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Vineyard zonation based on natural terroir factors using multivariate statistics – Case study Burgenland (Austria)

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Abstract

Aim: The aim of the study was to explicitly develop a methodology of delineation of natural Protected Designation of Origins (PDO) terroir regions for Austria, where PDO viticulture regions reflect natural conditions only in a formal manner.

Methods and results: There is increasing competition in the wine market from globalized trends, where the European Union (EU) and non-EU wine producers have adopted different market strategies to promote their wines and gain larger market share. The EU has therefore established protective agricultural product categories such as PDO and Protected Geographical Indication (PGI) based on the terroir concept which contrasts with USA strategies. Here, we first collected and derived as many as possible relevant physical geographical data for a total of 66,673 officially registered vineyard areas in Burgenland (Austria). Next, we applied factor analysis to these data with the aim to shrink their size and reduce their dimensionality. For each vineyard plot was derived a factor score which was used for performing k-means clustering. The best count of clusters, k-parameter, was estimated using five internal validity indices. Five homogenous management zones were created as a result of clustering. Correctness and accuracy of the clustering was evaluated by multidimensional discriminant analysis. The final zones were compared to current Districtus Austriae Controllatus (DAC) of Burgenland.

Conclusion: It was found by the comparison of DAC regions of Burgenland and our drafted zones that some of the DAC regions do not respect natural terroir zones, while these regions were created as PDO regions which should respect their natural terroir.

Significance and impact of the study: The presented methodology can be applied all over Austria and, with some modifications caused by different input data, to each EU member country where it is necessary to revise PDO regions' borders.

Key words: PDO regions, zonation, vineyard areas, terroir, factor analysis

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