



## Marlborough Meteorological Services

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# 1 Introduction

Blenheim's weather station is located at the Grovetown Park campus of the Marlborough Research Centre. The ongoing operation of this weather station is a core activity that the Marlborough Research Centre Trust has supported, since its establishment at this site in late 1985. Data from the Blenheim weather station and Dashwood weather station in the lower Awatere Valley are summarized monthly and made available, free of charge, on the Marlborough Wine Research Centre website [www.wineresearch.org.nz](http://www.wineresearch.org.nz). The summarized data are regularly used by the local community (Marlborough Express, local radio stations, educational groups, Marlborough District Council, Marlborough Winegrowers, science staff). Weather summaries and press releases are also provided on a monthly basis to the local media.

## 2 Rainfall

Marlborough is known as one of the drier regions of New Zealand, with relatively low rainfall in comparison to many other areas. Long-term rainfall records for the 71 years 1930 – 2000 (Table 1) show that average monthly rainfall was between 45 and 66 mm. However, what the average monthly rainfall data do not show is the marked deviations from average that can occur in any one year. Marlborough can experience sustained periods of low rainfall, where some individual months may only record 20% of average rainfall. Marlborough can also quickly swing from a prolonged dry spell to a period with very high rainfall, when some months can record 3 - 400% of the long-term average.

Spring is a critical time for pasture growth in Marlborough and if adequate rainfall is not received over this period, dryland pastoral farms can experience severe stock feed shortages. Blenheim recorded average to well above average rainfall in the four months July to October 2009. This meant that for pastoral farms in Marlborough, spring grass growth in 2009 was very good.

Table 1. Blenheim rainfall over the 2009–2010 season in comparison to the long-term average.

<b>Month</b>	<b>LTA<sup>1</sup> 1930-2000 mm</b>	<b>Rain 2009-2010 mm</b>
July	66	50.8
August	64	82.2
September	51	50.2
October	55	115.4
November	48	32.2
December	47	19.8
January	50	40.6
February	45	6.4
March	46	32.8
April	53	7.2
May	65	167.2
June	57	154.8
<b>Total July-June</b>	<b>647</b>	<b>759.6</b>
<b>% of LTA</b>		<b>117%</b>
<b>Total July-October</b>	<b>236</b>	<b>298.6</b>
<b>% of LTA</b>		<b>127%</b>
<b>Total November-April</b>	<b>289</b>	<b>139</b>
<b>% of LTA</b>		<b>48%</b>
<b>Total May-June</b>	<b>122</b>	<b>322</b>
<b>% of LTA</b>		<b>264%</b>

<sup>1</sup> LTA – long-term average

Following the good rainfall in late winter and early spring in 2009, Blenheim then experienced six consecutive months with below average rainfall (Figure 1). Total rain from November 2009 to April 2010 was only 139 mm, or 48% of the long-term average. Both February and April 2010 recorded only 14% of their average rainfall for those months. By the end of April 2010, Marlborough was very dry and some sub-regions were in the process of applying for drought assistance from the government.

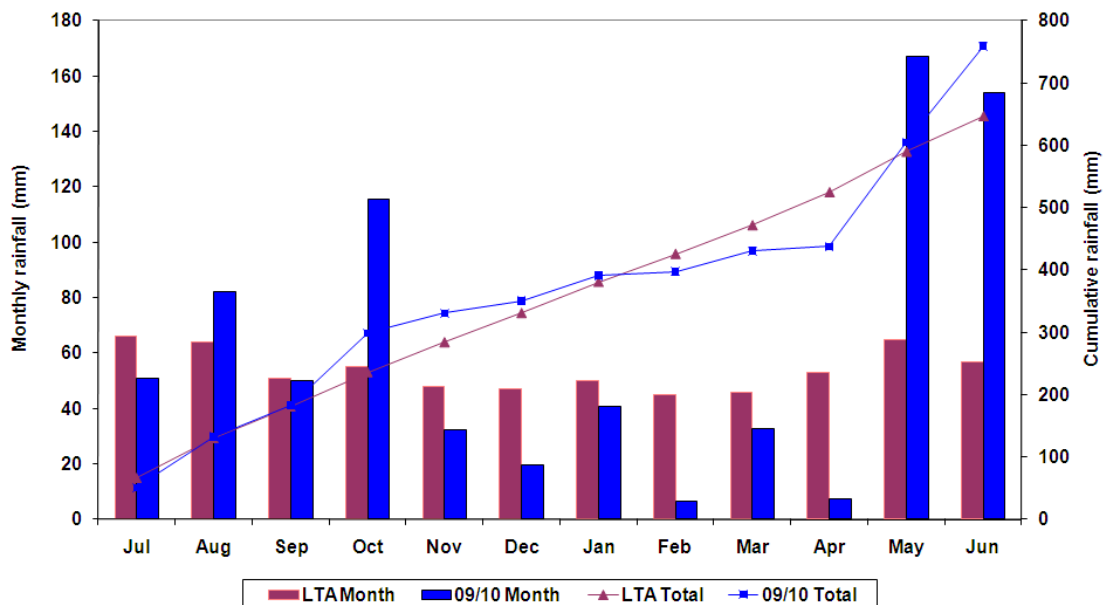


Figure 1. Blenheim monthly and total rainfall - July 2009 to June 2010.

On 12 May 2010, it was as if the rainfall tap had been suddenly turned from off to on. Blenheim recorded 167.2 mm rain in May 2010, 257% of the long-term average. May 2010 became the second wettest May on record for Blenheim, for the 81-year period 1930 – 2010. June 2010 was also the second wettest on record, and was almost the wettest on record, but in the end fell just 0.2 mm short, with 154.8 mm rain in June 2010, compared with 154.9 mm rain in June 1943.

Total rain for May and June 2010 was 322 mm, or 272% of the long-term average for these two months. This was 49.8% of Blenheim's long-term annual average rainfall, or to put that in context, Blenheim received half its annual rainfall in a six-week period in May and June 2010. In contrast, the previous eight months from September 2009 to April 2010 recorded a similar rainfall total, of 305 mm rain.

Of all years from 1930 to 2010, the highest monthly rainfall for Blenheim was recorded in September 1943, with 191.5 mm. As is normal convention, weather data are summarised monthly. However, splitting the rainfall totals into calendar months may not give the highest total for any consecutive 31-day period. The Marlborough Research Centre has daily rainfall data for Blenheim from 1941 onwards. With the incessant rain from mid May to mid June 2010, many people commented that they could not remember such a prolonged wet period. In order to determine the highest consecutive 31-day rainfall total on record for Blenheim, a running total from 1941 to 2010 was calculated. These data have then been sorted from highest to lowest over that 70-year period. The 31-day total for Blenheim from 11 May to 10 June 2010 of 272.8 mm is the highest on record, 81.5 mm greater than the highest monthly total recorded in September 1943.

### 3 Temperature

Temperature data for the 2009-2010 year are shown in Table 2. The mean temperature for the twelve months, of 13.4°C, was 0.6°C above the long-term average of 12.8°C (1930-2000). However, the mean was fairly close to those experienced in many of the last 20 years. August 2009, with a mean temperature of 10.9°C, was the warmest August on record, for the 80 years 1930-2009. With the very warm August, it appeared as if budburst and flowering of fruit crops in the 2009-2010 season were going to be very early. However, October 2009 was very cold and growth of fruit crops slowed as a result.

Table 2. Blenheim monthly temperature and growing degree-day summary, July 2009 to June 2010

	LTA <sup>1</sup> Mean Max °C	09/10 Mean Max °C	LTA Mean Min °C	09/10 Mean Min °C	LTA Mean °C	09/10 Mean °C	LTA GDD <sup>2</sup> (96-06)	09/10 GDD
Jul-09	12.4	12.4	1.5	2.2	7.2	7.3	23.3	16.2
Aug-09	13.5	16.0	3.0	5.7	8.4	10.9	32.5	56.0
Sep-09	15.8	16.6	5.1	4.9	10.6	10.8	72.0	64.6
Oct-09	18.0	16.9	7.2	5.8	12.7	11.4	113.5	71.0
Nov-09	20.2	20.3	8.9	9.4	14.6	14.9	140.1	139.5
Dec-09	22.3	22.5	11.0	11.8	16.7	17.2	204.9	211.3
Jan-10	23.6	23.6	12.0	13.3	17.9	18.5	234.2	242.4
Feb-10	23.5	23.7	12.1	12.2	17.8	18.0	217.2	210.6
Mar-10	21.8	23.1	10.5	10.6	16.2	16.9	195.7	208.1
Apr-10	18.9	20.6	7.6	9.1	13.4	14.9	107.8	152.0
May-10	15.5	15.8	4.7	6.8	10.3	11.3	77.6	63.7
Jun-10	13.0	13.5	1.9	4.1	7.7	8.8	36.5	23.3
<b>Total</b>	<b>18.2</b>	<b>18.8</b>	<b>7.2</b>	<b>8.0</b>	<b>12.8</b>	<b>13.4</b>	<b>1455.3</b>	<b>1458.7</b>
<b>Mean Deviation from LTA or % of LTA</b>		<b>+0.6</b>		<b>+0.8</b>		<b>+0.6</b>		<b>100%</b>

<sup>1</sup> LTA – long-term average

<sup>2</sup> GDD – growing degree days

## 4 Growing Degree Days

Growing degree days (GDD) above a base temperature of 10°C are a means of comparing seasonal temperature accumulation for many different crops. They are calculated as:

daily average temperature – 10 = growing degree day total for each day.

The growing degree days are then summed on a daily and a monthly basis and compared with the long-term average. Figure 2 displays the growing degree-day accumulation from September to April. This is generally regarded as the growing season for grapes in Marlborough, as it includes the period from before budburst to after harvest. The long-term average growing degree day line is plotted through zero. If a line is sloping upwards, this indicates that the temperature accumulation was warmer than average; if a line is sloping downwards, it indicates that the temperature accumulation was cooler than average. Figure 2 includes the 1996-1997 season when temperatures were generally below average throughout the growing season and the line tracked steadily downwards. Also included is the 1997-1998 season, which indicates that from mid January that season was very warm. The GDD line for the 2009-2010 season indicates that the GDD accumulation was much lower than average from the beginning of October through until early December. There was a hot period between mid December 2009 and early January 2010, when the GDD line recovered to some extent. However, from mid January through until the end of March, with only average temperatures, the GDD line stayed horizontal. The text and arrows on the graph describing the late flowering are with reference to the flowering of grapes in Marlborough.

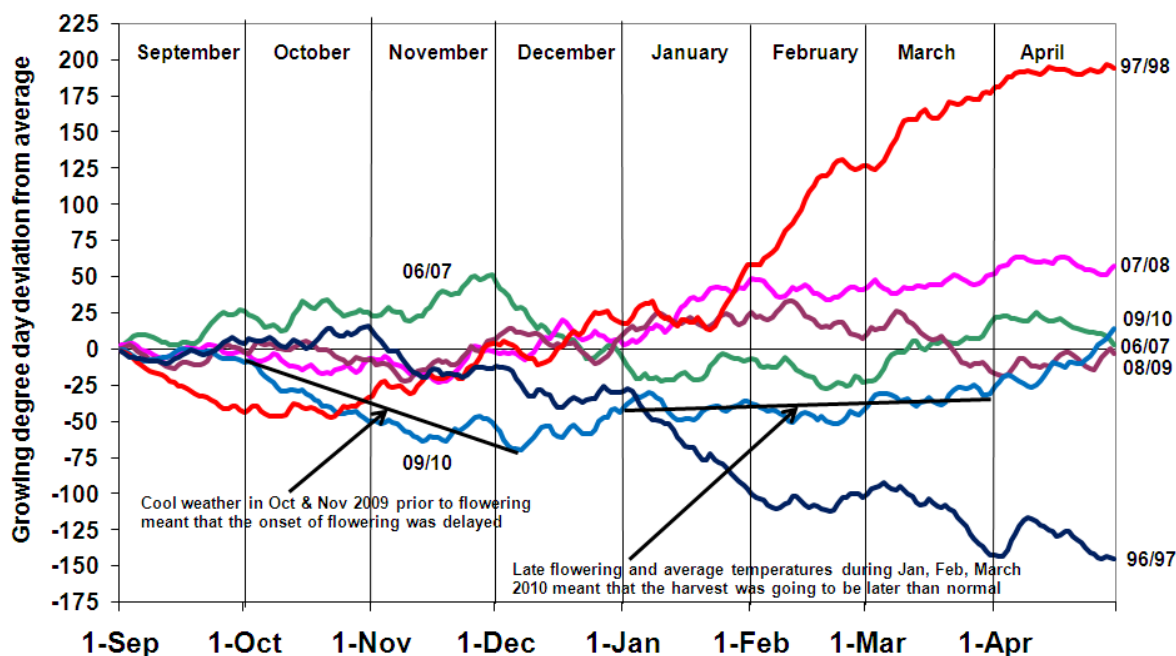


Figure 2. Growing degree days for Blenheim: days ahead (+) or behind (-) average

## 5 Dissemination of information from this project

- Monthly meteorological summaries for the Blenheim and Dashwood weather stations were posted on the Marlborough Wine Research Centre website in the first few days of the new month. These summaries were viewed on the website by approximately 50 people each month.
- Press releases were sent to local media at the beginning of each month, outlining details of the previous month's weather.
- Meteorological Report in Winepress July 2009 – June 2010 Issue Numbers 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193.
- The Vinefax service to subscribing Marlborough grape growers completed its fourteenth season of operation.
- Monthly meteorological summaries supplied to local media at the beginning of each month continued to provide the basis for newspaper and radio articles.
- The Nelson Marlborough Institute of Technology first-year viticulture & oenology class visited the Grovetown Park weather station.

## 6 Key Funding Sources and Collaborating Companies

Marlborough Research Centre,

Plant & Food Research,

Pernod Ricard New Zealand Limited,

Cloudy Bay Vineyards.