

WAXING LYRICAL OVER PASSIONFRUIT

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As highlighted in the SUMMER 2018 edition, PAI has been researching post-harvest treatments that may have a benefit for passionfruit to extend shelf life and preserve skin appearance. This piece of research was completed by AHR for Passionfruit Australia following negotiations that PAI has had with Liquidseal in the Netherlands. This research was not funded by our levy. We would like to thank Jenny Ekman and the AHR team for doing this mini trial for us.

Wrinkling during transport and storage creates a major challenge for passionfruit suppliers. While some consumers think that wrinkled passionfruit are ready to eat, wrinkling reduces the freshness and appeal of the fruit. While it is initially the skin that wrinkles due to moisture loss, eventually the pulp also dries out, reducing juiciness and flavour.

Passionfruit are **alive**. This means they still need to “breathe” i.e. use O₂ and release CO₂, just as we do. Thick waxes may prevent moisture loss, but they also restrict oxygen movement into the fruit. If this goes too far it can result in the pulp starting to ferment.

Applied Horticultural Institute (AHR) staff tested the effect of a number of fruit coatings on passionfruit postharvest storage life, respiration rate and internal atmosphere.

Having worked on many horticulture projects in the past, AHR have a great bank of resources available for download for **FREE** at their website:

<http://ahr.com.au/projects-resources>



THE TRIAL METHODOLOGY

Fresh Sweetheart and Misty Gem fruits were provided by JE Tipper at Sydney Markets. The fruit were divided into groups of 30 then individually numbered and weighed. Each group was then dipped into water only, Castle Polyethylene wax, Liquidseal LSFF-BioPH (LLB) or Liquidseal MG (LMG) coatings. The LMG coating, although classed as “ready to use”, was extremely thick. This meant the excess had to be wiped off the fruit using a paper towel.

All of the fruit were stored in vented containers at 8°C for six days to simulate post-coating transport and distribution. They were then moved to ambient conditions of around 22°C, as they would be displayed at retail or, for that matter, in a fruit bowl on the consumer’s kitchen bench.

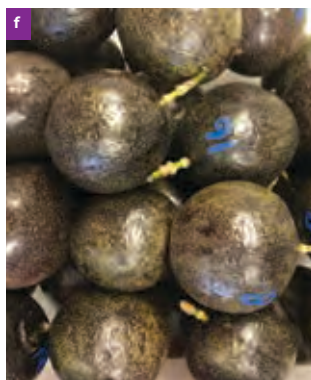
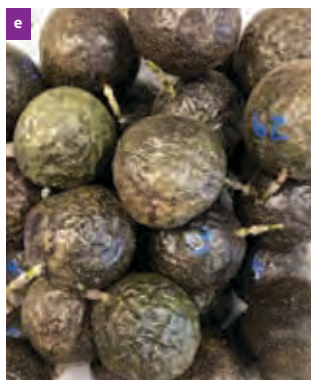


Figure 1. Passionfruit dipped in LMG wax were allowed to air dry (a) then the excess wiped off with paper towelling (b) This fruit dried with a dull appearance (c) especially when compared to the gloss gained by dipping fruit in one of the other waxes (d).

THE RESULTS?

At 8°C very little weight loss, mould or shrivel was evident in any of the fruit, across all treatments. However, both passionfruit varieties started to lose weight and shrivel rapidly once they were transferred to ambient conditions. Immediately apparent was the effect of the coatings on fruit appearance. Coated fruit generally had a smoother, glossier appearance, potentially looking more attractive to customers in a shop setting.

ON A PRACTICAL LEVEL, ALL THE COATINGS DELAYED SHRIVELLING.



Condition of untreated (e) and Castle wax dipped (f) passionfruit cv. Misty Gem after 6 days cold storage @ 8°C plus 3 days under ambient conditions @ 22°C.



Condition of untreated (g) and Castle wax dipped (h) passionfruit cv. Sweetheart after 6 days cold storage @ 8°C plus 6 days under ambient conditions @ 22°C.

The Liquidseal MG (LMG) coating was the most successful of the options trialed at reducing respiration rate and shrivel. However, large, sunken lesions appeared on fruit skin. This could be due to high levels of ammonia in this product, with the company currently working on new formulations to resolve the issue. Moreover, off-flavours were detected when AHR staff tasted the fruit, suggesting internal fermentation. This was supported by the fact that some fruit contained O₂ concentrations as low as 3%.

Liquidseal LSFF-BioPH (LLB) and Castle coatings provided more modest effects on moisture loss and shrivel than the Liquidseal LMG, but were easy to apply, gave the fruit an attractive gloss and provided significant delay in quality loss. Interestingly, the benefits were consistently greater for Misty Gem than for Sweetheart. These fruits did not taste any different to the untreated controls (see Figure 2).

It will be no surprise to many growers that using waxes can reduce shrivel. While only low numbers of fruit were used in these trials, the results suggest that applying Liquidseal BioPH (LLB) or Castle polyethylene wax as a postharvest treatment can extend the storage life of passionfruit. Growers need to decide for themselves whether the cost of applying these products can be recouped in terms of higher prices or more fruit sold. However, if the overall industry aim is to lift the quality of passionfruit at retail, then increased use of waxes could potentially provide similar benefits to plastic packaging – without the environmental negatives.

It will come as no surprise to many to learn that TEMPERATURE is the most important factor affecting storage life and quality of fresh passionfruit. Cooling fruit PRIOR to despatch is critical as refrigerated trucks do not cool fruit – the best they can do is hold the existing temperature.

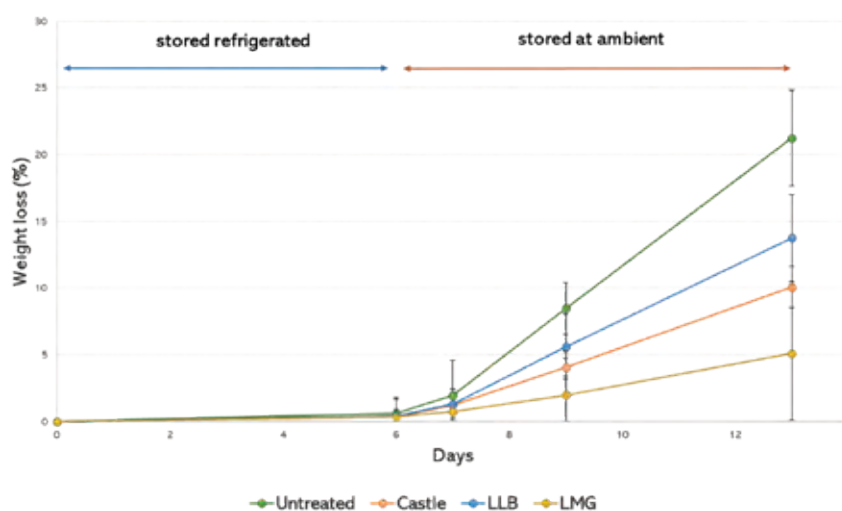


Figure 2. Effect of coating on weight loss of passionfruit cv. Misty Gem during cold storage and ambient display. Bars indicate standard deviations of each mean value.

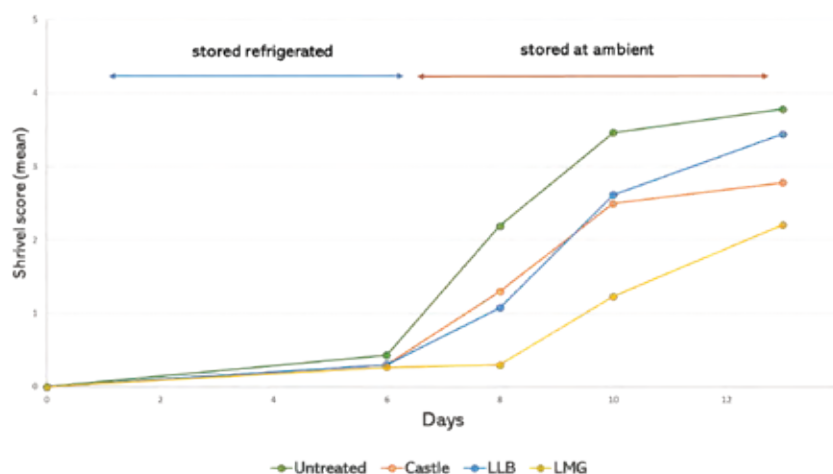


Figure 3. Effect of waxing on shrivelling of passionfruit cv. Misty Gem during cold storage and ambient display.

If you want to hear Jenny Ekman present about the Postharvest project and the trial work that she has completed, then make sure you get along to one of the Regional Field Days in 2020 – find out more on PAGE 7 or visit the Events section on our website at <http://bit.ly/paivent>