



**Pistachio Growers' Association**

## PGA Chill Newsletter Number 3 - 2017-18 Season

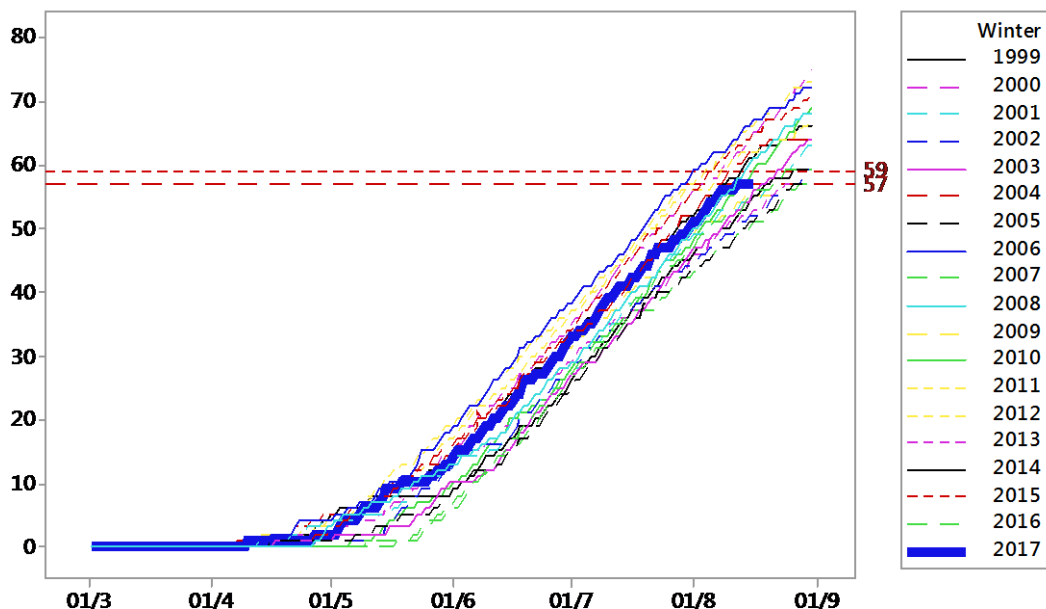
**16<sup>th</sup> August 2017**

In some areas, the good chill of early winter has not continued. As the tables below show, the Riverland and Sunraysia are below the required chill portions to 15<sup>th</sup> August. Growers in these areas need to consider taking mitigating action.

There is a probability table at the end of the report showing that the Riverland has about 80% chance of reaching the 59 chill portions required for the total season. For Mildura/Swan Hill, the probability is about 96%.

Other growing areas all seem to have already comfortably reached the required chill portions.

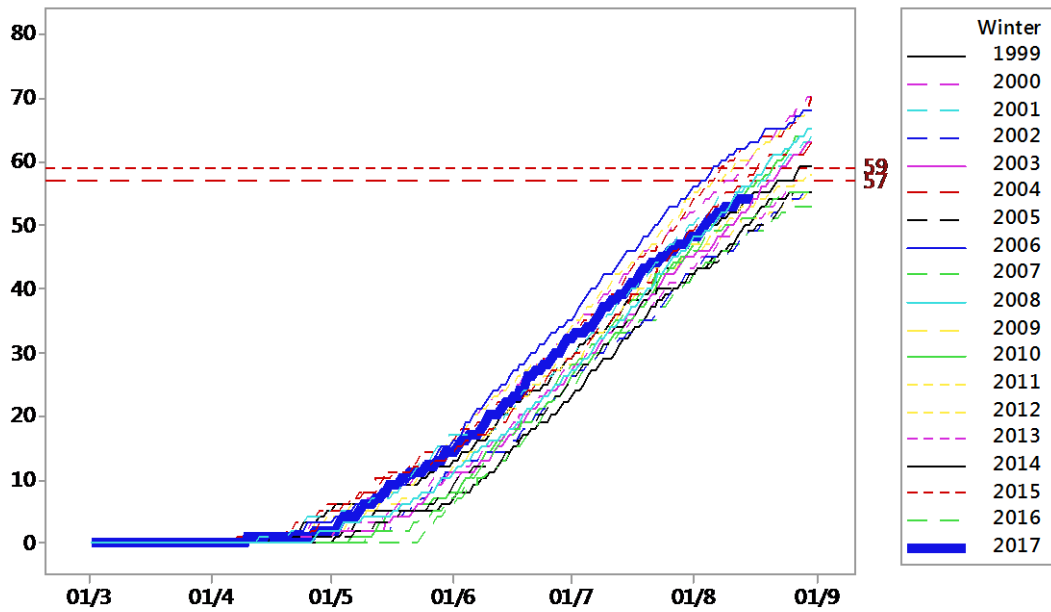
### Mildura



PGA research shows that 59 Dynamic Portions between 1st March and 31st August is sufficient chill. 57 Dynamic Portions to 15th August will in 95% of years produce 59 Portions by 31st August.

**Swan Hill/Mildura: 57 portions on 15<sup>th</sup> August, below average to the 15<sup>th</sup> August by 1 portion.**

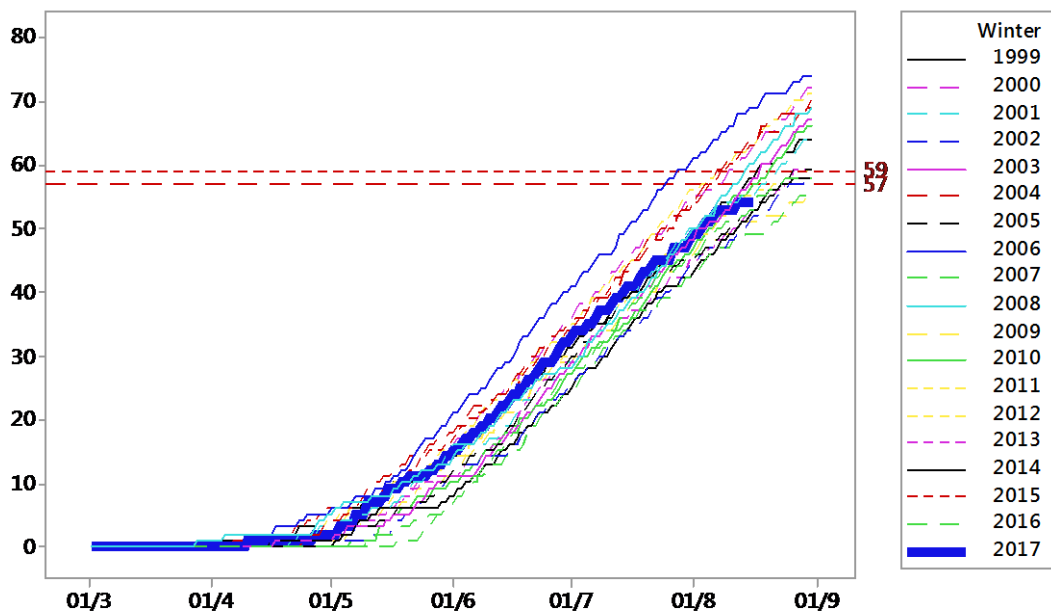
## Renmark



PGA research shows that 59 Dynamic Portions between 1st March and 31st August is sufficient chill. 57 Dynamic Portions to 15th August will in 95% of years produce 59 Portions by 31st August.

**Renmark: 54 portions on 15<sup>th</sup> August, below average to the 15<sup>th</sup> August by 1 portion.**

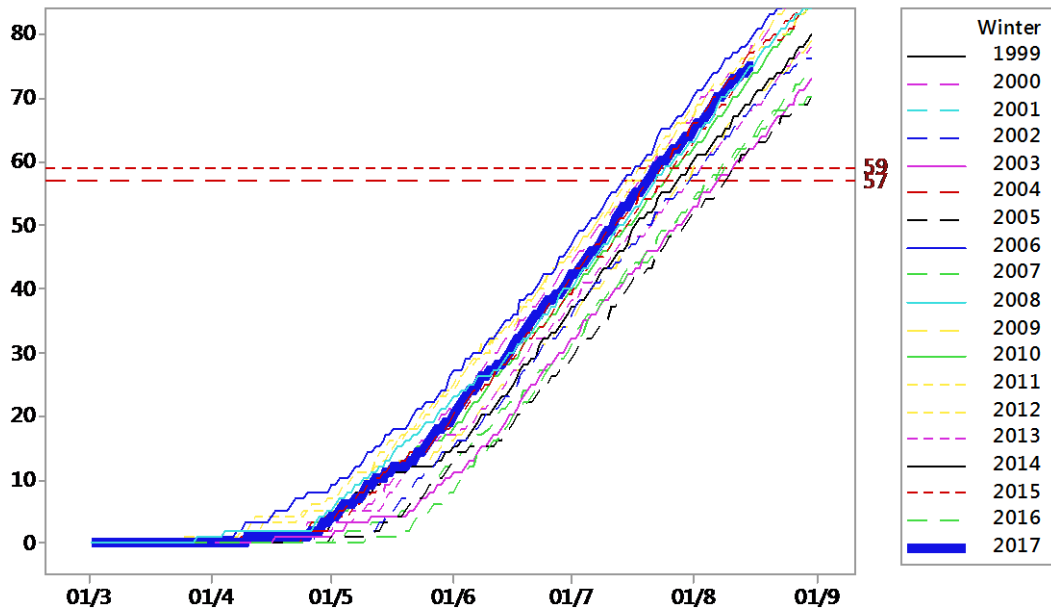
## Loxton



PGA research shows that 59 Dynamic Portions between 1st March and 31st August is sufficient chill. 57 Dynamic Portions to 15th August will in 95% of years produce 59 Portions by 31st August.

**Loxton: 54 portions on 15<sup>th</sup> August, below average to the 15<sup>th</sup> August by 3 portions.**

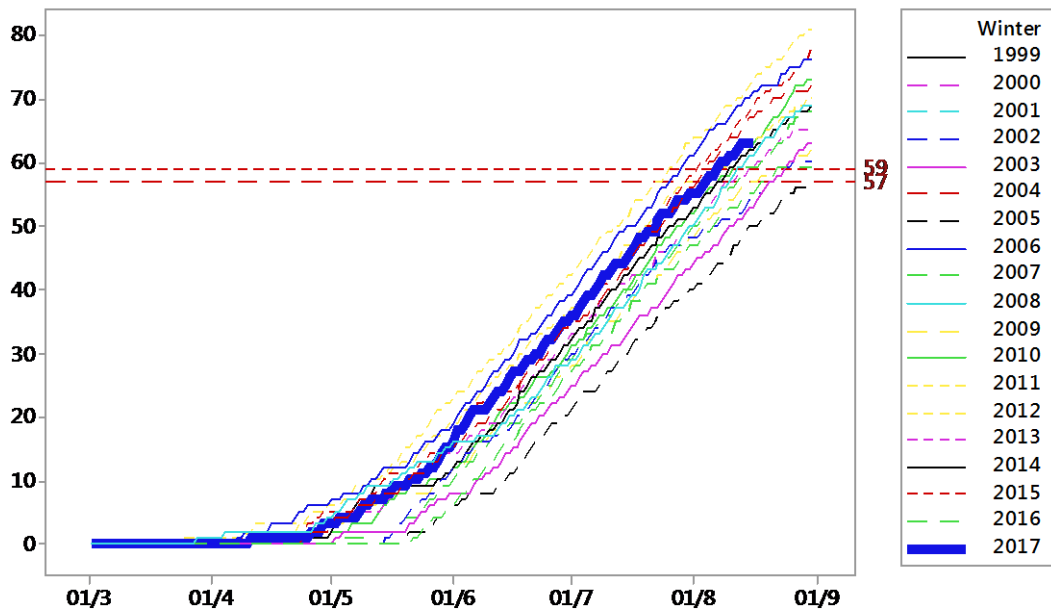
## Wagga Wagga



PGA research shows that 59 Dynamic Portions between 1st March and 31st August is sufficient chill. 57 Dynamic Portions to 15th August will in 95% of years produce 59 Portions by 31st August.

**Wagga Wagga: 75 portions on 15<sup>th</sup> August already.**

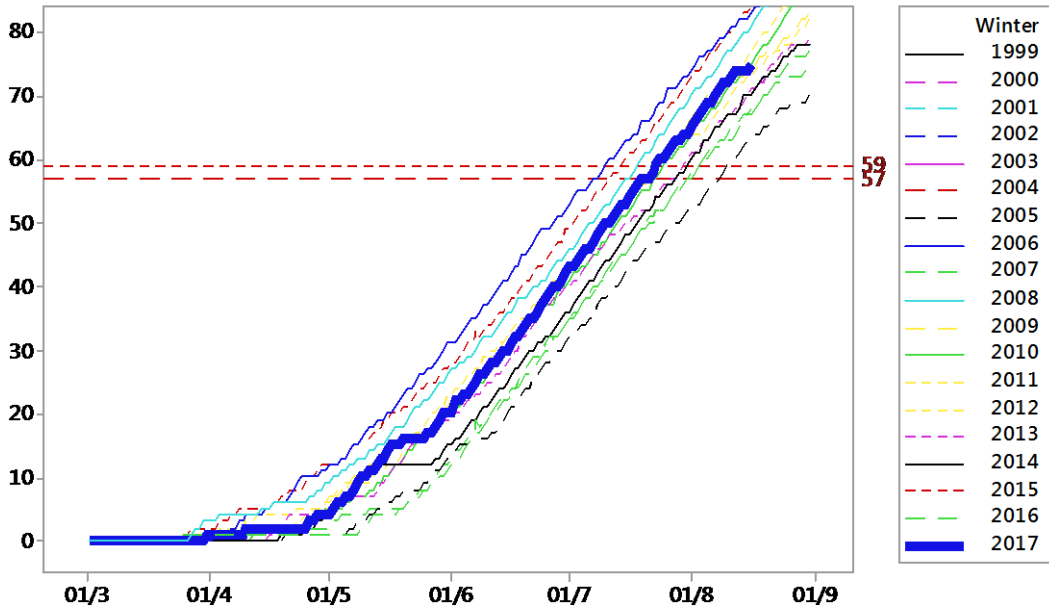
## Griffith



PGA research shows that 59 Dynamic Portions between 1st March and 31st August is sufficient chill. 57 Dynamic Portions to 15th August will in 95% of years produce 59 Portions by 31st August.

**Griffith: 63 portions on 15<sup>th</sup> August already.**

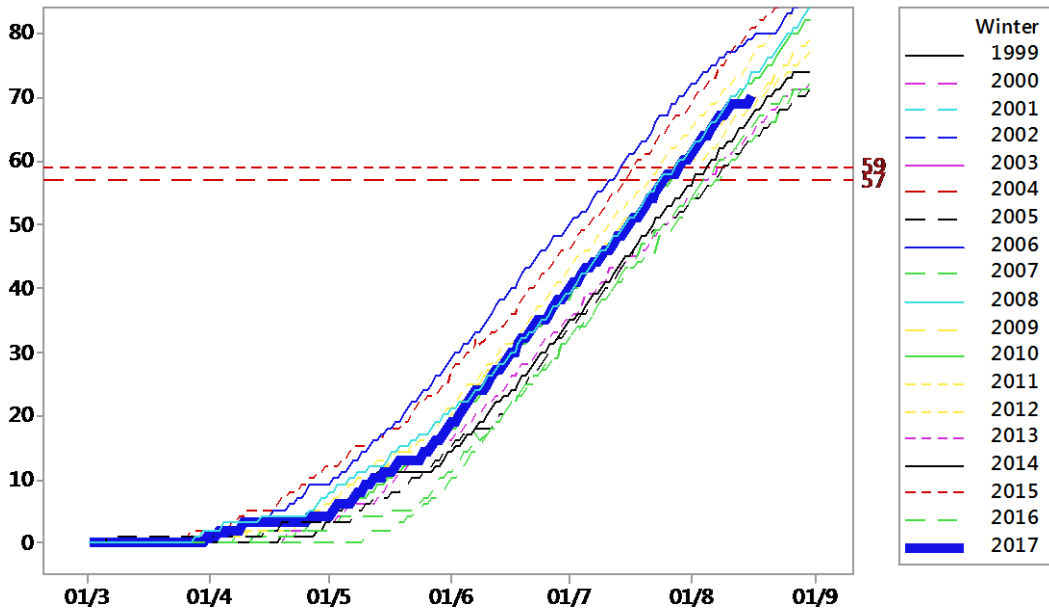
### Nhill



PGA research shows that 59 Dynamic Portions between 1st March and 31st August is sufficient chill. 57 Dynamic Portions to 15th August will in 95% of years produce 59 Portions by 31st August.

**Nhill: 74 portions on 15<sup>th</sup> August already.**

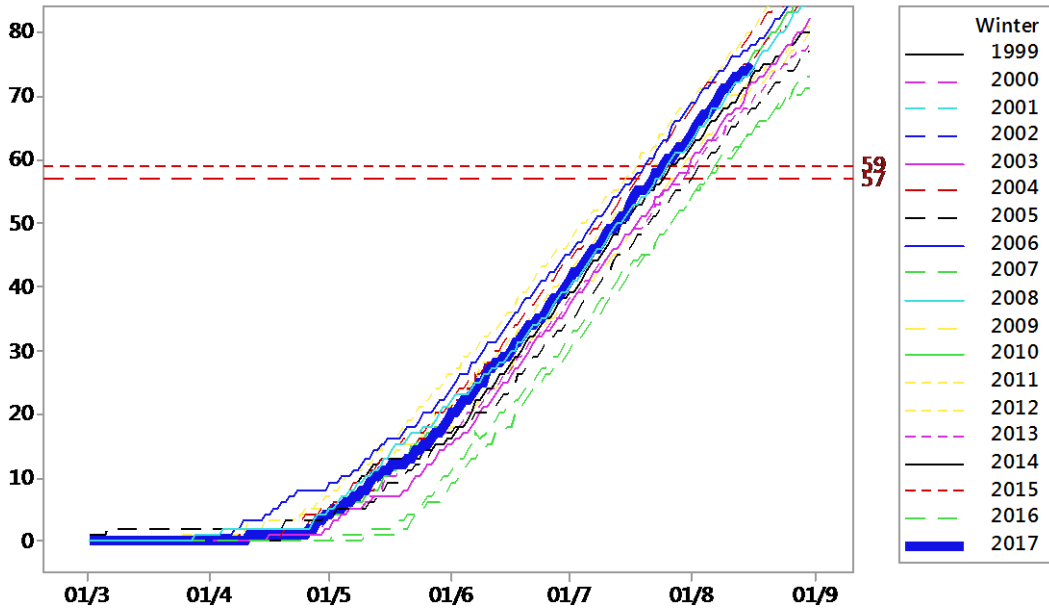
### Lameroo



PGA research shows that 59 Dynamic Portions between 1st March and 31st August is sufficient chill. 57 Dynamic Portions to 15th August will in 95% of years produce 59 Portions by 31st August.

**Lameroo: 69 portions on 15<sup>th</sup> August already.**

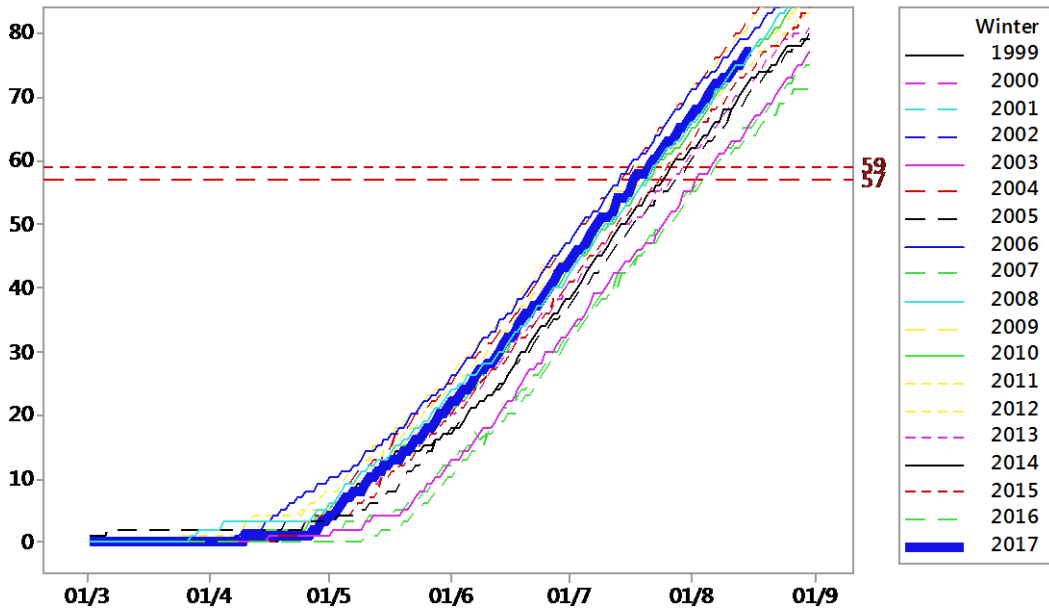
### Yarrowonga



PGA research shows that 59 Dynamic Portions between 1st March and 31st August is sufficient chill. 57 Dynamic Portions to 15th August will in 95% of years produce 59 Portions by 31st August.

**Yarrowonga: 74 portions on 15<sup>th</sup> August already.**

### Albury



PGA research shows that 59 Dynamic Portions between 1st March and 31st August is sufficient chill. 57 Dynamic Portions to 15th August will in 95% of years produce 59 Portions by 31st August.

**Albury: 77 portions on 15<sup>th</sup> August already.**

**Table: Possibility of reaching 59 portions by 31<sup>st</sup> August**

Station	Portion Now	Further require	Portion gain from 16/08 to 31/08					Possibility to reach 59 (%)
			Min	Q1	Mean	Q3	Max	
Wagga	75	-	7	8	9.9	11	13	100
Griffith	63	-	4	5.8	7.1	9.3	11	100
Mildura	57	2	3	5	6.6	8.5	11	96.5
Nhill	74	-	7	8	9.6	11	13	100
Renmark	54	5	4	5	6.6	8.5	10	77.9
Loxton	54	5	4	5.5	7	9.5	10	82.7
Lameroo	69	-	6	8	9.1	11	12	100
Yarrawonga	74	-	7	9	10.1	11.5	12	100
Albury	77	-	7	8.5	9.9	12	12	100

### **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, supported by the Australian government through Horticulture Australia Ltd, 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 1<sup>st</sup> March and 31<sup>st</sup> August. The research also shows that 57 Dynamic Chill Portions to the 15<sup>th</sup> August will, in 95% of years, accumulate to the required 59 Portions by 31<sup>st</sup> 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 even in seasons when the Chill Units are 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<sup>rds</sup> of the fruit buds not opening, i.e., 2/3<sup>rds</sup> 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.

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 orchard spray component of the PIT day in August 2017 was washed out, but there were some observations:

- ***Geoff Furness calibration factors support Jianlu’s work, showing our “standard water volumes” of 2000 litres (equivalent) appears inadequate in low chill situations. This may also be the case if chill is marginal, but there is no evidence.***
- ***Growers shouldn’t assume rates previously used are good enough, and should inspect buds closely for thorough wetness.***
- ***Growers should document tree size and rates used to learn from the process.***
- ***We still recommend maximum travel speed of 3.2 km/hr.***

**The critical issue for successful oil application is the 100% coverage of each and every bud.**

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