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VITICULTURE

Weathering the climate emergency

Dramatic climate change is impacting wine growers all over the world, so what can producers do to protect against, or reap the benefits of, these extremes?

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Winegrowing – viticulture – is an ancient practice which has burgeoned into a multi-billion-dollar industry. Last year saw the biggest global harvest in decades, clocking in at 292.3 million hectolitres, a veritable bumper crop, according to the International Organisation of Vine and Wine, which collects global data on production.

But the year before was a bad one. In 2017, just 249.8 million hectolitres of wine were produced, a historic low last seen in the early-1960s. The reason was a spate of frosts and heatwaves in Europe, where the bulk of wine is made. Given its sensitivity

to weather patterns, winemaking has been branded a canary in the mine for measuring the impact of climate change. So how is the industry responding?

Linda Johnson-Bell, chief executive of the UK-based Wine and Climate Change Institute, which advocates more sustainable winemaking techniques, says producers are already struggling to cope with rising global temperatures.

“Grape varieties ripen at different stages. In Bordeaux, for example, the Merlot grape is the earliest to ripen and Cabernet Sauvignon is the last. But with climate change, these maturation windows are shifting and

shortening, which means sometimes all the grapes need to be harvested at the same time. Small, traditional producers don't always have the manpower or the equipment to do this. So they can lose, say, a third of their crop simply because they couldn't harvest fast enough in the heat,” she says.

Italian oenologist Alberto Antonini, a specialist in the science of winemaking, is a consultant for major international wine brands and runs his own family winery in Tuscany. He too has witnessed extreme and unusual situations in vineyards. “In continental climates, spring and autumn are much shorter than before, and we are getting ‘water bombs’ when, say, 50 millimetres of rain fall in 20 minutes,” he says. “I have no memory of this happening 30 years ago. So we are now trying to understand how to face these new situations.”

The wine industry has to find ways to adapt to this new normal. State-of-the-art solutions are emerging. Precision viticulture, for instance, deploys technology such as soil sensors to detect when vines are being stressed through lack of water or too much heat. Computer models can simulate the microclimates of individual vineyards to try and predict returns on investment and calculate the most efficient ways of irrigating the land.

Some experts believe, however, that winemakers need to adopt far more traditional techniques to survive the vagaries of climate change. Ms Johnson-Bell says the problem is “wine has become a monoculture and has adopted the poorest farming practices”.

A particularly contentious issue is irrigation. Winemaking is a thirsty

industry. In new world wine countries, such as Australia and the United States, where climates are often desert-like or experience frequent high temperatures, vineyards typically have to be watered artificially. Conservation organisation the Water Footprint Network estimates 110 litres of water are required to produce one 125ml glass of wine. This figure is lower in old world areas such as Europe, where irrigation is strictly regulated and, in some places, banned outright.

Here, rainfall and other natural sources of irrigation, groundwater for example, are used instead. The technique is known as dry farming. This centuries-old method means roots are forced to grow deeper to find their own sources of water and in doing so absorb the nutrients and unique profiles of the surrounding soil, enhancing the wine's *terroir*. But converting irrigated vineyards to dry-farming methods is difficult and it can take years for the deeper root systems to develop and grow. Yields are usually smaller than those of irrigated vineyards.

Another solution is to start growing local grapes, rather than the crowd-pleasing, blockbuster varieties that are easy for shoppers to recognise, which often have to be irrigated to survive. Domestic grapes mitigate climate change because they are inherently suited to their landscape, reducing the need for irrigation and risk of failed crops.

Mr Antonini explains: “Sicily in 2017 had a very dry and hot season. I visited an irrigated Merlot vineyard, which was suffering a lot. Next to it there was a Catarratto dry-farmed vineyard, a domestic grape, which was very happy. The Merlot, which needs more water, is there just because the market is demanding Merlot. In contrast, the Catarratto is a Sicilian grape that knows heat, knows how to get through a drought. But this grape is harder to sell, as opposed to Merlot which is more popular. That's what we need to change.”

Consumers may have no choice but to accept changes in the wines they are used to drinking. The

“**Catarratto knows how to get through a drought, but is harder to sell, as opposed to Merlot which is more popular**”

profiles of classic, well-known grape varieties and the wines they create are changing as temperatures increase.

Ms Johnson-Bell says winemakers are already migrating to cooler climates. “They are experimenting to see if we can recreate, for example, a classic, crisp Sancerre from the Sauvignon blanc grape or an elegant red Burgundy from the Pinot Noir grape,” she says. “Will we find new climates that can return us to these classic profiles? Or are we going to have to readjust our palates and accept that the hot-climate versions of these wines are the new norm?”

Unpredictable yields, the potential loss of classic wine profiles and increasing calls for wholesale changes to growing techniques might sound like the global wine industry is facing a crisis, but Ms Johnson-Bell sees some positives.

“Viticulture, I think, is the perfect poster child [for climate change mitigation techniques],” she says. “The wine industry is perfectly poised to lead the agricultural sector. We have all that is needed: valuable historical data, a strong international communications infrastructure, a long value chain and an investment-friendly financial environment. And as a highly visible product, we have the consumer's attention. Brand protection is vital. It all sounds dire, but it's also an opportunity to find new solutions, new products and new services. Climate change can bring opportunity.” ●

GLOBAL WINE PRODUCTION FROM 1990 TO 2018

Including a historic low in 2017, caused by extreme weather (million hectolitres)

