



Between and within-field variation in physico-chemical soil properties of vineyards: implications for terroir zoning and management in Heuvelland, Belgium

Emma Tavernier (1), Ann Verdoodt (1), Wim Cornelis (1), Nele Delbecque (1), Lynn Tiebergijn (2), Marleen Seynnaeve (2), and Donald Gabriels (1)

(1) Ghent University, Soil Management (BW12), Gent, Belgium (ann.verdoodt@ugent.be), (2) Inagro, Beitem, Belgium

The 'Heuvelland' region with a surface area of 94 km² is situated in the Province of West Flanders, Belgium, bordering with France. The region comprises a number of hills ("heuvel") on which a fast growing 'wine culture' is developing. Both professional as well as non-professional wine makers together cultivate about 19 ha of vineyards, and are still expanding. Grapes cultivated include Chardonnay, Pinot gris and Pinot noir among others. The small-scale, strongly dispersed vineyards are located in different landscape positions of variable aspect. The objective of our preliminary study was to assess the between-field and within-field variation in physico-chemical soil properties of these vineyards with the aim to better characterise the terroir(s) in Heuvelland and provide guidelines for soil management.

Fourteen vineyards from five different wineries were selected for detailed soil sampling. Twenty-five sampling sites were chosen according to the topography, soil map units and observed variability in grape growth. The soil was sampled using 15 cm depth increments up to a depth of 60 cm or a shallower lithic contact. Composite samples of 5 sampling locations along the contour lines were taken per within-field zone. Besides the texture, pH, organic carbon, total nitrogen, available phosphorous and exchangeable base cations (Ca, Mg, K), also some micronutrients (Fe, B, Cu, Mn) were determined using standard laboratory procedures.

The soils developed on Quaternary niveo-eolian sandy loam and loamy sediments of variable thickness covering marine sandy and clayey sediments of the Tertiary. Where the Tertiary clayey sediments occur at shallow depth, they can strongly influence the internal drainage. At higher positions in the landscape, iron-rich sandstone layers are found at shallow depth. Fragments of this iron-rich sandstone can also be found at lower positions (colluvial material). This iron sandstone is claimed to contribute to the unique character of this wine growing region. According to the soil map of Belgium (scale 1:20,000), the soils are characterized by variable depth, texture, internal drainage and profile development. As such, the 23 vineyards in Heuvelland are found on 21 different soil types; of which 12 different soil types are included within our sampling strategy. Our sampling furthermore revealed an even greater variability in physico-chemical soil properties than reflected by the soil map. This leads to a 'tentative' conclusion that Heuvelland cannot be considered as one natural terroir as such and that the wine growers can potentially improve their production by adapting their management to local soil properties using the improved knowledge on the vineyard soils.