



Integrating expert based knowledge into terroir soil mapping

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Performing sustainable agricultural production system ought to integrate soil knowledge in order to maintain yield and preserve soil resources. This issue is particularly important for perennial vegetation production as financial investments are often done at least for a 30-year duration. But the main limitation with soil knowledge production is that soil mapping needs a large amount of data that can be expensive and time consuming. In the same time, farmers usually have a good knowledge or perception of their soils, mainly based on pragmatic observations and most of the time not integrated in soil scientist prospections. Therefore, the aim of our work was to develop a methodology in order to integrate winemaker knowledge into soil mapping process, from soil sampling design optimization to soil organization model production.

The example we presented is an application of the methodology on two vineyards in Bordeaux area (France): 15 ha in Saint-Emilion and 45 ha in North Médoc. For these vineyards, high-resolution soil survey (descriptions and lab analysis) and soil electrical resistivity surveys were done. Concomitantly, winemaker and vine manager knowledge were collected in order to produce an expert map and a vineyard zoning. The comparison of both soil scientist and expert maps shows that experts correctly visualized main variations of soil properties, among which soil texture (mainly clay fractions). Calcareous nature of soils is also well estimated by farmers on discretized soil map. Although main factor in soil water availability, the soil thickness doesn't really stand out from the expert map. At the end of the day, using empirical knowledge seems a good way to enhance the efficiency of a soil survey and then, the involvement of local experts in soil map building make these maps user-friendly for winemakers.