

THE GREAT CORK DEBATE

The question seems so straightforward: What is the best way to seal a bottle of wine?

And for centuries, the answer has been simple: a cork.

But today, there is great debate over what indeed is the best wine bottle closure. Some believe that natural cork remains the optimal solution. Others argue that alternatives, such as twist-offs or synthetics, are more reliable and less intimidating.

Wine Spectator has been reporting on this debate, and the scientific studies that have fueled it, for years. In this cover story, we aim to present

all sides of the issue in a comprehensive look at the science of wine closures. Senior editor James Suckling argues in defense of corks, while senior editor James Laube claims their time has passed. Associate editor Daniel Sogg sets out the current scientific evidence that both sides use to support their positions.

We hope that by airing the arguments, we'll help wine producers and consumers alike understand the issues better. After all, we all share the same goal: to ensure that the wine that comes out of the bottle is as good as the wine that went into it.

What are your thoughts? Sound off in our online poll at www.winespectator.com.

THE GENIE IN THE BOTTLE

The Virtues of Cork Go Beyond Mere Science BY JAMES SUCKLING

“POP!”

It's a sound every wine lover knows—that of a cork being pulled from a bottle of wine. But more than that, it is the music of wine itself, an echo that evokes a world of history and culture and a pleasure that touches all our senses.

I am not ready to give up cork quite yet.

Today, cork is under attack as the demon of all wine faults. Of course, it has its problems. Anyone who drinks wine on a regular basis has been disappointed by a bottle with musty, papery flavors that most likely came from a chemical called 2,4,6-trichloroanisole (TCA). TCA contamination can have many sources in a winery, including barrels, wooden pallets and certain paints and preservatives, but in too many cases, the chemical is traceable to a faulty cork.

A “corked” bottle carries no health danger, but it can certainly ruin an evening, whether a fun meal with friends or a special occasion such as a birthday or an anniversary. Then there's the frustration of the money lost when a tainted bottle can't be returned or replaced.

Some wine lovers are obsessed with finding “corky” bottles. They have become Ralph Naders of wine, looking for the metaphorical exploding car in every bottle, instead of focusing on the goodness and pleasure in it. They are living in fear of the cork.

But closure alternatives designed to prevent cork taint also forfeit cork's cultural advantages. Removing a twist-off, or screw cap, for example, involves about as much ceremony and delivers about as much joy as opening a bottle of ketchup or a jar of strawberry jam. Some may argue that twist-offs help to demystify wine, but wine is not a commodity in the manner of mineral water or milk. Wine represents civilization; reducing it to the level of mundane, everyday beverages and condiments with twist-offs erodes its core, its very essence.

Because of this, most consumers embrace corks despite the risks of encountering tainted bottles. According to a front-page story in London's *Daily Telegraph* in November, 2004, a recent survey of British consumers showed that 99 percent felt “positive” or “neutral” about wine corks. And most drinkers, according to the story, “are convinced that buying a screw-top bottle is social suicide. . . . consumers are indifferent to synthetic corks and content with normal corks but, despite the best efforts of the industry, they remain horrified by the screw top.”

I am certainly not horrified by alternatives to cork. For some wines, such as those made for early consumption or sold at low prices, twist-offs or other alternative closures may be appropriate. But I remember my grandparents in Santa Monica, Calif., during

CORK'S TIME HAS PASSED

Twist-Offs Are a Viable Alternative to a Marginal Closure BY JAMES LAUBE

HOW

does a 12-bottle case of wine shrink to an 11-bottle case or, worse, a 10-bottle case? When you factor in bad corks.

If corks worked the way they're supposed to—i.e., preserved wines so we could enjoy them at their best—then this debate over their reliability wouldn't be necessary. And scores of wineries, soon to be hundreds, around the world wouldn't be seeking alternative closures.

Yet a preponderance of evidence points to an unacceptably high incidence of failed corks. For wine drinkers, faulty corks lead to frustration and annoyance far too often. A bad cork is more than just a spoiled wine. It's hard-earned money down the drain.

In the worst cases, a cork tainted by a strong presence of 2,4,6-trichloroanisole, or TCA, imparts a musty, moldy character that makes a wine undrinkable; at low levels of TCA, an otherwise appealing wine might taste dull, flat or muted.

Even when TCA is absent, cork-finished wines show a frustrating inconsistency in quality and character. We at *Wine Spectator* know this because we often taste the same wine from different bottles. One time a wine will be brilliant; the next time it might taste stripped of its flavor.

And no, we're not just imagining this, or exaggerating the facts.

You hear complaints about bad corks from winemakers and winery owners. They're annoyed by cork's inconsistencies and frustrated that defective corks cannot be detected before they're put into a bottle. Many now carry backup bottles to tastings and dinners—just in case.

You hear complaints from restaurateurs. The threat of corky wines means that they face the embarrassment of serving an off bottle or of having customers return a bottle they'd looked forward to drinking but are unhappy with. When bad bottles need to be replaced it interrupts the flow of a dining experience and can even become a point of contention if the sommelier disagrees and wants to debate the matter.

You hear complaints from retailers and wholesalers, who end up hassling with returned bottles. Then there are the consumers who drink tainted wines and don't realize it. They are just underwhelmed by the wines. Many undoubtedly avoid those wines the next time they're shopping or ordering. It's not the wine's fault per se, but the winery's reputation and the merchant's business suffer anyway.

And, most significantly, you hear it from fellow wine drinkers. It's reached the point where encountering musty wines due to nasty corks has become exasperatingly predictable. How many times have you stood before a bottle, preparing to open it and wondering whether it's corky?

(continued on page 50)

THE GENIE IN THE BOTTLE

the warm summers of the 1960s and '70s, pouring California Chablis and hearty Burgundy from big, frosty, screw-capped bottles. I don't want to go back to that. If it's a great bottle of wine, I want to pull a cork.

In addition to its ceremonial aspects, cork is a key element in the maturation of wine. By definition, a fine wine is one that improves with age, and corks have an important and largely positive influence on a wine's evolution in the bottle.

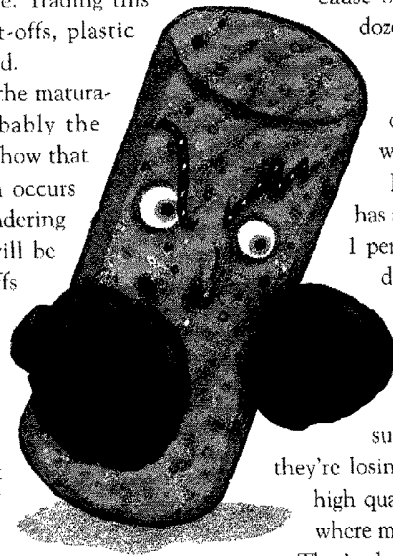
No one is quite sure how the process works because little research exists to explain it, but new studies that may help are expected this year from the University of Bordeaux. There's lots of talk about micro-oxidation, whereby minute amounts of air in corks interact with the wine over time in the cellar. (Some say the air is inside the cork; others say it passes through the cork.) To rob wine of this unique and mysterious, even magical, evolution is to rob wine drinkers of one of the main reasons they pay a premium for fine wine. Trading this for the conveniences promised by twist-offs, plastic stoppers and the like would be shortsighted.

In fact, alternative closures may derail the maturation process. Synthetic corks are probably the greatest offenders in this. Recent studies show that in wines with synthetic corks, oxidation occurs within the first month after bottling, rendering the closure useful only for wines that will be consumed almost immediately. Twist-offs have the opposite shortcoming: Various studies, particularly some from Australia, suggest these closures are too efficient in keeping air out of the bottle, and thereby retard a wine's evolution.

Brian Croser, one of Australia's greatest winemakers and a former advocate of twist-offs, has evaluated reds aged for about two decades under these closures. He voiced his concerns about their effect on ageable red wines in an interview last year published in London's *Observer*. "The wines are developed, but they're tinny and flat, like stale jam," Croser says. "The best wines sealed with a natural cork are better than all the screw-cap wines."

Corks remain the standard-bearer, and cork quality is getting better. In Portugal, which accounts for about one-fourth of the production of wine corks, the industry has been spending millions of dollars on research and development to improve product performance. Granted, this change was spurred by all the bad press on corks, but regardless, the top names in Portuguese corks are now spending money to produce the best possible versions.

Amorim & Irmaos SA is probably the best example of this.



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(continued on page 52)

CORK'S TIME HAS PASSED

How bad is it? A lot worse than you might suspect. In *Wine Spectator's* Napa office, we carefully track the number of "corky" bottles. In our tastings of California wines, the percentage of defective corks routinely runs at 15 percent. Do the math: It comes to roughly two bottles per case.

Perhaps we are unusually sensitive to TCA-tainted corks. But our results are not unusual. At the California Wine Experience this past November, hundreds of bottles of rare and expensive wines from many of the world's greatest producers were poured. All of the wines came directly from the owners' cellars, and should therefore have been in perfect condition (having been kept at ideal cellar temperature). A team of well-known sommeliers from around the country prepared the wines. They told me the percentage of "corky" wines ranged between 4 percent and 12 percent.

According to the sommeliers, one winery had a nightmarish incidence: Thirteen of its 72 bottles, or 18 percent, were off because of rank corks. And only one winery out of three dozen that presented wines had zero "corky" bottles.

After a recent wine competition in Australia, the 2004 Macquarie Bank Sydney Royal Wine Show, officials said that one of every 12 cork-sealed bottles was tainted by TCA.

Perhaps it comes as no surprise that the cork industry has a different estimate about cork failure: typically about 1 percent to 2 percent. Accept that, and defective corks don't seem much of a problem.

But let's face it: Cork producers aren't objective in their stance and don't pretend to be. It's their business and it's been a highly lucrative one. They've essentially had a corner on the market of wine closures for decades, if not centuries. But these days, they're losing their monopoly because they either can't ensure high quality corks or have ignored the problem to the point where many winemakers have said enough's enough.

That's why many cork producers have hedged their bets and now offer alternatives. They're smart enough to see the writing on the wall.

For the sake of argument, let's split the difference between my figures and theirs and say that between 7 percent and 8 percent of wines are corky. That translates to one bad bottle per case.

When it comes to closures, the main goal for most vintners is to help the wine be the best it can be throughout its life. Clearly, corks are a very weak link. In my opinion, screw caps, or twist-offs, are a better closure alternative from just about every point of view. (I don't like synthetic stoppers. I have found them difficult to remove and, in my experience, over time they can impart a slight chemical flavor and lead to high levels of oxidation.)

Moreover, the use of cork has had more to do with image and tradition than it has with cork's being the ideal seal. Virtually any vintner wanting to present the image of an upscale wine chose

THE GENIE IN THE BOTTLE

The cork giant, which represents close to 30 percent of the world market and which owns cork factories all over the world, has spent about \$55 million over the last four years to improve all aspects of growing and producing cork. It is at the forefront of research and development.

"Guarantees of 0 percent TCA can make great PR copy but are difficult to manage if you are not the only source of the problem," says António Amorim, chairman of Amorim & Irmaos SA. "Today, we all know that TCA and other anisoles can originate in many different wine-related materials, including wood, barrels, plastic and cardboard, so to talk about eradication would be irresponsible. The correct approach is not for cork companies to embark on the same promises of perfection that alternative materials have made, but to engage in the same type of risk management and quality control policies that all successful industries have in practice, whether it is the aerospace industry or the software industry."

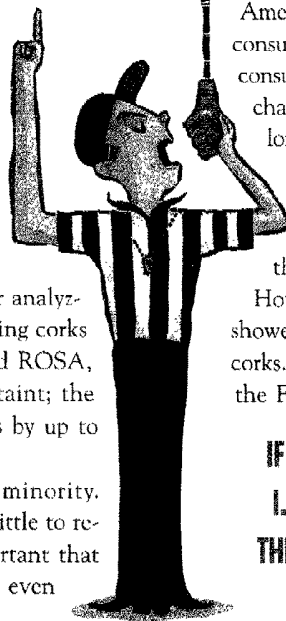
I visited Amorim's cork plantations and production facilities late last year, and the company appears to be taking great care at every level of the process, from growing and harvesting the trees to aging and boiling the bark to cutting, bathing and protecting the corks. Compared with a similar visit I made 14 years ago, the changes were impressive. Quality control is the key word now, whether analyzing samples with gas chromatography or treating corks with a new TCA-reducing technique. Called ROSA, the technique uses steam to leach out the taint; the company claims it can reduce TCA in corks by up to 80 percent.

Unfortunately, Amorim remains in the minority. Many cork manufacturers are still doing very little to resolve their TCA problems. So it's very important that wineries buy from the best cork manufacturers, even if the corks cost a few cents more.

On the other hand, we are now realizing that many "corky" wines are in fact tainted by environmental problems in wineries, such as moldy cellars, antifungal treatments and flame-retardant paints. At Hanzell Vineyards, Beaulieu Vineyard and Chateau Montelena in California, flawed wines with systemic TCA problems have contaminated perfectly good corks.

"Cork is often blamed for other taints in wines," says Dominique Labadie of Laboratoire Excell, a Bordeaux-based laboratory renowned for its work on TCA and other taints in corks as well as in winery construction and cleaning products. She says that one of the most recently identified wine taints that gives off musty, papery aromas comes from an agent called 2,4,6-tribromoanisole, a product that is used to treat wood and that is found in flame-retardant paints used for building construction.

Labadie admits that corks will never be 100 percent infallible and that other closures could one day prove superior, but neither



CORK'S TIME HAS PASSED

cork, primarily because the most prestigious wines from France did.

And the truth is that when corks work perfectly they are excellent closures. Trouble is, no two corks are exactly alike, so even when you find a wine with a perfect one, it's no guarantee for the other bottles. If you doubt this point, start collecting your used corks and give them a sniff. They all smell different. Some of them, you can be sure, could impart unwelcome flavors.

Another truth is that corks expire with age. A few wineries recognize that fact and recork their library wines every 25 years or so, but that's not a viable process for most collectors. Ultimately the wines you want to cellar the longest—typically your most expensive and prized bottles—run the greatest risk of eventual cork failure. If you've ever removed a dried out, brittle, crumbling cork from a wine bottle and watched the dusty film form in your glass, you know exactly what I mean.

Of course, most wines aren't aged very long to begin with. In America, at least, most wines, perhaps as many as 95 percent, are consumed within a year of purchase. And most white wines are consumed even earlier—often times within hours or days of purchase. One hardly needs a marginal closure such as cork when long-term cellaring isn't called for.

Twist-offs appear to be the best alternative at this point, but the wine trade has long frowned upon them. They were wrongfully assumed to be inferior closures because the wines they sealed were typically inferior-quality wines.

However, exhaustive testing by industry titans such as Gallo showed decades ago that twist-offs were actually far superior to corks. One of the early leaders in twist-offs is Stelvin, owned by the French firm Pechiney. This aluminum screw cap preserves

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the bouquet and flavors of the wine and allows the bottle to be easily opened and resealed.

Stelvin's track record for failure is virtually nil, according to wineries that have used the product. Wineries in Australia, for example, have experimented with Rieslings sealed with twist-offs for decades. Those wines taste fresh and lively after years in bottle, and each bottle tastes as fresh as the next, which is why more wineries are turning to twist-offs.

In California, PlumpJack bottled its Napa Valley Reserve Cabernet, a wine that sells for \$150, with a twist-off. Both of Carl Doumani's Napa Valley Rhône reds, Quixote and Panza, use the same closure. Caymus is bottling Conundrum, its white table wine, with twist-offs. Bonny Doon, Seghesio, Andrew Murray, Calera, Beringer (with its Two Tone Farm label), Whitehall Lane and Clos Pegase have each bottled at least some of their wines with aluminum caps. And there are other creative closures

(continued on page 53)

THE GENIE IN THE BOTTLE

research nor real-world experience has yet proven that twist-offs, or anything else, are better than corks at the moment. "I think that one day, screw caps could be better than corks, but the technology and know-how with screw caps is not there yet," she says, adding that winemakers may have to completely change their cellar techniques to accommodate such new closures. Those changes could include anything from using more sulfur before bottling to more oxidative techniques in the cellar.

But let's look beyond the stopper in the bottle. There are also environmental and cultural considerations to ponder.

Cork is a natural product that comes from some of the most beautiful forests in Europe and North Africa. Families of farmers have cultivated these cork plantations for centuries. Rare species of flora and fauna live there. The endangered Iberian lynx in Portugal is just one animal that could disappear with the demise of the cork market.

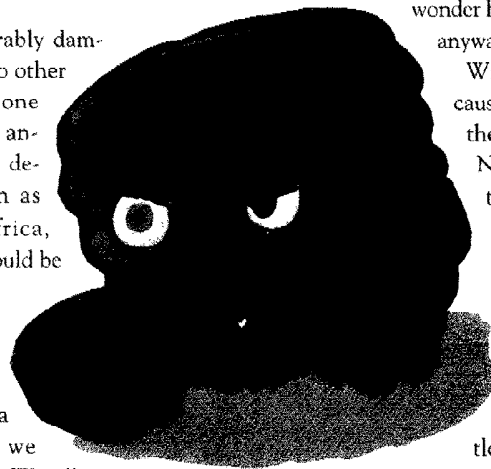
Whole economies could be irreparably damaged were there to be a sudden move to other closures. Portuguese cork-growers alone generate more than \$390 million in annual sales. The chances for economic development in poor countries such as Morocco and Algeria in North Africa, where large cork forests are located, would be significantly diminished.

Moreover, do we really want new closures that are made from petroleum derivatives (synthetic corks) and metal (twist-offs) when there is a natural option? We all know that we should be more ecologically minded. We all speak about using less fossil fuel; we recycle our bottles, cans and paper products. So why get rid of something as natural and straightforward as cork?

There are even public health factors to consider. Children certainly find it difficult to open a bottle of wine sealed with a cork, unless they are unusually proficient with a corkscrew. A twist-off is an entirely different matter. Even toddlers know how they work. And given all the colorful labels with animals on them, wine bottles look more and more like fruit juice or some other non-alcoholic drink.

Call me a romantic or, worse, a conservative, but I will not forsake corks for twist-offs or anything else—at least until more is known about them and how they affect the evolution of wine.

Every day my life seems to go a little bit faster; my personal space becomes a little bit smaller. Industrialization and technology are taking over my world. I find something soothing, something reassuring about the ritual of opening a good bottle of wine by means of a corkscrew, and I enjoy that irresistible "pop" when the cork comes out of the bottle. It lets the genie out of the bottle, and I am thankful for that. □



WE ALL SPEAK ABOUT USING LESS FOSSIL FUEL; WE RECYCLE OUR BOTTLES, CANS AND PAPER PRODUCTS. SO WHY GET RID OF SOMETHING AS NATURAL AND STRAIGHTFORWARD AS CORK?—JAMES SUCKLING

CORK'S TIME HAS PASSED

being studied and tested, too.

The broad-based use of alternative closures will undoubtedly be slow in coming, although their adoption is indeed gaining momentum. Wineries in New Zealand have wholeheartedly embraced twist-offs for the majority of their white wines. But alternatives will require mind-set adjustments from consumers. They will also involve changes in the way wines are made.

One issue will be how to deal with the fact that twist-offs provide an anaerobic environment for wine. But that should be an easy hurdle to clear. The ideal cork, one that preserves a wine the longest, produces a virtually anaerobic seal too.

But advantages in wine preservation aren't the only virtues of alternative closures. Twist-offs (or snap-on glass caps or any other invention that eventually makes its way to market) will eliminate the need for a separate tool—a corkscrew—to open wine bottles. (I wonder how many Americans actually own a corkscrew, anyway?) A twist-off bottle is simply easier to open.

Wine is a living thing, and many factors can cause it to change once in bottle, foremost among them storage conditions and microbial activity. No closure can save a poorly made wine, one that has Brettanomyces or volatile acidity or one that was aged in bad cooperage. Storage conditions after bottling have a huge impact on wine quality too, and one that has little or nothing to do with closures.

But let's assume that the wine put into the bottle is good. The best way to ensure that the wine that is poured out of the bottle is also good is to avoid using a stopper that has a built-in failure rate.

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I'm more nervous than ever that the special bottle I'm opening for dinner or for friends will end up smelling moldy, and that another opportunity to enjoy a fine wine will be destroyed. I'm not alone in opening bottles and sampling them before

serving them or taking them to a restaurant, just to be sure.

Those who associate corks with tradition and history are clinging to a false notion of romance at the expense of practicality. Except for people in denial, corks hardly convey an upscale image these days.

I think younger wine drinkers will gravitate to alternatives. They'll realize it's illogical to use a plug of tree bark that could be moldy, or tainted by TCA, to keep wine fresh. Savvy wine drinkers are already accepting that it's what's in the bottle that counts—not what seals it. They will support vintners who are more concerned about wine quality and preserving value for their drinkers than they are about the prestige that they think cork still implies.

Buying bottles sealed with cork is like playing Russian roulette. Pull enough corks and eventually everybody loses. Wine deserves better protection. Wine drinkers don't need the aggravation. □