

Table grapes: Less stress, more colour

Colour is an important quality in red table grapes, as consumers associate this with ripe and tasty fruit. The suboptimal environmental conditions in many growing regions negatively affect the berry colour development and could result in unacceptable commercial standards and significant financial losses.

Plant stress and colour development

The colour during berry ripening stage is mainly determined by the content and type of anthocyanins. Sugar accumulation promotes the synthesis of anthocyanins which improves fruit colour. It is well-established that certain abiotic stressors affect anthocyanin accumulation and consequently, colour development. These include:

- Low light during growing conditions inhibits the accumulation of anthocyanins.
- High daytime temperatures inhibit the synthesis and promote the degradation of anthocyanins.
- Low nighttime temperatures inhibit the respiration of leaves and fruits, decreasing the accumulation of sugar and anthocyanin synthesis.
- Excessive soil nitrogen promotes the conversion of sugars to amino acids and proteins, limiting the biosynthesis/accumulation of anthocyanins.
- Potassium activates a variety of enzymes, which can promote the transportation and accumulation of sugar.
- Excessive rainfall during the fruit ripening period increases the skin cell water content. High fruit moisture reduces the sugar concentration and anthocyanins accumulation, leading to substandard berry colour.

Nutrico's stress management program

While adverse environmental conditions are unavoidable, the effects of abiotic stressors and crop



Trial photograph showing superior colour development in the treated versus the untreated Crimson seedless grapes.

nutritional status can be managed throughout the growing cycle. This could have a positive impact on average fruit sugar content and colour. In combination with other best cultivation practices, Nutrico has expertly developed a table grape stress management program. This three-step plan aims to:

1. Enhance chlorophyll production by applying Tricon (B4427, Act 36 of 1947) three times between full bloom and set. Tricon contains Triaccontanol (490 mg/kg), Tocopherols (19 mg/kg) and Magnesium (9900 mg/kg) to increase photosynthesis.
2. Improve abiotic stress tolerance by applying FlavoMune™ (M154, Act 36 of 1947) three times between berry set and harvest. FlavoMune™ is a biostimulant and nutrient complex containing proprietary Bioflavonoid Extracts (50 g/kg).
3. Deliver optimal nutritional status by applying AG Ávue (K10124, Act 36 of 1947) three times from the beginning of veraison until harvest.

AG Ávue is a water-soluble plant nutrient, containing Potassium (345 g/litre) and Phosphorus (135 g/litre).

The efficacy of the stress management program was demonstrated in a trial conducted on Crimson Seedless grapes and the visual results obtained are shown in Figure 1. A significant increase in sugar content was measured in the treated grapevines compared to the untreated control. The trial outcomes show that the increased sugar levels resulted in superior colour development in the treated grapevines, possibly due to improved stress tolerance and increased nutrient uptake.

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