

### Location

All vineyards of the Columbia Valley lie in the rain shadow of the Cascade Mountains in south central Washington state. The entire region has been shaped over millions of years by the dramatic geological activity of plate tectonics. As part of the Pacific Ring of Fire (up the west coast of North America and down the east coast of Asia) subduction zone, volcanoes and related earthquakes have molded a vineyard area of strong east-west running ridges. These basalt folds and crests in the earth's surface provide south facing slopes to plant vines on. The entire appellation lies around the 46° north parallel, about the same as the Cote d'Or of Burgundy. Long daylight hours during the growing season provide additional energy for maturation in this slightly cooler climate.

### Rainfall

The Cascade Mountains, up to 14,000 feet high, effectively block eastward-moving wet weather systems from the Pacific Ocean. The eastern half of the state, then, is semi-arid, receiving six to eight inches of rainfall annually, most of it falling during vine dormancy. Rain is rare during the growing season, especially at the critical moments of flowering, fruit set and harvest. Water is supplied by drip irrigation, drawn from the vast reserves of the Columbia, Yakima and Snake Rivers. We control irrigation timing and amounts rather than being left to the whims of nature. We adjust our irrigation regimes to control shoot tip elongation in the spring, decreasing internode length, leaf size and number, balancing vegetative growth with vine yields.

### Soils

Soils are combinations of degrading basalt bedrock with wind and water-deposited sand, gravel and silt loam. Successive Ice Age scraping, flooding and depositing have left deep, moderately weak soils, ideal for classic vinifera. The soils have low fertility and low water-holding capacity, allowing precise control of vine growth patterns.

### Climate

Climate shows the effects of a continental site, but with marine influences. The western side of the state is dominated by the flow of marine air: heavy precipitation, frequent cloud cover, cool temperatures and high humidity ultimately prohibit the culture of classic vinifera varieties here. But east of the mountains, in the Columbia Valley, the combination of low rainfall, low cloud incidence, high light intensity, higher temperatures and low humidity allow the vines to flourish. A range of "heat summation" areas are found throughout the Columbia Valley from the low Region 1 sites in the Yakima Valley appellation to high Region 3 and low Region 4 sites along the Wahluke Slope. Frequent cooling breezes funnel from the mouth of the Columbia River to moderate summer temperatures. In addition, the three rivers provide significant influence in moderating cold winter and hot summer temperatures.

### Plant Propagation

All vines are planted on their own rootstocks, since phylloxera is not an issue. As a result, vine planting material can be selected by the quality and typicality of fruit the mother plant produces, rather than any phylloxera resistance or grafting capability factors. Recently-planted vineyards used vines propagated by aseptic shoot tip culture from our own indexed bacteria/virus free mother vines. Ours is the only winery in the U.S. to have an active shoot-tip culture program for vine propagation.

### Vine Culture

Training is typically a double unilateral cordon, spur-pruned, with varying numbers of buds depending on vine age and health, previous vintage, site vigor and stylistic goals. There are two wires, and some vineyards have moveable wires for shoot positioning. Plant spacing varies but is approximately 6' x 9'. This vine culture is precisely intertwined with our irrigation management.

### Integrated Pest Management

Because of overall low disease and pest pressures, we have some vineyards which are farmed organically. Throughout the other sites, we use a system of integrated pest management which looks at the vineyard as a biological entity, with a balance of plant and animals depending on each other. Monitoring pest populations, depending on the natural interplay of organisms, preempting disease incidence all dramatically reduce the number of inputs. Dozens of vineyard experiments are ongoing to improve the quality of fruit grown with fewer non-biological inputs.

### Acreage

The Columbia Valley now has more than 31,000 acres of classic varieties planted, making it second to California in U.S. vinifera-based wines. Nearly 300 growers farm the land, with new acreage and new varieties planted annually.