The Concept of Terroir in Viticulture

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Advanced Viticulture Short Course
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Pinot noir wines from Burgundy and Oregon
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Pinot noir wines same region different vineyards
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- Pinot noir wines from Burgundy and Oregon
- Pinot noir wines from the same region in different vineyards
- Pinot noir wines from the same vineyard in different blocks
The Concept of Terroir in Viticulture

Term “terroir” has 2 origins:

• From Latin word “terratorium” a derivation of “territorium” = delimited zone under roman army control.

• “Product of terroir”, used in the middle age to describe a natural product specific of a region and cannot be found somewhere else.

Terroir
An interactive ecosystem where vine growth, grape ripening and wine quality are influenced by the environment around the vine.
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Climate
- Temperature
- Radiation
- Precipitation

Soil
- Composition and physical structure
- Water availability
- Pedoclimatic
- Mineral nutrition: Nitrogen (N)...

Human factor
- Viticulture practices
- Winemaking

Grape quality potential

Genetic factors
- Variety
- Rootstock

Wine quality

Viticulture practices

Winemaking

Grape quality potential

Variety

Rootstock

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Climate

Climate varies with Time (vintage) and space.

**Macroclimate**
Climate of a large region studied over 30+ years.
*i.e. Rhône Valley*

**Mesoclimate**
Climate of smaller region over a shorter period (days).
*i.e. Chateau-neuf-du-Pape*

**Topoclimate** (slope, altitude, aspect)

**Microclimate**
Climate of a vineyard block or vine itself over very short period (hours).
Temperature and Radiation

Wine regions can be basically divided into 2 types of climates:

• Warm climate: wines with higher sugar levels (which produce higher alcohol wines).
• Cool climate: wines with lower sugar levels and more acidity.

Differences within same type of climate.

*i.e. Oakville AVA receives more sun and heat than the Medoc in Bordeaux, the Medoc produces Cabernet-Sauvignon wines with greater acidity.*
Vine Water Status

Effect of rainfalls and evapotranspiration on vine water status.
Vine water status also depends on soil (water holding capacity) and training system (canopy architecture and leaf area).

Irrigation is likely to modify terroir expression.
Soil

- Soil composition and physical structure
- Soil color
- Water reserve
- Mineral nutrition
- Organic matter
- Macro and micro-organism

i.e. Riesling wines on clay soil have more body than Riesling on limestone soil.
Genetic Factor

Varieties and rootstocks have different properties dictated genetically:

- **Ripening rate:**
  - Early ripening varieties (Pinot noir, Chardonnay...) vs. late ripening varieties (Mourvedre, Grenache...).
  - Rootstocks that induce (RGM) or slow down (420A) ripening rate.

- **Absorption of minerals**
  - Cabernet-Sauvignon more efficient in assimilating N than Riesling
  - Clone R3 of Sauvignon blanc more efficient in assimilating N than CL297

- **Synthesis and accumulation of metabolites**
  - Carmenere great producer of methoxypyrazines
  - Sauvignon blanc great producer of volatile thiols
  - Muscat great producer of terpenes.
Human Factor

• No vineyard or wine exist without the intervention of human (site selection, selection of varieties, growth improvement, winemaking...).

• Human decisions: choice of variety and rootstock, row orientation, vine density, cover crop, spray program, canopy management, irrigation, harvest...
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