What Does ‘Microclimate’ Mean?

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“Microclimate is almost like a sub-AVA,” says Erica Stancliff about the roles these atmospheric conditions play in American Viticulture Areas (AVAs).

Stancliff, a winemaker at Trombetta Family Wines and Pfendler Vineyards on Sonoma Mountain in California, and president of the Petaluma Gap Winegrowers Alliance, defines a microclimate as “a small subset of an area with unique climatic differences from the surrounding areas.”

A microclimate can affect just a few acres or it can span several square miles.

Environmental factors affecting microclimate include proximity to bodies of water, soil types, geographical features, elevation and altitude, as well as temperature and humidity. All these traits can vary even within a single vineyard.

A WINDY DAY AT GUST WINES IN THE PETALUMA GAP / PHOTO COURTESY OF MEGAN CLINE

“Not only is this a huge consideration for winemakers’ harvest decisions regarding ripeness, but it’s what makes some small winemaking areas and vineyards so unique,” says Stancliff.

Matt Dees, winemaker for The Hilt in Santa Barbara, California, has a keen understanding of how microclimates affect the various regions within his AVA. Like in Sonoma County, Dees says the biggest determining factor is the distance from the ocean. Vineyards within immediate proximity experience cold ocean air and fog.

In both AVAs, microclimate is further nuanced by the series of hills, valleys and plateaus throughout the region, all of which dictate a vineyard’s exposure to or shelter from oceanic effects. For example, fog can sink and settle into a valley floor, thus creating a cooler microclimate. Vineyards above the fog line will have longer exposure to the sun and warmer overall day temperatures, but may experience a more drastic diurnal range due to altitude.

These details dictate where certain varieties thrive best.

“Sta. Rita Hills gets what we like to call ‘refrigerated sunshine,’ ”says Dees. “It’s ideal for growing Pinot Noir, Chardonnay and Syrah. Ballard Canyon [AVA] … [has] warmer days and far colder nights, with sand-driven and clay over limestone soils. Syrah and Bordeaux varieties grow best there.”

Farther east, toward Happy Canyon, vines are exposed to an even more extreme diurnal shift, which helps widely planted Bordeaux varieties retain acid.

“I’m not even taking into account Los Alamos, Sta. Maria [and] Sta. Maria Bench,” Dees adds, commenting on the numerous sub-appellations within the broader Santa Barbara County AVA, each with its own unique environmental conditions.

Stancliff works with several vineyards throughout Sonoma County, where Pinot Noir is one of the most widely planted varieties. The grape is a case study in how the broader AVA is broken down into specific environmental conditions.

“In certain areas, like the Russian River, Pinot will ripen a little faster than the surrounding coastal regions, leading to a different flavor profile and tannin maturity,” she says. “In the Petaluma Gap, because of the long growing season, you’ll see ripe tannin and big structure development coincide with fresh acidity and dark, ripe fruit characteristics.”

Wind also plays a vital role in the Petaluma Gap AVA, named for the gap in the coastal ranges that funnels cool ocean breezes inland.

“[It’s] what defines our microclimate,” says Stancliff. “Vines respond by creating thicker skins on the berries.” Thicker skin creates more color, tannin and concentration of flavor in resulting wines.

“For all we do in the cellar, it’s important to remember that wine is defined by thousands of moments connected to the grapevine’s life—wind, sun, depth of roots and, of course, human intervention,” says Dees. “Terroir is driven by thousands of such moments.”