

## Abstract

Despite the expansion and increasing popularity of Touriga Nacional in Portugal, there has not been extensive research into the variety's response to different climate characteristics. The objective of this research was to test the relationships between different climate indices and berry composition and Phenology in Touriga Nacional in the Dão winegrowing region of Portugal. From the available data we can also explore any evolution of the climate, berry composition and phenology during the recorded years.

Climate and plant data were analysed from records collected at the 'Centro de Estudos Vitivinícolas do Dão' in the Dão wine region of northern Portugal between 1963-2010. Six common climate indices were calculated from the climate data for each year of the recorded period. Berry composition and phenology records of Touriga Nacional planted at the research centre from the same period were also analysed. Any trends or changes in climate or plant data were analysed over the recorded period. All climate indices were correlated against the plant data results to investigate any relationships.

An increase in the Growing Season Temperature Index (GST) during the studied period was observed that agreed with studies over a similar period in other parts of Europe. Various climate indices had some correlations with grape and vine parameters; generally acidity showed a reduction with increases in temperature-based indices. Budburst and harvest dates were confirmed to be hastened by higher temperatures. Also yield had a positive correlation with the Huglin Index (HI). HI had a better correlation with plant parameters because it is calculated over a 6-month (instead of 7-month) period.

Understanding the relationship between Touriga Nacional and climate indices can help producers maximise the potential of this important Portuguese variety, as well as aid its expansion into other Portuguese regions and other regions throughout the world.

*Keywords:* Touriga Nacional, Climate, phenology, berry composition, yield, rootstock