

Industry Roundtable: Modern Bottling Lines

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Lance Cutler



Durs Koenig

Gretchen Brakesman

THERE ARE CERTAIN universal truths: the Chicago Cubs won't win the World Series, dinner at the French Laundry is going to be expensive, and winemakers hate bottling. I know I hated bottling. Back in the day, no two pieces of equipment on our bottling line were manufactured in the same country. Keeping the line running and in sync took patience, skill and a good mechanic.

Things have changed a lot in the past 20 years. Monoblock bottling lines have revolutionized the process. Able to cruise along at maximum speeds of 300 to 350 bottles per minute, the really big lines are fully automated, computerized and engineered for precision. Fewer and fewer wineries maintain in-house bottling lines, choosing to use mobile bottlers or off-site agents.

We thought it would be enlightening to talk to some experienced people who run modern bottling lines. We wanted to know what was involved and

how they interacted with their clients. We wanted to get a feel for their personalities and how they handled the constant pressure of keeping the line running. We were lucky to get two great people who definitely know what they are doing.

Durs Koenig has been bottling since 1982. He had an interlude selling corks and glass, and then joined **Robert Mondavi** in 1999 where he eventually was appointed bottling operations manager. In 2006 he moved to the 2.7 million case **Sonoma Wine Co.** where he is in charge of operations, quality control and safety.

Gretchen Brakesman is director of sales and marketing for **The Ranch Winery**. She is part of a wine industry family. Her husband is a winemaker. Gretchen went to work for **Ramondin** in 2005. She moved to The Ranch Winery in 2007 where she handles sales, compliance and marketing.

Explain what needs to happen when you bottle wine.

Gretchen: In our application, the whole process starts when a client requests a bottling date. My winemaking team works with the client and sets up the dates. The client determines what needs to be done for cold stabilization, heat stability, any additions, whatever, to get bottle ready. Our primary filtration is cross-flow, but they can choose others if they prefer. We make sure that we are within our own quality specs. If the client has different specs, we have them sign a waiver to be sure they understand the ramifications of any changes they might make. We have a client rep on hand on bottling day. We run tests for SO₂, DO₂, pH, etc. The winemaker will then sign off, and we will start the run.

Durs: The winemaker gives the final approval. Then the lab will run analysis on DO₂, CO₂, SO₂, pH, etc. The day of bottling, QA will come along and make sure that all the parameters in tank are in range and they will clear us to bottle. They'll take bottles away, test them. The first bottle out of the filler has to be within range of the tank and then away we go.



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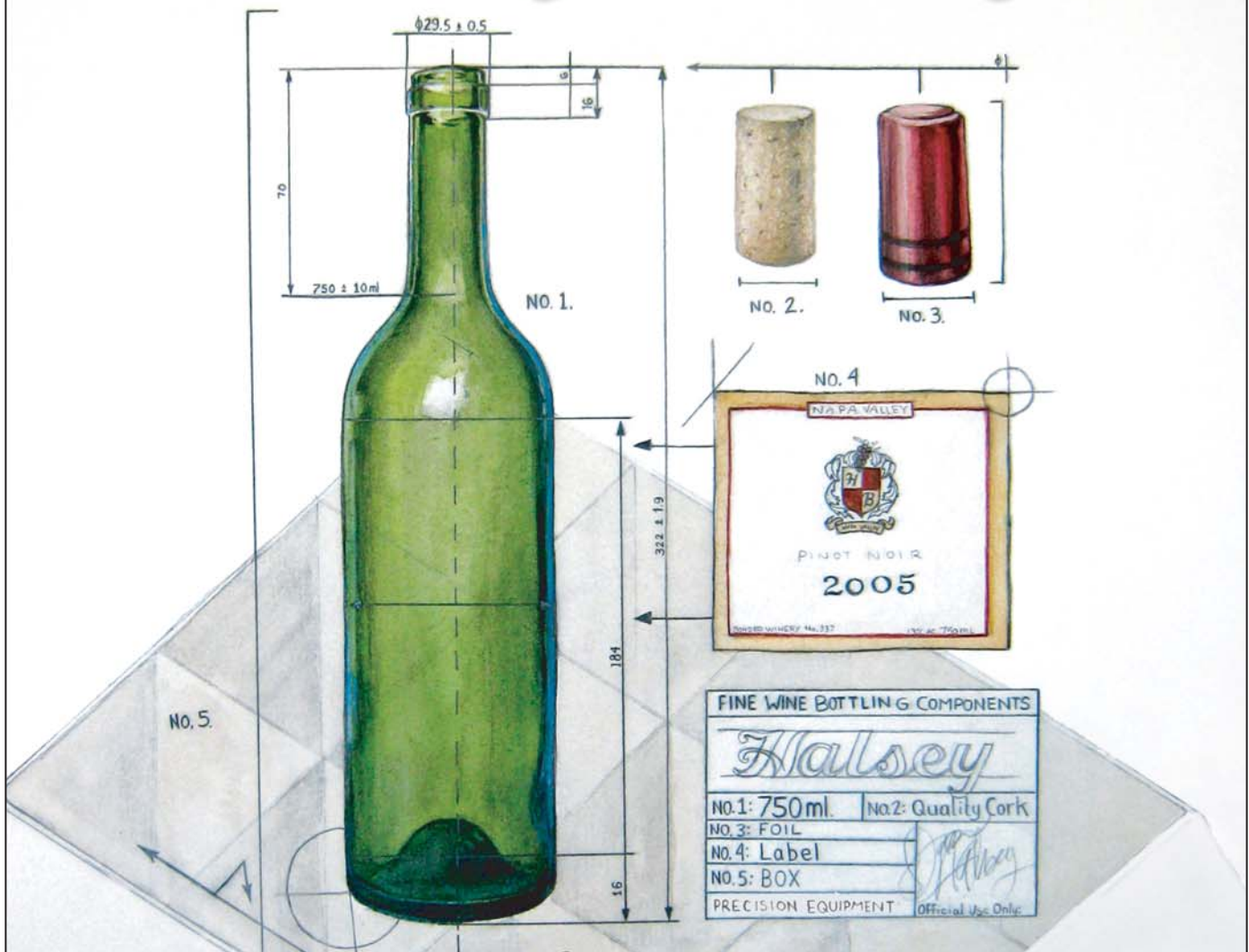


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You've got to start with the SO₂: is it what the winemaker wants? Then the CO₂ (no big deal for red wines): white wines take a little finesse because you lose a little from tank to bottle due to vacuums. But it is really DO₂ that I base my decision on. Is the DO₂ correct? Then we can run. Typically within two rounds of bottles from a filler you'll match the tank. Once you match the tank, run all day, don't stop.

How do you monitor DO₂?

Gretchen: We use a DO meter which measures the level of dissolved oxygen within the wine. We look for a range. We have our own specs, but winemakers may use different ones.

Durs: Typically, industry standards call for less than 1mg/liter in a bottle. We're in the flavor business. We don't want to oxidize any wine. Typically, we are measuring the first bottle, and that is the worst reading we're going to get for the day; so once we've matched the tank, we just keep running because it is a sealed system. Of course, we check a bottle every hour just to be sure.

Gretchen: Once you start running, you shouldn't have any problem. At The Ranch we grab a bottle every hour and run our entire QC again just to make sure everything is in range. The TTB also requires that you manage that, especially fill height. A lot of the bottles with the longer necks really skew the visual of what is in the bottle.

Durs: Everybody thinks there are 750ml in a bottle. Wrong. On a shelf, 750ml looks like a low fill. We put 752 ml into the bottle so it looks correct to the consumer. People tell me, "Durs, that extra wine adds up." I tell them, "I can give you what you want, but the consumer won't be satisfied."

What are the quality control issues when you are bottling?

Durs: Number one is wine quality because it is wine in the bottle that make sales happen. If you screw up a bottle, you don't just lose the price of that bottle, you can lose thousands of dollars in future sales. It's DO₂, it's the fill level, the cork not creasing, label skewing, label height, capsules wrinkling.

Gretchen: And the QC doesn't always come down to the bottler. It could be the supplier of the packaging. We just had a run where the bottle under the drip bead had sharp edges, so every single capsule that went on was tearing underneath. We have to figure out how to fix it so is acceptable to the customer so we don't have to stop the bottling because, if the bottling stops, that affects our schedule and costs a lot of money. You have to make it work, not just for the customer but for you, the bottler, as well.

Durs: When that happens, I call the client and say, "Bottling is stuck. We have to make it work. Here are our options." It's 150 bottles a minute coming at you right now. You've got to make it work. The pressure is on.

Gretchen: We require either the owner or winemaker be on-site, when the wine is being bottled, because we need to have answers right now if there is something wrong. We can't afford to be down for an hour.

Durs: The pressure is on. It's really do or die when something doesn't work. The clock is ticking at \$1,000 bucks an hour down time. Every day is crush in bottling.

The pressure is intense. We also have to deal with whatever is thrown at us. I don't buy these supplies. I can't direct the supplier on how to make things. It's whatever shows up.

Gretchen: If they haven't given you a mock up bottle beforehand and you haven't seen what their requirements are, then the package might be totally out of tolerance for what you're capable of doing on the line.

Durs: All we have are machine adjustments. We can't go to the supplier and have them run to our specifications. It's whatever shows up on a pallet. I'll do 12 different runs in a day. We've got to be nimble. It's like, "Man, we made it through that last run. Here comes the next one."

You have no control over the materials you are getting?

Durs: No, and the reason I mention that is when I was at Mondavi I would go for each production run. If they were running the paper for our labels, I'd show up and make sure they were doing it the way we wanted. The same with bottles and capsules. I would get exactly what I needed. Currently, whatever rolls in I've got to somehow get it to work.

Gretchen: We send out tolerances related to what our lines can do. We give minimums and maximums for labels and bottles, but they are very coarse. So you hope that clients will give you sample bottles before they run and some sample labels if they are new. You hope that they are communicating with you as much as you are with them.

Durs: But I've been within a day of bottling and not known what bottles were coming in. That creates some tension. If something fails and I've spent time, but nothing is working, then I'll say "shine" this product and let's move on to the next wine. That means get a cork in it but don't put a label on it.

We've got to take care of the wine. The wine is the important part. But after two or three hours, we've got our backs against the wall. We're into overtime at thousands of bucks an hour, so I tell my guys, get a cork in these bottles, safeguard the wine and we'll deal with this later. We have to go on to the next run. My decision point is whether it is a machine issue or a supply issue. I can't affect a supply issue so let's switch over.

Gretchen: If it's a machine issue, it's on us. It comes down to communication. If our star wheel breaks or the filler breaks, we tell the client we will make sure the wine is taken care of. We'll make sure it is safeguarded in the tank with argon gas or whatever they prefer until we get the machine fixed. But if it is a client packaging problem, that's another issue.

Durs: Yesterday I had glass with a 32 mm bead and a 28 mm capsule. Impossible to put them together.

What is your regimen when running multiple clients in a day?

Gretchen: We like to run the whites in the morning and start with the ones with the RS so you can work your way out. White to red is the rule. You might do one client in the morning with an RS, and then the same client wants to follow with a red. They might want to do them right in a row, but that's not how it happens. There is always a "clean in place" (CIP) run. It's all automated. It gets up to 220°F; it cleans the line, the filler and the spouts. After it goes through, we do a swab test. We'll get a positive or a negative for microbes.


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Durs: It's a bio-luminescence. We do a swab. You put it into a chamber, and it gives you a number that tells you when you are good to go.

Gretchen: So if it's a go, then you hook up your lines and go on. If it is a negative, you have to do another CIP. It's expensive because a CIP takes about two hours. If a client has different wines and they are willing to push through from one to another, that's great for us. We can be efficient and pass that savings on to the client because we don't have that downtime. Otherwise someone has to pay for that CIP.

How do you get labels onto the bottle straight?

Gretchen: Everything is computer tweaking now. We don't twist and move stuff around, and we don't deal with glue. Our labeler is pressure-sensitive, so our clean up and ease of adjusting are much better. We don't use glue at all, but that only affects people with small runs who can't afford to buy pressure-sensitive labels. Pressure-sensitive is expensive on small runs because you have to buy the die plates and everything else.

Some people say you could buy better paper with cold-glue labelers. Nowadays, you can get quality papers and do different things with the pressure-sensitive labels that you couldn't before.

Durs: I agree. Pressure-sensitive labels can mimic the best cold-glue label stock that was available. I'm certain of that statement.

At what speeds do you run your lines?

Gretchen: It depends on the package. The more complicated the package, the more you have to slow it down. On a good day, we run at 100 to 110 bottles per minute. On the other hand, we've had bottles that due to packaging or whatever they were doing brought us down to 20 bottles per minute, like when we used Alcoa closures. When we have to put on those Alcoa glass stoppers by hand, we have to slow things down. It always comes down to packaging. It has nothing to do with the wine.

Durs: We can't go slower than 50 bottles per minute. It bugs me. Normally, we bottle 150 bottles per minute on each of two lines. We have three bottling lines and one label line. I wanted to take the pressure off at change-overs on the big lines. So we'll sometimes bottle shiners and then come back to label them. The pressure relief was immense.

Is there a relationship between quality and speed?

Durs: The giant lines are designed for speed and to have long runs. You can walk away from those lines at that point. If you have a long enough run, you can leave. The engineers have taken care of that, and it shouldn't affect quality. If something goes wrong, the computer will stop the line; you'll have three bad bottles.

Gretchen: There are sensors all over these lines: at the corker, the capsuler, the labeler.

Durs: In the old days it was all relays or people; now they are all just programmable logic controllers (PLCs.) At Mondavi we put in new machines in 2000. We went from 20 year old machinery to brand new and more PLCs and controllers and variable frequency drives than you can imagine. PLCs are sensors talking to the computer to get the most efficient use out of the line. They talk to the computer, telling



the machines what speed to run at, when to ramp up or ramp down, waiting for bottle population to build up. They allow you to sense what is going on in the line and within certain parameters to slow down, speed up or stop machinery.

Gretchen: Most of the lines have that now. The corker has a PLC, so do the filler and the labeler and then there are PLCs for the line as a whole. If the corker and filler are running at 150 bottles per minute and the labeler is running at 300 bottles per minute, the PLCs will have the line slow up until they build some accumulation and population. They speak to one another.

Durs: Now that everything is monoblock, PLCs are it. That's where the action is. Currently monoblocks include rinsers, filler, corker or screw capper, and the capper is optional.

Can you improve a line sectionally?

Gretchen: Sure. You can add on to them. You can add a capper or other parts at a later date if necessary. It tends to be more expensive than buying it all together because now you have to buy makeshift things to work together.

Durs: My advice to anybody, if you are thinking about piecemealing a line together, is that you are better off starting brand new and fresh. You'll get a better throughput. You are better off having an engineer design the whole thing as one push. You get machine pitches that are correct. You get conveyors feeding machinery at the proper speeds. That's my one word of advice. Don't piecemeal an old line: rip it all out and engineer it new.

Gretchen: My advice is, "Don't buy a bottling line." Do it somewhere else. Why buy an entire line if you only use it a few times a year. If you are under 100,000 cases a year, it's just cheaper to farm out the bottling. A brand new line, these days, is \$2 million. After putting it in and the infrastructure and the drainage and the electricity and everything that goes with it, you'd have to be crazy to put in a bottling line. Unless you are doing estate bottling, and even then you could just get a mobile line to show up.

It's capital. If I was going to spend that kind of money, I'd spend it on other things. Even if you are doing 10,000 cases a month, you can go out there and get pricing for about \$2 a case. It just doesn't compute. When a company like ours can be efficient at bottling, we can pass the savings on to the customer. When we are running efficiently on a 10,000 case run including cross-flow filtration, we can come in at \$2.15 a case.

What kind of maintenance is required on these lines?

Durs: Your starting point is the manufacturer's recommendations. I've got four lines and three mechanics. We schedule two weeks for each line where we take it out of service and have the mechanics do everything to it. Tear it apart and put it back together again. Rebuild every filler spout, every o-ring, every gasket.

Gretchen: When there is down time, you can do all the major work you need to do. During the year, it is routine preventative maintenance. You do the best you can to keep up with that because there is a new problem every day.

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Making lane adjustments to the case packer at Sonoma Wine Co.

Durs: Given both our business models, we run our machinery more than most. We often don't have time to do everything we should as far as maintenance. Basically, we are anti-friction, so it's all about lubrication, cleaning. If something is going to touch your wine, then that's high priority. From there we work downward. Conveyors wear out, and at some point they start to create friction again. Those have to be changed out. There's a lot going on.

Gretchen: We have two mechanics for one line, and it's still not enough. We're also running two shifts and sometimes three shifts just to keep up with the needs of our clients. We bottle around 25,000 to 30,000 cases a week on average.

Durs: We bottle 130,000 gallons a week, around 60,000 cases. Usually from six to eight clients a week. The logistics are insane.

How do different closures affect your bottling line?

Gretchen: We really don't have a preference on closures, but from a marketing standpoint everyone wants to be new and different and exclusive. Now, you have **Novatwist**, which requires different parts in the chuck of the screw capper. You have **Zork**, **Stelvin** screw cap, the **Stelvin Lux** screw cap, all of which take different parts. **Alcoa** glass closures have to be hand-applied. Then, of course, there is regular cork.

With capsules, you have tin, polylam, heat shrink—although not too many people use that. So, the stuff that is out there is amazing. To keep up with the change parts to accommodate everyone is not totally doable. Again, it depends on whether we have the right partner. If a client with large production wants to go with something, then we would invest in it, but it comes down to a partnership and sharing the cost.

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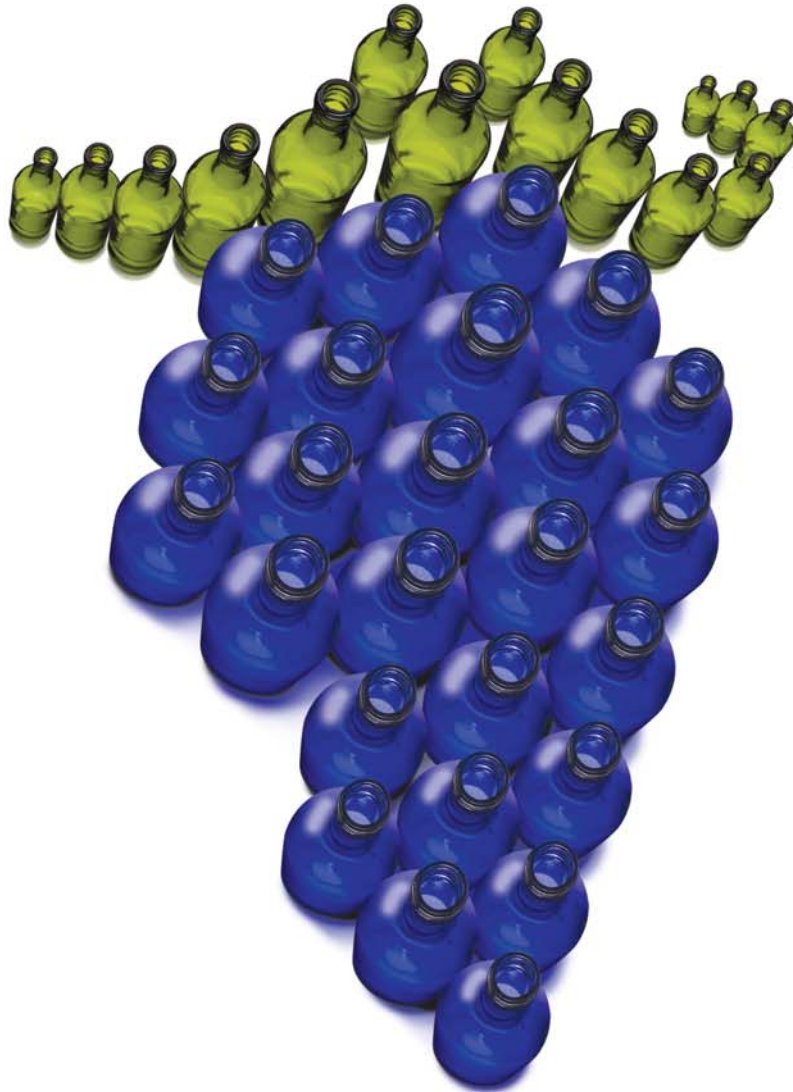
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Durs: I much prefer natural cork and tin capsules. It's a good business decision. We have less re-work, and my efficiencies go up. There is more wear to the corker with synthetic corks, so we prefer natural corks. If we run screw caps, then we nitrogen dose and that costs extra. Tin capsules go on so much easier than polylam. No wrinkles and we can just run, run, run.

Is there a speed to dollar effectiveness?

Durs: Yes. It is very linear. The size of your run affects your efficiency. There is a fixed amount of adjustment at the beginning of any run, and it doesn't have to be wine. It can be perfume, tires, whatever, but there is that fixed amount of dial-in to get it running right. Once you are dialed in, you can run for days.

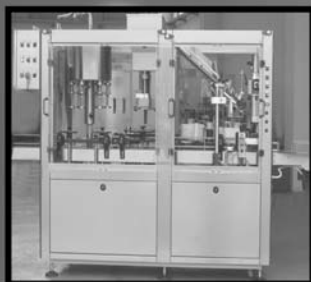
Gretchen: We charge our clients based on our efficiencies. If we are doing under 500 cases, we're not efficient: we have a hard time filling the bowl; we have a higher rate of loss. We lose more packaging because you are trying to tweak the package on the line, and a lot of small companies don't understand the amount of change and set up required.

Durs: It's not just bottling their wine. It's making eight different machines work perfectly all at the same time.

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Gretchen: Absolutely, so for us on less than 500 cases, we currently charge a minimum of \$2,500 because we know our labor costs and what's involved. The more cases run in the same lot, the better you are on your pricing. There are price ranges from 1,000 to 2,000 cases, from 2,000 to 4,000 cases, and above 4,000 cases we are so efficient because we are running in a full eight-hour shift. We don't have overtime, it's just one wine, we're only changing tanks, there's no filtration at the line, there's no clean in place.

Durs: That's inherent. It's the fixed dial-in. It's not all going to work that first five minutes. It takes a while to find the sweet spot on each and every machine.

Is QC now controlled by computers or do you still need people?

Durs: I'm busy investigating visual inspection systems right now. We still use people. We've got 36 people on the bottling line. They are really adept at noticing small inconsistencies. Unless we put a \$100,000 visual inspection system into the line, people are all we've got to check on labels. The people putting the bottles into the cases will hand me a bottle, and they'll see that the label is off just a bit.

Gretchen: We use people as well. A lot of it is visual. I think we still need eyes. The computer won't know if there is a wrinkle. Most bottling lines have QA/QC person on the line, and you usually look for the people loading the boxes to be your last check.

THERE IS SOMETHING MESMERIZING about technology and automation, especially bottling lines. You start with a line-up of empty bottles, and then there's the cacophonous clanking, spinning and turning, while they get filled, corked and cased, until finally they are labeled and finished. When the bottles are whizzing past you at over 100 bottles a minute, it can become almost hypnotic.

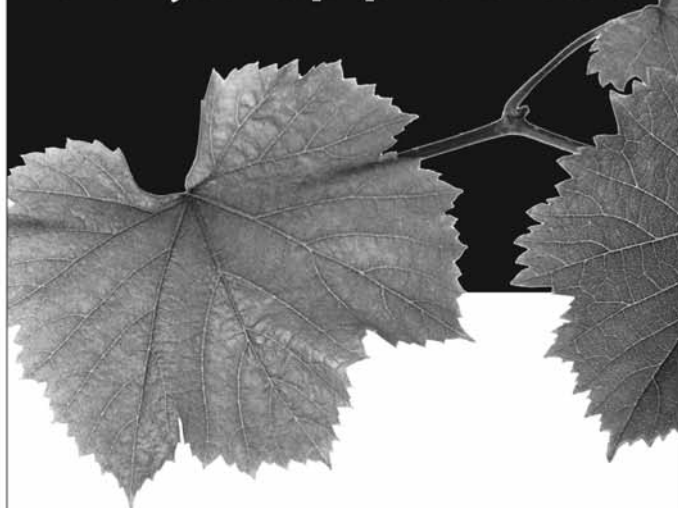
But savvy winemakers had better keep their wits about them because a simple moment of inattention can destroy an entire year's worth of careful winemaking. All it takes is a bad gasket to oxidize a whole batch of wine. It seems that bottling lines have gotten so expensive and specialized that more and more wineries are opting to farm out the job. Specialists who understand the machinery and focus on getting your wine into bottles safely make contract bottling a reality for lots of wineries, especially those under 100,000 cases of annual production.

Listening to our roundtable participants, I came away with one over-

riding concept: these people are under an incredible amount of pressure. They have to protect your wine, make sure the equipment is functioning and run tests all day long. They have to deal with bottles, closures and capsules that may or may not meet their exact specifications. They have to keep a full crew of workers attentive, occupied and safe. They have to pay attention to a lot of important details while being constantly aware that every minute of down time is costing them *tons* of money. Everything about winemaking is costly, but on the bottling line time is money.

As more wineries contract out their bottling needs, people like Durs and Gretchen become more critical components in wine quality. Their job is stressful, technical and difficult. This roundtable discussion has taught me just how tough their job is. As a winemaker, I have even more respect for their role. That they keep me out of the bottling room is just frosting on the cake. **wbm**

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