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Increased Abiotic Stress and Vineyard Diminishing Production: Climate Change? A Case Study

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According to projections to a near future, the Mediterranean Basin will experience a shift in climatic conditions with tendency to higher temperatures and lower and more erratic precipitation. The climatic data available for Portugal indicate that those phenomena have been felt since the 1950's and they might aggravate in coming years. Agriculture activities are specially affected by weather conditions and some agricultural systems are very vulnerable to changes in weather patterns. Viticulture is one of those systems that despite the overall adaptation of grapevines to a wide range of environmental conditions, the most valuable grape varieties only thrive in more specific climates. The economy of Northeast Portugal is heavily dependent on viticulture and for years the farmers have reported poorer productions but amid the natural and large departures of crop productions from the average it is not always clear if the lower production is a steady trend. We analyzed a 15 years series of production, the probable alcohol and the pH of the most and compared them with the temperature and rainfall of the same period. The data has gathered systematically in the same vineyards belonging to a farm state that is typical in size and in management practices to most medium size viticulture enterprises of the wine producing region of Douro Demarcated Region (DDR). The results show that the 15 years series of temperatures have a steady increase and that they encompassed a steady decrease in productions for all grape varieties observed. The results are aligned with the forecast for climate in the region and its consequences to the viticulture system. A number of mitigating solutions are proposed to avert the worst scenarios.