

## Defining Terroir

Terroir is a French term with no exact English counterpart. Terroir is defined as the sum of all the natural parameters - especially soil, topography and climate- which may potentially influence the character and characteristics of wine. Many view terroir strictly as natural phenomenon; that is, terroir refers to those qualities that derive strictly from the soil and subsoil, orientation to the sun, proximity to a river, altitude, climate, or the combined effect of these and other natural factors. These elements are usually seen as fixed and largely immutable and therefore beyond the control of human beings. However, one needs to add man to the definition of terroir as there would be no vineyards without man and it is the farmer that helps express terroir thru the multiple operations he does in the vineyard.

A helpful way of approaching terroir is by narrowing it down progressively. One can start with macro-terroir (country, region) then move to meso-terroir (district, locality) and end at micro-terroir (site). The degree of difficulty in identification increases exponentially as we move from macro to micro-terroir. But we know that identifying terroir finely is possible as shown for example by the Master of Wine examination. This can only be possible if there are certain memorable characteristics which can be recalled. These no doubt include techniques which leave a "cultural" imprint, but we can postulate that there must also be recognizable traits which stem from natural conditions - in other words, terroir.

Important are the soil factors, which influence the depth to which vine roots grow, and the amount of water held in this root zone. These factors include soil texture (proportions of sand, clay, silt etc) and the presence of stones. The effects that soil properties have on soil water availability is also well known

Terroir is generally thought to be about soil effects (at least in the micro scale over a few tens or hundreds of feet). We then need to know if effects are due to soil chemistry or soil physics. One of the most definitive study about the influence of soil on terroir was conducted by Professor Gerard Seguin of the University of Bordeaux. Seguin studied the chemical properties of soils around Bordeaux, including famous chateaux'. He found that soil chemical composition did not seem to have a specific influence on wine quality. Excellent wines could be produced on acid, basic and neutral soils; excellent wine can also be produced on soils with balanced chemistry and also on those with nutrient deficiencies.

The soil factors important are those that determine the amount of water stored in the soil (texture) and rooting depth. Seguin found that the majority of Grands Crus Classes of the High Medoc supplied enough water for the vine to grow until around veraison (color change). During the latter part of ripening water was deficient and supplied mostly by rainfall. And, interestingly, Seguin was able to explain that the limestone soils of Saint-Emilion and the clay soils of Pomerol provided the vines with a similar water supply pattern.

As well as direct effects of drought on vine physiology, there can be equally important indirect effects. For example, water stress limits leaf and shoot growth, and so a water stressed vine has better leaf and fruit exposure to sunlight than one growing vigorously with adequate water supplies. Indeed a main effect of soil water supply is on vine vigor.

In countries where growers are allowed to irrigate and where the soil drains rapidly, the skilled grower can manipulate water supply to stop vegetative growth before or around veraison thus mimicking the water supply of Bordeaux' great vineyards. Once the water supply variable is controlled climate takes on a greater differentiating effect.

Climate here is taken as the sum of temperatures, orientation to the sun, wind, humidity and hours of daylight. Given a specific varietal, the vines will grow differently and their fruit will have different flavors depending if it is grown in a hot or a cool environment. Wide diurnal temperature fluctuations will produce fruits with different flavors and sugar/acid balance than fruit grown in an area with little diurnal temperature fluctuation.

The finesse with which the farmer manipulates his vines will express terroir more or less. The decisions taken about soil management, irrigation (when and how much), fertilization (synthetic versus organic for example), canopy management will all affect plant growth and thus transcribe a sense of place. For example, if you fertilize your vines every year and water on a schedule you are not going to force the plant to explore much soil and to adapt to the climate. You will probably express your meso-terroir but not your micro-terroir. One must have the courage to intervene as little as possible to truly express terroir.

A vine cannot move. It is rooted to its spot on earth. It makes its grapes from water and minerals absorbed through the roots as they rummage through the soil and the sub-soil and from the light which fill the sky above.

The vine records everything – A soil tremor, a fog drenched January morning, a rainy cloudy March morning followed by a clear crisp blue afternoon, the fierce white trembling heat of a July afternoon: The vine will inscribe it all in its fruit.

The natural environment of a specific region offers a complex interaction of climate, microclimate, soil composition, slope and sunlight exposure, which all contribute to the unique character of wines from a specific locality. The sum of these factors is called Terroir. There are countless factors that humans bring to bear that could affect the expression of terroir. Because we still have significant gaps in our knowledge of the linkages between causal factors and wine character, we can only speculate as to the importance of these parameters. We may try to separate them into single elements, but in reality wine by its very nature is the consequence of many combined actions.