Will our grandchildren need a corkscrew?

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Most wine drinkers love corks. For the typical wine consumer the anticipatory pop of a cork and extractive arc of a corkscrew are an important part of the wine drinking experience.

Wine producers on the other hand, as visitors to this site know well, view natural corks with deep suspicion nowadays (and those of us who sometimes have to open dozens of bottles at a time see them as a pain). For reasons that may include a decline in cork production standards and certainly include increased awareness, the proportion of wines tainted in some way by TCA, a compound associated with cork treatments (and wood treatments) that makes wine taste anything from slightly muted to very mouldy, has risen to what the wine industry regards as an unacceptable level.

Estimates of this level vary wildly, as do different people's sensitivity to and awareness of TCA. The cork industry quotes less than two per cent. Some wine producers claim it is as high as 15 per cent. This year's International Wine Challenge, the two-week wine judging held every May in London, registered a TCA incidence of 4.9 per cent of the nearly 11,000 cork-sealed bottles opened. This is a failure rate far in excess of what would be acceptable in any other product.

Whatever the precise figure, wine producers are deeply worried that a significant proportion of their customers experience a substandard form of the liquid they originally put in the bottle. And they are almost more worried by a light incidence of TCA which simply flattens the aroma and fruit of their wines than by TCA at its most obvious, virtually undrinkable extreme. In the first case the consumer will probably think, wrongly, that the fault lies with the wine rather than the cork.

Because of all this uncertainty, wine producers have been seeking alternative bottle stoppers, or closures, with much lower or minimal risks of TCA taint, and closure manufacturers have been seeking their fortunes. The wine industry is by far the most important customer of the cork industry, much of it based in Portugal, the dominant cork producer being Amorim. More than 13 billion wine bottle closures are needed each year and, thanks to a worldwide trend towards selling less and less wine in bulk, the market is growing.

At long last we are now starting to see some real innovation in wine bottle closures, and suitable remedial activity in the natural cork industry itself, even though this problem-stroke-opportunity has been obvious to all in the wine business for at least 15 years.

The first generation of alternatives to natural cork were synthetic copies of the real thing, cylinders of various oil-industry-derived materials, so-called 'plastic corks' which, though improved, can still be difficult to get out of a bottle neck, and even more difficult to put back in. They retain natural cork's disadvantage, for those wishing to expand the wine market, of needing a special tool to extract them.

The synthetic cork was dealt a significant blow by the most important impartial research project comparing the technical performance of different closures, an Australian Wine Research Institute survey five years ago. This showed that synthetic corks started to let in dangerous amounts of oxygen after about 18 months, so are really suitable only for the most basic wines for early consumption. Although fierce competition between different manufacturers has brought synthetic cork prices down, rising oil prices will presumably put pressure on this, and it is still possible to find natural corks which cost less than synthetics.

For the moment, synthetic corks tend to be slightly cheaper than the total cost of the next most obvious alternative, screwcaps, which are currently the favourite closure for many a wine technician, although the special bottles needed for screwcaps are expected to become cheaper as screwcaps become more common – and there is no need to pay for a capsule over a screwcap.

Unlike synthetic corks, screwcaps are extremely good at keeping wine's enemy oxygen out of the bottle - almost too good in fact. It is becoming increasingly clear that screwcaps are associated with the opposite of oxidation, reduction, which can suppress wine's all-important aroma and even imbue it with a downright nasty one. This problem particularly affects Sauvignon Blanc, a grape that tends naturally to reduction, but not Riesling which does not share this tendency.

For the moment these two grapes are those most frequently found under screwcap, for their bright, aromatic, uncoaked wines have so far seemed to respond best to this particular seal. In New Zealand and Australia an estimated 30 per cent of all wines, red and white, are already bottled under screwcaps, which are gradually spreading throughout the northern hemisphere - although the jury is still out on the effect of screwcaps on oaked whites and reds which may actually need more oxygen during the ageing process than screwcaps allow.

Master of Wine Sam Harrop, a New Zealander who works in London as a wine technologist for Marks & Spencer, points out the urgent need for producers to rethink their winemaking techniques for screwcaps with their reductive tendency. Current practices are designed specifically for wines stoppered by natural corks. "It could be an absolute disaster if someone bottled, say, a regular Chablis under screwcap," he said. "Under cork it needs 18 months' bottle age to come round. Under screwcap it could take years, and still taste like acid water." Much less of the preservative sulphur dioxide is needed, for instance, under the screwcap's fierce protection than under natural cork.

But not all consumers are as thrilled by screwcaps as producers. They still carry the stigma of being associated with cheap wines and spirits – and, unlike the natural cork, they involve precious little theatre. For much the same reason crown caps, the sort of beer bottle closures that need to be levered off, are unlikely to take over from natural corks – although at least one good German producer Peter-Jakob Kühn is using them, disguised by thick black capsules.

More innovative alternatives now include the Vino-lok, a glass stopper reminiscent of an old-fashioned pharmacy, currently being trialled in Germany; Gardner Technologies' MetaCork, a US stopper which can be screwed off but is lined with a natural cork for re-sealing; and now from Australia the Zork, a plastic, peel-off stopper which so far seems good at keeping oxygen out and also provides the vital 'pop' when being extracted.

Zork has the disadvantage for producers of being a relatively late arrival on the scene and, initially at least, being more expensive than any other closure. But it is extremely easy to use and may well find favour with consumers because of what the manufacturers describe as "the sex appeal of the cork" i.e. the pop.

Meanwhile of course, the natural cork industry has at last been pulling up its socks, spending substantially on R&D rather than on smearing other closures, an unfortunate early tactic. Amorim has installed the ROSA technique which, it is claimed, can virtually eliminated TCA from its corks. And French rivals Sabaté are busy developing a plant at which they will treat corks with their Diamant process of TCA decontamination using supercritical fluid extraction. (A very similar technique was developed by Bordeaux oenologist Pascal Chatonnet, profiled on these pages, for Seagram in the late 1990s but the American company was then in such disarray that they never got round to patenting it.)

I would not be surprised to discover even more ingenuity in this commercially important field, but I feel sure we are far from throwing away our corkscrews.