

# Kickstarting Sticky Ferments – Check that VA!

Katheryn Cordova<sup>1</sup>, Eveline Bartowsky<sup>2</sup>, David Wollan<sup>2</sup> and Jason Amos<sup>2</sup>

<sup>1</sup> VAF Memstar 212 Pipeline Road, Nuriootpa, SA 5355

<sup>2</sup> Lallemand Australia, 23-25 Erudina Avenue, Edwardstown, SA 5039

## The Problem

There are various reasons why a wine results in a slow/sluggish or stuck alcoholic fermentation, including insufficient nutrition, microbial contamination, and elevated levels of acetic acid/volatile acidity. These factors can lead to stressed yeast. Such compromised fermentations can be difficult to restart and get to completion. Typical remedial processes to make the wine more conducive for completing fermentation include removal of toxic compounds (such as saturated short and medium chain fatty acids) with yeast cell walls and membrane techniques to remove acetic acid.

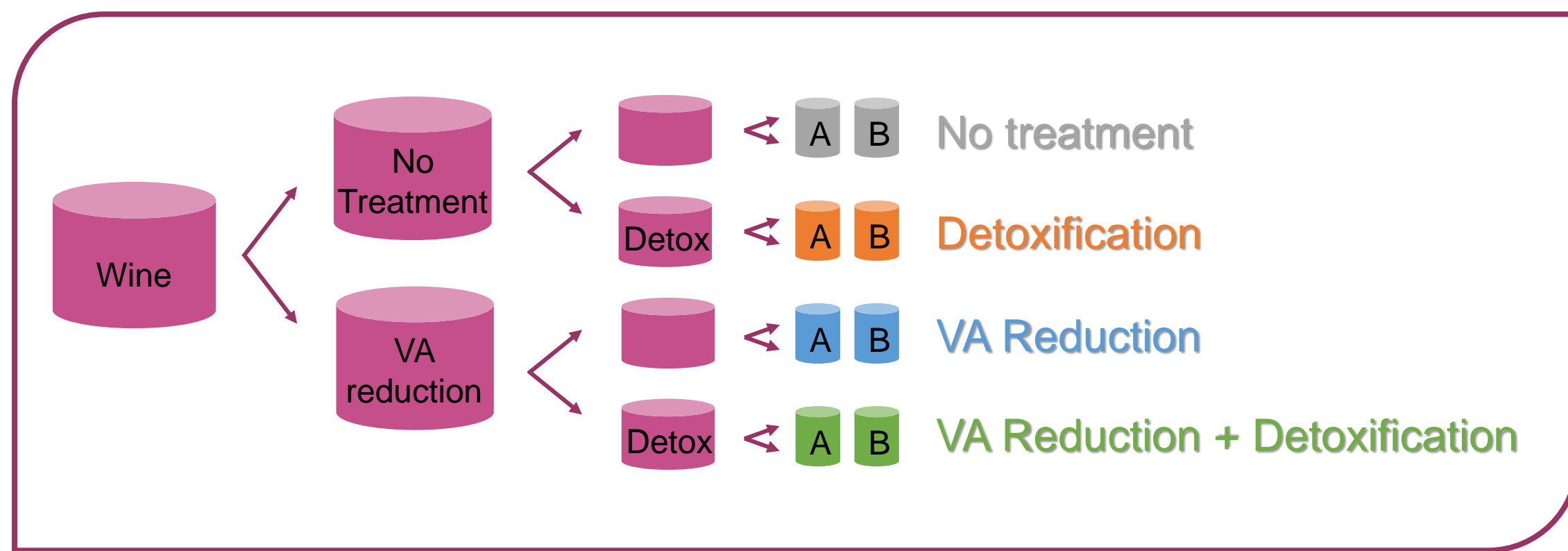
This study tested two common methods for preparing wine for fermentation re-initiation, either individually or in combination, reverse osmosis based acetic acid (VA) reduction and addition of yeast cell walls. Two stuck commercial Cabernet Sauvignon wines with high acetic acid concentrations (1.4-1.7 g/L) were treated to reduce VA and/or detoxify the wine, and then restart the fermentation with a fructophilic *Saccharomyces cerevisiae* yeast strain



## The Trial Plan

### Cabernet Sauvignon Wines

- Stuck AF wine
- Treatment
  - None
  - Detoxification
  - VA reduction
- Duplicates
- Restart AF



Wine	pH	TA (g/L)	F/T SO2 (mg/L)	G+F (g/L)	VA (g/L)	Malic acid (g/L)	Alc (% v/v)
A	3.57	8.0	5/11	22.52	1.42	0.09	13.25
B	3.51	9.1	7/18	23.4	1.73	0.08	11.92

### Detoxification

- Wine treated with yeast cell walls for 48 hr
- Yeast starter mix prepared
- Wine inoculated

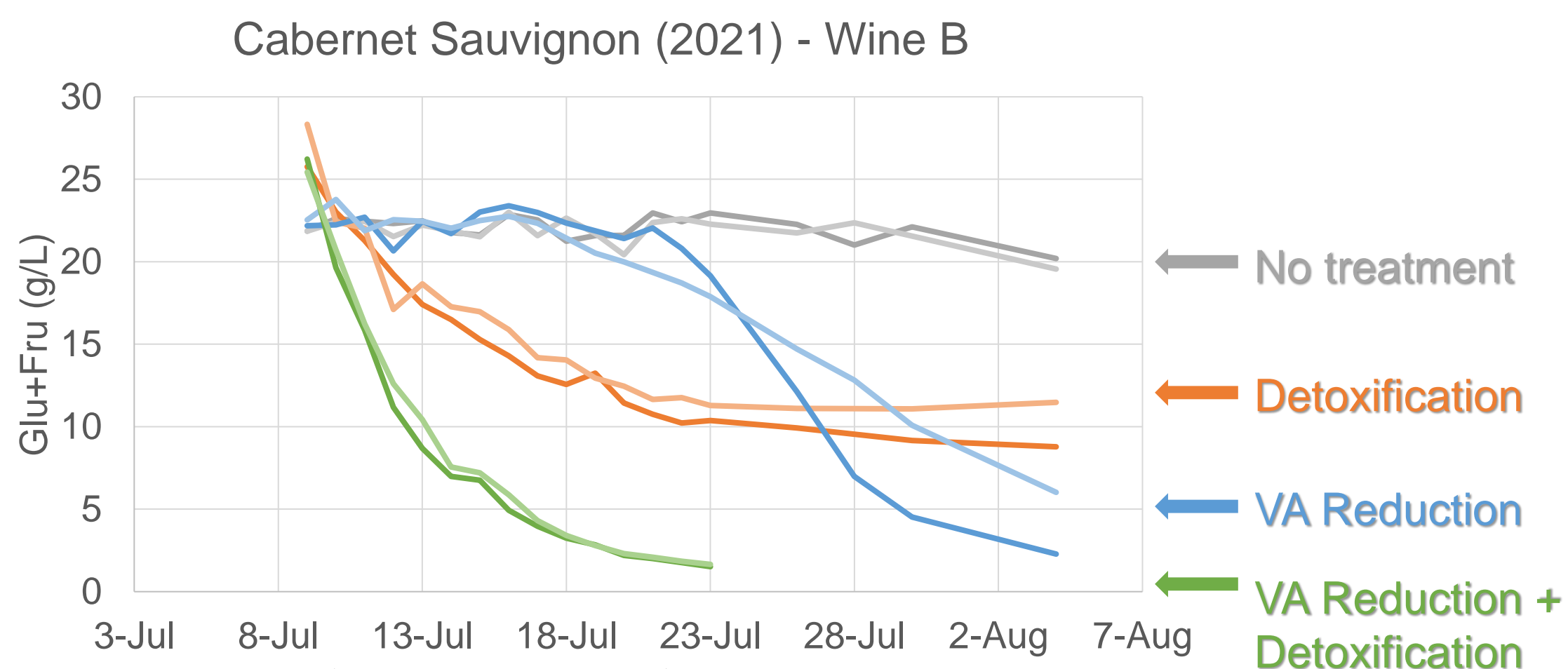
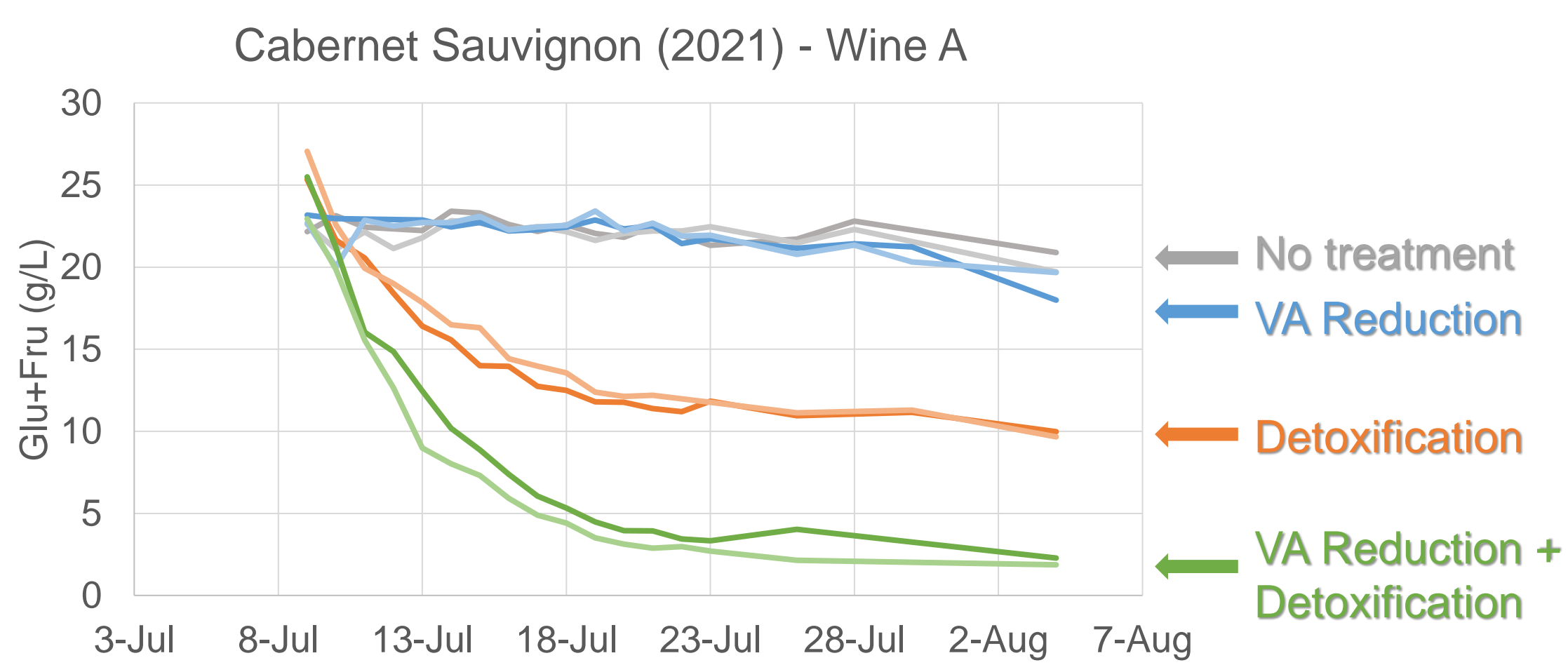
### VA reduction

- Wine treated with selective reverse osmosis membranes
- Aim for VA < 0.8 g/L

### Yeast starter preparation

- Yeast + rehydration protectant rehydrated in juice plus complex nutrition

## The Results



Yeast inoculation (9/7)  
Detoxification & VA reduction + Detoxification

Yeast inoculation (21/7)  
No Treatment & VA reduction

WINE A		G/F (g/L)		Acetic acid (g/L)		Alc (% v/v)	
		PRE	POST	PRE	POST	PRE	POST
No treatment	A	22.52	20.89	1.42	1.24	13.25	13.48
	B	22.52	19.72	1.42	1.2	13.25	13.48
Detoxification	A	22.89	9.98	1.42	1.25	13.18	13.83
	B	22.89	9.66	1.42	1.22	13.18	13.86
VA Reduction	A	23.13	17.99	0.77	0.83	12.54	13.01
	B	23.13	19.67	0.77	0.84	12.54	13.13
VA Reduction + Detoxification	A	23.7	2.28	0.68	0.86	12.64	14.07
	B	23.7	1.87	0.68	0.88	12.64	14.1

WINE B		G/F (g/L)		Acetic acid (g/L)		Alc (% v/v)	
		PRE	POST	PRE	POST	PRE	POST
No treatment	A	23.4	20.2	1.73	1.6	11.92	12.65
	B	23.4	19.56	1.73	1.52	11.92	12.64
Detoxify	A	21.94	8.78	1.74	1.73	12.53	13.13
	B	21.94	11.48	1.74	1.61	12.53	13.09
VA Reduction	A	23.93	2.28	0.76	0.86	11.99	13.45
	B	23.93	6.02	0.76	0.84	11.99	12.92
VA Reduction + Detoxification	A	22.87	1.17	0.69	0.77	12.06	13.44
	B	22.87	1.23	0.69	0.83	12.06	13.36

## The Outcomes

### High VA Wines with no treatment

- No fermentation for 2 weeks
- Re-inoculated to initiate fermentation after 2 wks
- Unable to restart fermentation

### High VA Wines with VA reduction

- No fermentation for 2 weeks
- Re-inoculated to initiate fermentation after 2 wks
- Fermentation restarted

### High VA Wines with Detoxification

- This treatment helps with getting AF restarted but struggles to complete AF because of high VA

### High VA Wines with VA reduction + Detoxification

- Completes AF efficiently and effectively

## Take home message

- High VA in a stuck wine will hinder alcoholic fermentation completion
- Wine matrix has a role in the ability to complete fermentation
- Treatment of a stuck wine with yeast cell walls will aid in restarting the fermentation
- Reduction in VA is fundamental for the restarting of fermentation in a wine with high VA

- A combination of reduction of VA and wine detoxification is essential to restart and complete fermentation of a stuck wine with high VA