

TACKLING SUN DAMAGE IN AUSTRALIAN FRUIT AND VEGETABLE CROPS

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Just as Australian growers face the reality of higher temperatures and reduced water availability, a liquid sunscreen is showing promise for reducing sun damage and helping to reduce the rate of crop transpiration.

In trials conducted on a wide range of horticultural crops across most of Australia's growing regions, a liquid formulation of calcium carbonate has reduced the impact and damage from sun exposure to fruit and vegetable crops. Further trials are underway this season to quantify the reduction in sun damage and the impact on plant water use from application of the liquid sunscreen Parasol.

Growers of a range of crops have been aware that sun damage was reducing their returns, but were generally accepting the loss. However, as the cost of other inputs such as fertiliser rises, they are seeking to protect their investment and improve their returns.

Recent predictions from the Intergovernmental Panel on Climate Change - for an average global temperature rise of 1.1 to 6.4°C, and a marked increase in the frequency of hot days and warm nights by the end of this century; plus the likelihood of 40% more droughts in eastern Australia by 2070 – also indicate that the impact of sun and moisture stress is likely to increase.

Shaun Heidrich is Australia/New Zealand regional manager for agricultural sunscreen products for Crop Care – in conjunction with US manufacturer Purfresh: “Most crops suffer some form of solar stress, and many growers are also facing limited or reduced water allocations. Parasol liquid sunscreen provides the opportunity to potentially grow crops more efficiently with the water they have available.

“Growers have been waiting for a product that is user-friendly for the operator, their application equipment, and the crop.

“As well as shielding fruit and leaves from sun damage, it is also believed that the sunscreen keeps the plant cooler, potentially allowing it to use water more efficiently.”

Applied by ground equipment or through aircraft, Parasol is available for use in Australia to protect a range of agricultural crops including apples, pears, stone fruit, citrus, tree nuts, olives, grapes, avocados, bananas, mangoes, lychees, guavas, pawpaws, pineapples, vegetables – including capsicums, tomatoes, potatoes, onions, cucurbits, and lettuce, seedlings, ornamental and nursery plants, cotton and peanuts.

The film of fine calcium carbonate particles can be sprayed directly onto produce and foliage during the growing season to build up a fine, protective coating that blocks harmful rays, while still allowing photosynthesis and fruit colouring. The aim is to build a good level of coverage prior to hot conditions, then to maintain that level through the season. It is easily removed at washoff in packing sheds.

Trials and demonstrations around Australia have provided the following information:

Mangoes: Under very hot conditions at Kununurra, WA, 40% of Calypso mangoes on the western side of the trees were sun damaged. That loss was reduced to 15% on trees treated with Parasol. For the entire tree, sun damage was reduced from 32% to 11%. If 20% more fruit were be picked from treated mango trees, the grower could expect a return on investment of \$21 to \$32 per tree (based on Brisbane 2007 market stats for Kensington Pride mangoes) – or \$3570 to \$5440 per ha (at 170 trees/hectare), plus potential benefits from increased fruit quality and size.

Apples: The liquid sunscreen Parasol was introduced to Australia late last summer, and successfully used on apples in Victoria – where Granny Smith growers improved yield by 20%, for a return of \$8000 hectare. Parasol reduced sun damage loss and helped to lift fruit quality.

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Capsicum: A practical sun-protection product for the crop is something capsicum growers have been seeking for a long while. Capsicums sunburn very easily, causing 20 to 30 % fruit loss during the worst periods – particularly towards the end of the season and during winter when the fruit is less protected by foliage. Parasol has helped protect capsicums and transplanted seedlings from sun damage.

Pineapples: Pineapple growers have been looking for a solution to sun damage, but there were problems with removing previous products from the fruit. Trials with Parasol showed that it was easily removed from the pineapple at wash-off.

Stone fruit. In South Australia, trials with cherries are looking at the effect of post-harvest Parasol treatment on buds. Reducing the effect of the sun on bud development may also reduce “doubling”.

Avocados: There appears to be reduced moisture stress in avocado trees when the foliage canopy is coated with a reflective film of liquid sunscreen. In trials on an Atherton Tableland farm, Hass avocado trees sprayed with Parasol in late August were visibly healthier than untreated trees - displaying a blue-green colour under the hot spring conditions being experienced in the north.

Grapes: Melissa Quinn, Peracto Research, reported reduced sunburn damage in Marsanne grapes at Nagambie, Victoria with one application of Parasol during extremely hot conditions in 2007. A sap-flow meter also showed reduced water stress in vines treated with Parasol. This effect will be further examined in wine grapes in the coming season at the SARDI Research Station, Nooroopta, South Australia, using a new sap-flow monitoring machine.



Mango trees with a reflective film of the liquid sunshield Parasol. The fine, protective coating blocks harmful rays, while allowing photosynthesis and fruit colouring. The aim is to build a good level of coverage on fruit and foliage prior to hot conditions, and to maintain that level throughout the season.



Avocado with a protective coating of Parasol liquid sunscreen on leaves and young fruit.



Pineapples and sunshine go together, but the fruit can suffer severe sun damage. These pineapples have been sprayed with a reflective coating of Parasol sunscreen, which has proved easy to remove from pineapple fruit in one of many Australian trials on fruit and vegetables.

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