

Table grape punnet packaging research – summary

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This study focuses on the effect of punnet lid venting and SO₂ sheet type on the post storage quality maintenance of export table grapes packed in 500 g cartons (B05D configuration). Thompson Seedless and Red Globe grapes were packed in commercially available punnets representing three levels of lid venting, namely 100% open (no lid), 15 cm² vents and 9 cm² vents. The punnets were packed in 94 x 2 mm perforated bags in various configurations/combinations with paper and plastic SO₂ sheets of different standard dimensions. The quality of the grapes was evaluated after simulated sea export conditions. For detailed results and recommendations, please refer to Progress Reports GF-08 attainable from DFPT Research.

FINDINGS & RECOMMENDATIONS

This is a preliminary communication on the research conducted to date. A full report with verified findings will be published on completion of the research.

Punnet lid venting

It was demonstrated that punnet lid venting (Figure 1) influenced the post-storage quality and most notably, the efficacy of decay control end level of SO₂ damage during grape storage.

- No lid: 100% Open punnet;

This punnet configuration with deeper tub (higher side-walls) is often exported for final inspection and packaging (e.g. flow wrapping or lidding) near to the market. The most effective decay control was obtained when no punnet lids were used. However, the highest levels of SO₂ damage were often recorded in these open punnets, when packed in combination with the Paper 6 x 4 (600 x 400 mm carton footprint) SO₂ sheet. This combination must therefore be avoided for commercial grape exports. Where commercial circumstance dictates this method of export, a paper barrier between the SO₂ sheet and the punnets should be considered. However, this concept should be tested in the coming season and it must be stressed that this has not been evaluated yet. More bruising occurred on grape berries in the open punnet pack configuration, albeit in only one of the four grape populations used in the study. This suggested that the cause of bruising in open punnets was the result of the grapes being more exposed during packing and post-packaging handling, rather than the effect of the packaging *per se*.

- 15 cm² vented lid;

This “more vented” punnet lid has a combination of “slit” openings around the perimeter of the punnet lid and 4 x 4 mm diameter circular vents spaced around the lid label. The best overall results in terms of decay control in lidded punnets were obtained with 15cm² vents.

- 9 cm² vented lid;

This “less vented” punnet has 8 x 16 mm diameter circular vents spaced around the position of the lid label. Overall, the decay control with the 9 cm² vented lid was inferior compared to the 15 cm² vented lid.

The information generated to date suggests that when growers order lids for punnet packaging, the combined venting area in the lid should ideally be a minimum of 15 cm². Incorrect placement of sticker labels over vents in punnet lids must be avoided. Increased punnet lid venting could be considered in future, although marketing considerations such as sufficient lid space for labelling and other consumer and aesthetic requirements are commercial realities to be considered.

SO₂ sheets per cultivar

- For Thompson Seedless grapes, the best decay control was obtained with 6 x 4, 6.6 g Na₂O₅ Paper or the 6 x 4 Plastic SO₂ sheets. The Paper sheet should however not be used in combination with open punnets, due to the higher risk of SO₂ damage. Also see comment under “No lid” above.
- For the coming season, any of the Plastic 6 x 4 SO₂ sheet configurations tested can be used in combination with 15 cm² lid vents on Red Globe grapes. The Paper SO₂ sheets tested in this research gave higher levels of SO₂ damage in die 6 x 4 format.

The Paper 4 x 3 (400 x 300 mm carton footprint); 3.3 g Na₂O₅ sheet, developed for the 4 x 3, 4.5 kg grape box should not be used in 5 kg B05D punnet packaging, due to the risk of inferior decay control. In future, use of a Plastic 60% dual release SO₂ sheet for punnet packaging may become an option. Results will be made available after comprehensive testing.

Figure 1:
Top view of punnet lids with various degrees of venting; 15 cm² (left) and 9 cm² (right), with the conventional labelling position indicated by black lines.

