

Taking steps to limit damage

By 2030, Victoria's average annual temperatures are projected to rise by between 0.3°C and 1.6°C — meaning the number of days over 35°C will nearly double.

Fruit growers are considering how to prepare for such conditions with options such as netting or spray-on sunscreen products that may protect their valuable fruit.

Many species and varieties of fruit in northern Victoria are growing close to the boundary of their ideal area of adaptation for temperature.

For example, apple production in northern Victoria increased significantly in the 1990s after the development of apple varieties with high market acceptance and higher heat tolerance.

Even with more heat-tolerant varieties, it will be normal to have some sunburn damage that causes lower and more variable pack-outs.

Plants living in an environment with ambient temperatures close to the limit of tolerance will be the first to show definite adverse symptoms.

The latest intensive orchard production systems rely heavily on dwarfing rootstocks and pruning systems that allow good light-penetration through the canopy.

These systems can also increase the risk of sunburn damage.

With retailers and wholesalers demanding a more perfect skin finish and rejecting produce that is bleached or discoloured by the sun, there is increasing incentive for growers to include sun protection as part of their management practices.

In the past two years, Plunketts Orchard in the Goulburn Valley has suffered 30 per cent and 20 per cent losses, respectively, due to sunburn damage on fruit — a total loss in income of \$500 000.

Plunketts routinely uses a spray sun protection but has also trialled shade netting with proven results. Subsequently, an investment

Product	Total fruits sampled	Marketable fruit	Marketable fruit %	Major burn	Major burn %	Minor burn	Minor burn %
A	112	102	91	3	2.6	7.0	6.3
B	100	85	85	3	3.0	12.0	12.0
C	104	92	89	5	4.8	7.0	6.7
Control	97	81	84	8	8.2	8.8	8.2

Table 1 ... Spray-on product results from a grower designed and operated replicated trial on gala apples in the 2009/10 season, with three replicates and five product applications.

Treatment	Good fruit %	Red blush %	Sunburn grading			
			1	2	3	4
Net	86	9	1	6	0	0
No net	57	11	15	10	6	0

Shade netting results from a farmer designed and operated trial in the 2009-10 season:
Variety Granny Smith from two sites: Undera - netted, Home - not netted.

Sunburn gradings:

Grade 1 - Very light brown blush; could be marketed as second-grade fruit, but will probably go off in storage.

Grade 2 - Visible light brown mark.

Grade 3 - Visible dark brown mark, but not sunken.

will be made in shade netting across all of the orchard's new developments.

The Plunketts have answered a series of questions with information from their own property that gives us a closer insight into the pros and cons as well as the costs associated with protecting fruit from sunburn.

Q: About what percentage of your total fruit production was damaged by sunburn in the past two seasons?

A: 2008-09: about 30 per cent; 2009-10: about 20 per cent.

Q: What was the approximate cost of the sunburn protection methods that you used?

A: Spray-on: about \$10/bin or between \$1000 and \$1200/ha for a season of five to seven sprays.

Netting: about \$40 000/ha (net is estimated to last at least 10 years, while the structure could last indefinitely).

Q: Approximately what was the percentage reduction in sunburn

damage due to spray-on sun protection products?

A: There was only a small benefit from using spray-on sun protection products on a block of Gala apples in the 2009-10 season (see Table 1).

Shade netting doubled the income from the Granny Smith block. The 2007-08 income, for which no shade netting used, was \$150/bin, while the 2009-10 income, in which shade netting was used, was \$300/bin (see Table 2).

Netting also protects the crop from hail, wind and bird damage. The water saving is about one third.

Q: Describe any negative effects that you think might have arisen from using the sun protection methods.

A: Bees don't like shade netting so we routinely use hives inside the net; however, the extra shade may still affect the bees. Powdery mildew is more of a problem, but it can be controlled with sprays.

Spray-on products may increase



Blemished ... Apples show evidence of sunburn.



Covered ... Netting is used to reduce sunburn damage.

the pressure of some insect pests (such as codling moth), due to the product reducing the coverage and effectiveness of certain insecticides (especially the newer insecticides).

■ Every orchardist's situation is different, and each grower should seek information and further ad-

vice in applying sun protection measures.

■ Climate adaptation officer Sam Lolicato has recently produced *Sun protection for fruit* — a practical manual for orchardists in Northern Victoria. For a free copy, phone Sam Lolicato on 5833 5226.