

Excerpt from Workshop 5  
Oregon Pinot Camp 2008



## SOIL INTO WINE

### *Digging Deeper into Oregon Pinot Noir*

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#### **Part 1: Geological History of the Willamette Valley**

Illustration: Willamette Valley soils map in the Reference section

Until about twelve million years ago, Western Oregon was on the floor of the Pacific Ocean. Before that, for thirty-five million years under the sea, it was slowly accumulating layers of marine sediment, the bedrock of the oldest soils in the Willamette Valley.

Starting about fifteen million years, the pressure created along the coast by the collision of the earth's Pacific Plate and North American Plate gradually pushed western Oregon up out of the sea, creating the Coast Range and the intensely volcanic Cascades Mountains further inland. The Willamette Valley thus began as an ocean floor trapped between two emerging mountain ranges.

During this period of uprising, from about fifteen million to six million years ago, rivers of lava erupting from volcanoes on the east side of the Cascades flowed down the Columbia Gorge towards the sea, covering the layers of marine sediment on the floor of the emerging Willamette Valley with layers of basalt.

The Willamette Valley continued to buckle and tilt under pressure from the ongoing coastal collisions, forming the interior hill chains that are typically tilted layers of volcanic basalt and sedimentary sandstone, such as the Dundee Hills and Eola Hills. (See Figure 2, page 3)

The next geologic activity to add to our soils was the creation of a layer of wind-blown silt (called "loess") on the northeast facing hills west of where Portland sits today. This started as long ago as a million years and may have continued until about fifty thousand years ago. The silts that were blown came from the valley floor in the area, but originally, they derived from the earlier basalts and sediments that had been severely weathered.

Much, much later, about eighteen thousand to fifteen thousand years ago, at the end of the last ice age, the melting of a glacial dam near the location of Missoula, Montana repeatedly flooded the Willamette Valley, creating a lake up to the 400-foot contour level, with only the tops of the two-tone hills sticking out, and leaving behind deep silts.

Thus we have in the Willamette Valley a complex series of soils with interesting and diverse origins:

**Marine sediments** that were laid down on the floor of the Pacific Ocean  
Examples: Willakenzie, Bellpine, Chuhulpim, Hazelair, Melbourne, Dupee

**Basalts** that originated as lava flows from eastern Oregon  
Examples: Jory, Nekia, Saum

**Ice Age Loess**, silt blown up from the valley floor onto northeast-facing hillsides  
Example: Laurelwood

**Missoula Flood** deposits brought down the Columbia Gorge as the result of a repeatedly melting glacial dam  
Examples: Wapato, Woodburn, Willamette

Figure 1: *Rock Sequences in NW Oregon*

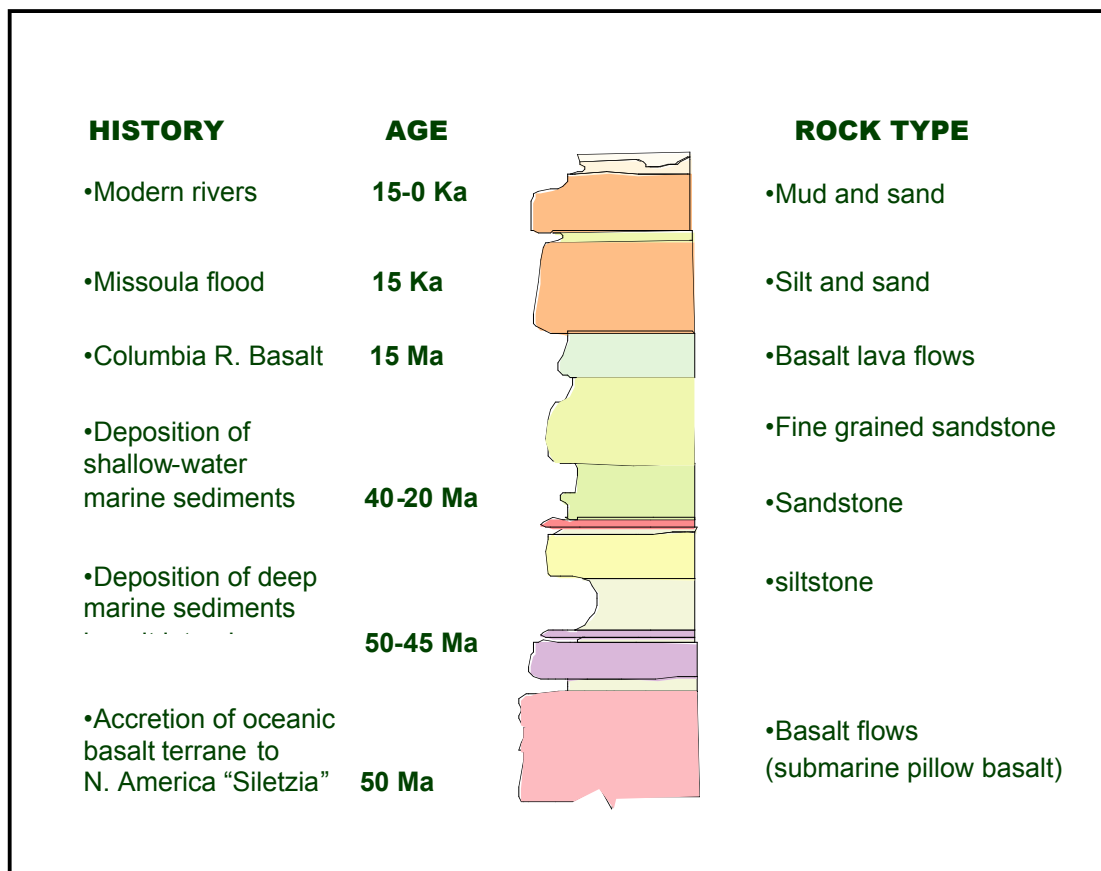
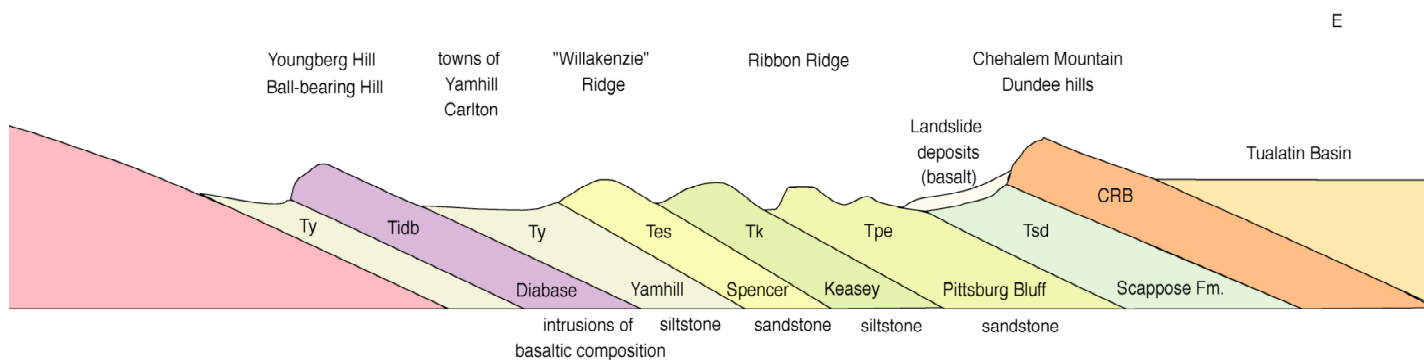


Figure 2: Geology Provides the Landscape - rock layers tilted sideways



### Why we focus on basaltic and marine sedimentary soils in this workshop?

Much is said about how and why the Willamette Valley is the perfect place to grow Pinot noir. But once that most fundamental “long term vineyard decision” has been made, it must be said that not every acre in the Willamette Valley is suitable for growing great Pinot noir. Indeed, most of the acres of the Willamette Valley are those deep, rich valley-floor soils brought to us all the way from Montana by the Missoula Floods at the end of the last ice age. These valley floor soils are paradise for a great diversity of crops, but they spell trouble for Pinot noir. Pinot noir at low elevations is subject to frost damage in the spring, and in such deep soils it becomes overly vigorous, and unable to ripen its fruit properly.

In almost all cases, great Willamette Valley Pinot noir grows on rocky hillsides facing south or southeast, at least 200 feet above sea level and avoiding cooler hilltop microclimates over 800 feet. This is a common factor among the six new AVA’s within the Willamette Valley, regardless of soil types and weather patterns. As it turns out, sites that meet these qualifications are generally found on basaltic or marine sedimentary soils, just because of the way the Valley was formed in the first place. Sites with loess soils are often suitable also, but are relatively rare in the Willamette Valley.

### Relationship between soil types and AVA’s

There is not a direct correlation between specific soil types and the six sub-appellations of the Willamette Valley, as can be clearly seen on the Willamette Valley AVA’s map in the Reference Section. Some have one predominant soil type; others have two or three different types. For most AVA’s geographic/climatic factors are as important as soil type in defining the unique characteristics of the appellation.

- **Dundee Hills AVA** – mostly basaltic but marine sedimentary at the lower elevations on the western and northern slopes
- **Eola-Amity Hills AVA** - mostly basaltic but marine sedimentary at the lower elevations on the western and northern slopes

- **Chehalem Mountains AVA** - basaltic and marine sedimentary on the southern and western slopes; ice-age loess on the northeastern slope
- **Yamhill-Carlton District AVA** - marine sedimentary predominant
- **Ribbon Ridge AVA** - entirely marine sedimentary
- **McMinnville AVA** - primarily marine sedimentary with some basalt and alluvium

More complete descriptions of each these six AVA's are provided at the end of this section

### **Descriptions of the Six Willamette Valley Sub-AVAs**

[Descriptions provided by winemakers from each AVA, independently]

#### Dundee Hills

The first grapes in the Willamette Valley were planted in the Dundee Hills. It remains the most densely planted locale in the valley and state. Within the 6,500 acres of this almost exclusively basaltic land mass that runs north-south and overlooks the Willamette River to the south and the Chehalem Valley to the north, and which rises to 1,067 feet in elevation, more than 1,250 acres of grapes are planted on approximately 50 vineyards. It is approximately 30 miles to the southwest of Portland and 40 miles east of the Pacific Ocean, with protection from the ocean climate provided by the higher Coast Range of mountains.

Dundee Hills soils are reddish, silt, clay, loam soils derived from Columbia River basalt flows and, as such, are easily decomposed to provide moderately rich, deep, and good water-holding soils. Soils and climate differentiate this AVA. The hillside planting regions above 200 feet provide good water and air drainage, good frost protection, moderate fertility, and moderate temperatures for adequate ripening, but with acid retention.

Pinot noirs from this AVA are characteristically red to black fruited, with raspberry to black cherry ranges, offering earth, truffle, cola, and perfume aromatics and flavors, with light spices and a core of sweetness on the palate.

#### Eola-Amity Hills

The name of this AVA is derived from a ridge of hills adjacent to the Willamette River. The ridge is actually composed of the Eola Hills, straddling the 45<sup>th</sup> latitude on the southern end, and the Amity Hills on the northern spur. The proposed minimum elevation for the AVA is 200 feet

Two of the predominant influences on the characteristics of wines from the Eola Hills are shallow soils and the Van Duzer corridor. The soils of the Eola Hills contain volcanic basalt from ancient lava flows. The basalt is combined with a preponderance of marine sedimentary rocks and/or alluvial deposits. These soils: Nekia, Woodburn, and Steiwer are generally much shallower and rockier relative to most other Oregon AVAs. These shallow well-drained soils tend to produce smaller grapes with greater concentration.

The Van Duzer Corridor essentially provides a break in the Coast Range that allows cool ocean winds to flow dropping temperatures dramatically, especially during late summer afternoons. These late afternoon and evening breezes help provide the cool nights that keep acids firm and are essential for optimal ripening

The wines tend to be bigger, more full-bodied wines. The fruit components tend towards blackberry, black cherry, and plum contrasted with raspberry, strawberry, and cherry flavors, which may predominate

in wines from deeper soils. The mineral content of the terroir is often present both on the nose and on the palate. The wines often display considerable focus and clarity of fruit. They also favor primary fruit character over spice, tending toward the darker black fruit spectrum (black cherries and blueberries). Compared to other North Willamette Valley regions, the wines often exhibit brighter acidity and firmer structure, along with considerable longevity, this due to the cooling effect of the Van Duzer Corridor. Wines from lower elevations tend to lean more toward plum and bramble fruit, showing slightly more secondary flavors such as earthy, mineral and spice/herbal tones (e.g. white pepper and dried flowers).

### Chehalem Mountains

The Chehalem Mountains AVA is a single uplifted land mass southwest of Portland in the northern Willamette Valley, extending 20 miles in length and 5 miles in breadth. These mountains stretch from the town of Wilsonville in the southeast, snake between Sherwood and Newberg, and reach almost to Forest Grove in the northwest. They include several discrete spurs, mountains, and ridges, such as Ribbon Ridge and Parrott Mountain. The highest point within the Willamette Valley is the Chehalem Mountains' Bald Peak, at 1,633 feet, which effects weather for the AVA and helps to distinguish it from the adjoining grape-growing hillsides and surrounding lowlands, less appropriate for grapegrowing.

It is the geography and climate that largely differentiate this AVA from others. That notwithstanding, the variety of soils within the AVA helps to play host to different grape varieties. Soils on the southern and western slopes are basaltic (including Saum and Jory) and ocean sedimentary (including Melbourne and Willakenzie). Soils on the north face of the mountains are wind-blown loess (Laurelwood). Inappropriate heavier alluvial soils are largely excluded from the AVA by virtue of its minimum elevation of 200 feet.

Within the almost 70,000 acres of this AVA are over 1100 acres of grapes, grown in more than 80 vineyards, and 15 or so wineries. The Ribbon Ridge AVA is a sub-AVA of the Chehalem Mountains.

A wide range of Pinot noirs can be produced in this AVA, from more lightly red-fruited, elegant and balanced stylings, to black-fruited, briery, earthy, and highly structured wines carrying brown spice and wood notes, plus most gradations in-between.

### Yamhill-Carlton District

North of McMinnville the land slowly rises to the hamlets of Carlton and Yamhill. Low ridges surround the two communities in a horseshoe shape. The free-flowing North Yamhill River courses through the center of a lush patchwork quilt of nurseries, grain fields, and orchards. The neatly combed benchlands and hillsides of the Yamhill-Carlton District are home to some of the finest Pinot noir vineyards in the world.

Historically nourished by forestry and farming, this area is rapidly emerging as a global center of Pinot Noir production. This pastoral corner of Oregon's northern Willamette Valley creates a unique set of growing conditions. The Coast Range to the west soars to nearly 3500 feet (1200m) establishing a rain shadow over the entire district. Additional protection is afforded by Chehalem Mountain to the north and the Dundee Hills to the east.

The coarse-grained, ancient marine sediments native to the area are the oldest soils in the valley. These soils drain quickly, establishing a natural deficit-irrigation effect. Thus, the vines stop vegetative growth earlier here than elsewhere, leading to more complete ripening, even in cooler growing seasons. This allows Pinot noir to develop deep ruby colors and broad, silky tannins. The mouth-filling wines exude powerful fruit aromas of raspberry, blackberry, and black cherries complexed by minerality reminiscent

of pipe tobacco, espresso, clove, and dark chocolate and accented by scents of rose, violet, lavender, and sweet wood smoke. These are alluring, complex, supple gems of Pinot noir to sip and savor.

### McMinnville

The McMinnville AVA sits due west of Yamhill County's wine country home, the city of McMinnville. It extends approximately 20 miles south-southwest toward the mouth of the Van Duzer Corridor, Oregon's lowest Coast Range pass to the Pacific Ocean. The proposed AVA is a blend of geo-climatic factors that make it unique among Yamhill County's proposed AVAs. Specifically, the appellation encompasses the land above 200 feet and below 1,000 feet in elevation on the east and southeast slopes of these foothills of the coast-range mountains. Geologically, this region is dramatically different in soil profile from other winegrowing areas in Yamhill County. The soils are primarily uplifted marine sedimentary loams and silts, with alluvial overlays. Beneath is a base of the uplifting basalt. Clay and silt loams average 20–40 inches in depth before reaching harder rock and compressed sediments, shot with basalt pebbles and stone. The uniqueness of the soils for winegrowing is in the 20–40 inch depth.

Climatically, this AVA is, again, in its own class. These primarily east and south facing slopes sit in a protected weather shadow of the Coast Range Mountains. Rainfall is lower (33 inches annually) than sites only 12 to 20 miles to the east. The foothills also provide protection from chilling winds in the unstable air conditions of spring and fall. Winegrowers also have the option of placing vineyards on more southerly facing sites to take advantage of the drying winds from the Van Duzer Corridor. There are presently approximately 600 acres planted in the AVA. Of greatest note is the flavor qualities of the Pinot noir wines from this area. Unlike the wines from hillsides to the east, the Pinot noirs from these soils are highly pigmented, with a strong backbone of tannin and acidity and a massive palate of black fruit and earthy flavors.

### Ribbon Ridge

Ribbon Ridge is a very regular spur of ocean sediment uplift off the northwest end of the Chehalem Mountains, comprised of a relatively uniform five square miles (3,350 acres) of land in a breadloaf-like shape. In excess of 300 acres within 15 vineyards are currently planted on the ridge. The AVA is distinguished by uniform ocean sedimentary soils and a geography that shows it protected climatically by the larger and taller land masses surrounding it. Paucity of aquifers forces many vineyards to be dry farmed. The AVA's elevation minimum is 200 feet, with its highest point 683 feet.

Pinot noir characteristics from Ribbon Ridge include predominantly black fruit (black cherry, blackberry, and black currant), moderate to high structure sometimes bordering on rustic, good acidity especially in higher elevations, and good extraction. Wines contain fine tannins, a range of brown and wood spices, fresh-turned earth and chocolate dependent on vintage. Wines are thought to ultimately age very well.