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Industry Roundtable: Barrel Care

Three industry experts talk about preparing, handling and storing barrels.

by Lance Cutler

The first time I took delivery on a container of barrels, I remember opening the doors and getting hit with that rich, heady scent of new oak. We'd use pallets to forklift the barrels out of the container, swell them with water, number them and mildewcide the outsides. We'd rinse the barrels on the barrel washer, move them to barrel racks and then fill them with wine. In those days we used wooden bungs, and we'd turn the barrels so the bungs stuck out at about two o'clock, allowing us to stack the barrel racks. We'd load the full barrels onto a truck, strap them down and run them to the warehouse where we would stack them five racks high.

That's when the fun would start. The wooden bungs would often crack the bung stave. Sometimes the bungs would wick, and mold would grow on the tops. We would find leaks in the chime and the heads. Bug borers would find their way into the warehouse and eat their way into the barrels, causing wine leaks. Unfocused forklift drivers would misplace barrel racks, and they would topple into one another until we'd have to use chains and forklifts to try to right the fallen barrels.

Worst of all was trying to figure out how to store empty barrels for re-use. We were told to rinse them, gas with SO_2 and bung them. We were also told to rinse them, gas them and store them upside down with paper cups in the bung hole. Others told us to fill them with SO_2 and citric acid in a water solution. There was a time when heads were pulled and the barrels were scraped, but none of us liked the results too much.

Barrels are a huge investment for any winery. Taking care of that investment is still a hassle. We wanted to learn the best way to care for barrels. We wanted to know the consensus on preparing new barrels, handling used barrels and storing empty barrels. We located a diverse trio of experts to give us the information we needed.

Charles Thomas | Douglas Rennie | Juan Peña

Charles Thomas is the director of vineyards and winemaking for **Quintessa**. He's been making wines in Napa Valley for 30 years, including stints at **Rudd Winery**, for **Jess Jackson** and at **Robert Mondavi** for 16 years.

Douglas Rennie is a Master Cooper who works as head of quality control at **Seguin Moreau** in Napa. He's been a cooper for 35 years, 20 years with Seguin Moreau.

Juan Peña is in charge of the entire barrel production area for **Benziger Family Winery**, a position he has held for three years. He's worked in winery cellars since 1998.

What do you recommend for new barrel preparation?

Doug: We would put in seven to eight gallons of hot water. We'd roll the barrel around and then set it on either head. You can also put hot water on the outside head, the one that is upright, to help soak up the wood. Then flip it over and do the same. People nowadays don't want to waste a lot of water, so this is what we recommend. We used to recommend filling the barrels to swell them, but people have gotten away from it. Some people like to rinse out the barrels, but most winemakers don't want to lose any of the oak flavor.

Charles: We use the hot water processing method, using about 4 to 5 gallons of hot water. We shake it around as Doug described. I think it pulls out a little bit of oak tannin. When I've tried unprocessed barrels, I've tended to prefer some processing. In the past, we used an overnight cold soak, but with water use issues, we do that less and less. The hot water processing seems to do a good job of predicting the leaks and also softens the flavor of the barrel a little bit.

Juan: We used to do what Doug has described. We'd put warm water into the barrel and seal it with a bung so we'd get a vacuum. Now we have a steam machine, so we steam the barrels for about 30 seconds and then bung the barrel to create a vacuum, and that seals up the whole barrel. If there are any leaks, you can hear them whistling. It seems to be working better than the previous method. After we steam the barrels, we pull the bungs, give them a quick rinse, maybe two to three minutes on the barrel machine just to get any residue out, and we're set to go.

Doug: Steam is a good method, but you have to be careful how long and how hot the steam actually is because it may open the pores inside the barrel. So you have to keep your eye on that.

In the past people used to mildewcide the barrels; do you do that anymore?

Doug: A few people still do that, but usually it's just the head and the chime of the barrels, not the actual body of the barrel.

Juan: I knew wineries that used to do it, but I don't know if they still do. Their thing was cosmetic, just to keep the barrels looking nice. It stops mold growth because you have a cover on there, sort of like waxing your car. The problem is that you are sealing the barrel, and it doesn't breathe like it should.

Doug: You have to be careful with that so you don't seal the pores that allow the barrel to breathe.

Charles: The other thing is, "What exactly is this mildewcide that you are putting on?" Is it something you want around your wine? There are some great wines made with mildewcide on the heads, but you have to ask yourself, "What do I want to have in here?"

Doug: In the cooperage, for any French, European or Russian wood, we would normally varnish the chime, at the ends of the staves. Now, we have to use a food-grade varnish because we are part of the HACCP program, and everything has to be food-grade. So the varnish we use on the ends of the staves is food grade. Even the oil in the hoop press machines has to be a food-grade oil, in case it drips on the barrel.

What's involved with filling barrels?

Charles: It's all a question of whether you are barrel-fermenting or filling with already fermented wine. When fermenting in the barrel, the level of solids matters in how easily it will finish fermentation. Higher solids make it easier to finish fermentation while lower solids create more of a danger with stuck fermentations. On the other hand, higher solids give you a greater potential for some off-aromas. To a certain extent, higher solids may absorb some of the oak extraction from a new oak barrel, and depending on the wine, that's not necessarily a bad thing.

Juan: At Benziger we have different winemakers with different opinions, and sometimes those opinions are opposite from each other. One winemaker likes some solids going into the barrel, but leaves them behind when he racks. Another settles more before going into the barrels but then leaves the lees in the barrel when he racks. When you rack, you usually clean barrels, but this winemaker doesn't. He leaves them dirty. We rack the wine to a tank, protect the barrels with a little sulfur, and the next day we fill the barrels which stirs the lees. It's way different from what I am used to, but it's working for him.

When you rack wine, what do you do to the barrels?

Charles: When we rack, we'll put them on a standard Bordeaux rinser and rinse out the sediment. We use a spinning head, and it seems to do a good job of rinsing out the sediment and everything else. If there are heavy tartrates, we use hot water. We'll drain them in between as much as we have time for, depending on the lot size, often overnight. We don't use ozone on a normal racking. We have an ozonator and will use it when we take care of empty barrels.

Juan: We do the same thing but have different protocols for different winemakers. On a first time racking, when we know there will be a lot of sediment, we give it a one- or two-minute cold water rinse on the barrel machine. After the rinse, we'll give the barrel a two- to three-minute steam and put the bung in to get a good seal. The heat loosens up all the stuff in the barrel. We'll put it back on the barrel washer with cold water, no ozone. Another two minutes to get all the solids out and your barrel is nice and clean. We treat new barrels and old barrels differently. With new barrels we just give them a quick minute or two of steam and then rinse.

Doug: A few minutes of steam is fine, but you have to be careful. One winery was cleaning oak tanks, and they really blasted them with steam. When they put wine in those tanks, it found its way through the wood. The wood is still alive in new barrels. Usually the moisture content is between 12 and 14 percent, so the wood will still expand and contract. That's why we recommend water to expand the wood first.

Do you usually ozone barrels when you rack?

Juan: No. Ozone is only used for empty barrel maintenance or if we know that the wine previously in the barrels had some problem. We would rack one day, clean and ozone the barrels and let them sit overnight. Then we would fill them the next day.

Charles: If we rack a large lot, we'll clean the barrels, let them sit overnight upside down and then refill the next day. A small lot we'll do the same day. If we have wine with problems, then we'll ozonate the barrels and fill them the next day.

How do you handle empty barrels?

Doug: We think you should clean them, and then give them a good rinse. The barrels should dry for at least 24 hours. When it's completely dry, then we would spray a few seconds of SO_2 and bung the barrel. You need to reapply SO_2 every three weeks. About a week before filling those barrels you should get them wet in case the wood needs swelling, rather than trying that the day before you need them.

You don't want to store barrels in a hot, dry area. You want cool and dark storage conditions. We even cover the barrels with cardboard to keep the light away from them. That prevents joints from opening. It's the difference between the exterior and the interior of the wood in the barrel. Any light, especially sunlight, can dry out the exterior.

Charles: We treat our white barrels differently than our red barrels. This is something that we did years ago at Mondavi, and I found that it worked quite well. If the white wine lot is clean, organoleptically and microbiologically, we'll actually leave the lees in there. So, you'd empty the barrel, drain out any lees that fall out, and then just leave it upside down and let it dry. It needs about two days to dry, sometimes longer. At that point we'll SO_2 them and bung with paper cups. We store the dry barrels bung side up because we use SO_2 discs, and it's easier for us. I like the discs because you are generating a certain amount of heat, and I think it may help push the SO_2 into the pores of the wood a little bit.

I think the white lees are essentially pulling moisture out of the barrel. This idea has been in response to when we were having VA incidents in medium to long storage of empty white barrels, storing them three to six months and seeing VA coming on. It takes more work to clean the barrels because the lees are dry at that point, but you do need to remove all the solids before you fill them again. So you use hot water and need to check inside the barrel to make sure the cracks and crevices are clean.

With reds, we clean the barrel, ozonate it and then let it dry out completely before we burn SO_2 in it 24 to 48 hours later. Then we go back on a twice-monthly cycle to lightly freshen the SO_2. We bung the barrels with cups.

Juan: On white barrels, we rinse for two minutes with hot water to get the solids out. Then we steam them for three minutes and re-rinse with two minutes of hot water and a minute of ozone. When they are dry a day or two later, we turn them up, gas them with SO_2 and bung them with paper cups.

For red barrels, we rack the wine and leave them dirty. We just let them drip-dry and turn them back up, hit them with SO_2 and that's it. We SO_2 the barrels every three weeks. During the storage process, we inspect and smell them to see how they are doing. If any of them smell off, we pull them out of that program and clean them, but usually they are fine. Right before filling, we give them two to three minutes of steam and a cold water rinse and then fill them.

Charles: That's fairly common in different parts of Europe. People have been doing that for decades, maybe even centuries. Part of the idea is that you've got a lower pH residue from the wine on the surface of the wood, so it makes it less hospitable to mold and bacteria.

Juan: Yeah, that was a new one for me. It was a shock. Basically, you're leaving it in the same elements as when it's full of wine and protecting it with the SO_2. They actually amazed me. These barrels smell really good. They smell better than the ones you actually rinse.

New barrels are very expensive, do you worry about the steam you're using to clean them extracting oak flavor?

Charles: Possibly, but it may be the duration of time that's involved. Typically, with cold water it's an overnight soak, so you've got 12 or more hours to extract. Hot water may extract more, but it happens very quickly. When I've done controlled trials on them in the past, the two methods are roughly equivalent. I don't have experience with steam, but the advantage there is it happens very quickly.

Juan: I don't see much difference between our steaming a new barrel, as opposed to soaking one overnight, because the steam is so much faster. We steam newer barrels very quickly. We steam the older barrels a bit longer because you have to protect them a little more, but the newer ones not much at all because the fresh oak is nice and healthy. We noticed that when we steamed used white barrels before barrel fermentations, those barrels went through fermentation faster than the barrels that we didn't steam.

When you steam the barrels, you conserve a lot of water, and it's fast. It works great because inside the barrel it gets to 220 degrees, so you extract anything that is in the wood, even the sulfur gas that you've put into the health of the barrel. That sulfur seeps into the wood too because the wood is breathing; so when you steam it, you pull all of that out. You steam the older barrels for three or four minutes. When you are finished, you have less than a gallon of water from the vapor. The barrel washer will use 25 to 30 gallons of water.

And the water in the barrel looks just like wine. You clean a Chardonnay barrel, and it looks like wine. We send samples to the lab, and pH is still low; the SO_2 is way up there. Whatever you put into that barrel gets extracted, everything that was in the wood comes out and you have a brand new barrel again. It's just not toasted, but it's like a brand new neutral barrel.

Do you worry about using chlorinated water when you clean your barrels?

Charles: It's one more thing that can have a problematic effect on your wine. Fortunately, we're on our own well, and we monitor it, so it's fine as far as contaminants. But we are definitely a no chlorine zone at the winery, just because of the things that can happen with TCA and cellar taint. I know that there are wineries on city water that will carbon-filter their water for barrel cleaning.

Doug: Anywhere we use water it is all filtered. When we test a barrel, all the water goes through a filter. In the toasting room we have hoses to soak the barrel to bend it, and all of that water is filtered. We do the same with the flour that we use to set the heads. It's all unbleached flour. We don't want to take a chance. So all the water is filtered, and the flour is unbleached.

Can barrels be successfully reconditioned?

Doug: We haven't gone for it because you never know exactly how much wood to shave off. Then you have to re-toast the barrel, and the wood will expand and contract again. There can be problems with open joints when you put the heads back on. It's never going to give you the same flavor as a new barrel, and it's a lot of work for results that are questionable.

Charles: We tried this at Mondavi in the early eighties for about a year and a half. We got out of it as fast as we could. You shave off a certain amount of an export barrel, and you've got plenty of physical barrel to keep it tight; but what we saw was that there was still wine residue in the surface that we were toasting. We got a distinctive toasted sherry character that worked its way into the wine. We got out of that business pretty quick.

Juan: We've never tried reconditioning barrels, but I have worked with some little custom jobs. They added oak alternative inserts because they had no money to buy barrels. If you can't afford barrels and you need oak flavors, that's all you can do.

Charles: Inserts are a bit of a different story, and it seems like they've been getting pretty good results.

Are there any secrets to storing filled barrels?

Juan: It's mostly about space. You can stack the barrel racks higher and move them around easier.

Doug: What we would stress about stacking barrels is that you would have your **Chateau Ferré** barrels (the 21 mm) barrels on the top rather than the bottom. They have a longer chime, and there is a croze where the head sets that can be down to 17 mm thickness. The weight of four or five barrels could cause problems so we always recommend that Chateau Ferré be on top. Bordeaux export and Burgundy barrels are 25 to 27 mm and better able to handle the weight.

Charles: Most of our barrels are in pyramids in a cave, and about 95 percent of our barrels are Chateau Ferré. One of the temptations of barrel racks is that you have a tendency to forklift them when they don't really need it. If you are trying to settle something out really well, there's an enforced stability that you have with a pyramid that you don't necessarily have with racks.

Juan: When I get a work order, I simply go by the bar codes on the barrels. The only thing I watch for are which ones are thin-staved and which are thicker, so I can put the thin stave barrels on top. In the cave we only stack three high, but all of the thin ones go on top.

How does humidity and temperature affect the barrels?

Charles: Higher humidity and lower temperature up to a certain point are good. It seems 70 to 90 percent humidity is good. Above 90 percent and you really have to be on top of it.

Doug: If the humidity is too high, stuff will start to grow. If it is too low, it can affect the joints and increase evaporation.

Juan: We monitor the humidity in the cave and have fans we can turn on to control it. We keep it around 70 to 75 percent humidity.

What about barrel repairs?

Doug: Cracked staves usually have to be replaced because they are never going to get any better. Ninety percent of the time, it's the bung stave that cracks because it is the weakest stave with the hole drilled through there. Bore bugs, we just use a wooden spile, pound it into the hole and trim it off. Often we'll see a problem on the chime, the end of the stave where the wood has been cut. Sometimes the wine will channel through the stave and leak out through the chime. If it's on the chime, we locate the leak and use a spile. If it's on the head, we would use a wooden wedge.

Has barrel quality improved?

Doug: I think the toasting of the wood and the aging of the wood have improved. Modern machinery has improved the efficiency of making barrels greatly. The scientific side comes into play on the toasting now. We use two clocks and heat guns to get the inside/outside temperature. That was never really available in the past.

Charles: I think they are better although some people say modern barrels are more like furniture than barrels. I see more consistency of both the physical properties of the barrel and the flavor from the toasting part. Overall it's an improvement.

Doug: Nowadays, every cooperage has sanding machines where the barrel will get sanded. Actually, anyone can make a barrel look good on the outside, but the most important part is the inside: the way the wood is seasoned and toasted. There is no reason now for anyone to have barrels that don't look good, so they actually are finished more like furniture these days.

Juan: Compared to the older barrels I've seen and worked with, new barrels are a lot better. The machinery made a lot of difference.

Doug: On the coopering side of it, we've lost some traditions, like the way we put heads together. At the same time if you go to a cooperage today, you'll see the same traditional tools that are centuries old. All repairs have to be done by hand. There's no way a machine can replace a stave, so all the traditional tools are still found in every cooperage.

After selecting and purchasing grapes, your selection of barrels influences the flavor of your finished wine more than just about anything else you do. With barrels costing over $1,000 apiece, it behooves winemakers to take care of them and to maximize the flavors you get out of them. Being conscious of water conservation means that the 4- to 5-gallon soak of a new barrel described here is a good idea. It also makes sense to me to leave the outside of the barrel in its natural state. It saves time, money and reduces the potential problem of closing the pores on a barrel.

This roundtable introduced me to the use of steam to clean barrels, and the assurances of both Doug and Juan that the steam does not leach out oak flavor makes steam cleaning something I will look into further. Most intriguing are the different methods of storing empty barrels, especially leaving the lees in the barrel to dry. It seems that both white and red lees will work with empty barrel storage, and it is fascinating (but oh so typical) that different winemakers use exactly opposite procedures.

More than anything, when it comes to the care of barrels, diligence is the issue. All too often barrels get forgotten in some dark, dank cellar or the inaccessible corner of a warehouse. Time passes quickly and before you know it, it's been months since you gassed the empty barrels, not weeks. Caring for your barrels is not difficult, provided you are conscientious about cleaning, drying, storing and gassing them. Barrels are an expensive proposition and they deserve our attention if we are to maximize their value. **wbm**