



Pistachio Growers' Association

Pistachio Growers' Association Inc

Chill Newsletter # 1 - 2023

1st July 2023

Chill report for the 2023 season is explained based on the recent research paper which highlights the importance of early chill onset to reach 59 dynamic chill portions by the 31st August. The growing regions are described in terms of their latitude, which has greater influence on chill onset and to reach the required chill portions for the season.

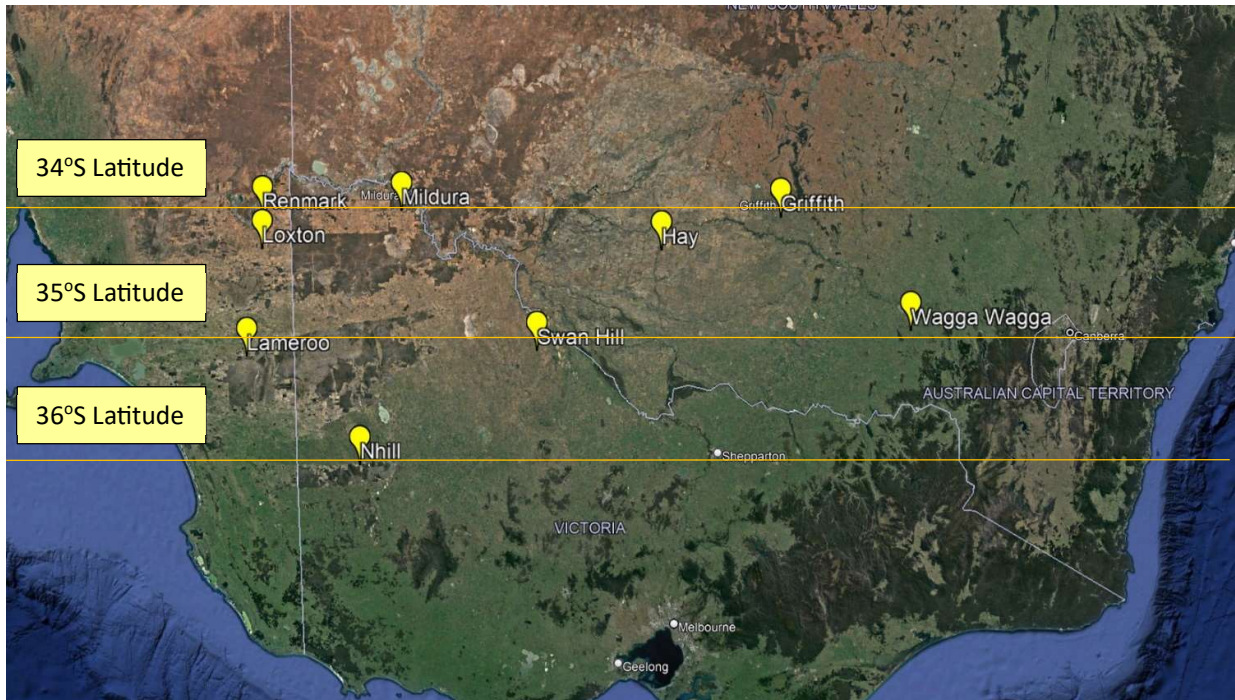
Winter chill onset for 2023 was earlier than average in Renmark, Loxton, Mildura and Griffith (34°S latitude), about the same in Swan Hill and Lameroo (35°S Latitude) and later than average in Wagga Wagga (35°S latitude) and Nhill (36°S Latitude). Chill onset ranged from the 3rd April (Nhill, Lameroo & Hay: earliest) to 12th April (Mildura and Renmark: latest).

Chill portion accumulation was above average in all locations during the beginning of the season until late May and is tracking around or marginally below average since the beginning of June except Wagga Wagga which tracks the highest chill accumulation (42 chill portions) above average by the end of June. Chill accumulation along 34°S latitude is the lowest and ranges from 26 to 28 chill portions. Chill portions are quite varied around 35°S latitude from 29 in Swan Hill to 37 in Lameroo and 42 chill portions in Wagga Wagga. This variance is likely due to altitude across these sites with Swan Hill being the lowest (70 m above sea level) and Wagga Wagga at the highest (180 m above sea level) altitudes. Nhill, further south at 36°S Latitude has attained 40 chill portions so far.

Chill portions will continue to be monitored to make appropriate recommendations by mid-August 2023.

The climate forecast by the bureau issued on 3rd July for August to October

- Above median maximum temperatures are likely (greater than 80% chance) for almost all of Australia.
- For August to October, minimum temperatures are likely to very likely (60% to greater than 80% chance) to be above median for almost all of Australia.



How to read the new graphs??

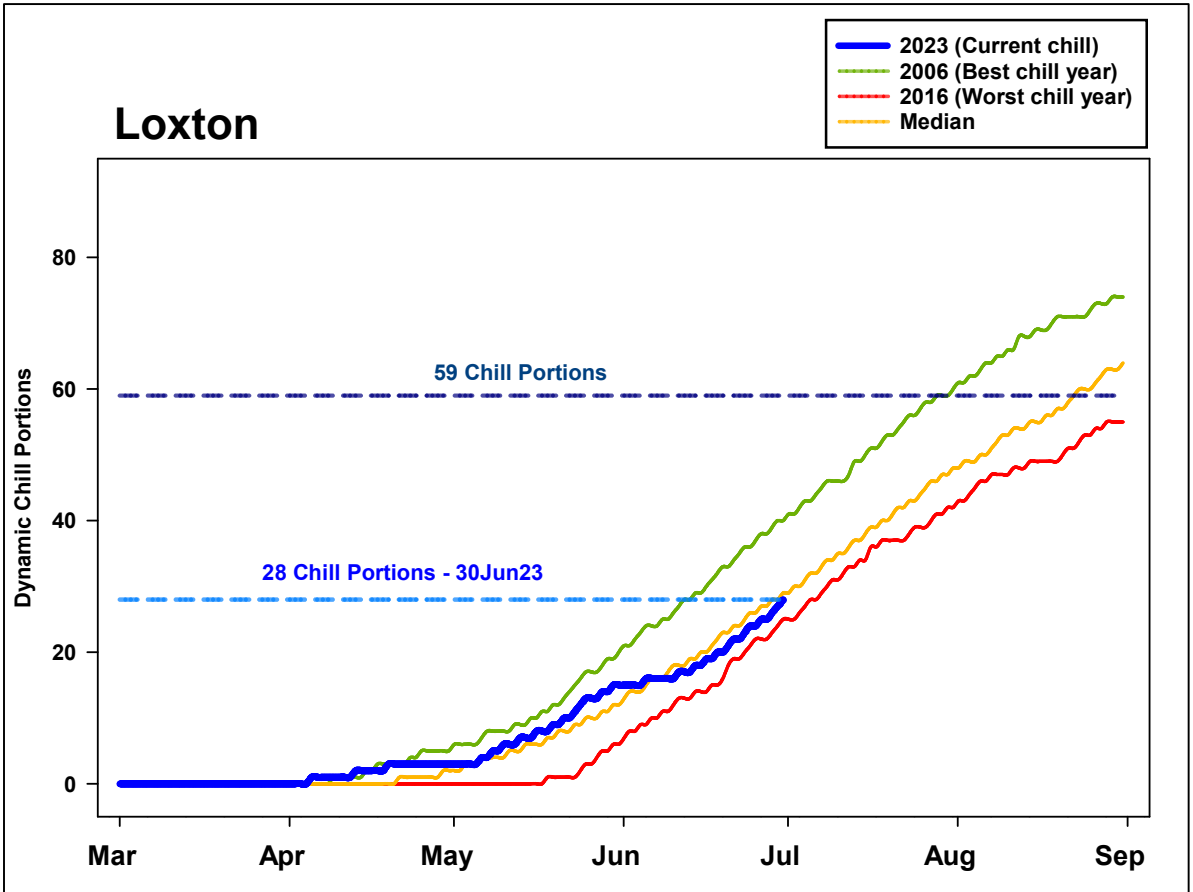
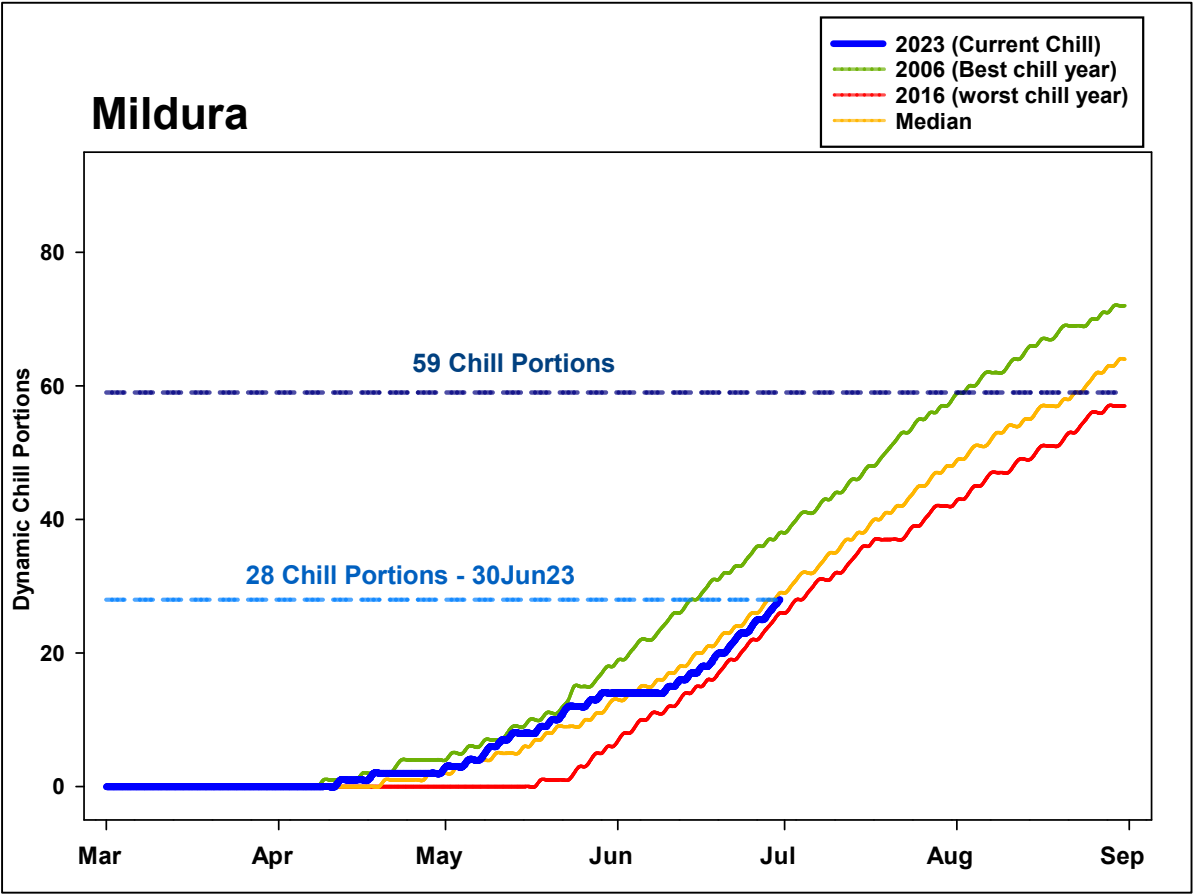
Chill portions are on the x-axis and time (from 1st Mar to 31st August) on y-axis. **BRIGHT BLUE** line tracks the chill portions for the current season (2023). The **GREEN** line indicates the year of best chill, and the **RED** line denotes the year of worst chill so far, of the respective locations. All other years of previous records fall in-between these two lines. The **ORANGE** line is the estimated median across the years on record for the respective location, which means the chill accumulation was half the time above and half the time below this line over the past years of observations. The **LIGHT BLUE** dashed horizontal line indicates chill portion of the respective location as of 30th June 2023. The dashed **DARK BLUE** horizontal line with “**59 chill portions**” denotes where chill needs to be by 31st August 2023.

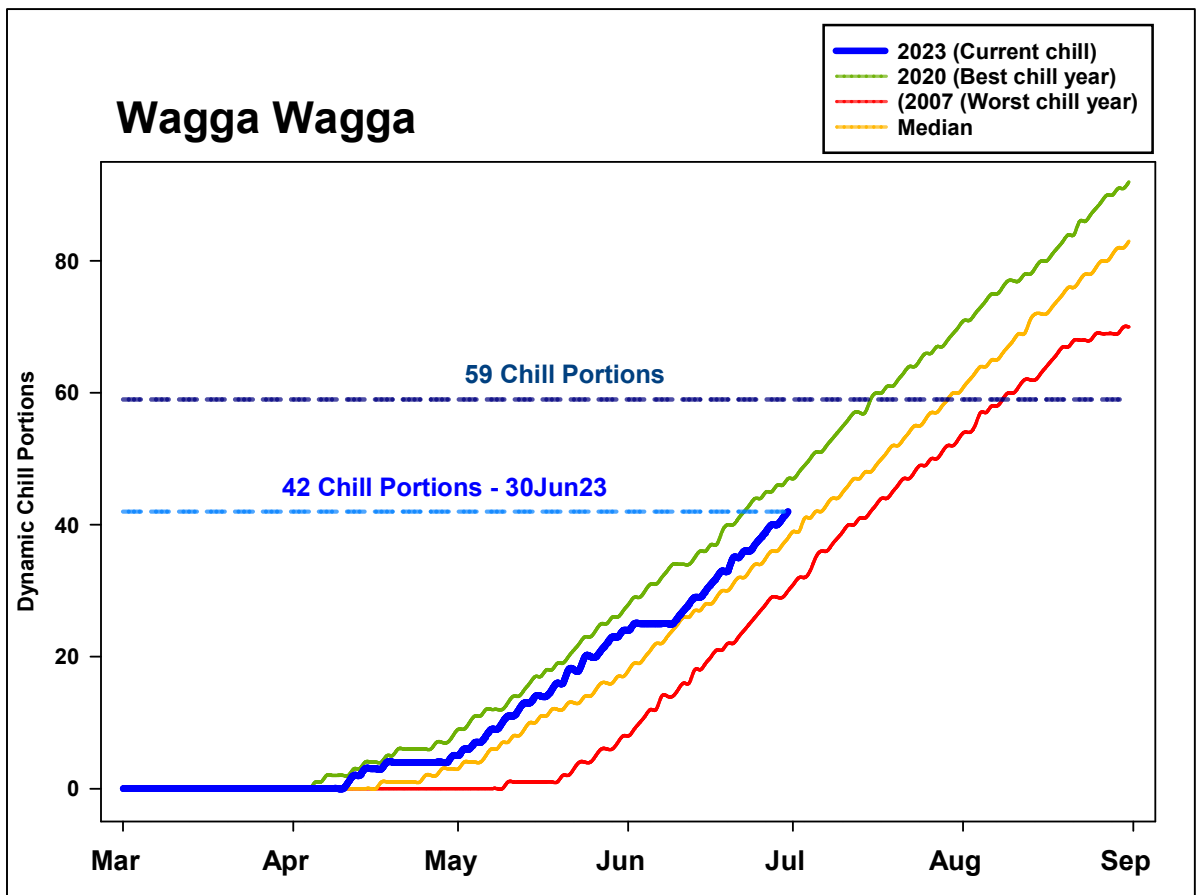
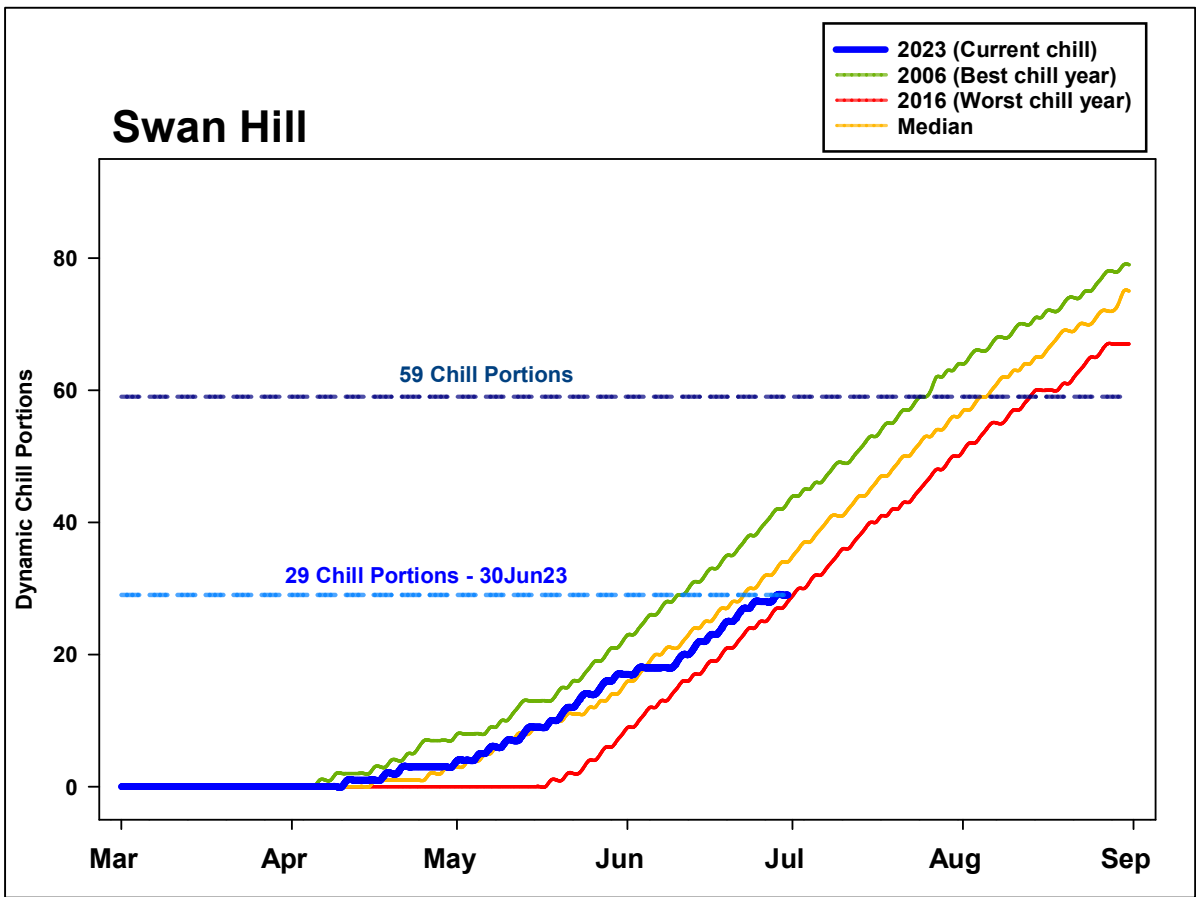
Being the first year of forecast, the chart for Hay has only one bright blue line to track current season’s chill accumulation and is devoid of other coloured lines.

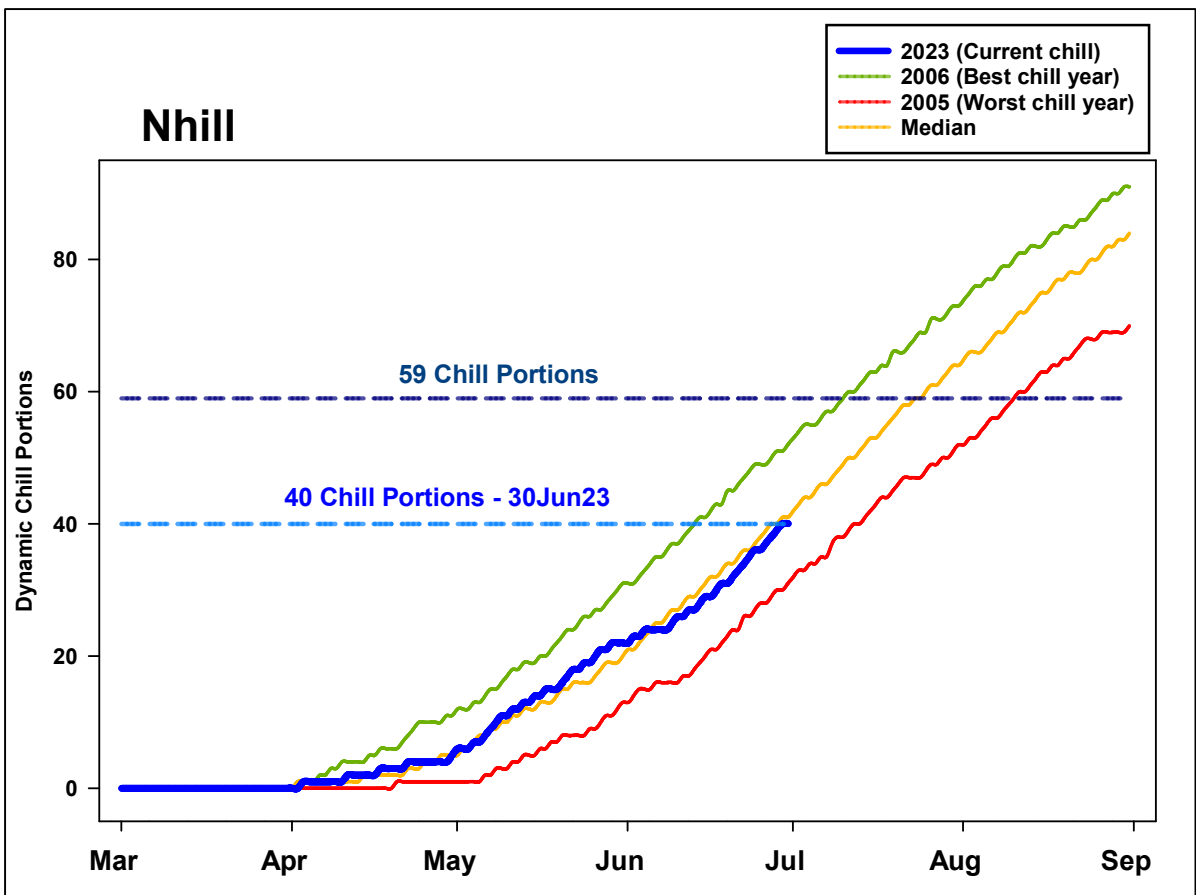
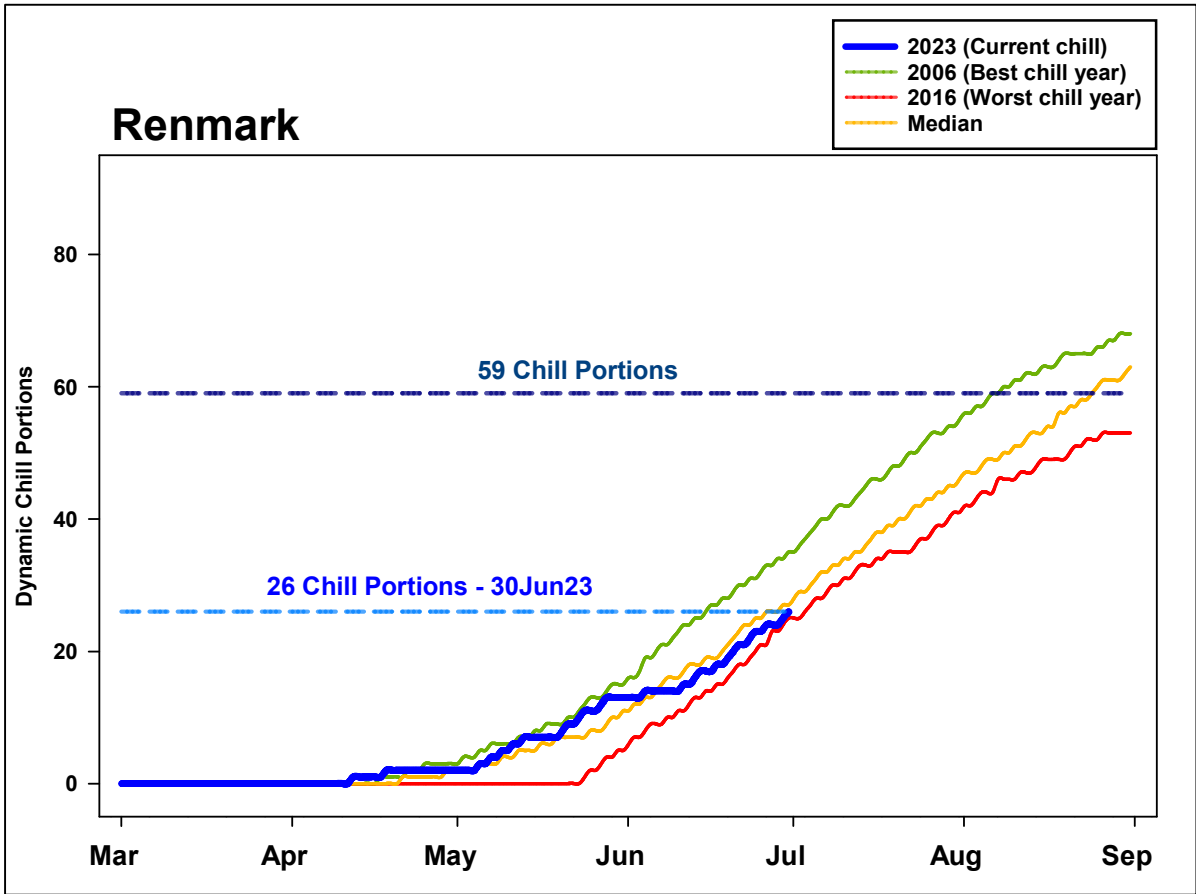
We welcome your comments on the new design of the charts.

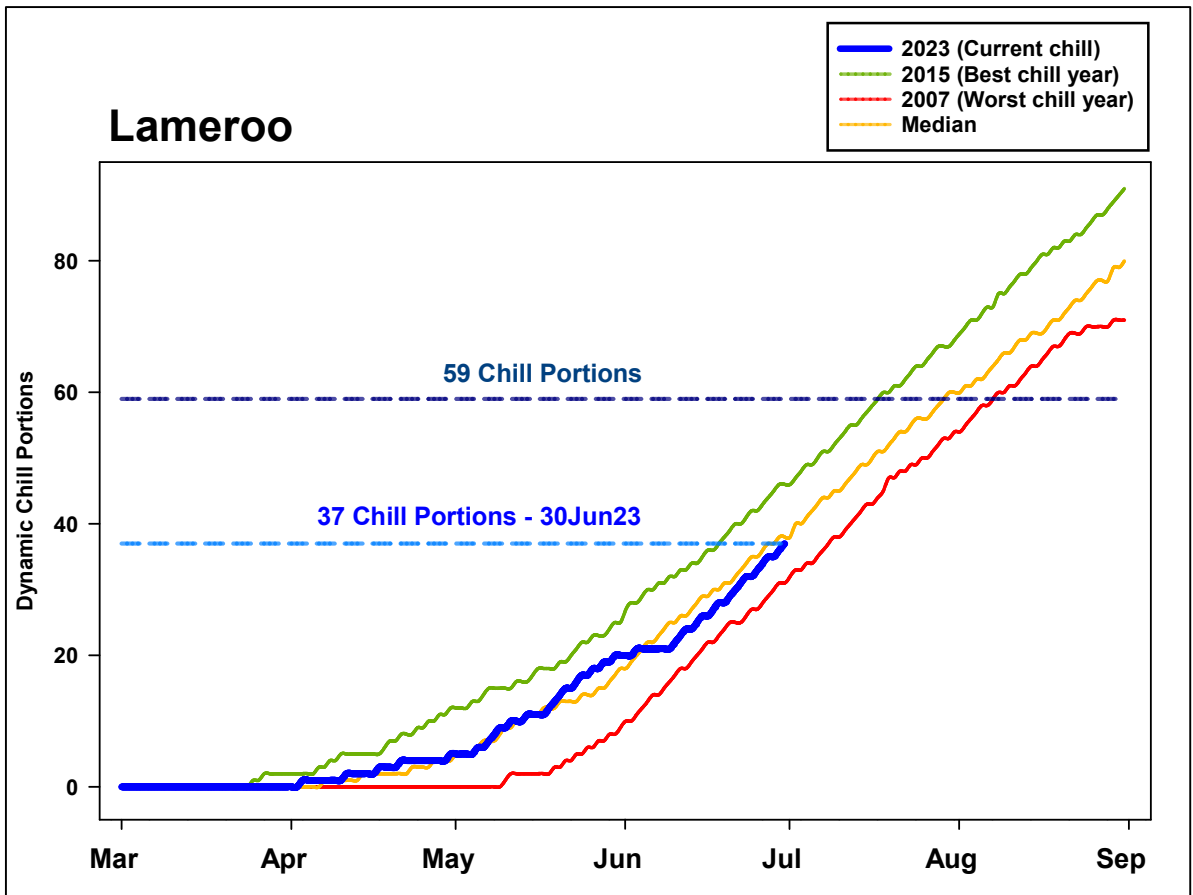
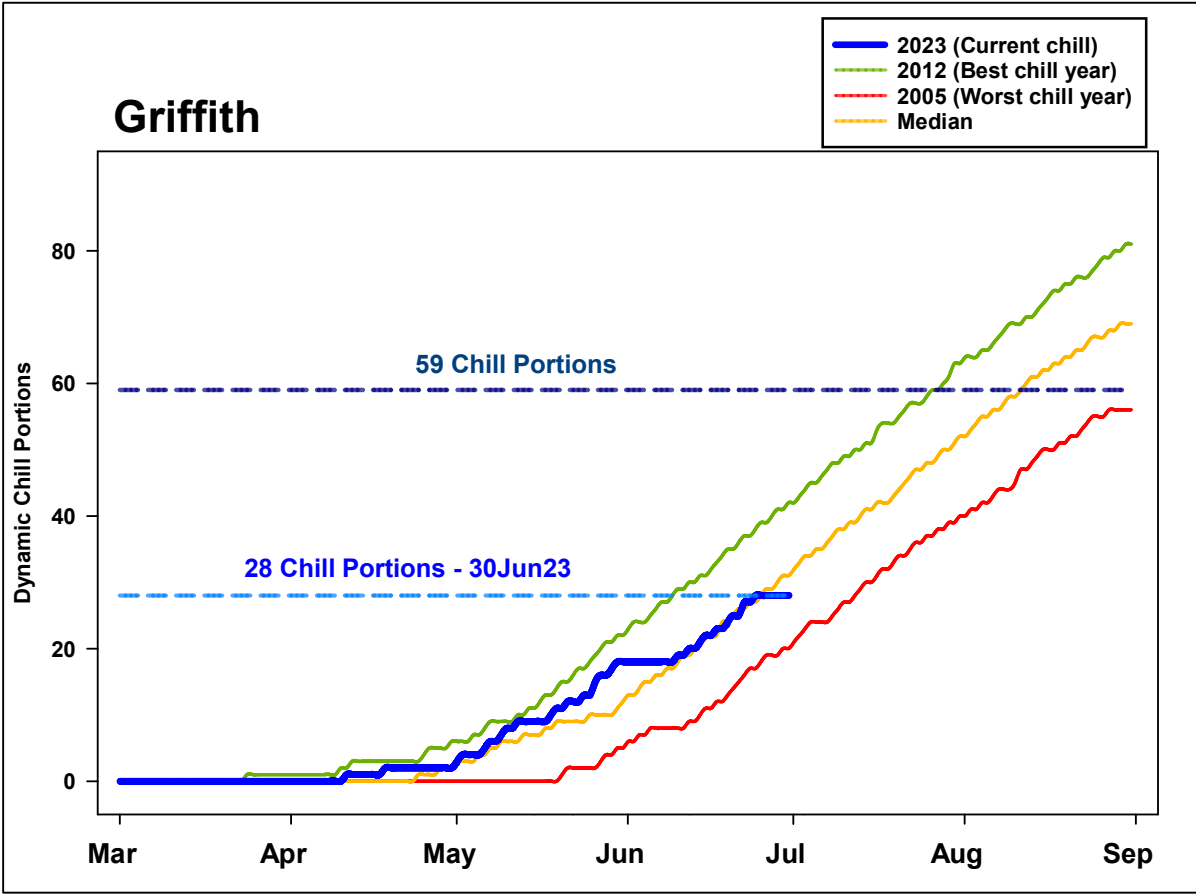
Should you have any questions or clarifications, please do not hesitate to contact

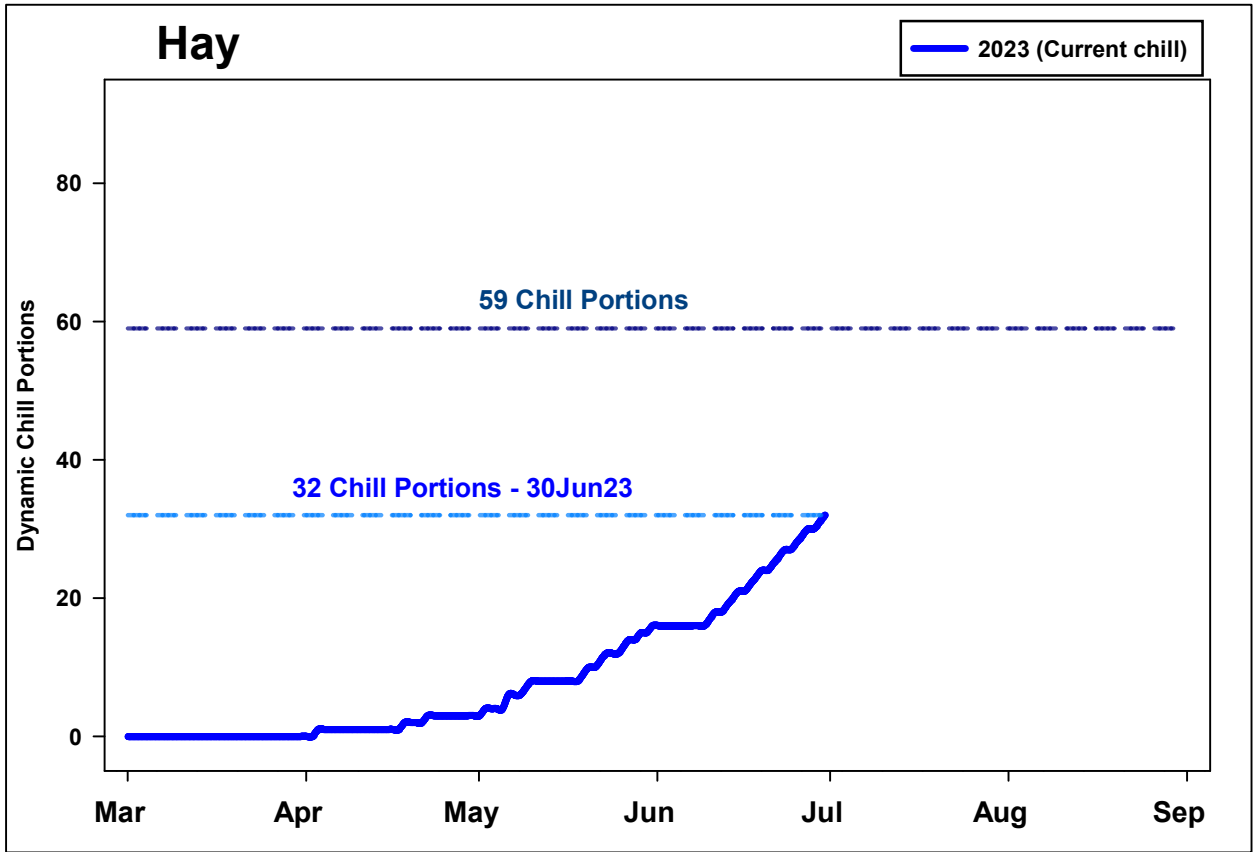
Dr Maha Mahadevan on 0401 214 901.







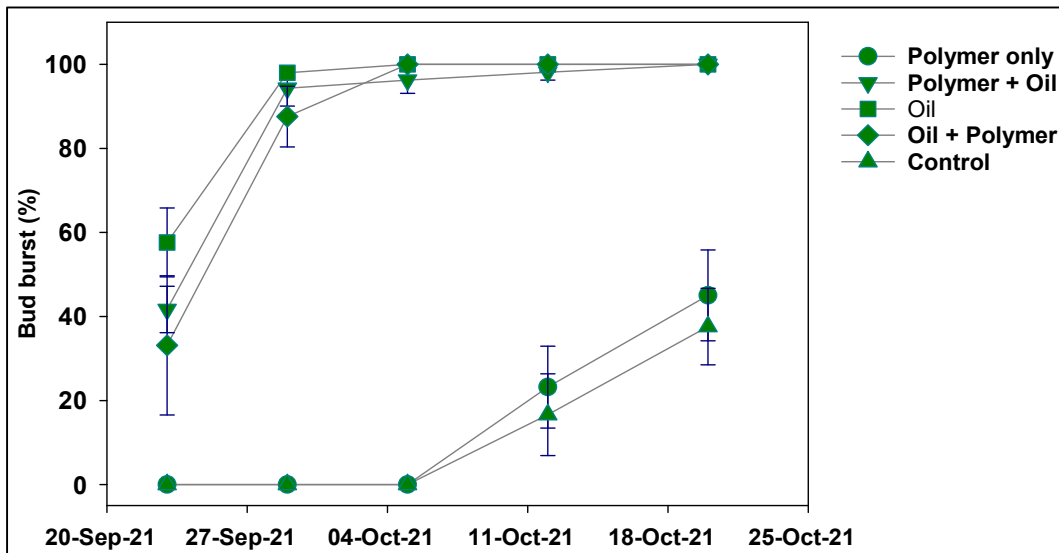




Chill Background Information

Pistachios are extremely sensitive to lack of winter chill.

Lack of chill will result in very uneven opening of flowering and vegetative buds; some will not open until November or December; many buds will not open at all. Harvest will be very uneven and late. This was confirmed in PGA research done last season in the Riverland by Dr Maha Mahadevan. The Riverland had insufficient chill in the 2021 winter.



On trees that did not receive the recommended oil spray in late August, only 40% of the fruit buds opened.

PGA research has shown the Dynamic Chill model to be the most appropriate method to measure the chill requirement of pistachios. The research has shown that *Sirora* pistachios require 59 Dynamic Chill Portions between 1st March and 31st August. The research also shows that 57 Dynamic Chill Portions to the 15th of August will, in 95% of years, accumulate to the required 59 Portions by 31st August. Unless the required Chill Portions are received, growers should take mitigating action. The experience of some growers show that oil sprays may be of assistance to yields in seasons when the Chill Units are below or even a little over the requirements found by the research.

Mitigating the effect of low winter chill

Research in California and Australia has shown that winter oil application will significantly mitigate the effect of insufficient winter chill. Correctly applied oil can increase crops with insufficient chill by up to 50%. If there has been sufficient chill, little benefit seems to result from the oil application.

Oil application may bring the trees into flower up to a week earlier. The increased risk of frost damage should be considered by growers before applying winter oil in August.

Trials over seven years in California showed limited adverse effects from annual oil application. In the single season where lower yields were recorded from the oil treated trees, the week during the flowering of the treated trees was very wet, affecting pollination. A week of rain during pollination will affect crop load.

Winter oil is registered in NSW and SA only for the treatment of scale. Growers can only apply oil for the registered purpose.

Application time: Ideally the third week of August.

Oil to use: Refined, heavy, emulsifiable horticultural spray oil. Typically, about 860 g/litre petroleum oil. One brand that is used is: "Vicol Winter Oil" – Winter Dormant Miscible Oil – Insecticide

Concentration: 3% to 6 %, i.e., 3 to 6 litres per 100 litres of applied spray volume. PGA research has shown that in low-chill years, the higher concentration shows better yields. Care must be taken not to over spray – excessively high rates of oil will burn trees and perhaps kill them.

Application rate: Spray volume is dependent on tree size but must be applied to the point of runoff.

It is critical that all bud scales are thoroughly wetted.

On average size trees, the application rate is up to 1,800 litres/ha. The very warm winters of 2013, 2014 and 2016 demonstrated the benefit of well applied oils. The orchards that ensured total coverage achieved the good off-crop results. Orchards that did not spray oil had 2/3^{rds} of the fruit buds not opening, i.e., 2/3^{rds} of the crop potential were lost. The vegetative shoots that sprouted late, in November and December did not have fruit buds, i.e., the following crop was also reduced.

To be effective, the oil application must be applied to EVERY bud.

One key issue for the application is the tractor speed. Californian research shows that tractor speeds of 2mph, 3.2kph, produce significantly better results for any spray application than faster speeds.

The results of the PGA research in the low chill 2016/17 season clearly demonstrated that application rates of 4,000 l/ha had massive increases in yield over 2,000l/ha. There was no such benefit of the higher application rate in the high chill 2015/16 season.

Some growers always apply oil unless the chill is well above the required Chill Portions. They say they do this to ensure scale control and also to be conservative. In such cases, to reduce cost, they use a 3% oil spray rather than 6%. If the chill has been low, growers usually apply at 6%.

The raw data is collected from the Bureau of Meteorology sites. The data for each orchard may be different. This data and information is provided as a guide to growing pistachios in Australia. Each grower should ensure that actions taken on their orchard is appropriate for their orchard. The PGA Inc and its office bearers will not accept responsibility for the actions of individual growers on their orchard.

Chris Joyce, Chair, Research Committee
Pistachio Growers' Association Inc

This newsletter is an output of Project PS17003 - Pistachio Productivity Improvement Program.

	<p>This project has been funded by Hort Innovation using the pistachio research and development levy and funds from the Australian Government. For more information on the fund and strategic levy investment visit horticulture.com.au</p>
---	--