

Case study: Yalumba

Air bag press design – a ‘first principles’ approach to the purchase decision

Rory Lane

Technical Product Development Manager
Australian Winemakers Pty Ltd
Victoria

Introduction

With a plethora of designs available to choose from when evaluating a bag press purchase, and an equivalent amount of information from suppliers, it is incumbent on wine producers to think critically and logically when it comes to this major investment decision. In doing so, perhaps it is wise to ask two universally applicable questions: “Why do we press grapes?” and “what type of wine do we want to make?”

This questioning is designed to align our attention to a ‘first principles’ mode of thinking, something that can be difficult given the infinite possibilities associated with winemaking (not to mention business) decision-making, but it is eminently worthwhile.

The press is undoubtedly the beating heart of the winery. At its core is one simple function, to remove wine from grape skins. By first principles, the value of the press is therefore measured by how effectively it removes wine or juice from those skins. Effectiveness may indeed differ from winery to winery – some may see yield as of greatest importance, others the degree of oxidative association or suspended solids or perhaps the speed with which the task is completed. The most likely is a varied combination of all of these and perhaps more. But if we look at the wine press in terms of our initial two questions, it forces us to make a choice about what we value in this part of the winemaking process. And how many of us have honestly done just that?

White wine press trials at Yalumba, Angaston

In 2007 The Yalumba Wine Company (Yalumba) undertook a review of its white pressing regime at its Angaston winery and conducted a trial to compare three press designs to determine which design best delivered a particular attribute that they felt was important to their wine style. In their case the measure was Low suspended solids. The reduction of suspended solids in white juice is deemed beneficial because:

- it reduces undesirable aroma precursors to promote clean varietal expression
- it reduces the load on and cost of refrigeration and fining required for settling juice in tank prior to fermentation, and by extension
- reduces the amount and cost of lees filtration
- reduces the proliferation of polyphenol oxidase enzymes that lead to browning and reduction of aroma.

By undertaking this trial work, Yalumba had a clear set of criteria against which it wished to measure its white wine presses. The benefits of undertaking in-depth and well considered trial work ▶

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are many. Clearly, Yalumba understand their wine style, the process needed to attain that style, and then gathered and applied relevant data to their purchase decision.

Yalumba's method was to trial three press designs side by side over a month of the 2007 vintage, to evaluate the percentage of suspended solids in free-run and pressings fractions, both inline and final, and make a decision on their next press purchase. The designs trialled were a conventional side membrane airbag press, a Della Toffola central membrane airbag press, and a screw press. The data is summarised in Tables 1-3, and Figure 1.

Table 1. Side Bag percentage solids Yalumba Angaston 2007.

Side Bag AV F/R IL	4
Side Bag AV F/R FINAL	4.61
Side Bag AV PR IL	3.00
Side Bag AV PR FINAL	3.21

Table 2. Della Toffola Central Membrane percentage solids Yalumba Angaston 2007

Central bag F/R IL	2
Central bag F/R FINAL	3.80
Central bag AV PR IL	0.83
Central bag AV PR FINAL	1.10

Table 3. Screw Press percentage solids, Yalumba Angaston 2007

Screw press AV F/R IL	2.50
Screw press AV F/R FINAL	4
Screw press AV PR IL	5.10
Screw press AV PR FINAL	4.33

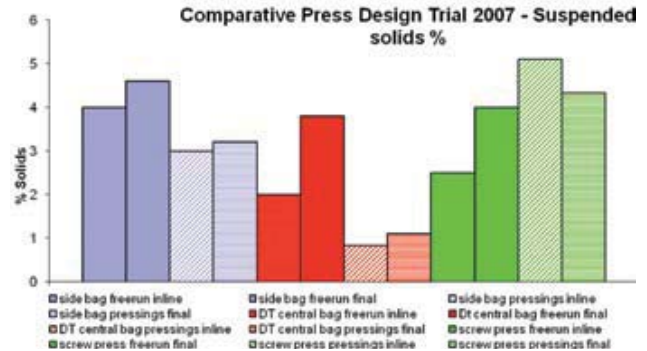


Fig. 1. Accumulated comparative data on free-run and pressings suspended solids from vintage 2007 at Yalumba Angaston.

The data shows clear distinctions between the performances of the three press designs, the Della Toffola central membrane design delivering significantly lower average suspended solids in both free-run and pressings than either side bag or screw press. The side bag delivers lower suspended solids in the pressing fractions than the screw press; however this result is reversed for the free-run fractions.

It can be argued that this data reflects some key points of the physical design of the three presses, especially between the side and central membrane presses. The main difference between the two designs is the orientation of the membrane, and the consequences of this orientation on draining area. A central membrane is fixed around an axial bar inside the press, whereas a side bag is fixed to one side of the inner circumference of the press. In this case, the bag itself blinds a significant percentage of the surface area

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Fig. 2. The Della Toffola Central Membrane Air Bag Press.

of the press, dramatically reducing the draining surface area. This is most noticeable on filling, when the bag is deflated and positioned underneath the doors, preventing juice from draining down until sufficient volume is achieved to spill past the bag edges. By comparison, there is no blinding of the draining area on filling a central membrane press, and juice can exit from close to the full 360 degrees of the internal surface area from the second filling beginning. Any suspended solids accumulated in the juice at this stage of the pressing cycle have come not from the press, but from the harvester, hoppers, crusher and pumps preceding it. The side bag by comparison accumulates some solids inside the press attempting to exit from around the bag itself.

The data for the screw press supports this view, as it allows for good early draining, but then contributes significant solids from the harder, heavier shearing action of the pressing mechanism, in comparison to an air bag. By nature of its design, the Della Toffola central bag press in effect acts as a pre-drainer and press in one.

In discussions with Yalumba winery manager, Alan Hoey, he said: "The Della Toffola central membrane press is different to a standard press and the performance of the technology is evident and aligned to improved wine quality. The main economic benefit is that you are able to produce more as a result of the speed of operation whilst providing tangible benefits over many years."

As Alan Hoey alludes, the added benefit of this pre-draining action is the effect that it has on cycle times. With immediate separation, cycle times are cut significantly. This will enable a greater number of cycles per day, and thus a greater volume of fruit to be pressed in the same time. This may reduce labour costs or indeed reduce the number of presses required to process a given volume of fruit per vintage. Or conversely it could enable an increase in processing capacity. Have you ever considered how these benefits may impact your business?

Trial work of the kind as conducted at Yalumba can be a lengthy and at times expensive undertaking, but as this example shows, it can be of great value when making large purchase decisions.

Acknowledgement

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Rory Lane is a qualified winemaker with experience in both Australia and the US. He is based at Australian Winemakers'

Melbourne office where he consults with wineries across Australia, both large and small. He is also the owner and winemaker of The Story Wines, a boutique urban winery in Cheltenham, Vic. Rory can be contacted on (03) 8405 9000 or email rlane@cellarplus.com.au or visit www.cellarplusgroup.com.au ■



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