Getting hot under the *collerette*

IT IS NO SECRET that the average temperature of Champagne's growing season increased greatly in the 1990s, and although a greater rise has always been on the cards for the noughties, not even the most pessimistic observers correctly predicted the increase being twice as great as in the previous decade.

The data is in for 2009, and since the world's greatest sparkling wine gains no advantage from a temperature increase, we can be fairly certain that of all the climate-change data circulating, Champagne's has not been massaged. From the 1950s to the '80s, the average temperature of Champagne's growing season was a steady 57.7°F (14.3°C), but in the '90s it increased to 59°F (15°C). Any guesses for the noughties? When asked this question at a presentation last year, I reckoned it was likely to be close to 60.8°F (16°C). If the questioner, sommelier Agustín Trapero, seemed alarmed, what might he think now that we know the latest ten-year average has shot up to 61.9°F (16.6°C)?

But focusing on the temperature rise gives too simplistic an impression of meteorological changes over the past 20 years. For example, the pan-European drought year of 2003 is often cited as an indication of "global warming," yet spring started off with temperatures of 12°F (–11°C), which destroyed 50 percent of the potential crop in Champagne; then there were violent storms in June and flooding throughout France in December. Even a basic overview of Champagne's climatic transformation over the past two decades is fairly complex. Gradually the winters have become longer, wetter, and generally warmer, while the summers have been shorter, hotter, and more erratic. Champagne remains very much a cool-climate region, but the number of days when temperatures exceed 86°F (30°C) are on the increase. There is more rainfall in general, changed rainfall patterns, more extremes in rainfall (though drought is less of a hazard for a region that sits on a soft chalk reservoir 980ft [300m] deep), and there are more violent storms than before. Winds in

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excess of 30mph (50km/h) are on the rise, and atmospheric humidity over 90 percent is more common. There are more extremes in hours of sunshine, with an increase in both overcast and bright days. So, rather than just getting hotter, there are extremes and unpredictability in the spectrum of weather patterns, which is why the term "global warming" has, in general, been replaced by "climate change."

What impact has climate change had on Champagne's viticulture? With less winter frost, there are more pests and diseases to deal with, while an earlier budbreak exposes the vine to a greater likelihood of spring frost. The earlier budbreak encourages an earlier veraison, which sadly now encompasses a hotter period of summer, which shortens the ripening process. High winds can cause physical damage to the vine, causing its metabolism to shut down; this can occur under various different combinations of wind, temperature, and humidity, thus climate change can halt ripening, as well as speed it up. The increase and growing unpredictability of precipitation, humidity, and temperature during veraison and harvest have increased the incidence of severe rot—always one of Champagne's greatest dangers—but earlier-ripening clones have further exacerbated this problem.

What are the results for the grapes produced? Surprisingly, ripeness levels have risen, despite an increase of 50 percent in yields, while unsurprisingly acidity has dropped and pH has notched up a little (*see chart*). The total acidity in the chart is expressed as sulfuric, as per the original source data from the CIVC, and as tartaric in parentheses. These are just averages, of course. Every average masks the peaks, and with the peaks in the region's climate becoming ever more extreme, the 2003 harvest was Champagne's wake-up call.

This was the earliest harvest since Champagne's climate records began in 1822, and even compared to the previous three most famous hot years, the acidity is significantly lower and the pH worryingly much higher. In fact, 2003 has the lowest acidity and highest pH on record—I even found one wine with a pH of 3.7! With a relatively small crop and a shortage of Chardonnay due to the spring frosts, many producers did not declare a vintage, but most did vinify at least one pure 2003 for in-house use. This year could not be made in the same way as every other year; and with climate change likely to produce more 2003s rather than fewer, Champagne's winemakers need to have pure 2003s to look back on, so that when the next one does occur, they can see what they did and what the results were, learning from any mistakes they may have made. ■

Regional average	Yield	Natural alcohol	Total acidity	pH
Over the past 10 years	14,980kg/ha	9.9%	7.4g (11.38g)	3.10
Previous 30 years	9,825kg/ha	9.6%	8.8g (13.5g)	3.05
2003	-	10.6%	5.8g (8.9g)	3.28
1976	-	10.5%	6.7g (10.3g)	3.17
1959	-	12%	6.3g (9.7g)	N/A
1947	-	11.5%	6.1g (9.4g)	N/A