

The 2003 vintage

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2003 will be remembered by wine professionals as the year of the heat wave, just as 1956 is remembered for its freezing cold winter and 1991 for its spring frost. 2003 will also go down in history as an early vintage with below average, or even very low yields at certain estates. Winemakers will recall the challenges they encountered: deciding on the best date to start picking, bringing the fermentation of very sweet must to successful completion, correcting acidity, and (for red wines) carefully overseeing maceration and malolactic fermentation.

The most important characteristic of the 2003 vintage is its precocity. Flowering and *véraison* (colour change) occurred about a week in advance of the average date for the past decade in our red wine reference vineyards. This precocity is even more marked when one compares the phenological stages in 2003 with the average dates in previous decades (Table I). Grapes have clearly been ripening earlier and earlier over the last twenty years, probably due to the effects of global warming.

Table I

Dates of peak flowering and peak véraison (colour change) for red wine varieties in reference vineyards for some of the earliest vintages of the last thirty years

Year	Peak flowering	Peak- <i>véraison</i>
2003	May 27 th	July 29 th
1999	May 31 st	August 4 th
1997	May 23 rd	July 31 st
1990	May 27 th	August 6 th
1989	May 29 th	August 4 th
Average		
1993 - 2002	June 3 rd	August 7 th
1983 - 1992	June 11 th	August 15 th
1973 - 1982	June 16 th	August 21 st

Table 2
2003 average monthly weather statistics compared to normal (1)

	Temperature (°C)						Hours of sunshine (hrs)			Rainfall (mm)		
	Maximum			Average								
	2003	Normal	Difference	2003	Normal	Difference	2003	Monthly average	Difference	2003	Monthly average	Difference
January	8.5	10.0	- 1.5	5.5	6.6	- 1.1	104	84	+ 20	101	83	+ 18
February	10.4	11.8	- 1.4	6.2	7.8	- 1.6	115	99	+ 16	86	77	+ 9
March	18.8	14.8	+ 4.0	12.8	10.0	+ 2.8	230	153	+ 77	42	67	- 25
April	20.4	16.9	+ 3.5	14.6	12.0	+ 2.6	240	173	+ 67	43	81	- 38
May	22.0	21.0	+ 1.0	16.5	15.8	+ 0.7	237	199	+ 38	57	73	- 16
June	29.1	24.3	+ 4.8	23.3	19.0	+ 4.3	269	226	+ 43	62	58	+ 4
July	28.2	26.7	+ 1.5	22.4	21.1	+ 1.3	301	244	+ 57	61	52	+ 9
August	32.6	26.9	+ 5.7	26.0	21.2	+ 4.8	289	231	+ 58	51	57	- 6
September	25.2	23.9	+ 1.3	19.3	18.3	+ 1.0	219	191	+ 28	41	85	- 44
October	17.5	19.0	- 1.5	13.4	14.4	- 1.0	139	137	+ 2	191	87	+ 104

October												
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(1) normal = monthly average from 1973 to the end of 2002

To a large extent, the weather during the growing season accounts for the precocity of the 2003 vintage as well as the composition of the grapes. The data we cite comes from the weather station at the Domaine de la Grande Ferrade (INRA) in Villenave d'Ornon (Table 2).

January was cold (1.1°C less than normal) and wet (101 mm of precipitation compared to the usual 83 mm). The cold weather continued for the first twenty days of February before turning milder. An average maximum temperature of 15.3°C was recorded in the last eight days of the month. Despite the warmer temperature, the average monthly thermometer reading was decidedly lower than normal (-1.6°C). Although total rainfall (86 mm) was close to average, the showers were concentrated at the beginning of the month.

The first 5 days of March were very rainy (40 mm) whereas the rest of the month was dry (only 2 mm of rain fell) and exceptionally mild. There were three weeks of cloudless sky, with cool nights and very high temperatures for the season (the average monthly maximum was 4°C higher than normal). This weather encouraged bud break to take place at the normal time, although the unfavourable weather in January and February had led us to believe that it would occur later than usual. At this stage, there was a good number of bunches, so a relatively average-sized crop was expected.

April was hot (the average temperature was 2.6°C higher than usual) and dry, with only fifty percent of normal rainfall. May was quite warm and dry with some rain in the first ten days of the month. The last ten days of the month were very hot with daytime temperatures often exceeding 30°C. This weather was very beneficial for vine growth. The first flowers appeared towards the end of the second ten day-period in the most precocious plots. Flowering peaked on May 27th in our reference red wine vineyards. This was 7 days in advance of the average date over the last decade (1993-2002), but much more so – almost three weeks – compared to the fifty year average! Flowering occurred at a similar time to 1990 and 1989, although slightly later than 1997. It was relatively long and irregular, perhaps due to the unfavourable weather in the first week of June (47 mm of rain between the 2nd and the 7th).

June was very sunny and hot, with occasionally scorching temperatures. Rainfall was uneven, with storms affecting some areas much more than others. There were several moderate to strong rainstorms (20-60 mm) on the 3rd and 4th of June. Violent hailstorms struck on the evening of June 24th, mainly in the Entre-Deux-Mers, but also in the Premières Côtes de Bordeaux, the Graves, and some *communes* in Saint-Emilion, affecting approximately 6,000 hectares. Damage was considerable at some estates: rows of vines flattened, leaves and grapes crushed, and canes mutilated. This not only caused a significant crop loss in 2003, but also compromised the 2004 vintage.

July was hotter than average (+ 1.3°C) with highs of over 30°C on many days. Monthly precipitation was close to normal. Rain fell in two short periods: 25 mm from the 1st - 3rd and 32 mm on the 15th and 16th. August was marked by an exceptional heat wave, both in terms of temperature and duration. For eleven consecutive days, August 3rd – 13th, the thermometer went above 35°C, with several days over 40°C. Rainfall was less than average, with several storms towards the end of the second ten day period.

Table 3
Weather in June, July, and August 2003
compared to the 1973-2002 average

	2003	Normal
Total temperatures (°C)	lows	1,638
	highs	2,758
	average	2,198
No. of days when temperature was	≥ 25°C	78
	≥ 30°C	41
	≥ 35°C	15
Hours of sunshine	860	702
Global radiation (MJ/m ²)	2,067	1,837
Rainfall (mm)	174	167
No. of days during which rain was	≥ 0.5 mm	21
	≥ 10 mm	7
		27
		5

Table 3 compares the weather for June, July, and August with the statistical average. These three months are noteworthy because of high temperatures, the number of hot (maximum ≥ 30°C) and very hot (maximum ≥ 35°C) days, and the great amount of sunshine. Total rainfall was about average at the weather station in Villenave d’Ornon. However, as is often the case in our region at this time of year, precipitation was of varying intensity and distribution (downpours rather than showers). Although the 2003 vintage will be most remembered for its particularly high temperatures, water supply was never completely insufficient, and the vines were able to continue growing to a satisfactory degree. Of course, there were significant differences depending on location. Rainfall was variable (total rainfall of 35-82 mm in July and 28-68 mm in August). Some areas did, in fact, suffer from water stress, which interrupted ripening. On the other hand, and as usual, temperatures were more

consistent (average daily temperatures varied from 21.2 – 22.6°C in July and 24.6 – 26.0°C in August).

Peak *véraison* occurred in our red wine reference vineyards on July 29th (table I). At this stage, there was a 20 day advance compared to the average date for the past fifty years, but only one week compared to the last decade. This advance was slightly greater than at peak flowering.

September was hot with little rainfall (41 mm as opposed to an average of 85 mm), 80% of which fell in the first ten days.

Grape ripening is strongly influenced by the vine's water balance, which obviously depends on: the soil's water reserves and access thereto, the weather, and viticultural practices. A gradual decrease in water supply, leading to moderate water deficiency at *véraison*, plays an important role in grape composition. This results in: higher sugar content, lower concentration of malic acid, and, for red wine varieties, more anthocyanins and tannins. Water deficiency also influences the size of the grapes and therefore the volume of the harvest, which explains the low yields in 2003.

Cold soils (which are generally moist) in areas where precipitation was low in June, July, and August experienced only moderate water stress. In 2003, which was conducive to good ripening. However, on excessively dry soils, insufficient rainfall led to severe water stress in certain cases. As a result, leaves dried out and fell off, and grapes shrivelled. In the majority of such plots, although water stress at *véraison* brought growth to a halt, photosynthesis continued in the young and adult leaves, even though some of the old leaves fell off. Sugar concentration therefore increased, compounded by the effects of evaporation due to high temperatures – which also contributed greatly to the decrease in malic acid.

The statistics in table 4 compare the composition of red wine varieties in several very early vintages. They show that sugar concentration was exceptionally high and acidity particularly low in 2003.

Table 4
Average composition of red wine varieties from the Faculty of Oenology's reference vineyards
in several early years
at peak véraison during the final sampling before picking

Year	Date	Weight of 100 grapes (g)	Total acidity (g/l, H ₂ SO ₄ /l)	Sugar (g/l)	Estimated alcohol content (18 g = 1% alc/vol.)
MERLOT					
2003	5/09	145	2.5	238	13.2
1999	17/09	153	3.1	222	12.3
1997	12/09	189	3.6	199	11.0
1990	20/09	142	3.2	220	12.2
1989	12/09	145	3.4	231	12.8
CABERNET SAUVIGNON					
2003	15/09	118	3.3	222	12.3
1999	20/09	136	3.6	202	11.2
1997	15/09	159	4.3	190	10.6
1990	28/09	113	3.7	199	11.0
1989	17/09	118	4.5	208	11.6

In 2003, deciding when to start picking was particularly difficult. A compromise needed to be found, on the one hand, between the high sugar levels and very low acidity and, on the other hand, the quality of the aromas and (for red wine grapes) the tannin content. It was also necessary to take into account differences in grape composition for the same variety planted in different types of soil.

One of the hallmarks of the 2003 vintage was that the grapes arrived at the vat room at particularly high temperatures. Another is that sugar levels throughout Bordeaux were greater than ever before to our knowledge. Finally, certain grape varieties (Sauvignon Blanc, Sémillon, and Merlot) had very low acidity, which is quite unusual for our region. Winegrowers overcame these challenges with varying degrees of efficiency and ease according to the type of equipment at their disposal and their technical expertise.

These days, most cellars are equipped to control fermentation temperatures for both white and red wines under normal circumstances. However, due to the particularly high temperatures and the need to bring in grapes reaching optimum ripeness more or less all at the same time, cellar equipment frequently proved insufficient in 2003. Seeing as a vintage like 2003 could very well reoccur, it seems necessary for winegrowers to improve their fermentation capacity. Simply stopping picking during the hottest time of day helped solve some temperature-related problems.

Given the very low acidity at certain estates due to low malic acid levels, it was sometimes necessary to acidify the must, especially for white wine varieties and certain lots of Merlot. Acidification is a delicate process due to the fact that some acids are necessarily formed during alcohol fermentation. The lower the initial level of acidity, the greater the increase. This natural process can ultimately produce wines with a normal level of acidity. To limit mistakes, it is recommended, when acidification proves to be essential, to do so gradually, throughout fermentation.

Picking of Sauvignon Blanc grapes to make *dry white wines* in certain very early ripening plots started around August 15th. The speed at which the white wine varieties ripened caught some winegrowers by surprise. The musts were rich in sugar and generally had a low level of acidity; slight acidification was necessary on occasion.

2003 was generally a successful vintage for clay-limestone soils, which is always the case in dry years. Grapes grown in gravelly soil were of more uneven quality as they were less resistant to the abnormally high temperatures. Relatively high alcohol content and low acidity account for the volume and body in these dry white wines. However these characteristics can, on occasion, detract from the wines' crispness and aromatics.

Picking for *sweet white wines* started exceptionally early and was over in an unusually short time – all the grapes were harvested by late September.

The hot, wet weather in the first ten days in September encouraged the rapid development of botrytis on grapes which were very sweet thanks to the extremely hot weather in August. Later, humid mornings and very hot, sunny afternoons quickly led to even higher sugar levels. In some cases, grapes came in with more than 25% potential alcohol. These very unusual conditions limited the number of times pickers needed to go out in the vineyard. Indeed, at some estates three quarters of the crop were picked in a single wave.

The 2003 sweet white wines are powerful and rich. They have a bouquet of great finesse with relatively discreet botrytis and should age perfectly.

We have emphasised the unusual composition of the *red wine* grapes at harvest time (high sugar content, low acidity). There were also very good anthocyanin and tannin levels. Showers in early September brought fear that rot would develop. However, the hot, dry weather that followed put an end to our worries. In fact, the grapes were perfectly healthy.

The end of alcoholic fermentation was sometimes laborious due to the high sugar content. Malolactic fermentation was also difficult on occasion, but the exact reasons for this are yet not fully understood.

The wines are deeply coloured, powerful, and have a great deal of tannin. On the whole, they lack neither fruitiness nor aromatic finesse, especially when the grapes were picked at the correct time. 2003 red Bordeaux has a complex structure thanks to very ripe grapes. The wines will certainly become more round in the coming months. They give every indication of good ageing potential.

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