

# Dealing With Seed Tannins In Red Wines

Dan Berger

**K**nowing that the real character in red wine comes from the skins, many California winemakers who are aiming to get lots of flavor into their wine rely to a great degree on extended post-fermentation maceration.

All well and good, in theory. With long maceration, the short-chain tannins polymerize into long-chain tannins, and this has the effect of “integrating” the tannins into the wine, making it softer.

But the subject is far from simple to understand. In fact, the effect of long-term maceration on wines that are made in a later-than-once-upon-a-time harvest model has yet to be fully tested by scientific principles.

The real-world question is, then: Is long post-fermentation maceration, in and of itself, really helpful in making a red wine taste better when grapes (such as Cabernet Sauvignon) are harvested at 27° or 28° Brix? Moreover, are such wines still candidates to age a decade or two, as were their predecessors from the 1970s and 1980s, when Brix levels at harvest were lower?

One of the questions raised by those interested in the effect of extended

maceration is: What actually happens when seeds are left in contact with wines that, over the course of the fermentation, rise to 15% alcohol or more? The question is valid, inasmuch as long-term macerations of the past were conducted in juice that usually topped out at 13.5%, and rarely exceeded 14%.

Since higher-alcohol solutions tend to extract more tannins from the skins and seeds than do lower-alcohol solutions, it would be nice if someone would conduct a series of scientific tests to determine the rate and accumulation of tannin extraction from both seeds and skins in wines at 13.5% alcohol, 14.5% alcohol and more.

Since no such work has yet been done (at least the scientists I spoke with hadn't heard of such work), all we have left is our intuition. And it would seem likely that once the skins of Cabernet grapes reach that wizened state that we see on the vine at 28° Brix, the acid and pH are radically different from in the past, when everyone picked at 23.5° and when 24.5° was considered to be pretty darned high. And at that level, what has happened to the seeds, and how do they react to higher alcohol in solution?

One key element here is that tannins extracted from seeds are alcohol soluble; skin-derived tannins are water soluble, and since there is a lot more water in wine than alcohol, there is a far easier extraction of those sorts of tannins.

However, it's also known that seed tannins are more aggressive, and many winemakers believe that the difference in solubility gives them an opportunity to adapt their winemaking technique to the kind of tannins they get. Another query for the scientists is: Since seed tannins are alcohol soluble, doesn't extended maceration in today's later-picked world make for harder tannins in the wines?

Seed-derived tannins have a long, notorious history of being considered a problem in red wine. One anecdotal story (told to me by a longtime wine industry insider) was that Julio Gallo ruminated over the problems of seed tannins decades ago. According to the tale, he devised rudimentary techniques to try to get rid of the seeds. One device was a simple skimmer that workers were asked to use to manually remove seeds from tanks of fermenting wine.

In fact, extended maceration is also thought to remove color from red

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wine. The role seed tannins play in that process was addressed some time ago by Dr. Vern Singleton and researcher Koki Yokotsuka, who published a technical paper on the subject entitled, “Effects of Seed Tannins on Enzymatic Decolorization of Wine Pigments in the Presence of Oxidizable Phenols.”

To deal with this and other issues regarding tannin extraction, Australian winemakers usually are strong foes of extended maceration of red wine, partly because of the risk of higher-alcohol seed tannin extraction. It’s all well and good to seek longer-chain tannins, they say, but the risks of that process outweigh the benefits, in their opinion.

Instead, they argue, dark-colored red wine (from Cabernet, Shiraz and possibly Merlot) gains most of its flavor and “appropriate” tannin (whatever they take that to mean) from more thorough cap management techniques, in which punch-downs are considered to be inefficient and pump-overs more efficient, but still lacking in thoroughness. They also say the jury is still out on other more radical measures, such as submerged cap fermentation.

To make a further point, the Aussie invention of the rotary fermenter, which is three decades old, is still yet to be a proven and efficient method for phenolic extraction from red winegrapes, since it is a tricky device that has shown some promise in some areas, and it is still hard to predict what the results will be.

During a visit I made to Australia in 2000, a winemaker for BRL Hardy in Padthaway told me she was loathe to use their rotary fermenters for certain lots of wine because it’s possible to make errors that can ruin an entire lot of wine. Excessive extraction is the risk, she said.

The best technique, the Aussie says, for getting good color and flavor extraction during fermentation is to use the system known as “rack and return,” otherwise called *délestage*.

The idea is to crush the fruit and then, whether or not a cold soak is used, to fill a tank and begin the fermentation. Once the cap is fully formed, the wine is drained off and placed into

another empty tank, allowing the cap to sink to the bottom of the tank.

Then the still-fermenting must is gently returned to the tank, spraying the entirety of the cap, thus more thoroughly breaking up the cap and resulting in a more complete extraction.

The concept seems to work well, especially in concert with another Australian technique of draining off before fermentation is complete, and allowing the final 5° or 6° Brix to ferment to dryness in barrels. Australian winemakers and others who have done this say the resulting wine seems to be softer, and color and phenolic extraction are unaffected by the concept.

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— Dr. Andy Waterhouse  
UC Davis

The practice of *délestage* (rack and return) makes more sense in large wineries, which typically have many large tanks, some so large that even linebackers would have a difficult time physically punching down the cap. That means you would otherwise have to pump over, but then you don’t get a uniform trickle through the cap—you might not be getting 100% contact.

In theory, if you remove all the juice from the tank, you can break up the cap more completely. Moreover, at least one researcher notes that the practice also allows for the removal of seeds, something Julio Gallo would have loved.

Dr. Bruce Zoecklein, enologist at Virginia Polytechnic Institute, credits *délestage* with helping retain the fruit character of red wines and minimizes tannin and phenolic extraction, especially from seeds. He said oxidative polymerization of some phenols occurs during free draining, but it is at that time that the winemaker can remove seeds.

*Délestage*, he said, is done once a

day, and that each time you allow the cap to sink you can remove more seeds, because the fermentation liberates them from the pulp in the cap. After a number of rackings, you could deport 40% of the seeds or more, Zoecklein said.

A key reason for this, he said, is that, “through analysis and sensory determination, we found our wines are highly dominated by seed phenolics. This was a problem; the seeds were at times immature due to overcropping and asynchronous ripening.”

Joe Shirley, winemaker for Trinchero Family Estates, has had good success using *délestage* to remove seeds. Shirley said the seed removal process must be done during active fermentation, when you get good separation between seeds and skins.

“We do *délestage* in a slightly different manner than other wineries might do it,” he said. “We have a 3-inch ball valve at the bottom of the tank. What happens is that instead of going off the (upper) racking valve, we use the bottom valve, and a guy with a plastic snow shovel stands there and is shoveling the seeds off into a bin. Some raisins come out, too. As the cap descends, we get a lot of seeds.

“We do lose a little juice, but it’s pretty effective for a couple of reasons. In Cabernet and Merlot especially, where you usually have good color and thicker skins, you can be relatively aggressive with the seeds.

“Also, we ferment cooler than most people, and that allows us to draw out the fermentation, to get four or five rackings.”

He noted that the rack-and-return system requires additional tank space in which to rack the fermenting juice, “which means you need an empty tank available. That’s why some smaller wineries can’t do this. They don’t have the additional cooperage.”

He said many smaller wineries would love to be able to use such sophisticated techniques, but that would require expanding, and “it may be that the county won’t let them add tank space.”

Shirley said that with Pinot Noir, *délestage* works well because “it’s

easy to overextract the seeds, so seed removal really helps tannins in Pinot.”

He said Jim Kennedy, now at Oregon State University, did a lot of work on cap management in Pinot when he was at UC Davis. He determined that one benefit of punch-down extraction is that when seeds sink to bottom of the tank, the extraction of bitter tannins from them is a lot less, compared with pump-overs.

Dr. Andy Waterhouse at UC Davis has written a book on dealing with color and phenolics in red wine. Titled *Red Wine Color: Revealing the Mysteries* (\$59), the book is a thorough look at the issues surrounding the making of red wines, and often is quite technical.

Waterhouse, who uses the term “drain and fill” when referring to *délestage*, said, “When we did our experiments, we didn’t see the same outcome between drain and fill and extended maceration. Extended maceration gave us greater tannins than the drain and fill.”

However, he also said his experiment wasn’t very extensive, and that “we didn’t see much difference between it and the standard pump-over with Cabernet Sauvignon with medium-level fruit. One thing is pretty clear—if you have grapes with unripe seeds, you do not want to do extended maceration.”

He also said he knows of no winery that was doing both *délestage* and extended maceration.

One researcher in the field told me, “Extended maceration isn’t a bad idea in theory, but there is an actual loss of pigment through extended contact with the skins. You may not be able to see it with the naked eye, but we know you lose color—and you are also picking up more tannins from all sources—skins, seeds and oak.” The result is extraction of a broad range of compounds, some of which may not be beneficial for the production of fine wine, especially when grapes are being harvested as late as 28° Brix.”

One reason for the desire to get more complete flavor extraction is to maximize all that the grape has to offer.

Such efforts usually result in more than one form of juice contact with the skins, such as a cold soak. However, each wine has a certain level of solubility, and if a winemaker chooses to do four days of cold soak, the amount of time left for proceeding with an extended maceration is theoretically reduced. Or is it?

Left unanswered at this point are the following: What is the effect of a 10-day maceration after a four-day cold soak? Or, is the 10-day maceration when no cold soak was conducted just as efficient in gaining the desired flavors? Moreover, what is the effect of *délestage* followed by a long maceration period? Again, research would reveal the significant differences, especially in various alcoholic solutions, from 13% to 16%.

Raising these questions here doesn’t mean others haven’t already thought of and begun working on this knotty subject. ■

*(Dan Berger has been a wine columnist since 1976. Currently he issues weekly wine commentary, Dan Berger’s Vintage Experiences and a nationally syndicated wine column. His books include Beyond the Grapes: An Inside Look at Napa Valley and Beyond the Grapes: An Inside Look at Sonoma Valley. To comment on this article, contact him through edit@winesandvines.com.)*

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