

Global Warming Concerns for Growers

A new study from the Tyndall Centre for Climate Change Research in Norwich predicts soaring temperatures. Some countries will warm up twice as much as others over the next century. (New Scientist 11th November 2000). The six nations set for the lowest rise in mean temperature (of around 3°C) are Ireland, UK, New Zealand, Chile, Uruguay and Argentina. Major European wine producers like France, Italy, Spain and Germany are all marked for rises of 4 to 4.9°C along with USA, Australia and South Africa. Changes of this magnitude must have an effect on viticulture, but there has been relatively little research on grapevines and how they might react.

Hans R Schultz at Geisenheim has looked at how predicted changes in climate for European viticultural regions may affect the distribution of grape varieties. Based on the weather over the last 10 years, cultivars like Merlot and Cabernet Franc become feasible even in Germany. Altered rainfall patterns are widely predicted with forecasts of heavy precipitation in winter and drier summers with extreme temperatures. Higher soil surface temperatures will increase evaporation rates and thus loss of soil moisture - potentially a problem where irrigation is not permitted or water is scarce.

Increased levels of carbon dioxide in the atmosphere have implications for photosynthetic efficiency. Current levels of 370ppm are 30% higher than before the Industrial Revolution and may double by the end of the 21st century. In the short-term, photosynthesis is stimulated by an increase in carbon dioxide. An experiment on Riesling in Montpellier reported an increase in photosynthesis of 35% for a near doubling of carbon dioxide, with no change in transpiration rate. The vines are thus using water more efficiently and this may give some resistance to drought. Other experiments with Sangiovese suggest that this increased photosynthetic activity results in an increase in leaf canopy and vegetative dry matter (+49%) but only 21% more reproductive material (fruit). This has implications for canopy management and fruit quality.

The other major climate change concern is the thinning of the ozone layer with holes developing over Australia and South America. This is likely to result in increased levels of UVB - known to damage plant cells. A field experiment in Geisenheim using various UV absorbing films found UVB exposure reduced amino acids and carotenoids in grapes raising concerns about yeast nutrition and flavour profile in the fruit.

The full implications of climate change are still uncertain, but one predicted benefit may be for the marginal UK wine industry to become a serious rival to Champagne. Ridgeview Vineyards (rated a star performer by Tom Stevenson in his Millennium Champagne Guide) point out the combination of chalk and clay soils in the Sussex Downs "bears an uncanny similarity to the Champagne region". However, Stephen Skelton (English winemaker) says, "I personally don't see our harvests getting earlier or our natural sugar levels rising much - two things which I would have thought might have happened if our climate was getting warmer." He adds "The number of days over 30°C in July and August in 'cool' winegrowing regions is always a good clue as to a region's suitability for vines and we have precious few of these." In the longer term that may be all set to change - after all an Englishman was first to describe how to make sparkling wines some 30 years before Dom Perignon.

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