



THE CARBON TRAIL OF CLOSURES

Just when you thought nothing more could be said about closures, along comes another twist of the bottle top - sustainability. Dr Jamie Goode takes a look at the many environmental issues surrounding wine bottle closures.

The complex and seemingly never-ending debate on wine bottle closures has taken another turn, towards a focus on sustainability and carbon footprints. This article takes a look at the issues, and asks if they're likely to have a significant impact on the closures debate or whether it's just an attempt by the cork industry to fight back against competitors.

Back in the mid-1990s when alternative closures were first used in significant numbers, the sole focus was on eliminating cork taint. When screwcaps entered the fray in 1999, the naïve contemporary understanding of closures was that their role was to keep wine in and air out. It was only when the results of serious comparative closure trials were released that people realised post-bottling wine chemistry was more complex than they'd thought.

Hence the focus moved from clear-cut taint issues towards oxygen transmission, because of the realisation that the amount of oxygen the closure transmits has an important effect on wine development after bottling. Too much, as in the case of some of the

early synthetic corks, and the wine develops too fast. Too little, as with the commonly used screwcaps with tin/saran liners, and there's the risk of the opposite problem – reduction, caused by the development of smelly sulphur-containing compounds like sulphides and mercaptans. To avoid this, winemakers using screwcaps have had to be very careful with their wine-making protocols. And what is the right amount of oxygen transmission by the closure? Just enough to avoid reduction – but no one knows how much this is, partly because of the difficulties in measuring such small fluxes of gas.

The debate about oxygen transmission continues. But now there's a new front emerging in the battle over the wine seal: sustainability, the environment and carbon footprints.

Packaging under scrutiny

Previously the wine trade had focused on the sustainability of vineyard practices, because viticulture is a high input form of agriculture. But now the spotlight is on winery practices, packaging and the supply chain energy

inputs. Leading UK supermarket Tesco, responsible for approximately 20% of UK off-trade sales, has initiated an ambitious programme that will soon see all food and drink labelled with the product's carbon footprint, including the packaging. They're also looking to reduce packaging waste by 25% from the 2006 figures by 2010.

"As a business we want to achieve a 50% reduction in energy usage by 2010," says technical manager Andy Gale. "We think we have a unique relationship with our customers and we want to lead consumers in a green consumption revolution."

Another UK supermarket, Sainsbury's, has just released two wines in the standard bottle size of 75cl, but in PET (polyethylene terephthalate), a plastic. It weighs one-eighth of a glass bottle, reducing transport-related emissions. In addition, these wines – one a New Zealand Sauvignon, the other an Australian Rosé – are bottled in the UK from bulk-shipped wine, a practice being talked up as a way to cut shipping-related emissions. The Sainsbury launch is supported by WRAP (Waste &

Resources Action Programme), which is funded by the UK government. Australia's Wolf Blass will soon release wines in PET bottles in the UK (Wolf Blass Green Label Chardonnay and Cabernet Shiraz), as a result of the success they had with them in Canada last year. While the use of PET for mini bottles has been common for some time, no one had previously touted it as a serious alternative to glass for standard bottles. If PET is accepted by consumers and creates an increase in recycling, there may be a move away from glass.

Bag-in-box, an increasingly popular wine packaging, is also likely to gain support from those concerned with carbon emissions. Typically, bag-in-box wines are shipped in bulk and bottled at destination, which is the most efficient way to transport wine for long distances. For ground transport, bag-in-box is also light and space efficient.

"We have been looking at the carbon footprint issue in great detail to understand what this means, for a year or so," says Adrian Atkinson, development director for Pernod Ricard's wine portfolio in the UK. "We are committed to reducing the impact on the environment of all our activities and carbon footprint seems to be getting more coverage. We are closely watching the British Standard Institute's study to clarify rationalisation of labelling, especially on an international basis." Atkinson adds, "To me, what is unclear is where the footprint starts and stops. The work we are doing on reducing the impact to the environment is to be an ingrained value of our business, and not just a sticker on a bottle, off-set credits or a logo on a website." He reveals that Pernod Ricard have developed a 75cl PET bottle, which has only been launched in Canada.

A closer look at closures

The two major closure manufacturers, who have the most to gain from a carbon audit have both, not surprisingly, commissioned surveys focusing on sustainability, carbon footprints and environmental issues. But while there's clearly a strong motive for them to do this work, it would be unfair to suggest

QUOTE UNQUOTE

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Steve Smith MW, winemaker at New Zealand's Craggy Range

that such surveys are just attempts to bash the competition.

The first study was conducted by French company Oeneo Bouchage. They are the company behind one of the new generation of wine closures, Diam, looking to take on the three market leaders of natural cork, synthetics and screwcaps. Diam is a 'technical' cork, made from small pieces of ground-up cork, combined with synthetic microspheres and a binding agent, to form what looks and feels like a natural cork, but more regular and with a grainy complexion. The cork particles are rendered taint-free by washing them, ironically enough, in carbon dioxide. The CO₂'s kept at a temperature and pressure that puts it in a 'supercritical' state, where it has the cleaning power of a liquid, with the penetration power of a gas.

Oeneo's report, carried out by a French consultancy Cairn Environment, used the Bilan Carbone method (developed by the French Environmental Protection Agency) for assessing greenhouse gas emissions. Three closures were examined: natural cork, screwcap (which they manufacture as part of their closures portfolio) and

Diam. Of course, in-neck closures are accompanied by capsules, so the impact of these was taken into account. The results show clearly that natural cork has the smallest carbon footprint, and screwcaps the greatest, with Diam somewhere between (see the comment). So where does this leave synthetic closures? No figures are yet available, but it is likely that they come in somewhere between Diam and screwcaps.

"We have a project underway with a UK-based consultancy to analyse our materials and processes to calculate the carbon footprint of our closures," says Simon Waller of Supremecorq. "Once we have this information we intend to make it available to retailers and customers to help them in their own carbon management projects."

The second survey, released in July 2007, was carried out by Amorim, the world's largest cork producer, responsible for 50% of the world's corks by volume and 70% by value. The document is an independently-audited sustainability report, taking in several issues. With regard to global warming this report highlights the positive impact of natural cork forests in retain-

1 Contribution of closures to the carbon footprint of wine

	Unit mass (grams)	Tons of CO ₂ equivalent per million units
Natural cork with PVC capsule	4.80	11.9
Diam with PVC capsule	5.80	24.7
Diam with aluminium capsule	5.95	28.9
Screwcap made from 35% recycled aluminium	4.92	52.3
Screwcap made from 70% recycled aluminium	4.92	35.9
Glass bottle	400.00	183.3

ing CO₂ (4.8m tons annually in Portugal, which is 5% of the country's total emissions); the role of corks as a carbon sink during the product life cycle; the fact that Amorim generate 46% of their energy needs from vegetal biomass, including cork dust; and the way Amorim uses less polluting maritime transport for its products where possible. The report also touches on the ecological significance of the cork forests themselves.

"By providing environmentally sound jobs to countless farming communities," says the Amorim report, "cork forests not only foster biodiversity but also provide the means to sustain and retain populations on the land, preventing additional migrations to already overcrowded cities."

Carlos de Jesus, communications director for Amorim added: "Without cork, some of these areas would be deserted." But he also said this environmental angle "is not a panacea for the cork industry: it works only if aligned with a policy of research and development and quality control."

The retail impact

This all sounds like bad news for screwcaps. But how significant will these sorts of data prove in the real world? It is unlikely that consumers will suddenly let closure carbon footprint considerations affect their wine-buying habits. It is also unlikely that influential retailers will specify natural cork as a closure type on the basis of environmental impact. And while the impact of screwcaps is high relative to natural cork, if a sizeable number of producers shift to PET bottles, then this could work in favour of the screwcap, because this is the only suitable closure for this bottle type.

As an aside, perhaps those choosing to bottle with PET for environmental reasons should be brave enough to do away with the long-sleeved screwcaps that are designed to resemble capsules and instead adopt short-skirted screwcaps as are commonly used with PET for other beverages. This would reduce the carbon footprint markedly.

COMMENT

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Adrian Atkinson, development director of Pernod Ricard's wine portfolio

One million glass bottles, averaging 400g each, have a carbon footprint of 183 tons. So if screwcap has a footprint of 35.9 tons/million units, this is around a fifth of the impact of a glass bottle. In the context of a bottle of wine, it appears significant. Other factors contributing to the carbon footprint of the bottle of wine will include transport issues, because sea freight has less impact than road freight, and the energy used in the production of the wine itself (some wineries are now announcing that they are carbon neutral).



More significantly, quibbling over small amounts of carbon emissions may be a moot point. New Zealand winemaker Steve Smith MW of Craggy Range argues convincingly that with the cost savings he makes by buying screwcaps rather than more expensive alternatives, such as Diam, he can more than offset the extra carbon footprint.

"The increased carbon footprint of a screwcap works out at 0.00679 kg CO₂ per unit," he says. "To put that into perspective, it is the equivalent to driving 18 metres in a 2000cc car."

Smith points out that in New Zealand there are programs such as EBEX 21 that use carbon credits to establish regenerating, permanent CO₂ sinks on private property, that otherwise would not be funded. "This is a professional audited system that not only provides an opportunity to develop carbon sinks, but also will leave a wonderful legacy of new native forests for future generations," he says. "These regenerating native forests would not have happened without the funding gained from carbon trading." Smith adds that, "tradable credits are now regarded as the most realistic approach to enable a world wide reduction in carbon loading by encouraging reduction of carbon emissions [because a cost will come with emitting carbon] but most importantly funding carbon sinks that otherwise would not have happened."

By Smith's calculation, if he uses a screwcap, rather than Diam plus aluminium capsule, and puts the margin he saves towards buying carbon credits, he will be operating with a significantly smaller carbon footprint.

"There is an almost overwhelming trend in the world today to develop marketing strategies using 'carbon footprint' as a justification for supporting one product at the expense of others," says Smith. "The current debate in the northern hemisphere on food miles as a justification for buying local is a true reflection of using flawed conclusions to establish trade protection. It is likely a case of NZ wine sent by container on a boat to London uses less carbon in transport than sending a case of wine to London from Bordeaux by truck."

In closing

I can only speak from a personal perspective, but it's hard to justify using a closure that compromises wine quality in pursuit of lowering my carbon footprint. Closure choice is driven by many factors, including performance, wine style, consumer acceptance, cost and image. Environmental and sustainability decisions can factor into this equation, but it is unlikely they will be more than just one of many elements in the process. But one thing is certain: we are likely to hear a lot more about carbon footprints over the coming months. ■