

Rā Tuatahi - Rāpare 17 Mahuru 2026
Day 1 - Thursday 17 September 2026
Wāhanga (session) 3: Case Studies



MICHAEL BRAJKOVICH MW















Pressing

- Willmes pneumatic UP / Merlin 4000 L
- Capacity 3.0 – 3.5 tonnes
- Whole-bunch pressed
- Champagne-like Cycle

Pressing

- Minimal *Retrousses*
- 3.5 – 4 hours
- Gravity flow to settling tank



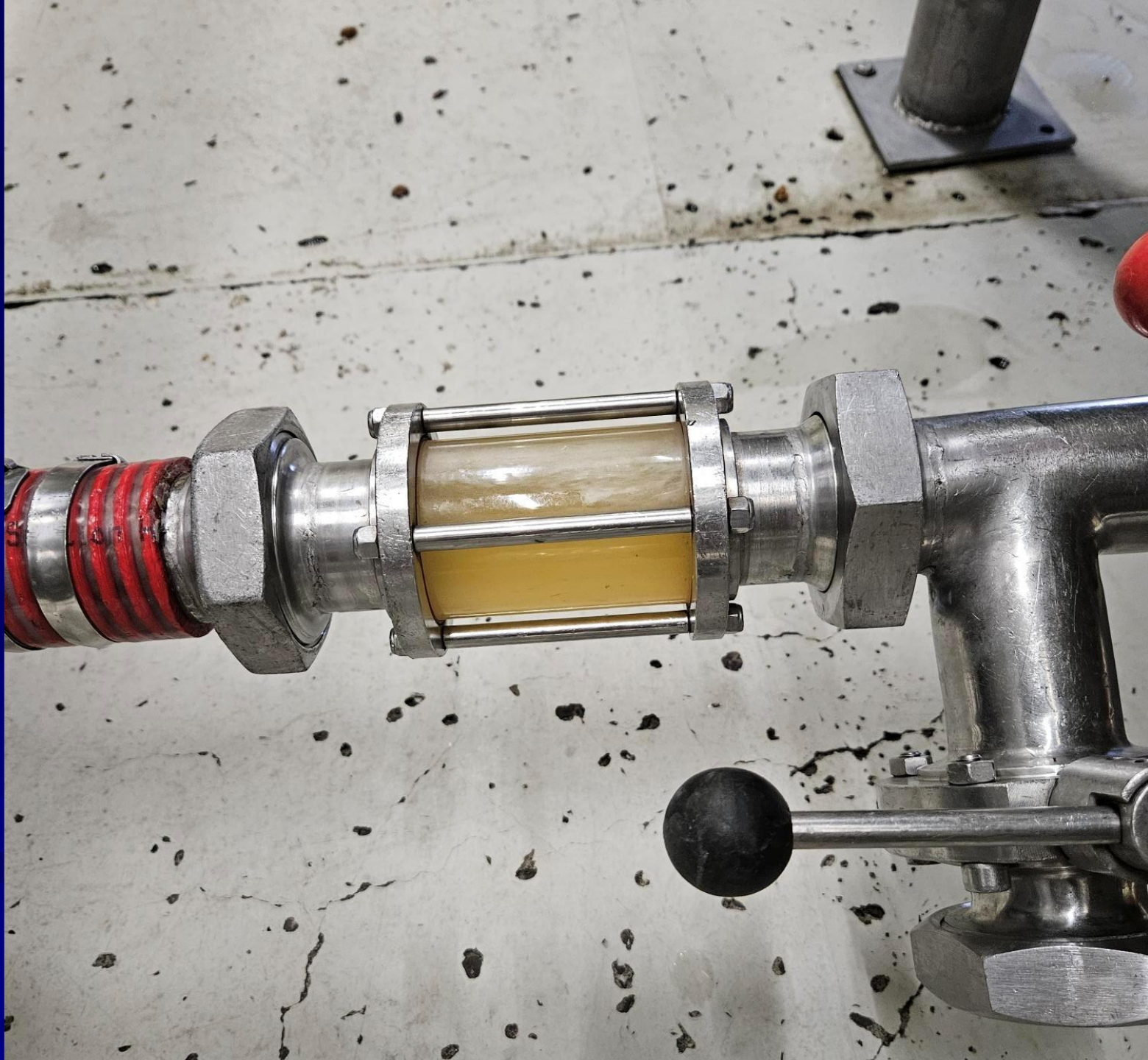


Settling

- SO₂ required, min. 60 mg/L Total
- Mainly to inhibit polyphenol oxidases
i.e. Tyrosinase and Laccase
- 12 hours
- Temperature 12 °C

Settling

- Option to include or exclude lees
- Minimal lees quantity
- No lees filtration required
- Continued settling of lees in coolstore



Juice Turbidity

- Typically in Kumeu: 190-270 NTU after racking
- Lees approx 0.5-1.0 % of juice volume

Juice Turbidity

Above 500 NTU can result in excessive reduction faults.

Below 80 NTU can lead to sluggish fermentation.

Homogenise juice gently before filling barrels.

Juice Turbidity

“....Sulfur and certain pesticide residues in the lees explain the effect of juice turbidity on the formation of light sulfur-containing compounds.”

– Ribéreau-Gayon *et al* (2000)

■ Handbook of Enology Vol.1 – The Microbiology of Wine and Vinifications

Barrel Fermentation

- 228 L French oak pièces
- François Frères
- Gillet
- Seguin-Moreau
- Mercurey
- Taste **all** new barrels **every** year

Barrel Conditioning

- 55°C warm water
- Approximately 10 L rotary spray rinse
- ~1 minute
- 10 L warm water in barrel, soak on one head 6 hours, then drain
- 10 L warm water in barrel, soak on other head 6 hours, then drain
- Critical step

New Barrels %

- Estate = 20 %
- Coddington = 25 %
- Hunting Hill = 25 %
- Mate's Vineyard = 30 %

New Barrels %

- Village = Old barrels + Stainless Steel
- Rays Road = 100% Old barrels
- RR Single Vineyard Mendoza = < 5 %

New Barrels %

- $228 \text{ L} = 85 \text{ cm}^2/\text{L}$

- $500 \text{ L} = 67 \text{ cm}^2/\text{L}$

- -22%

- Need to adjust % of new oak



Nutrition: Oxygen

- Addition of 1.5 ml / L pure oxygen gas
- Day 1 + day 2 of visible fermentation
- Also midway through fermentation
- Equipment built in-house
 - Nigel Tibbits (2003) *Aust. Grapegrower & Winemaker*







Indigenous Yeast

- Since 1984 with reds
- 1986 with whites
- Less yeast dominance on aroma
- Better mouthfeel
- Better expression of vineyard and variety

Indigenous Yeast

- Dr Mat Goddard
- Dr Richard Gardner
- Student projects by
 - Richard Warren
 - Casey Jun
 - Kelsey Serjeant
 - Duncan Darroch



Indigenous Yeast - Warren (2004)

- *Saccharomyces cerevisiae*
- *Pichia fermentans*
- *Hansenia uvarum*
- *Candida zemplinina*
- *Issatchenkia orientalis*
- *Issatchenkia terricola*
- *Zygosaccharomyces bailii*
- *Hanseniaspora occidentalis*
- Unknown species SCH-47



THE UNIVERSITY OF AUCKLAND
NEW ZEALAND

Indigenous Yeast - Warren (2004)

- *S. cerevisiae* dominant species. Only species found at the end of fermentation
- Barrels were one likely source of different strains of *S. cerevisiae*
- Wineries that regularly use commercial yeasts had mostly escaped commercial strains in their wild ferments.



Indigenous Yeast – C.Jun (2006)

- *S. cerevisiae* initially very rare
- Non- *Saccharomyces* relatively high numbers at start of ferment
- Significant contribution at that stage
- Species diversity collapses mid-ferment
- *S. cerevisiae* dominates right through to end of ferment

Thermal Profile – Serjeant (2007)

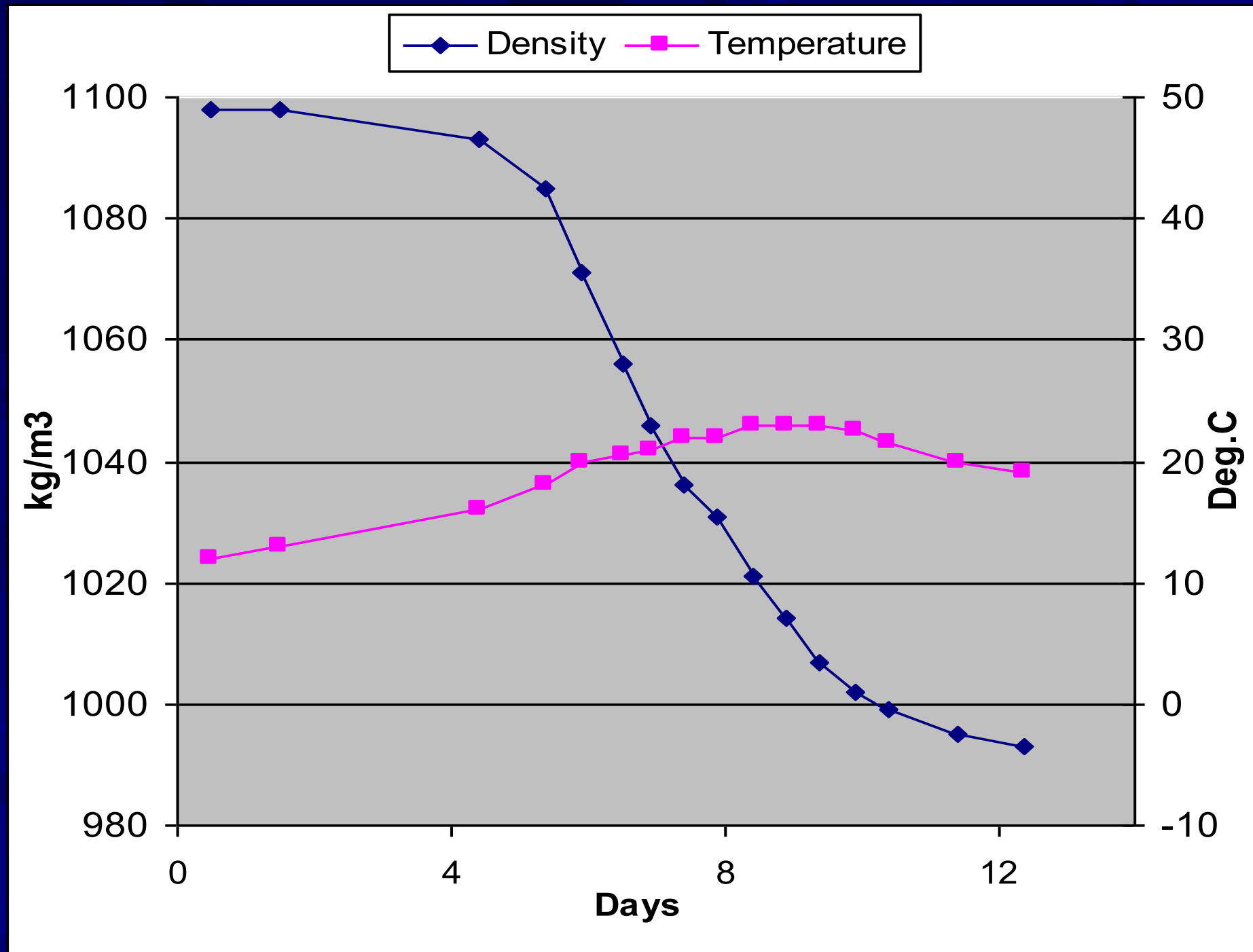
- Advantage for *S. cerevisiae* is greater at temperatures $>20^{\circ}\text{C}$
- Colder temperatures may favour Non- *Saccharomyces* species

Pied-de-Cuve ?

Our technique of wild-yeast fermentation is **not** the same as using a *pied-de-cuve*.

If you make a *pied-de-cuve* for inoculation, then all that remains are several strains of *Saccharomyces cerevisiae*, which will then carry out the entire fermentation from start to finish.





Fermentation Temperature

“At very high temperatures (28-30°C), the rapid release of carbon dioxide entrains certain substances, causing aroma loss, but lower temperature fermentations at 18°C or at 23-24°C do not necessarily produce wines with a significant varietal aroma difference.....”

Fermentation Temperature

“....Fermentations at 18°C or lower are therefore not a means of enhancing the fruit characters of aromatic varieties.”

– Ribéreau-Gayon *et al* (2000)

■ Handbook of Enology Vol.1 – The Microbiology of Wine and Vinifications

Fermentation Temperature

- Aim to keep barrel fermentation temperatures in the 20 – 24°C range
- Tank fermentations controlled to 20°C

Nutrition: Nitrogen

- Previously: Standard addition of 0.1 – 0.2 g/L diammonium phosphate (DAP)
- But, is this really necessary?

Nutrition: Nitrogen

■ YAN levels in juice (2006):

– Pinot Noir	251 mg/L
– Pinot Noir	328 mg/L
– Chardonnay	275 mg/L
– Chardonnay	268 mg/L
– Chardonnay	226 mg/L

■ 2007: No DAP added.

Influence of Lees

- Lees maturation of white wines now very common, especially Chardonnay
- Usually in barrel
- Benefits:
 - Protection from Oxidation
 - Improved mouthfeel
 - Greater complexity
- Total Time in barrel: 11 months

Influence of Lees: Barrels

- Lees are kept in suspension by stirring, or “Batonnage”
- Yeast lees are reductive, provide protection from oxidation
- Oxygen from the wood, especially the bung hole, prevents excessive reduction

Malo-lactic Fermentation

- Primarily for deacidification
- Diacetyl by-product
- Possible to reduce diacetyl with extended time on yeast lees
 - Bartowsky & Henschke, 2004

Malo-lactic Fermentation

- Previously inoculated several barrels with commercial strain, then spread
- Now, wait for spontaneous MLF in barrels then use these for inoculum
- Spontaneous MLF much more likely in **new** barrels

Fining

- Proteinaceous. eg Gelatin, Casein
- Work smarter at the pressing stage to eliminate the need for such fining
- → No fining necessary

Fining

- Check for protein instability
- Stability test: 40°C for 48 hours
- After barrel fermentation, and time on yeast lees, bentonite rarely necessary

Filtration

- Lenticular filters used previously
- Slow and painstaking
- Obvious effect on sensory attributes

Filtration

- Crossflow filter used since 2016
- Neutral effect on wine quality



Membrane Filtration

- Membranes immediately prior to filling machine
- 0.8 micron nominal prefilter
- 0.65 micron final filter

Bottling

- Low vacuum gravity filler, 12 heads
- ~ 2000 bottles / hour
- Laminar flow into bottle
- Minimal Oxygen pickup < 0.3 mg/L

Bottling

- Low vacuum gravity filler, 12 heads



Bottling

- Laminar flow, re-machined surfaces



Bottling

- Laminar flow into bottle, centering bell
- Minimal Oxygen pickup < 0.3 mg/L



Bottling

■ SO₂ addition to ~ 40 mg/L Free

■ Village 2025 42 / 111

■ Rays Road 2024 40 / 131

■ Estate 2024 42 / 128

■ Mate's Vineyard 2019 39 / 131

Closures

- Stelvin, with Saran-tin liner
- 30 mm for Village, Estate, Rays Road
- 31.5 mm for Single Vineyards
- Diam 30 for 3 L double magnums

Summary

- Hand harvest
- Whole-bunch pressing
- Sulfur dioxide
- Settling
- Juice Turbidity
- Barrels
- Wild Yeast
- Oxygen

Summary

- Temperature
- Nitrogen
- Batonnage – Lees Ageing
- Malo-lactic fermentation
- Fining
- Filtration
- Bottling
- Closures

