

Target-specific digital soil mapping supporting terroir mapping in Tokaj Wine Region, Hungary

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Tokaj Wine Region – located in Northeast-Hungary, at Hegyalja, in Tokaj Mountains – is a historical region for botrytized dessert wine making. Very recently the sustainable quality wine production in the region was targeted, which requires detailed and “terroir-based approach” characterization of viticultural land and the survey of the state of vineyards.

Terroir is a homogeneous area that relates to both environmental and cultural factors, that influence the grape and wine quality. Soil plays dominant role determining the viticultural potential and terroir delineation. According to viticultural experts the most relevant soil properties are drainage, water holding capacity, soil depth and pH. Not all of these soil characteristics can be directly measured, therefore the synthesis of observed soil properties is needed to satisfy the requirements of terroir mapping.

The sampling strategy was designed to be representative to the combinations of basic environmental parameters (slope, aspect and geology) which determine the main soil properties of the vineyards. Field survey was carried out in two steps. At first soil samples were collected from 200 sites to obtain a general view about the pedology of the area. In the second stage further 650 samples were collected and the sampling strategy was designed based on spatial annealing technique taking into consideration the results of the preliminary survey and the local characteristics of vineyards. The data collection regarded soil type, soil depth, parent material, rate of erosion, organic matter content and further physical and chemical soil properties which support the inference of the proper soil parameters.

In the framework of the recent project 33 primary and secondary soil property, soil class and soil function maps were compiled. A set of the resulting maps supports to meet the demands of the Hungarian standard viticultural potential assessment, while the majority of the maps is intended to be applied for terroir delineation. The spatial extension was performed by two, different methods which are widely applied in digital soil mapping. Regression kriging was used for creating continuous soil property maps, category type soil maps were compiled by classification trees method. Accuracy assessment was also provided for all of the soil map products.

Our poster will present the summary of the project workflow – the design of sampling strategy, field survey, digital soil mapping process – and some examples of the resulting soil property maps indicating their applicability in terroir delineation.

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