AgNOVA TECHNOLOGIES

An American Vanguard Company

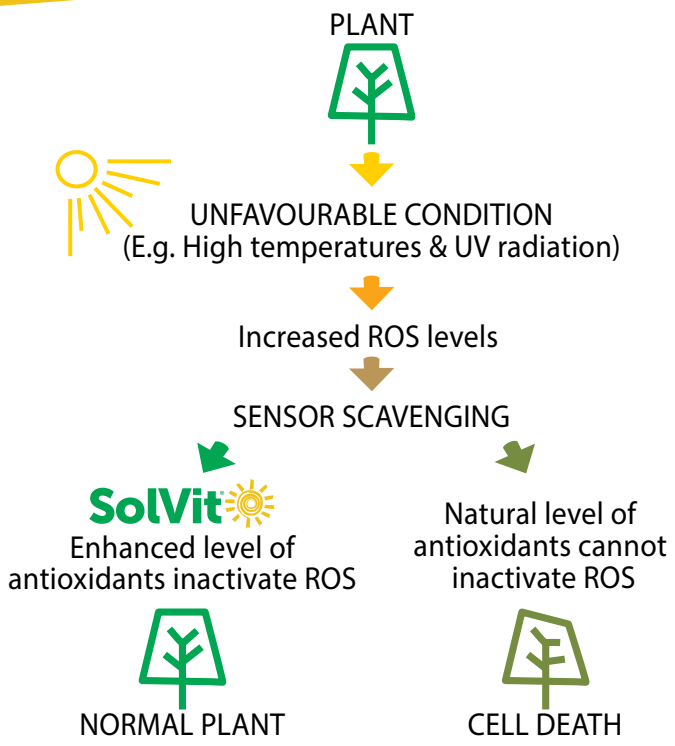
AgNote

SolVit®

Crop Protectant

SolVit® physiologically reduces the impact of oxidative stress and in particular sun damage by radiation and heat.

- **SolVit** optimises the yield of certain vegetable crops by reducing the impact of sun damage. SolVit is a unique product that acts on the physiology of the plant, and must be used in a preventive program commencing prior to the first damaging heat event.
- **SolVit** combines UV absorbing compounds with effective natural antistress antioxidants and a natural biostimulant.
- **SolVit** deactivates excessive Reactive Oxygen Species (ROS) by-products, formed by the plant when exposed to high temperatures and UV radiation, to a level that reduces their destructive impact on plant cells.



Crops and Sunburn

Sunlight is the driving force for growth and development of green plants; in the process of photosynthesis, solar energy is transformed into carbohydrates which form the basis of human nutrition.

However, in some cases, sunlight induces severe damage of plant tissue, especially in fruit and vegetables. Nearly all high-value fruit and vegetables are susceptible to light-induced skin damage, including capsicums and tomatoes.

Sunburn may cause 10–50% yield losses, depending on the variety and local climatic conditions. In growing regions with hot and dry summers, common across Australia, the phenomenon of sunburn is well known.

What is Sunburn?

Sunburn damage to fruit is caused by absorption of excessive solar radiation by the fruit. It can be differentiated into 3 main types: sunburn necrosis, sunburn browning and photo-oxidative sunburn.

When plant tissue is exposed to high temperatures and UV radiation, cell metabolism results in the formation of by-products that become destructive to plant tissue. These radical by-products are collectively referred to as Reactive Oxygen Species (ROS), and include a range of oxygen-based compounds such as hydrogen peroxide. In high concentrations, they destroy cell membranes via oxidation ("oxidative stress"), and this leads to cell death.

Plants respond by forming antioxidants which eliminate ROS and prevent the cell membranes from disintegration. The most prominent antioxidants in plants are α-tocopherol ("Vitamin E"), ascorbic acid ("Vitamin C"), carotenoids and phenolic compounds.

Among these compounds, α-tocopherol is the most effective natural antioxidant; one molecule of α-tocopherol inactivates up to 220 radical molecules! The major function of α-tocopherol is to keep the cell membranes functioning, even under severe environmental stress like overheating. In this process, α-tocopherol works hand-in-hand with ascorbic acid in the antioxidative defence reaction. The unique ingredients in SolVit boost this defence reaction when plants need it most.

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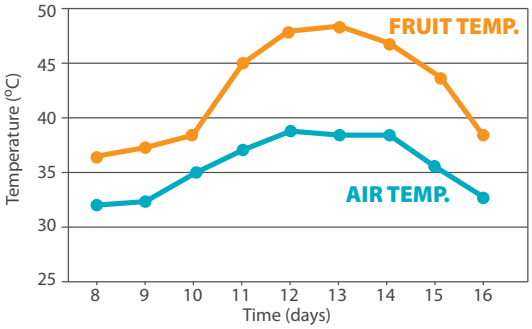
When does Sunburn Damage Occur?

Sunburn damage in fruit and vegetables is triggered by local overheating of the fruit or vegetable skin and tissue. On warm sunny days, the fruit skin temperature may be 10–15°C above the ambient air temperature. This means an air temperature of 28°C can equate to a fruit skin temperature of 38°C or higher, which results in local overheating and subsequently to skin lesions.



This graph illustrates the relationship between air temperature and fruit surface temperature. Note that fruit surface temperature can be considerably higher than air temperature, and fruit surface temperature determines the level of sunburn.

Source: Yazici and Kaynak, 2006.

In addition to air temperature, high levels of UV radiation can damage plant tissues. UV radiation is readily absorbed by humidity in the air, therefore there is a higher risk for UV damage during dry weather periods. Injuries caused by tissue overheating typically result in bleached areas on the fruit surface and in severe cases, large black or brown lesions.

Formulation

In a premium formulation that includes specific adjuvants to enhance uptake and use efficiency, SolVit has a pH of 4.5–5.5 and specific gravity of 1.09–1.10.

Application Timing

Begin applications prior to damaging heat and radiation conditions that cause crop damage (i.e. heat events >28°C and/or high radiation). SolVit must be applied 2 to 3 days prior to damaging conditions.

Multiple applications are more effective than a single application. In a program commencing prior to heat events, each application of SolVit will provide protection for approximately 7 days. Continue applications at an interval not greater than 7 days while the risk of damaging heat events persists. Use local weather services for planning application programs.

CROP	RATE	CRITICAL COMMENTS
Vegetables: Tomatoes and capsicums	1.5 to 2.0 L/ha	Commence applications at early fruit set. The higher rate will provide increased protection. Follow application timing instructions.

Mixing/Application

Shake well before use. Slowly pour SolVit into the spray tank three-quarters filled with water and with agitation running. Alternatively, prepare a pre-mix by adding SolVit in equal parts with water and stir immediately. Add this mixture to the water in the spray tank with agitation running.

For vegetables, the water volume used should be around 500 L/ha, with a medium droplet size. Spray volume should match the canopy size, and be increased as the crop grows. Thorough, even coverage of all plant parts is essential.

Compatibility

SolVit can be tank mixed with other products. Refer to Compatibility AgNote for more details.

For more information scan the QR code or contact your local Area Sales Manager

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