

Prologue - Digital Terroir: What does it mean?

Throughout this thesis reference will be made to the term Digital Terroir. To begin I would like to define this concept and how it relates to the original French *terroir*.

P-1 Terroir

Terroir is a French word that lacks any real translation into English. A direct translation is soil or terrain however *terroir* encompasses more than this and cannot be explained from purely physical conditions. It has been defined generally as a “growing environment” (Johnston and Robinson, 2001) or in relation to viticulture as the “total elements of the vineyard” (Wilson 1998). This definition has been expanded by Martin (2000) to define *terroir* as the conjunction of all the attributes, historical, geographical, human, biological or environmental, of a given (delimited) region that contribute to the individuality of the wines produced there. It is the inclusion of cultural attributes and an implied reverence of the land that makes *terroir* so difficult to quantify. Many experts in the viticulture and oenology fields refer to a “mental” aspect of *terroir*, both from a viticulturist’s perspective of the vineyard and as a link perceived by the consumer between the wine and the locality (Wilson 1998). Thus when a consumer purchases a bottle of French wine he/she is not just purchasing an alcoholic drink but also a remembrance or feel of the locality. This approach allows for the marketing of wine as a unique product - rather than a generic commodity - and is perceived as a way of countering the incursion of “brand” wines into the market (Wilson, 1998). Supporters of organic viticulture have even suggested that the use of chemicals within a vineyard will impact on *terroir* and for a wine to be labelled with a *terroir* classification such inputs should be banned (Johnston and Robinson, 2001)

From a scientific view, a term that is both a function of soft and hard sciences is difficult to define and quantify. One solution proposed by Goode (2001a) is that *terroir* be simplified to describe the physical environment of the grape. This provoked a strong response from within the viticulture world (Goode, 2001b). Few it seems are prepared to forsake the “mental” aspect of the production or remove the winemaker from the *terroir* philosophy. Despite being decried, the sentiments of Goode are relevant in the need to quantify viticultural environments. Many “New World” countries lack distinctive *terroirs* (maybe from a lack of history/culture). The popularity of blended rather than single vineyard wines is further diluting regional (*terroir*) influences. For these regions, and for the environmental quantification of “Old World” vineyards I am proposing a new term “Digital Terroir”.

P-2 Digital Terroir

This concept is based on emphasising the growing environment of the vine rather than the totality of the winemaking experience. As the name suggests digital *terroirs* are modelled *terroirs*. The model seeks to identify areas of differing environments based on soil and meso-climatic information. Given information on local soil, terrain and climatic, a prospective vineyard may be mapped in terms of its “digital *terroir*” prior to establishment. The accuracy of such a model is dependent on the accuracy and validity of data input.

As stated above, the difficulty in modelling *terroir* lies in quantifying the cultural aspects of produc-



tion. Whilst it is difficult to quantify the “sense of place” that Johnson and Robinson (2001) feels contributes to the awareness and intensification of terroir, some cultural properties, that influence the physical environment, can be incorporated into the “Digital Terroir” model. In particular the effect of basic management practices on the micro-climate and soil surrounding the vine may be modelled and the data used as input to the digital terroir model. The model, as Goode (2001a) suggested, is still concerned solely with the physical environment of the plant however managerial decisions that will influence this physical environment are included as variables.

Digital terroir is essentially an alternative term for a viticultural management zone or class. The management zone philosophy is one being strongly advocated as an interim approach towards site-specific crop management (Cupitt and Whelan, 2001). Management zones (and digital terroirs) can be approached from either a yield (quantity), quality or a combined yield*quality point of view. The quality approach is more traditional and closer to the french view *terroir*. However in “New World” viticulture (Chile, Australia etc.) there is also a niche for bulk commercial wines produced from lower quality winegrapes. The production of bulk, “brand” wines runs contrary to the philosophy of *terroir* however not to digital terroir. Whether approached from a quantity or quality perspective the ability to segregate a production unit into smaller zones with similar production potential will provide opportunity for increased production efficiency.

There is no constraint on a digital terroir to be spatially contiguous. The same digital terroir may exist at two or more discrete locations i.e. digital terroirs really describe classes rather than zones. Digital terroir may be unstable temporally. If management strategies are aimed at uniformity of production through differential input application then digital terroir may change with input application, for example the deep ripping and the addition of gypsum to a soil may improve drainage and reduce sodicity that may impact on vine performance and thus quality (Cass *et al.*, 1995). Finally, if various quality parameters are being managed there is a potential for different digital sub-terroirs. Thus sugar may be managed by a digital sub-terroir and grape pH another and titratable acidity, colour etc. by other digital sub-terroir. These sub-digital terroirs will sum to the digital terroir of the site whilst allowing for a better differential distribution of inputs.

P-3 References

- CASS, A., WALKER, R.R. AND FITZPATRICK, R.W. (1995). *Vineyard soil degradation by salt accumulation and the effect on the performance of the vine*. In: C.S. Stockley, A.N. Sas, R.S. Johnstone, and T.H. Lee (eds.). Proceedings of the Ninth Australian Wine Industry Technical Conference. July 16-19, 1995, Adelaide, South Australia. pp153-160
- CUPITT, J. AND WHELAN, B.M. (2001) Determining *potential within-field crop management zones*. In: G. Greiner and S. Blackmore (eds.). Proceedings of the Third European Conference on Precision Agriculture. June 18-20, 2001, Montpellier, France. pp7-12
- GOODE, J. (2001a). *Terroir: Muddy thinking about the soil*. <http://www.wineanorak.com/terroir.htm>
- GOODE, J. (2001b). *Terroir revisited: towards a working definition*. <http://www.wineanorak.com/terroir2.htm>
- JOHNSTON, H. AND ROBINSON, J. (2001) *The World Atlas of Wine* (5th edition) Mitchell Beazley: London
- MARTIN, D. (2000). *The search for terroir - a question of management*. In Proceedings of the 5th International Symposium on Cool Climate Viticulture and Oenology, January 16-20, 2000, Melbourne, Australia
- WILSON, J.E. (1998) *Terroir - The role of geology, climate and culture in the making of French wines*. Mitchell Beazley. London

