PFR SPTS No 8856

Marlborough Meteorological Services

Agnew R, Raw V.

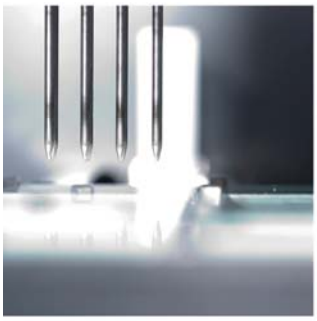
August 2013





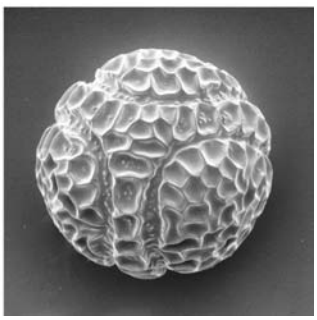










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1 Introduction

Funding from the Marlborough Research Centre Trust enables the ongoing dissemination of weather information to the Marlborough community in a number of different ways. Monthly press releases to the local media are used for radio and newspaper reports. Weather data are used for phenological and yield prediction modelling in the grape industry, for botrytis disease risk prediction in grapes and for warning of impending drought in the agricultural sector. Agricultural- and horticultural-associated businesses use the weather information for planning/reporting, engineering companies use rainfall data for construction projects. Schools use the data for weather-related projects. Comprehensive weather data summaries are updated monthly and made available online at www.mrc.org.nz

2 Weather Data Summary for the 2012/2013 Season

The following data summary and text is not intended to be a complete picture of the weather in Blenheim for the 2012/2013 year. It is only a small snapshot of some aspects of the weather that are recorded at the Blenheim weather station.

Table 1. Blenheim weather summary for the 2012/2013 growing season.

	LTA Rain mm	12/13 Rain mm	LTA Mean Max °C	12/13 Mean Max °C	LTA Mean Min °C	12/13 Mean Min °C	LTA Mean °C	12/13 Mean °C	LTA GDD	12/13 GDD	LTA PET mm	12/13 PET mm	LTA Sun hours	12/13 Sun hours
Sep	53.6	32.4	16.2	16.4	5.9	6.3	11.1	11.4	70.4	67.2	72.3	77.6	192.2	204.6
Oct	64.0	53	18.1	18.7	7.8	7.5	13.0	13.1	107.3	110.6	99.1	112	225.3	239.5
Nov	52.3	7	19.8	19.8	9.3	7.8	14.6	13.8	143.2	123.9	121.8	116.6	238.7	266.9
Dec	51.2	25.4	21.8	23.6	11.6	12.3	16.7	18.0	206.5	239	139.0	149.8	248.5	256.4
Jan	44.0	59	23.4	23.7	12.7	12.6	18.0	18.2	238.1	242.9	138.8	159.4	260.9	281.1
Feb	48.2	18.6	23.1	23.3	12.4	11.1	17.8	17.2	215.2	196.1	108.4	115	220.4	291.1
Mar	40.1	22	21.4	22.3	10.4	10.7	16.0	16.5	192.9	198.1	100.3	104.1	229.5	255
Apr	43.1	102.5	18.8	19.5	7.8	9.8	13.3	14.7	110.8	124.1	61.9	72.5	193.6	153.2
Total	**396.5**	**319.9**							**1284.4**	**1301.9**	**841.6**	**907**	**1809.1**	**1947.8**
Mean			**20.3**	**20.91**	**9.7**	**9.76**	**15.1**	**15.36**						
LTA comparison		**81%**		**+0.61**		**+0.06**		**+0.26**		**101%**		**108%**		**108%**

LTA – long-term average, GDD – growing degree-days, PET – potential evapotranspiration

2.1 Rainfall

Of the eight months September 2012 to April 2013, only April recorded well above average rainfall (Table 1). Total rainfall for the growing season was only 81 % of the long-term average. However, total rainfall for the seven months September 2012 to March 2013 was only 217.4 mm, or 64% of the long-term average of 341.6 mm. Only seven years in the 83 years 1930 – 2012 recorded lower rainfall during this seven-month period. The question then arises, how was it that Marlborough did not experience a severe drought over the growing season, as occurred over the whole of the North Island? Blenheim was fortunate to receive almost double the normal rainfall in August 2012 (data not shown). This had the effect of saturating the soil at the beginning of the growing season prior to the months of below average rainfall. However, in the case

of dryland pastoral farming, landowners are reliant on regular rainfall at least every few weeks to avoid the onset of a drought. Although the 2012/2013 season had relatively low rainfall, as previously indicated, Marlborough received rainfall events about three to five weeks apart that helped to alleviate the onset of a serious drought for the dryland pastoral farming community. The only month not to receive a significant rainfall event was November 2012.

2.2 Temperature and growing degree-days

The mean temperature for the growing season was 0.26°C above average. Six of the eight months were warmer than average (Table 1); December 2012 was markedly warmer (+1.3°C). The warm temperatures during December occurred while a large proportion of Marlborough's Sauvignon blanc vineyards were flowering. A consequence was that a higher percentage of flowers set fruit, leading to above average berry number per bunch, and heavier bunches in many Sauvignon blanc vineyards. Heavier bunches helped to compensate for lower than average bunch number per vine as a result of cool temperatures in December 2011 over the period of bunch initiation. In contrast, warm temperatures in December 2012 over the period of bunch initiation for the 2013/2014 season will result in above average bunch number per vine at harvest in 2014.

Temperature data from the Blenheim weather station are used in a Sauvignon blanc yield prediction model developed by Dr Mike Trought. This model is used to give the wine industry advance notice of whether yields in the coming season are likely to be above or below average. Temperature data from vineyard weather stations is also being used in a Sauvignon blanc flowering prediction model developed by Dr Alistair Hall.

Growing degree-days for the 2012/2013 growing season (black line - Figure 1) were well ahead of the previous cool season 2011/2012. However, the growing degree-day line indicates that the 2012/2013 season was close to the long-term average.

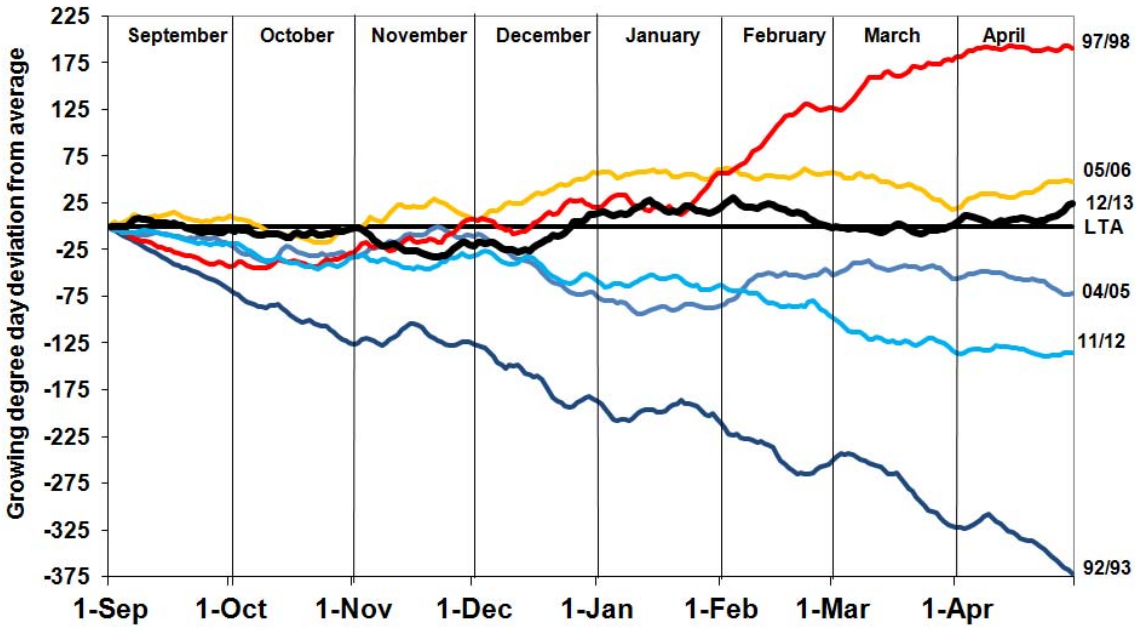

Figure 1: Growing degree-days for Blenheim: days ahead (+) or behind (-) average: growing degree-day summation starting from 1 September.

2.3 Seasonal water balance

Figure 2 presents the seasonal water balance, which is the difference in a running total of rainfall and evapotranspiration over a 3-month period. November and December 2012 and February and March 2013 experienced well below average rainfall. Most of these months also experienced above average evapotranspiration due to warmer than average temperatures. The combination of low rainfall and higher than average evapotranspiration meant that the seasonal water balance plummeted from a position of water surplus at the beginning of November to be in a major water deficit by mid January. Figure 2 indicates that, compared with the previous two seasons, the accumulated water deficit was substantially greater in the 2012/2013 season until late March. As a consequence of high rainfall from April to June 2013 the water balance recovered very rapidly.

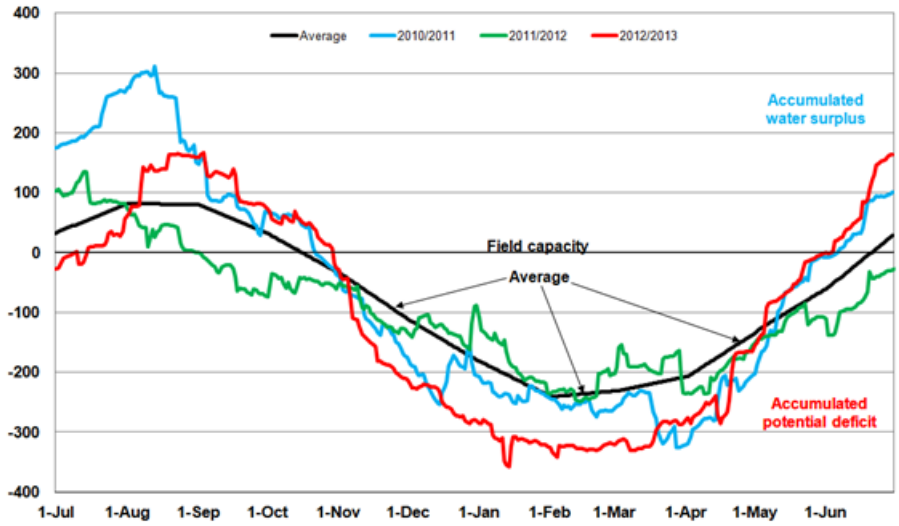

Figure 2: Seasonal water balance for Blenheim: difference between 3-month totals of rainfall and potential evapotranspiration

2.4 Wind-Run

Wind-run measured in kilometres is recorded by the Blenheim weather station and summarised on a daily and monthly basis. Wind-run is a way of converting the average daily wind speed in km/hr into a total distance measurement for the day. Average daily wind speed (km/hr) * 24 hours = Daily wind run (km). An easy way to visualise wind-run is to think of a balloon being released at 9 am. The total daily wind-run is the distance that the balloon would travel in a 24 hour period. In Blenheim where it is relatively calm a lot of the time, the average daily wind-run is between 200 and 300 km (8.3 – 12.5 km/hr wind speed). In contrast at Cape Campbell on Marlborough's exposed eastern coast, average daily wind-run is between 600 and 700 km (25 – 29 km/hr wind speed).

A noticeable trend in recent years has been a decrease in the average daily wind-run that is being recorded at both the Blenheim and Dashwood weather stations in Marlborough. Figure 3 highlights the decrease in average daily wind-run in Blenheim for the three years 2012 to 2013, in contrast to the 14 years 1996 to 2009. Currently no suitable explanation can be given as to why daily wind-run has been lower over the last three years.

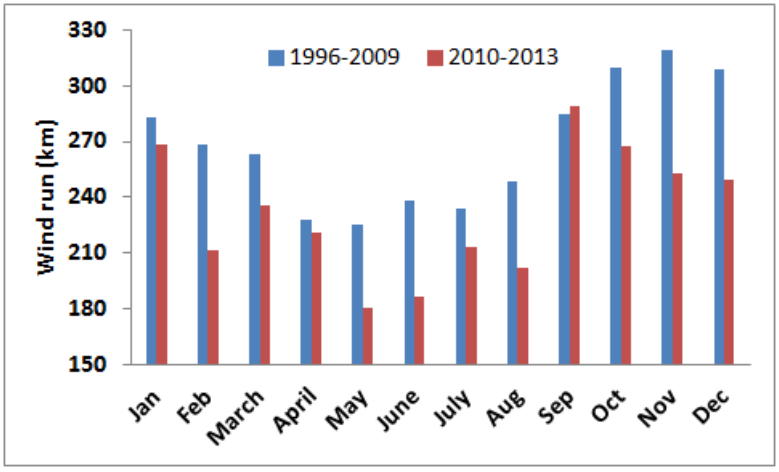

Figure 3: Monthly average wind-run (km) as recorded at the Blenheim weather station

3 Dissemination of Information from this project

The weather data summaries as provided on the Marlborough Research Centre website are the most comprehensive and readily available of any region in New Zealand. People downloading these summaries save themselves many hours of work having to generate a similar summary from the National Climate Database. The data summaries are integral to the decisions being made by staff in many companies associated with the rural industries in Marlborough. The wine industry relies on these summaries in order to adjust management decisions based on the climate data. The weather data are also used extensively by research scientists and students. Marlborough Winegrowers continues to publish Met Report in their monthly magazine Winepress. This magazine is circulated to approximately 100 recipients in the local and national wine industry.

4 Key Funding Sources

Marlborough Research Centre Trust

The New Zealand Institute for Plant & Food Research Ltd.

Marlborough Winegrowers

National Institute of Water & Atmospheric Research (NIWA) (annual calibration and maintenance of the Blenheim and Dashwood weather stations)

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