

Wine East[®]

News of Grapes and Wine in Eastern North America

November-December, 2007

First High Altitude Symposium

The Elevation of Wine: The First International High Altitude Viticultural and Winemaking Symposium was held on June 14, 2007, at Snows Lake Vineyard in Lake County, California. Such topics as the effects of elevation on winegrape growth, physiology, fruit and wine composition, vineyard management and winemaking practices have not been widely investigated, and the symposium was designed to bring together viticulturists, winemakers and journalists from four continents to define high altitude, share viticultural and winemaking experiences, compare wines of high altitudes from around the world, and lay out

an integrated vision for future research into the effects of high altitudes on winegrapes and wines.

The symposium was the outgrowth of interest in mountain viticulture in Lake County, which has the largest concentration of high altitude vineyards in California, with vineyards ranging from 900 feet to 3,000 feet in elevation. With new plantings and winery projects starting up over the last 15 years, members of the Lake County Winegrape Commission began discussing the possibility of a symposium three or four years ago and made the decision to fund it with the Commission and a dozen wineries and vineyards sponsoring it.

In his opening remarks, Peter Molner of Obsidian Ridge Vineyard and the symposium chair, said, "We're

here out of curiosity. We starting doing research, talking to people, talking among ourselves, and realized there wasn't much research [that] had been done, so we're here to ask people to help lead us in this direction. ... Many of us have been growing fruit in the mountains. And I think anybody who lives in the mountains and grows fruit in the mountains realized something is different – the light is different, the air is different, the wine is different, the grapes are different. Let's find out today what is exactly different."

While the symposium obviously focused on high altitude climate and terroir, many growers and winemakers east of the Rockies could relate to their problems with such issues as low winter temperatures, spring frosts or diseases and insects. None of the speakers came from the East, but what they had to say would have been of interest to many Easterners.

The keynote address was given by Randle Johnson, consulting winemaker at Hess Collection Winery in Napa and Director of Winemaking at Columé Winery in Argentina, the latter being the world's highest vineyard at 9,900 feet.

The morning session featured two papers under the heading "The Terroir of High Altitude," one by Dr. Gregory Jones of Southern Oregon University, and the other by Leo McCloskey, president and co-founder of Enologix, Inc. Panel dis-

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cussions on viticulture, winemaking and marketing followed at the end of the morning and in the afternoon. The emphasis in these sessions was on hands-on experiences of participants from Italy, Australia, Argentina, and California. The moderators were Glenn McCourt of University of California-Davis Extension; Jim Gordon, editor of *Wines & Vines*; and Paul Wagner of Balzer Communications.

No proceedings are being published, but transcripts can be viewed at www.theelevationofwine.org/transcripts/2007. To give some idea of the kinds of topics covered at the symposium, excerpts from the transcripts, somewhat edited here from their presentation in oral form, follow with the kind permission of Shannon Gunier, Executive Director of the Lake County Winegrape Commission. She

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The Second International High Altitude Viticultural Symposium has tentatively been scheduled to be held in June, 2009.

Dr. Gregory Jones devoted all of his talk to weather and climate influences and hazards at different elevations. This is a small part of what he had to say:

“What defines high elevation? Is it a vineyard planted in Argentina at 7,000-8,000 feet, or is it the difference between being planted in Carneros versus Amador County in California, or is it the difference between the bottom block or the upper block of this vineyard? These

are all very, very different kind of issues, and I think they drive very different kind of weather and climate issues. There are a lot of different types of vineyards: Stone Mountain Vineyards in Virginia at 1,700 feet, Alta Seca Vineyard in Oregon at 2,450 feet, and Terra Creek Vineyard in Colorado at almost 6,500 feet. We can go to Central Otago in New Zealand at 1,400-1,500 feet. Douro Valley in Portugal, 2,000 or more. Madrona Vineyards up in the foothills, 3,000 feet or more. And then Chateau Aigle in Switzerland at 3,100 feet. All of these are very different kinds of environments, and the mountainous areas around them will help determine what climate really does in those regions.

“When we look at this, we have to define it in two basic frameworks

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– relative relief, which is simply the difference in elevation between the highest and lowest points in a given area, and absolute relief, the difference in elevation between a given location and sea level. When we talk about elevation parameters, we really need to say, ‘Are we talking about it in an absolute sense, or in

a relative sense?’ because they do mean slightly different things.

“In most vineyard areas, relative relief is the most important aspect of what we really look at from elevational differences. This produces topographical effects on all characteristics of weather and climate that really are site issues that we know that we try to maximize.

“In a very high absolute elevation relief, though, we need to know that there are some pretty significant things that go on in weather and climate compared to similar low elevation vineyards at the same latitude. So we need to think about these as two different things.

“From the local or topographical influence kind of characteristic, first of all, elevational differences do drive temperature differences. On average, the atmosphere cools at about 3.6 degrees Fahrenheit per thousand feet, or one degree Fahrenheit for 275 feet. That’s a very basic average number. It varies quite a bit, depending on characteristics of the environment, but if you’re in a tropical environment versus a mid-latitude environment versus an arctic environment, you’re going to have very different kind of changes and temperature with height. You need to know that there are large-scale variations that occur in how temperature does change. On average, though, for mid-latitudes, this rule of thumb of one degree Fahrenheit per 275 feet is pretty good.

“We know that slope effects are very important in terms of air movement. This varies by aspect a little bit. We know that there are diurnal wind characteristics, inversionary characteristics, thermal zones – all of those kind of things become very important. In one Oregon vineyard, we know that air flows up the valley and up into the mountainous areas during the daytime, and we know it turns around and flows downhill at nighttime. Knowing the strength of that, and the direction of it is very important for any given local relief kind of a framework. These are all

thermally-driven. Sometimes they’re very driven by the local landscape. Other times they’re driven by the greater kind of macro-scale kind of a flow of the atmosphere around you. There are some very different things that can go on from one region to another.

“There are also thermal zone characteristics. One that is very important is that in an inversionary environment in a valley we have typically an area where cold air pools and there’s a warmer environment aloft. You need to know a little bit about the width of the valley and the openness of that air flow that will determine the depth of that thermal environment. Knowing the shape of the valley that you’re in is very important.

“Complex terrain equals complex inversion. This is very, very important because when you look at inversion depths, the strength of inversions, and also how they break during the daytime, a mountainous region can produce some very interesting characteristics. How the air flows into those mountainous valleys produces a very different kind of structural inversion depth. It can produce one that breaks at a given time in mid-morning versus one in late morning, so we have some very big differences that occur across the terrain. We can also get some fairly big differences in rising air as the inversions break. Complex terrains will produce very large differences across a given area.

“As you move upward in the atmosphere, we have a lower density of all constituents from oxygen to carbon dioxide to water vapor. If you look at the average density structure as we move up in the atmosphere, at 3,000 feet, we’re roughly at 89% of what we are at sea level. At 9,000 feet we’re roughly at 60% of the atmosphere at sea level – a very different kind of environment for plants.

“One of the important issues that comes into play with this is carbon dioxide, because we know that

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when we look at water, nitrogen, and carbon dioxide, those are three very limiting issues for plant growth. However, the abundance of CO₂ to O₂ at high elevations decreases, and this is very important about uptake. When the CO₂ uptake is less at higher altitude, it typically limits photosynthetic activity and productivity at ambient solar radiation.

"The gradient of CO₂, of course, is less because there's less of it in the air, so plants have to adapt physiologically. Again, looking at differences in elevation relative to carbon dioxide and density, the radiated differences are also very important. Higher elevation surfaces both gain and give off radiation or heat very quickly. This produces a pretty dominant sun/shade effecting kind of issue. You have higher intensity and more ultraviolet radiation. Chlorophyll degradation in leaves and berry skins also occurs more rapidly in high radiation environments.

"Elevated climates are fairly distinctive; they have a distinct combination of temperature, radiation, wind, and rainfall patterns that varies quite a bit over the nature of the landscape. There is large climate variability that occurs, as well, at both temporal and spatial scales, depending on where you are. There are many complex interactions, and I think this is very important – being able to tie those together and understand them as best you can in your own individual environment. However, they're kind of hard to isolate overall. Growing seasons tend to be shorter at higher elevations, but plant growth can be intense. Understanding kind of what happens in a more favorable radiation environment and these marked contrasts between day and night temperatures is pretty important."

Here is some of what keynote speaker Randle Johnson, with experience in both California and Argentina, had to say about starting a mountain winery.

"You think the logistics are tough putting in a vineyard in the mountains – try putting a winery in the mountains. That's a topic for another whole conversation or seminar, but the one word that you need to look at first in a feasibility of a winery, anywhere, is the wastewater. That is probably the number one issue that getting permits is going to deal with: What are you going to do with your wastewater? Regulators view wineries as huge consumers of water, and even though you may only have 500 gallons, they're going to make you put in a wastewater system that can handle, you know, Gallo in Modesto.

"How many roads are you going to have to put in? Roads are cheap, and they're regulated. Then there's power. You're up in the boondocks

on top of a mountain, and you can't just string a couple of wires on a little telephone pole. You're going to need three-phase power because you're going to have pumps and vineyard shops, welders, electric welders, whatever. You need to get three-phase power, and the power company isn't fast – you need to sign up for three-phase power a year or so in advance.

"Water – probably the number one issue. Most hillside vineyards have too much in the winter and too little in the summer. So what's your water development going to be? There are a lot of good wells in the mountains, believe it or not. You have to go deep, but a lot of sites have good water and wells. Springs. My best vineyard in Argentina has

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ALTITUDE (Continued from page 35)

a year-round stream and we named the vineyard after it, Rio Blanco. Surface water. Lots of times in the mountains the only water you get is what the rain gives you, so you try to capture surface water and get it into a reservoir. You do that with drains, too. Is the reservoir going to need to be lined? If you're dealing with a lot of rocks, you can't haul in a bunch of



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clay to compact a reservoir. You've got to throw a liner in there.

One of the panelists, Ernesto Bajda of Bodega Catena Zapata in Argentina, spoke about the differences in two of his vineyards, one at 3,500 feet and the other at 5,000 feet.

"After four or five years of research on the different altitudes, we saw there was a big difference in the average temperature and a very marked difference in the sunlight intensity of the different regions. The higher altitude, we have very marked slopes there, so during the whole day we have a breeze, a cold breeze, and as we go higher we have more breeze and more cold climate. And the sunlight intensity, basically our theory is that as we go higher we have less filtration of the

radiation, so that's one of the theories we have.

"Basically, these two factors, the low temperatures and the high radiation or more light, make the plants work more on their photosynthesis – we have primary photosynthesis and increase it, and secondary photosynthesis. That means more anthocyanins, more colors, aromas, flavors. And there's also a big difference in the day and night temperature, which makes the plants to breathe less, to have less respiration during night so they do not consume what they produce during the day, which finishes in bigger net accumulation."

The "Marketing – From Mountain to Table" panel was chaired by Paul Wagner. Here are a couple of excerpts including Wilfred Wong, cel-

larmaster of Beverages and More!; Ronn Wiegand, publisher of Restaurant Wine; and Jeff Prather, Ferry Plaza wine merchant.

Paul Wagner: We've talked about high altitude viticulture. We've talked about high altitude winemaking. Is there such a thing in the marketplace as a high altitude wine?

Wilfred Wong: It's niche wine. I believe there is no specific market for high altitude wines, and there will never be one except for a very small niche market.

Ronn Wiegand: It's a small niche and it'll grow as much as we educate. I think I've only seen one wine list out of thousands that has a mountain vineyard section. Nobody has any high altitude wines that I've seen.

Jeff Prather: I agree with both these gentlemen that there isn't a category, but I'll say, "not yet." We haven't come up with a definition for it yet.

Paul Wagner: Marketing wine is an awful lot about finding words that people actually understand. ■

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