Muscadines are known to be hot weather grapes - but we have discovered cold-hardy muscadines and we have a serious acid control/adjustment problem in winemaking. This is why I joined this webinar about acids in wine. I have 20 years experience in making wine using vinifera and hybrids - but these muscadines are really different.

Given that these grapes are an unknown quantity, I would hesitate to make any assumptions about the issues involved in their acid management. A full analysis of acid and other components, like potassium, would be very helpful as you try to figure out what's driving your pH and TA, and how it can be adjusted effectively.

Having a crop with very high TA this year, I used Potassium bicarbonate to the maximum level and lowered the TA to 11. Flavor still reflected a harshness in the mouth. I then diluted the batch with H_2O and got the TA down to 8. The wine now has a mild rose flavor. Is it possible to revitalize a stronger more desirable flavor? Is refermentation an option? Also I have not bottled this batch. Thanks so much for your help. Lastly, I have started some Trolhogan vines. They are seedless and have an excellent flavor. Can a seedless type be mixed in and still yield a good table wine?

The problem with dilution is that you dilute everything, including the compounds contributing to wine aroma. This is why we'd always recommend benchtrials for any additions, including dilution. Tradition suggests that diluting the juice prefermentation, rather than at the end of the process, will give you a more integrated sensory profile, but there's no experimental data to support or refute this theory.

As for winemaking from seedless grapes, there's no reason why you can't do it! Seedless grapes generally aren't used for winemaking because they've been selected for eating out of hand, rather than for wine production- generally, they have thinner skins than grapes selected for wine making, and of course lack the seeds that contribute the tannins desired in red wines. That doesn't mean you can't use them, however- it's always good to experiment, and you may find that Trolhagen wine blends perfectly with your other fruit.

The tests that were shown for the double salts treatment-- were these results shown for after the wines were recombined or before being added back to the total wine batch? If only on the treatment batch, what was the effect on the recombined wine batch?

The results I showed from the double salt study represented the changes seen in the small lot prior to mixing back into the larger lot. It's also important to remember that this experiment was performed on a model wine- that is, a mix of water, alcohol, and acids meant to mimic that found in various wines- rather than in an actual wine. At this point, we're using a model wine so that we can accurately measure the amount of acids and their reactions without unpredictable interference from the multitude of unknown compounds found in real wines. We have not yet extended the project to see how this acid reduction will proceed once the removed portion is blended back into the main lot, but as I mentioned in the talk, we can make some calculations based on pH, dissociation constants, and other known chemical properties that suggest we won't be removing malic acid preferentially from the larger lot. Once we have a good handle on how these reactions work in a model solution, we'll perform similar experiments on real wine, as

other wine components- like acids, polyphenols, and polysaccharides- will change the reaction kinetics.

I would be interested in knowing if people are using water to deacidify, or maybe a combination of calcium carbonate in the fermenter, water addition in the fermenter and then MLF.

All of the above! Dilution is one way to deacidify, and combinations of dilution and calcium carbonate are also used. The idea is to figure out which combination of these tools will work for your wine.

What pH/TA target to drive to in the must and how to best manage, particularly in high TA and high pH must.

This will vary by wine style- fruitier or sweeter wines can handle higher TAs and lower pH and still be balanced, while reds generally require lower TA and higher pH. I think we gave a pretty good overview of the things to watch for with pH in the slides, if you revisit that section. I would shoot for pH 3.3-3.4, though fruity white wines or sweet wines can be balanced with lower pHs. For TA, I would recommend shooting for 9 or below, but realize that you may not get there- and excessive additions of chemical deacidification will probably harm your overall sensory profile more than high acid.

How best to manage this? That depends on the wine, your wine style, and what techniques you're comfortable using. With this webinar, we attempted to give you a basic understanding of the principles involved and of the most complicated methods- finding the right combination for your wines will take some experimentation.

What is the upper range of temperature vs time for effective cold stabilization. I see a lot of acid crystals dropping when temps get to about 45 in the winery for weeks during winter, but is that cold enough to get out all that might drop later?

Your wine will only be stable down to the temperature you use for stabilization- if the wine is exposed to colder temperatures in later handling, there's the potential for further precipitation. This is why the general recommendation for cold stabilization is 29°F- a temperature colder than most wines will be subjected to later. At this temperature, your wine should be stable after about 2 weeks; higher temperatures will require longer stabilization time, but once again, the wines will only be stable at that temperature or warmer.

Why no discussion of ameliorating the juice with water, to reduce acidity? Many wineries do this (but don't talk about it, of course). As I understand it, Tom Cottrell once did a study using different levels of amelioration, and his sensory panel could not detect any effects until the level of amelioration approached 20%.

Amelioration (addition of water), back-sweetening to decrease the perception of acid, and blending are all viable ways to manage acidity; we didn't address them in this talk because time was limited. Amelioration is certainly simple, but must be handled carefully, as it dilutes everything, not just wine acids (see earlier reply above.) Further, the fact that the

wine matrix is buffered (as we discussed in the webinar) means that it's difficult to predict the amount of deacidification that a given water addition will effect. Bench trials are especially important for water additions, as every wine matrix will react differently, but in terms of acid reduction and changes in flavor, it's impossible to translate the results of one study on one cultivar into across-the-board recommendations.

This may be going too deep into the subject for a one-hour presentation, but it would be very useful for a more detailed overview of the acid characteristics of the relatively new grape varieties.... Marquette, for instance must have a very high proportion of Malic acid, as (we learned the hard way a few years ago on one batch) addition of Potassium bicarbonate can cause huge changes in both TA as well as pH.

Unfortunately, we don't yet *know* the acid characteristics of all the new cultivars, as we're just starting to have vineyards planted in enough regions to understand the variation caused by cultivar vs. region, and do the research to determine average acid ratios. Research planned in the Northern Grapes SCRI will help us answer these types of questions. The important thing to remember is that acid reduction methods aren't cultivar specific, though the more you know about your juice, chemistry-wise, the better you can apply these techniques.

I was hoping you would comment on products offered by Scott Labs to adjust acidity in own grapes? That is if you have used any of them?

I'll need a more specific reference than this- but Scott Labs have very knowledgeable technical support, and should be able to answer any questions you have about their products.