat, Northeast Spain

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The impact of global warming obviously varies according to the type of wine produced and the geographical location. The importance of understanding climate variability and soil water holding capacity is especially important in vineyards growing in steep slopes. Texture and soil depth are factors that influence the accumulation of water and, therefore, its influence on grapes ripening. The study was carried out during 2009 and 2010 vintages in two regions El Molar (EM) and Porrera (PO). 5 different parcels located in the AOC Priorat, selected by having different soil texture, facing slope orientation and altitude: EMDA, EMBA, POMO, POME and PODA. Weather stations located in each vineyard recorded climate data (temperature, humidity, rainfall, radiation, wind speed and direction). Tukey test was applied for post-hocanalysis (SPSS statistical package, version 17.0) between plots.
Climatic data revealed 2009 as a warmer vintage comparing with the temperate 2010. Porrera region resulted in lower Temperature, VPD and GDD. Soil analysis revealed EMDA as a parcel having the finest texture. In Porrera the highest and steepest vineyard (PODA) show the higher amount of gravels and stones; whilst POMO has a balance between fine elements and stones. Topsoil and subsoil layers are notably different in the POME parcel. The two plots PODA and EMDA are those with major differences between berry weights within the two years of study, indicating a greater variability. EMDA has the largest grape production, regardless of the vintage probably due to the fine soil texture. At the end of the maturation period, the ratio SFT / kg was higher in EMDA and PODA, corresponding with a greater leaf area in EMDA. In general the two plots are more irregular, with greater differences over the years with higher rainfall (2010) compared to dry years (2009), where the ratios do not show much difference. Concerning Ravaz-Index, the most unbalanced vigour corresponds to EMDA (this explains major productions of grapes) and POME, which shows higher pruning weight, where the soil is more heterogeneous. In the warmest years (2009), wines acquire a greater alcoholic degree, acidity and lower pH in EMDA and PODA. In the other hand, the results in the temperate year (2010) show more variability depending on the type of soil and slope of the plot. Wine phenolic composition does not seem to follow a behavior strictly related to soil type of each plot, with a major importance of the interannual climatic conditions.