

THE ESSENCE OF EARTH & WINE: *Terroir*

What Makes Terroir?



Landscape



Climate



Soil



Grape Variety



Vine Management



Wine-making Tradition

Terroir

A “*terroir*” is a wine grape production region, sharing a similar landscape, soil type, climate, grapes, vine management, and wine making tradition, which combine to provide a unique set of wine characteristics.

SELECTED ELEMENTS OF TERROIR: LANDSCAPE, CLIMATE, AND SOIL

Landscape

When choosing a site for a vineyard, water and air drainage are the two most important considerations. Evaluation of the landscape and soil determines whether the site is suitable for a vineyard or if modifications are required. Soil scientists often look at:

- **Slope:** how steep is the hill?
- **Air drainage:** how does the air move over the landscape and between the vines?
- **Curvature:** what is the shape of the slope?
- **Aspect:** what direction is the slope facing?
- **Permeability:** how well can water move through the soil?
- **Penetration resistance:** how well can the roots penetrate the soil?

While wine grapes can grow well in many soil types, an ideal vineyard soil has a thin layer of topsoil and well-drained subsoil, which prevents root rot.

Climate

Wine grapes can grow in many climates. When choosing a grape variety, it is important to understand the landscape geography and micro-climates within a site. In general, extreme heat or cold

harms the vines and excess precipitation or humidity causes plant diseases. Identifying weak areas can help plan for better management during the growing seasons.

Keeping Frost at Bay

Frost can be very damaging to grape buds, fruit, and vines, so viticulturists must be aware of this risk. It is essential that the landscape enable some mixing of air layers to prevent frost from settling on the vines during cold nights. Sites that are slightly elevated drain cold air, which collects in depressions on the landscape.



Frost on Vines

Water Availability and Drainage

Water drainage is critical; deep, well-drained soils help buffer the effect of heavy rainfall without reducing nutrient availability to the plant.



The profile of a well drained soil

Soil

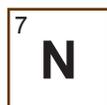
The soil pH (acidity level) is determined in part by the rocks (parent material) from which the soil comes; acidic soils have toxic levels of Al (aluminum). Wine grapes require significant quantities of K, N, P, Ca, and Mg from the soil during the growing season.

- What is the soil pH?
- What amendments can we use to adjust soil pH?

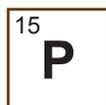


Soil and Wine

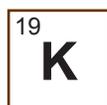
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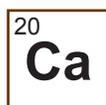
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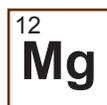
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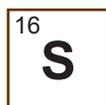
potassium



calcium

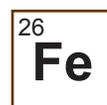


magnesium

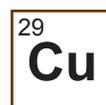


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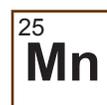
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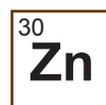
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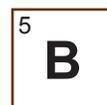
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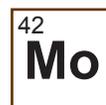
manganese



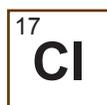
zinc



boron



molybdenum



chlorine

BIOS

James Fisher is a soil scientist specializing in viticulture. He is the principal of Soil Solutions, LLC, in Malvern, PA and uses his experience in agricultural business, soil science, and geospatial mapping to help viticulturists increase the health and fertility of their soil, optimize wine grape production, and determine ideal site selections for vineyard blocks.

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Eldon Nygaard founded Valiant Vineyards in 1996. He is also a State Representative in South Dakota and actively pursues legislation favorable to the wine industry in his state and the nation.

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