



Notes from the American Society for Enology and Viticulture Annual Conference in Seattle

ASEV is the professional association for the wine industry in the U.S. This is not a nerdy group that talks in scientific code and dresses in white lab coats, and it's not just for scientists and educators. It welcomes everyone from the wine industry and its affiliates. Lyndie Boulton, its long time executive director told us that society membership stands at about 2600. Considering that there are now over 6000 wineries in the U.S., the wine industry can do better. In 2009 ASEV gave out \$60,000 in graduate and undergraduate scholarships to the brightest lights in our industry's future and this alone merits our complete support and undying loyalty to the society. In addition, the Eastern Section of ASEV provided eight graduate scholarships to students in the East and Midwest. ASEV also hosts two of the most important and well-attended national wine industry conferences, the Unified Symposium in Sacramento and its annual conference which is usually held in a western state but may, for the first time, be hosted in the east in the coming years. Finally, ASEV publishes the American Journal of Enology and Viticulture, one of the most significant peer-reviewed enology and viticulture research journals in the world. AJEV alone is worth the price of admission. I would encourage anyone who has a passion and-or stake in the wine industry to join both national ASEV and its Eastern Section. I'll suggest that ASEV is the common denominator of the wine research and industry community and deserves your support. I am part of the viticulture and enology research and education establishment and would appreciate your support of it. It represents an endorsement of my work. If you read my viticulture newsletter regularly and you are not a member of ASEV or at minimum the Eastern Section, maybe you could consider this payback. The scientists, educators and students who benefit from the scholarships and journal are not doing their work completely out of a sense of altruism but they are actually trying to help YOU to make better wine. For information about ASEV and how to join, go to their web site at: <http://asev.org/>

The following are two areas of research were presented at ASEV and have a direct impact on wine growers in the non-western states and other humid wine regions. I believe these projects validate the necessity and value of viticulture and enology research and the mission of ASEV.

I have heard Dr. Gavin Sacks, enology professor at Cornell talk about his research into methoxypyrazines (MP) many times yet every time I hear him he introduces some new wrinkle that he has added to his research on this complicated and problematic molecule to wine makers, perhaps particularly to those of you trying to make fine wines in the East. The effects of MPs, particularly on red wine flavor profiles along with sometimes abrasive acidity are what scare many wine consumers from Eastern wines so we are well served to get these problems under control.

MPs are a bit of viticultural and enological Mr. Jekyll and Dr. Hyde in wine making. First of all there are the variations of the base methoxypyrazine compound that in Sauvignon Blanc from New Zealand has mass appeal and is the foundation upon which an entire wine industry has been built. On the other hand, there is the nasty lady bug taint that caused massive problems in Ontario in 2001 and remains a threat each harvest season. It is also the cause of veggie, herbal, green flavors in varieties like Cabernet Franc, which for right or wrong has become a key red *vinifera* variety in our region due to its cold hardiness. His research has led to specific recommendations about canopy and crop management practices that can help to reduce levels of MPs and make red wines more palatable and has been widely published in both peer-reviewed and industry publications.

Ever the scientist, Dr. Sacks doesn't want to simply understand what is happening but also how it happens. With MPs he wonders how they accumulate under some conditions and less in others and what causes their degradation. MPs are synthesized up to veraison then amounts begin to decline towards harvest. A precursor to MPs is hydroxypyrazine, an odorless compound that with the addition of a methyl group follows a pathway to becoming the MP of green pepper and asparagus that we hope to avoid. This has been known since the mid 70s.

He also wanted to know how MPs degrade? It is unlikely that it's a result of volatilization. It turns out that degradation is just a reversal of the formation process. OCH₃ is the easiest bond to break and eventually the green, herbal odor dissipates. His lab used peppers to track HP conversion to MP and found good correlations for amounts in formation and degradation. There is an enzyme involved in the conversation process and if this can be regulated, it might be easier to control the accumulation and degradation of MPs.

The MP project at Cornell has been an amazing collaboration between viticulture and enology scientists and extension educators and the results have greatly advanced our understanding of this complex problem. Better yet, it has offered growers and winemakers effective recommendations on how to deal with the problems of MPs in red wines in particular.

I would encourage you to read about the work of Dr. Sacks in a variety of sources including this summary by Dr. Tim Martinson and Justin Scheiner in the *Appellation Cornell* newsletter: <http://www.cals.cornell.edu/cals/grapesandwine/appellation-cornell/upload/research-focus-issue-1.pdf> There was also an excellent article on the topic by Alan Lakso and Gavin Sacks in the May/June 2010 issue of *Practical Winery and Vineyard*. Justin Scheiner, one of his graduate students, gave a fine presentation at last year's PQA wine seminar.

Dr. Sacks' web site URL is <http://www.nysaes.cornell.edu/fst/faculty/sacks/index.html> I always appreciate Lucie Morton's vivid descriptions of the vigor monster that wine growers live in fear of each season. Vine vigor is the singular viticultural problem and challenge that stands between growers and good wine in this region and the problems that a plus-size vine can cause are well documented. We spend a lot of "after the horse has left the barn" viticultural effort and time trying to control vine vigor using tools like vigor diversion, hedging, leaf and lateral removal, cover crops, even covering the ground with plastic; all are costly in terms of materials and labor and may or may not have the desired effect in any given season.

On the flip side, a balanced vine and canopy has virtues almost too numerous to count and each of these will contribute to the quality of the grapes harvested from them. My personal preference is to find a vineyard site with superior characteristics and apply to it a thoughtful design and careful development that will yield a balanced vine of modest size but I know this is, at least up to now, the exception rather than the rule in Eastern wine growing. Much of viticulture as we practice it is a band-aid approach to dealing with poor site and design features and it would be much easier (not to mention more fun and less expensive) to use viticulture not as a way to cover mistakes but actually make way for fine wines. But then in woodworking I was once told that the mark of a true craftsman was the ability to cover his or her mistakes. I suppose a comfortable balance is the best compromise.

Good researchers deal with reality so it's no surprise that Dr. Tony Wolf at Virginia Tech is looking at ways to control vine vigor in the Mid-Atlantic, a region that gets about four inches of rain per month. I have mentioned before that ill-timed rain is the enemy of fine wine and it would be helpful to wine growers to have more options to control excessive vine vigor. Two graduate students working on this project, Gill Giese, who is also the viticulture instructor at Surry Community College in North Carolina, and Tremain Hatch, recently graduated and working in the Virginia wine industry, gave presentations about their work on regulating vine vigor using root stocks, cover crops, root pruning, and root restriction bags. This was a very complex experiment that incorporated multiple variables. As you might expect the results are very interesting, if not viticulturally compelling.

The goal was to impart some stress to the vines, reduce vine vigor and improve fruit metrics. Test vines were Cabernet Sauvignon 337 on 101-14, 420A and Riparia Gloire. Root pruned vines were treated at bud break to a depth of 24", at first with a ditch-witch type device but later with a ripping shank. Cover crops were grown in standard method of row middle with clean strips and full cover extending under the vines. Of the five different types of grass cover crops were tested including Aurora Gold fescue, Elite II fescue, orchard grass and rye grass and KY-31 tall fescue. Overall the fescues performed the best. Cover crops were tested under the vine row and all treatments yielded 0.8 to 2 lb of pruning weights per vine. The fescues really knock down vine vigor. All treatments achieved 20 to 40 percent leaf gaps in the canopy. Elite II plus root pruning dramatically reduced vine vigor. Not surprisingly treatments with both full cover and root pruning resulted in the most significant reduction of vine vigor. The soil loses moisture much faster with cover crops which results in less top growth but more roots growing away from the vine into the row middle.

In Tremain's experiment a fabric pot that holds 12 liter of soil was used to restrict the exploration range of the vine root system. Treatments included the three rootstocks on CS 337 with strip/no strip cover crop. Riparia Gloire lowered the pruning weights but vines with root restriction had even more dramatic reductions. RG + RR and full cover crop caused too severe reduction in vine growth and impeded the ripening of the crop. Leaf layers are reduced using cover crop treatments and cover crop treatments tended to reduce yield components. Juice chemistry showed no significant difference between treatments and RG reduced vigor yet crop size increased – both of these are curious results that would benefit from further explanation.

Gill and Tremain collected a boatload of data from these complicated trials including fruit chemistry, shoot metrics, nitrogen and water use, pruning weights, nematode counts, and stem water potential. While a paper has not yet been published about this work, Tony has written about in his *Viticulture Notes* newsletter (see Sept-Oct 2009) and Gill and Tremain have been on the lecture tour talking about it. If you have a less than ideal site (i.e. a typical site in the Eastern U.S.) this research has relevance to you. It is well worth further investigation on your part and a test plot in your vineyard.

I attended two viticulture research colloquia at the conference and they were outstanding. The first was led by Dr. Sara Spayd from North Carolina State University and it focused on how vine physiology impacts wine quality. The discussion weaved in all directions touching on canopy management practices such as is it better to remove laterals or leaves and when to remove either or both, and one of my favorite topics: what are the relative effects of light and temperature on grape maturation. It appears that in warmer areas lateral removal is preferred whereas cooler regions employ leaf removal at various times and degree. It was observed that warm/hot regions have reverted to more sprawl canopy configurations to shade and cool fruit that were used in the past.

The second colloquium was much more free form and guided by Dr. Peter Cousins from USDA-ARS. The discussion was all about vine balance, what it is and how to achieve it. We talked about the vine in nature compared to the cultivated vine and how as viticulturists we manipulate it to do what we want it to do (sometimes). We talked a lot about trellis systems and how climate change will affect a high-light efficient system like VSP. I liked the comment by Dr. Glen Creasy from New Zealand that growers are light farmers and we need to optimize our vine-trellis-canopy performance according to conditions and economics. Of course Peter led us down the rootstock road and there was a great discussion of the impact and effects of rootstocks on vine performance. In Nova Scotia, a tree fruit extension agent asked why dwarf vines are not used in vineyards. I had never really thought about it. As apples trees downsize to fit onto high density trellis systems in modern orchards, why can't we do the same thing to vines? Grape reeders now have Pixie vine to assist in their research, a bonsai style of plant. We don't really want to go that far in commercial viticulture but why not size vines according to viticultural and wine making goals? We discussed the murky subterranean world of the root system and how growers can achieve a better balance between root system and the above ground vine systems.

I walked away feeling pretty queasy realizing that there is so much we do not understand about basic grapevine function and physiology. As Dr. Sacks explained, we know a lot about what happens but not much about how and why. If we understood more about the how and why we might be able to grow even better wines beyond the limits of what we is currently our experience.

Mark L. Chien
Statewide Viticulture Extension Educator
Penn State Cooperative Extension
July, 2010