



Pistachio Growers' Association

PGA Chill Newsletter Number 3 - 2021 - 22 Season

15th August 2021

The season continues to produce inadequate chill in the Riverland with adequate chill east of Swan Hill. Riverland growers are encouraged to consider the use of oil sprays at the higher concentration as outlined later in this report.

Growers in the Riverina have received adequate chill.

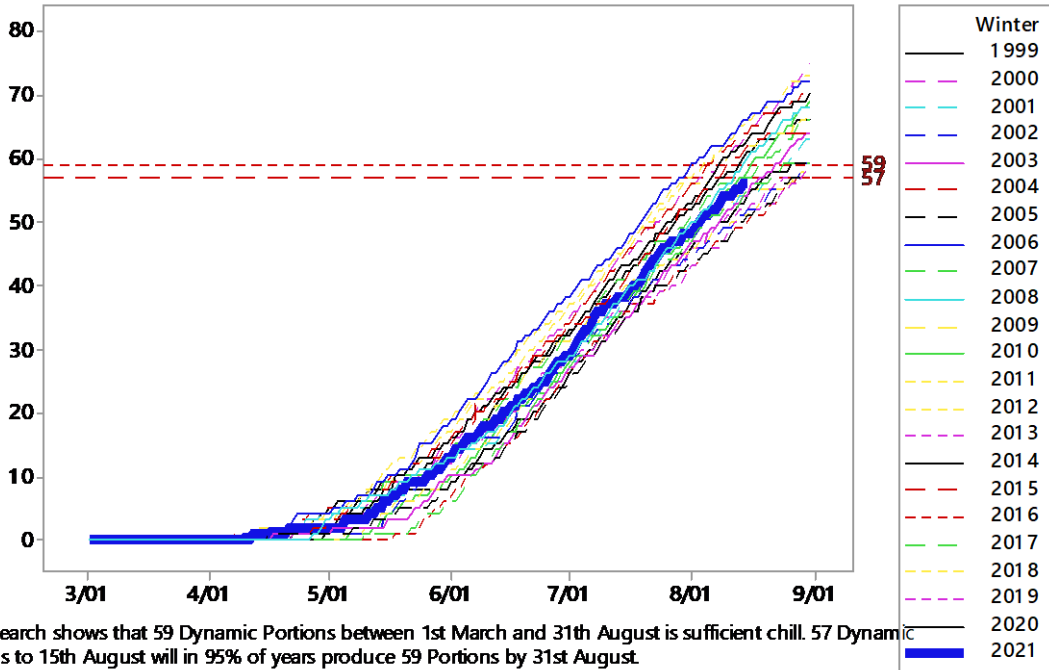
The situation in Sunraysia is not as clear. Whilst the Dynamic Chill Units, the preferred method for the PGA to measure winter chill, is showing sufficient chill for Swan Hill, an alternative model for measuring chill, hours $<7^{\circ}\text{C}$, shows that the hours are well below normal.

Mildura is close to adequate chill by the Dynamic model with a 95% chance of receiving the 59 Dynamic Chill Units by 31st August. Again the hours $<7^{\circ}\text{C}$ are well below average.

Measuring chill is not a precise science. Growers in Sunraysia will need to consider the options of higher or lower concentration of oil. The higher concentration of oil has a higher cost. The coming season for most growers will be an on-crop. What should growers invest to protect an on-crop?

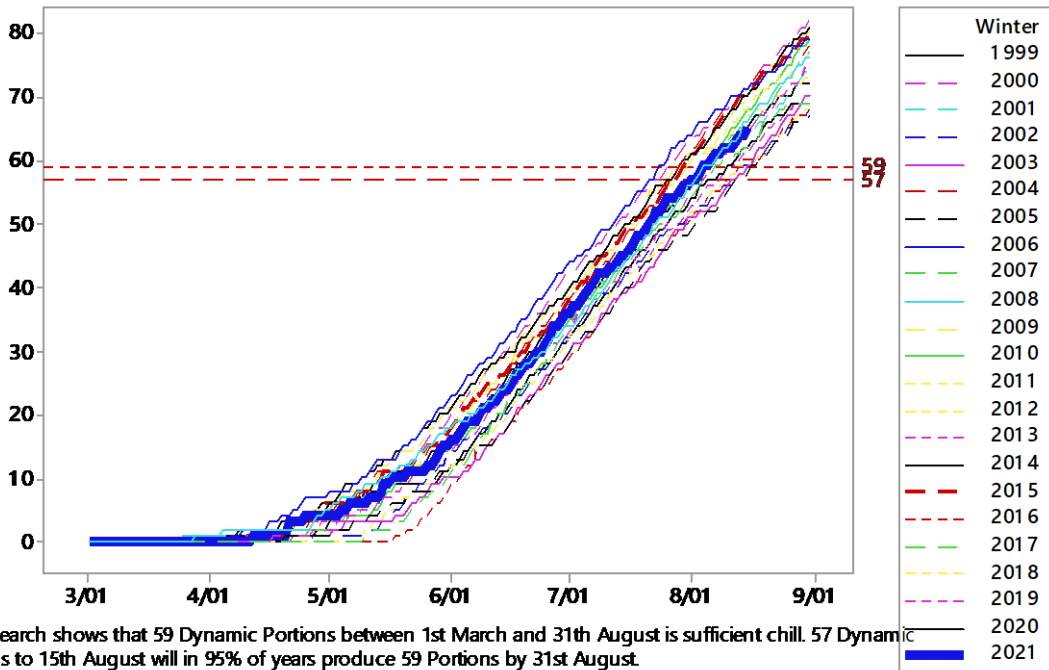
Growers of young, non-bearing, trees are encouraged to apply low concentration oil. This will increase the chances of an even budburst so all trees start the season at the same time. There are further comments on young trees later in this newsletter. Growers should consider these comments especially the risk of late frost.

Mildura



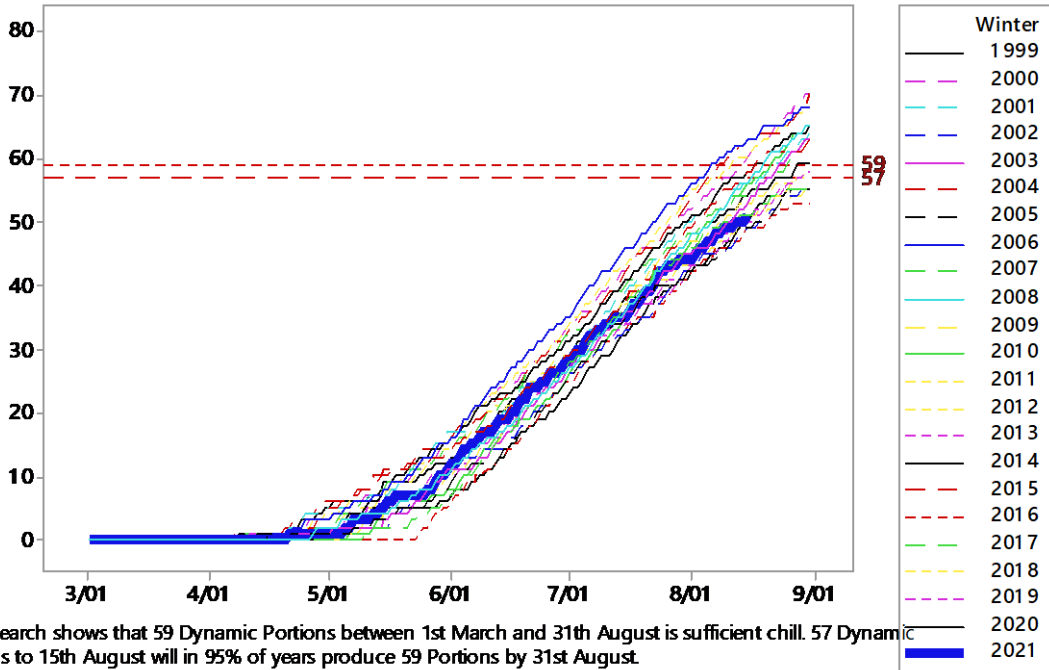
MILDURA: 56 portions on 15th August, below average to 15th August by 1 portion.

Swan Hill



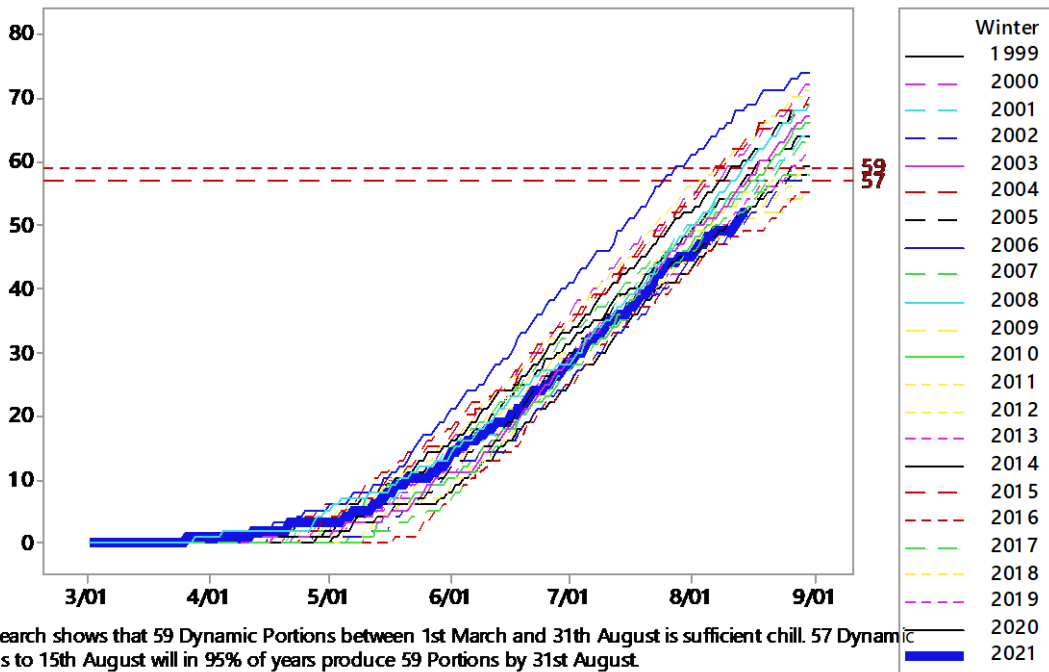
SWAN HILL: 65 portions on 15th August.

Renmark



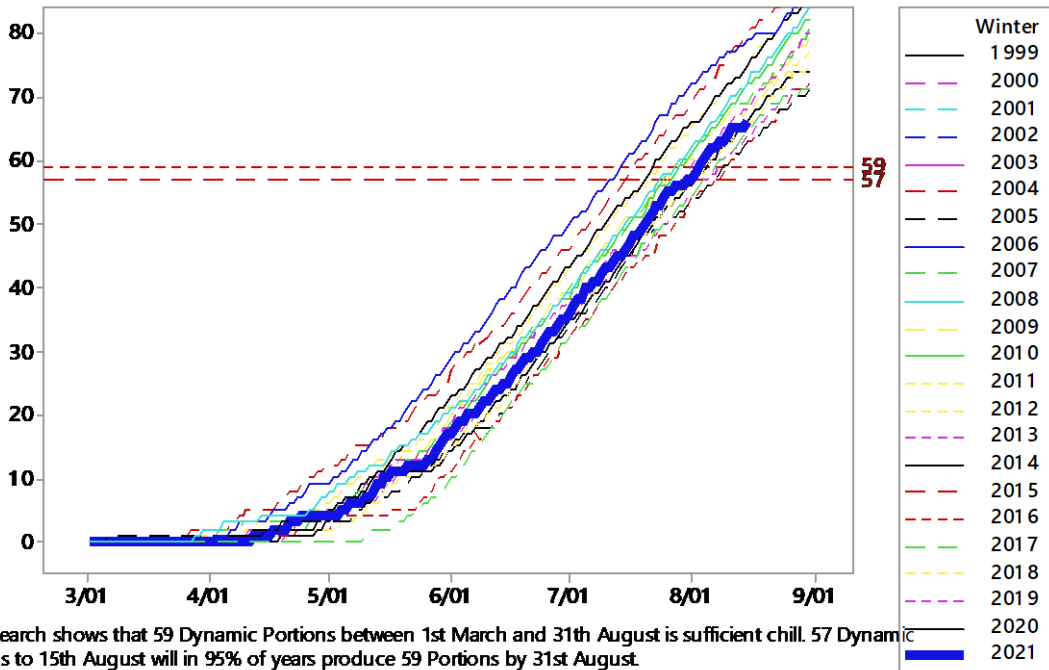
RENMARK: 51 portions on 15th August, below average to 15th August by 3 portions.

Loxton



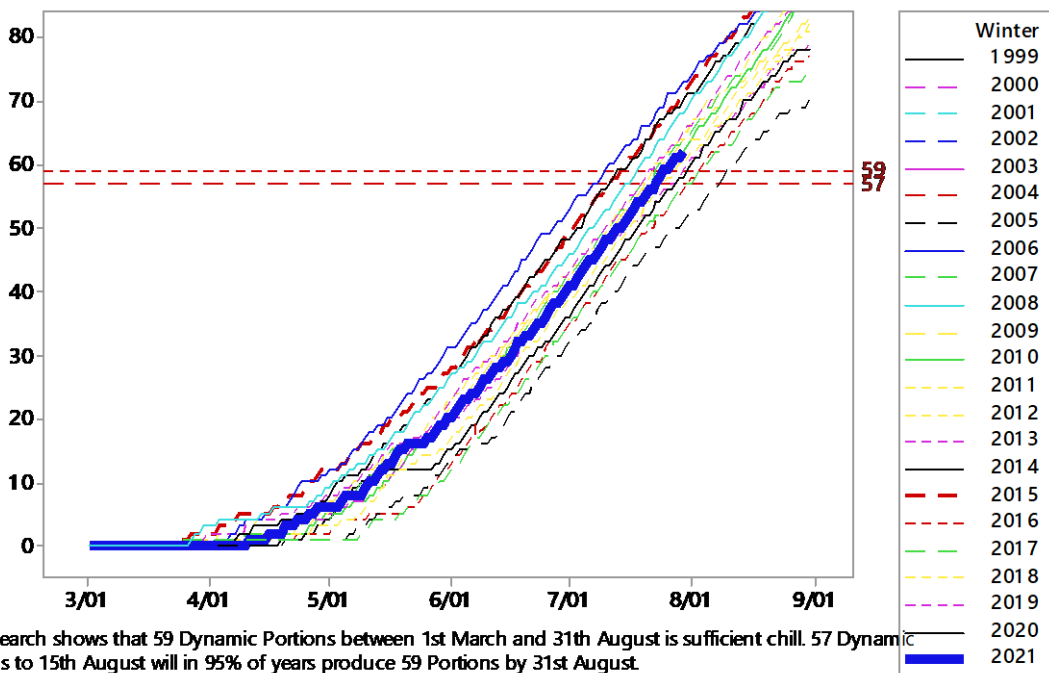
LOXTON: 52 portions on 15th August, below average to 15th August by 4 portions.

Lameroo



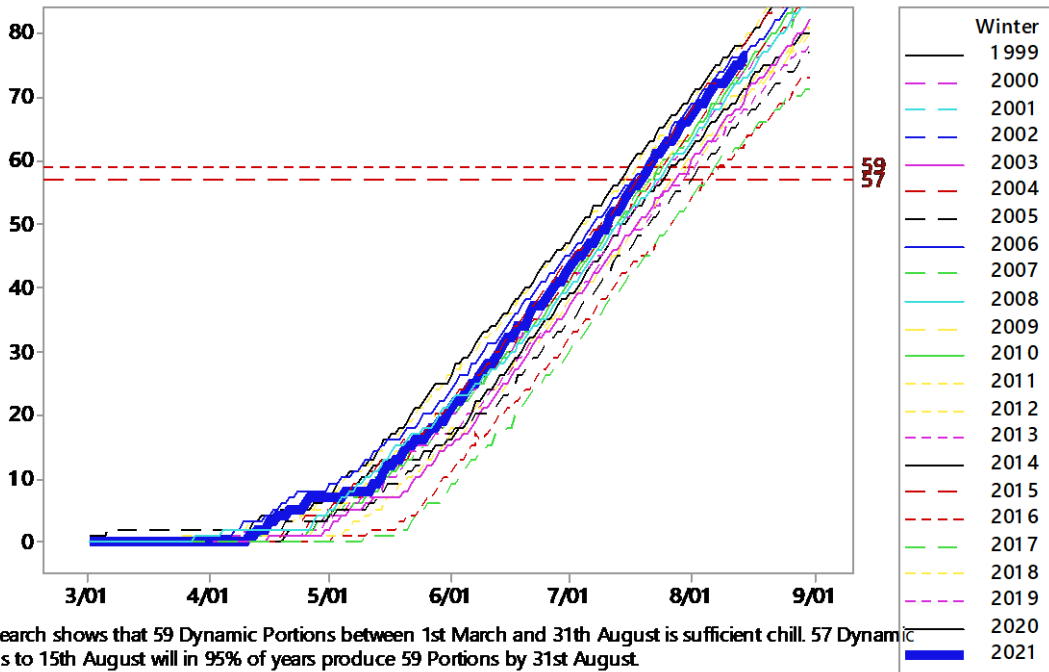
LAMEROO: 66 portions on 15th August.

Nhill



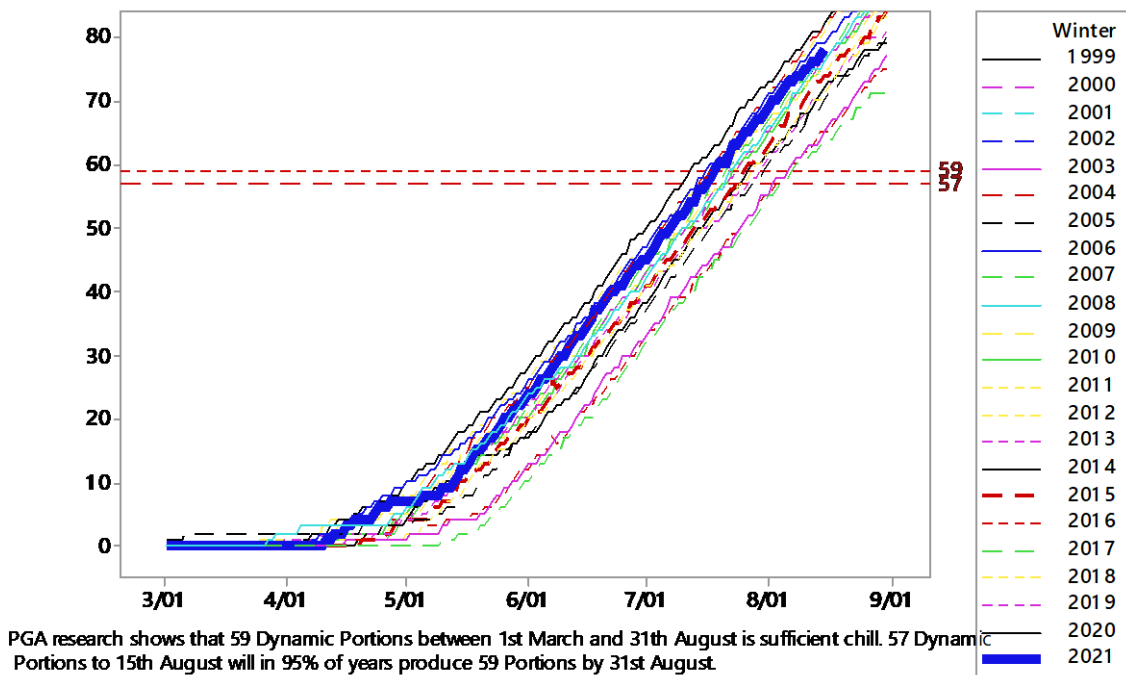
NHILL: 62 portions on 30th July, due to missing data, no further calculation was conducted.

Yarrowonga



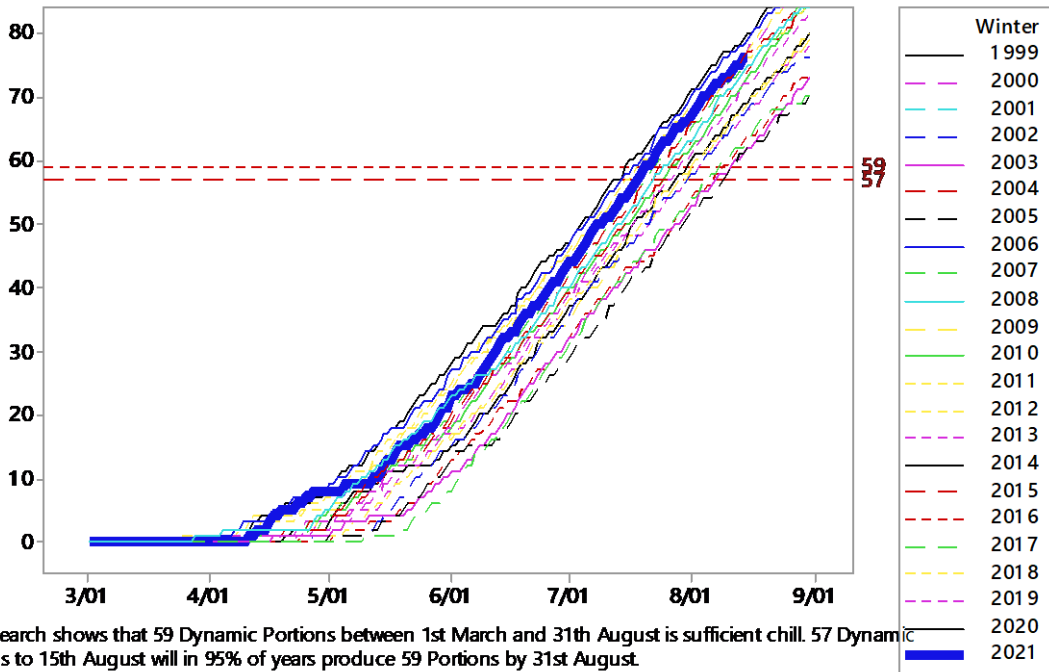
YARRAWONGA: 76 portions on 15th August.

Albury



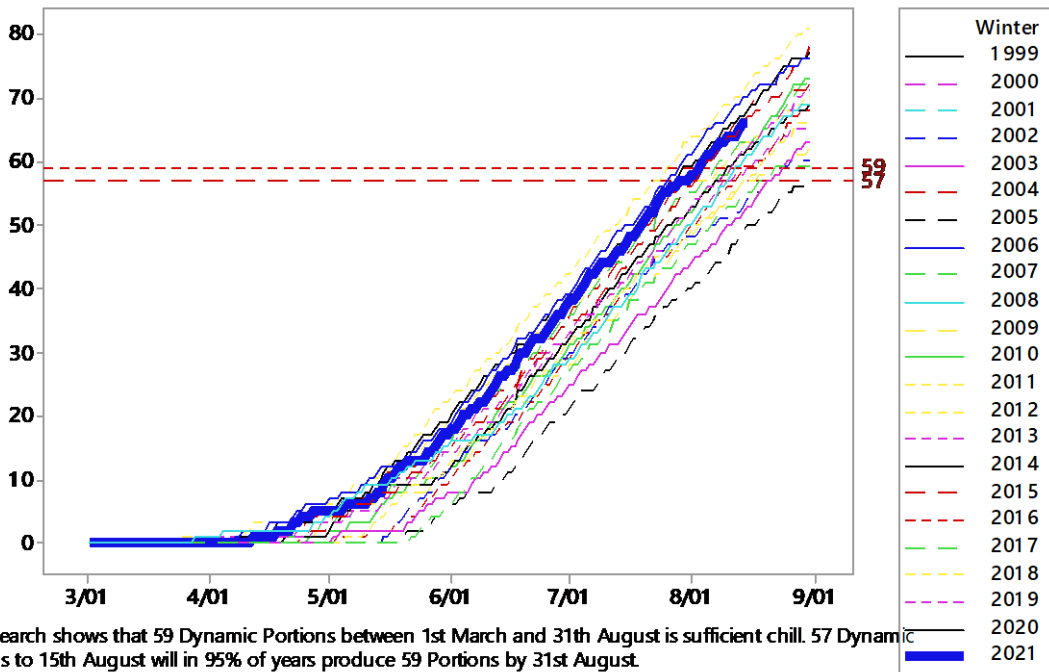
ALBURY: 78 portions on 15th August.

Wagga Wagga



WAGGA WAGGA: 76 portions on 15th August.

Griffith



GRIFFITH: 66 portions on 15th August.

Table. Possibility to reach 59 portions by 31st August

Station	Portion Now	Further require	Portion gain from 16/08 to 31/08					Possibility to reach 59 (%)
			Min	Q1	Median	Q3	Max	
Wagga	76							
Griffith	66							
Swan Hill	65							
Mildura	56	3	3	5	7	8	11	95.2
Nhill	62+							
Renmark	51	8	4	5	7	8	10	25.3
Loxton	52	7	4	6	7	9	10	53.6
Lameroo	66							
Yarrawonga	76							
Albury	78							

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.

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. There are no reported cases of adverse effects in Australia from oil spraying except when the oil was applied at excessively high concentrations.

Whilst oil application has been extensively researched for the effect on yield in bearing trees, many farmers also apply oil to young trees. Young trees can also suffer from insufficient chill with delayed and uneven budbreak. In poor chill seasons, some young trees will not break bud for 2 to 4 weeks after the earliest leaf out. Only low concentration oil (2%-3%) seems to be required to produce an even early leaf out. There is no formal PGA research on young trees.

Oil application may bring the trees into flower up to a week earlier than untreated trees. The increased risk of frost damage should be considered by growers before applying winter oil in late 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. There are no reported cases of adverse effects in Australia from oil spraying except when the oil was applied at excessively high concentrations.

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 oil 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 typical application rate is about 1,800 litres/ha.

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

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 was 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.

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

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

