



Enhanced Maturity Trial 2016- Wine Evaluation

Isosceles Vineyard, Te Mata Estates
Maraekakaho Rd, SH50,
Hastings

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Prepared by:

Helen Henry

Reviewed by:
Ant Mackenzie
Consultant winemaker
Hawke's Bay

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1.0 Introduction

Henry Manufacturing Limited conducted an Enhanced Maturity Trial on a Te Mata Estate vineyard (Isosceles) on Maraekakaho Rd, Hawke's Bay (the Triangle).

From that trial, 12 micron wines were made by Karen Ball at the Eastern Institute of Technology (EIT), Hawke's Bay. The white grapes were fermented off skins and the red grapes were fermented on skins.

The treatments for each wine are described in Table 1.

Table 1: Description of Treatments

Treatments	Chardonnay	Syrah	Merlot
Control	Control	Control	Control
HML32 plus Silco sprayed once (HML32Plus)	Treatment 8	Treatment 4a	Treatment 4a
HML32 sprayed once (HML32Once)	Treatment 19	Treatment 13a	Treatment 13a
HML32 sprayed twice (HML32Twice)	Treatment 26	Treatment 22a	Treatment 22a

This report presents a summary of the winemaking process and a qualitative comparative evaluation of the 12 microvin wines.

For further information about the timing of the treatment applications, refer to the full report 'Enhanced Maturity and Botrytis Trial 2016' available from Chris Henry, Henry Manufacturing Limited or from the website www.henrymanufacturing.co.nz.

2.0 Winetasting Workshops

Wine tasting of the three wine flights were presented at three workshops - Gisborne, Hawke's Bay and Blenheim. An open invitation to winemakers and viticulturalists was made. Ant Mackenzie led the evaluation and discussion.

Winemakers had an opportunity to taste the wines and evaluate and discuss the differences then rank them in preference. At the Hawke's Bay workshop it was done blind; at the Gisborne and Blenheim workshops, participants knew which treatments they were tasting to assist in the evaluation.

3.0 Fermentation and Winemaking Process

The fermentation and winemaking process is described in Figure 1 and Figure 2. There were no acid or sugar adjustments and they were not fined in any way. No copper was added prior to bottling. This resulted in degrees of reductive notes but it was very minor and did not affect the subsequent qualitative evaluation of differences.

Figure 1: Flow Diagram for the Microvinification of Red Wine Varieties at EIT Winery

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Figure 1: Flow diagram for the Microvinification of Red Wine Varieties at EIT Winery

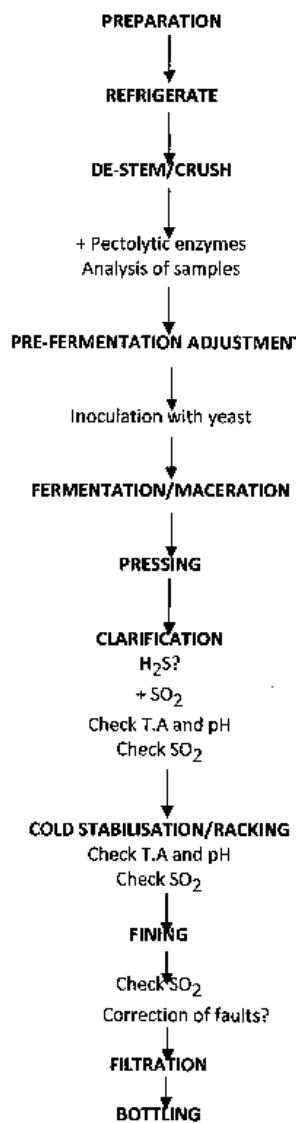
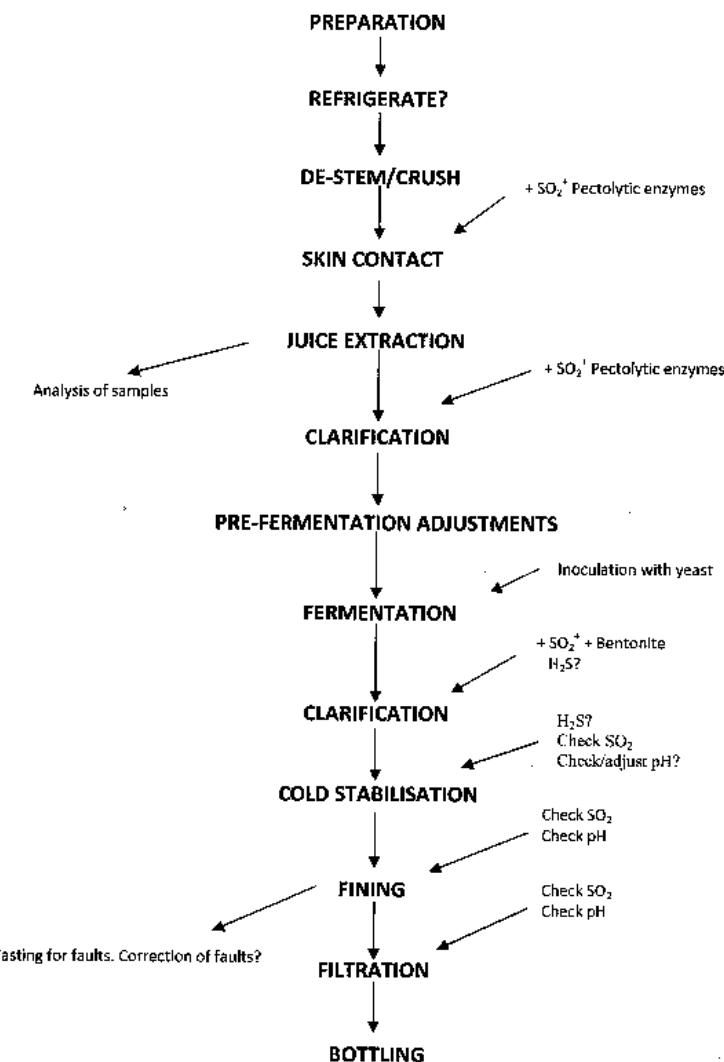


Figure 2: Flow Diagram for the Microvinification of White Wine Varieties at EIT Winery

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Figure 2: Flow diagram for Microvinification of White Wine Varieties at EIT Winery



4.0 Chardonnay

4.1. Wine making and Fermentation

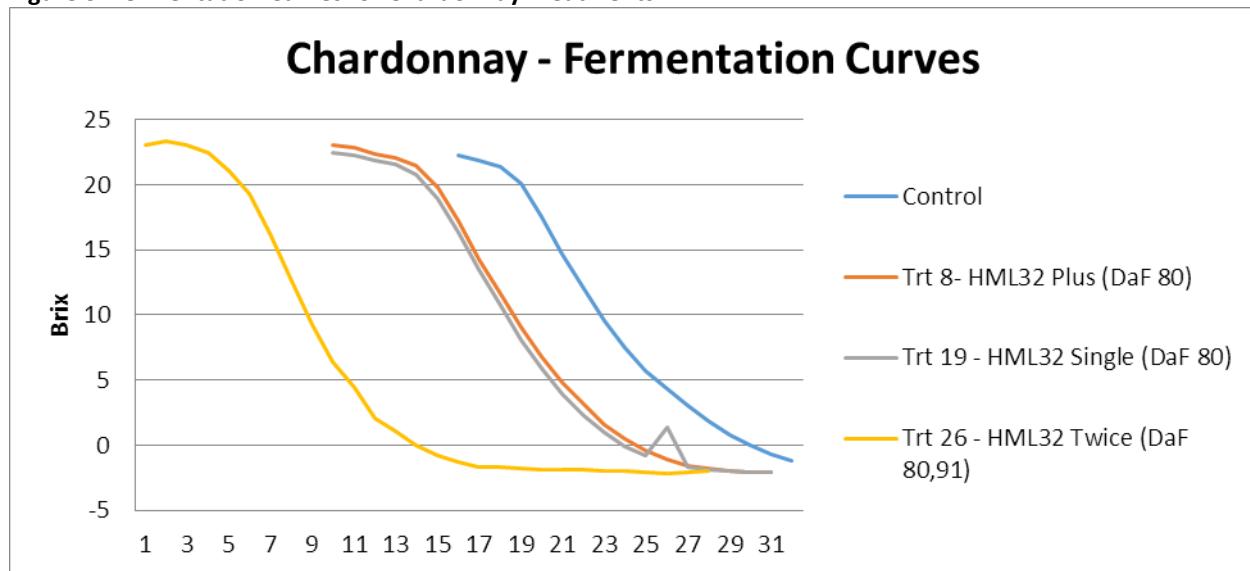
The four replicates of Chardonnay Treatments 8, 19 and 26 and the Control were harvested at a target brix of 22.5. The pH, TA and Brix of the juice is shown in Table 2, along with the date of harvest.

Table 2: Juice - pH, TA and Brix of Chardonnay Treatments and Control

	Date of harvest	pH	TA	Brix
Control	22 March 2016	3.27	7.94	22.3
Treatment 8 (HML32Plus)	15 March 2016	3.33	7.80	23.0
Treatment 19 (HML32Single)	15 March 2016	3.26	7.76	22.5
Treatment 26 (HML32Twice)	8 March 2016	3.22	9.57	23.3

Fermentation proceeded evenly as shown by the curves for each of the four wines in Figure 3. These indicate that the treatments did not affect the fermentation process. The wines were placed in the chiller after ferment and then racked off and bottled.

Figure 3: Fermentation Curves for Chardonnay Treatments



Note: DaF means days after 5% flowering

4.2. Comparative Sensory Evaluation

While it was an informal evaluation, most participants detected favourable differences in the treated Chardonnay wines when compared to the control, as well as between the treatments. When ranking their preference, any one of the treatment wines was generally the first preference compared to the control wine. One Marlborough winemaker thought the control presented classic Chardonnay elements and that the other wines would have needed some acid adjustment. However, all wines were of commercial wine quality indicating that the treatments did not have any downside to final wine quality; rather they enhanced wine quality in a number of different ways.

Ant Mackenzie's evaluation of the Chardonnay wines is summarised as:

At the Hawke's Bay workshop I did not detect a big difference between the wines but now knowing what they are, I do detect some differences. The last wine (Treatment 26 HML32 sprayed twice) was my preference but my 2nd preference was the control. The last wine was the richest, softest and the roundest yet it was the highest TA. Treatment 26 was harvested two weeks ahead of the control; if it had been left to hang on the vine for as long as possible, I would expect even more enhanced characteristics.

His tasting notes are provided in Appendix 1.

5.0 Syrah

5.1. Wine making and Fermentation

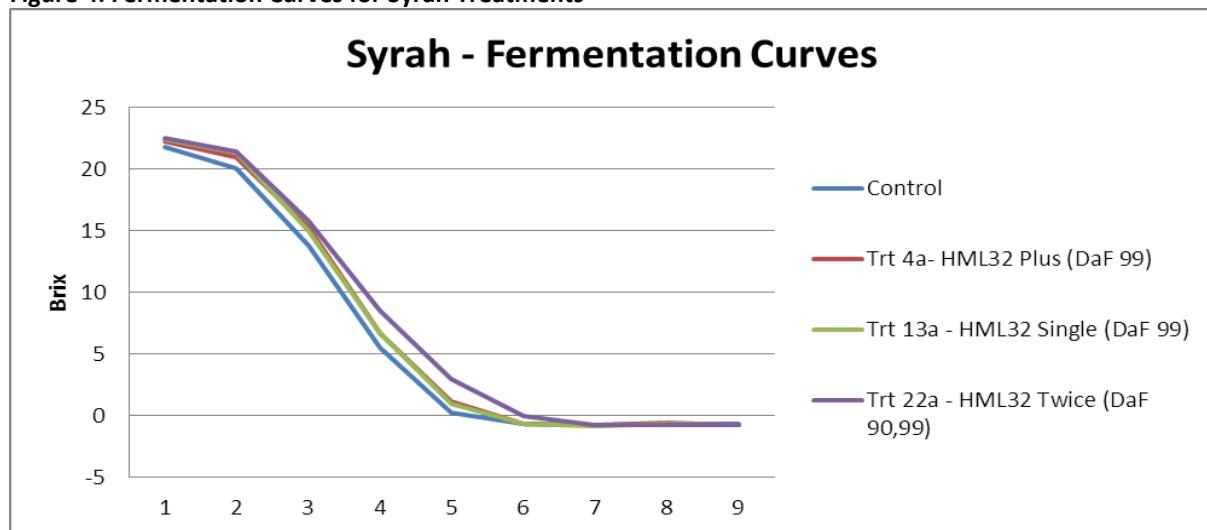
The four replicates of Syrah Treatments 4a, 13a and 22a and the Control were harvested on the same day - 29 March 2016. It was understood that commercial harvest was imminent but it was another week before it was harvested. The pH, TA and Brix of the juice as measured the next day is shown in Table 3.

Table 3: Juice - pH, TA and Brix of Syrah Treatments and Control - 30 March 2016

Juice	pH	TA	Brix
Control	3.16	8.20	21.8
Treatment 4a (HML32Plus)	3.17	8.20	22.2
Treatment 13a (HML32Single)	3.20	7.95	22.4
Treatment 22a (HML32Twice)	3.18	7.9	22.5

Fermentation on skins proceeded evenly as shown by the curves for each of the four wines made from the Syrah in Figure 4. These indicate that the treatments did not affect the fermentation process.

Figure 4: Fermentation Curves for Syrah Treatments



Note: DaF means days after 5% flowering

The unfiltered fermented wine (pre cold stabilisation) was analysed by AWRI wine cloud and the tannins and phenolics are shown in Table 4. The treatments show an increase in tannins and phenolics over the control.

Table 4: Unfiltered Syrah wine after fermentation, pre cold stability Tested AWRI 11 March 2016

Wine Cloud	Vintage	Total Tannins	Total Pigments	Total Phenolics	Pigmented Tannins	Free Anthocyanins
Control	2016	0.68	20.81	40.85	0.84	19.41
Treatment 4a (HML32Plus)	2016	0.78	24.68	44.57	0.88	23.22
Treatment 13a (HML32Single)	2016	0.77	25.96	45.24	0.86	24.53
Treatment 22a (HML32 Twice)	2016	1.12	32.08	54.72	0.91	30.56

Note 1:Tannin recorded in g/L epicatechin equivalents

Note 2: Other results recorded in Absorbance Units and are therefore comparative results not quantitative.

5.2. Comparative Sensory Evaluation

For the Syrah wines, all participants detected favourable differences in the wines when compared to the control and between the treatments. Descriptions ranged from peppery spice to fruity spice and preferences were varied across the treatments. Treatment wines were found to have more mid palate weight and concentrate than the control which was a bit thinner. Discussion in Hawke's Bay in particular was around how each wine might be used. Again, all wines were of commercial wine quality.

Ant Mackenzie's evaluation of the Syrah wines is summarised as:

There is a bigger range of differences in these wines which all had the same residual sugar. I found the treatment of HML32 sprayed twice sweeter, richer and more supple with tannins at the front of the palate and more fruit and spice notes. Treatment 4a (HML32 with Silco sprayed once) was also spicy but with gamey notes. It was vibrant and bright. The control I found to have slighter greener tannins, good richness and back palate.

His tasting notes are provided in Appendix 1.

6.0 Merlot

6.1. Wine making and Fermentation

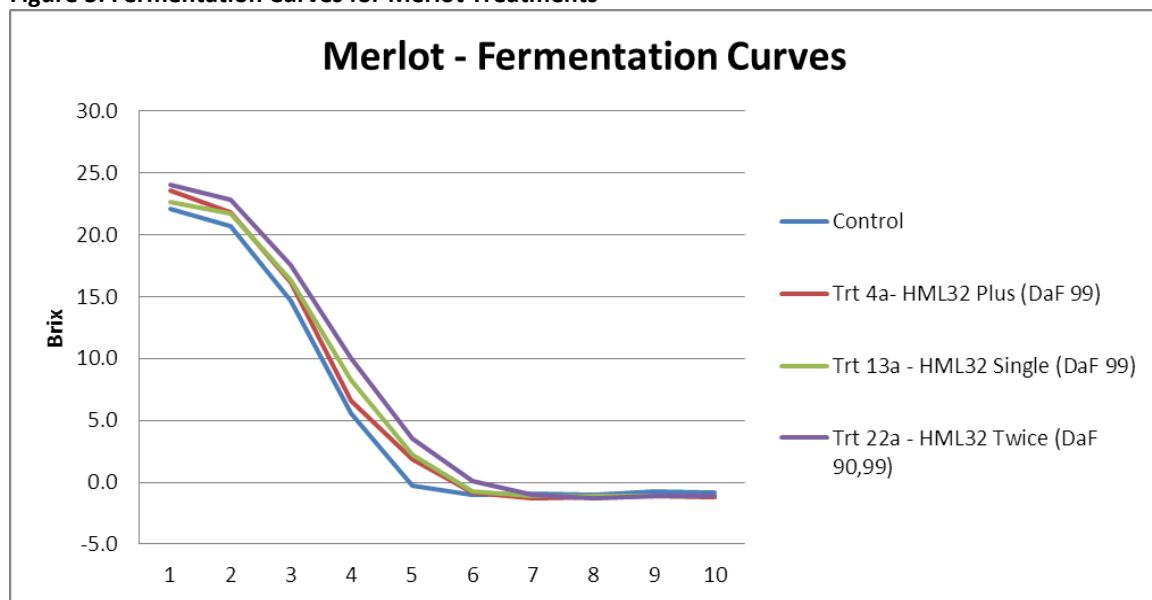
The four replicates of Merlot Treatments 4a, 13a and 22a and the Control were harvested on the same day -29 March 2016 (just ahead of the commercial harvest). The pH, TA and Brix of the juice as measured the next day is shown in Table 5.

Table 5: Juice - pH, TA and Brix of Merlot Treatments and Control - 30 March 2016

Juice Values	pH	TA	Brix
Control	3.37	6.10	22.1
Treatment 4a (HML32Plus)	3.41	5.70	23.6
Treatment 13a (HML32Single)	3.36	6.10	22.6
Treatment 22a (HML32Twice)	3.38	5.95	24.0

Fermentation on skins proceeded evenly as shown by the curves for each of the four wines made from the Merlot in Figure 5. These indicate that the treatments did not affect the fermentation process.

Figure 5: Fermentation Curves for Merlot Treatments



Note: DaF means days after 5% flowering

The unfiltered fermented wine (pre cold stabilisation) was analysed by AWRI wine cloud and the tannins and phenolics are shown in Table 6. The treatments show an increase in tannins and phenolics over the control.

Table 6: Unfiltered Merlot wine after fermentation, pre-cold stability Tested AWRI 11 May 2016

Wine Cloud	Vintage	Total Tannins	Total Pigments	Total Phenolics	Pigmented Tannins	Free Anthocyanins
Control	2016	0.82	14.89	39.98	0.86	13.46
Treatment 4a (HML32Plus)	2016	1.16	26.32	51.36	1.00	24.65
Treatment 13a (HML32Single)	2016	1.38	33.41	58.55	1.19	31.42
Treatment 22a (HML32 Twice)	2016	1.56	36.62	62.73	1.36	34.35

Note 1:Tannins recorded in g/L epicatechin equivalents

Note 2: Other results recorded in Absorbance Units and are therefore comparative results not quantitative.

6.2. Comparative Sensory Evaluation

For the Merlot wines, all participants detected favourable differences in the wines when compared to the control and between the treatments. The treatment wines were plusher and more vibrant. There was a clear enhancement of colour in the treatments as reflected in the wine cloud analysis compared to the control.

Again, all wines were of commercial wine quality.

Ant Mackenzie's evaluation of the Merlot wines is summarised as:

All three treated wines were better than the control. The treatment of HML32 sprayed twice had a broader flavour spectrum with tannins that coats the whole mouth and my second preference was HML32 and Silco (Treatment 4a) which was full, rich, plums and spice with front phenolics. The control was slighter greener, tarry with an edgier palate.

His tasting notes are provided in Appendix 1.

7.0 Summary

All treatment wines in all three varieties were found to have enhanced elements over the respective control wines.

For the Chardonnay, the achievement of hitting the target brix 2 weeks ahead of the control can have benefits in terms of avoiding late season diseases but if conditions allowed it to be left hanging on the vine for those two weeks, further enhancement of the juice quality could be expected.

For the Syrah, all treatment wines provided a greater richness and more tannins over the control, even though the difference in brix was only about half a brix. This provides opportunities to the wine maker for blending as well as the potential to make a higher quality single vineyard wine.

For the Merlot, all treatment wines provided a greater richness over the control with an increase in brix from 0.5 to nearly 2 brix and a significant increase in tannins and phenolics. Heavily cropped Merlot can be difficult to ripen and these treatments were able to ripen and enhance the juice quality.

The ability to enhance ripening and juice quality in the vineyard is an additional tool for winemakers to produce high quality, high value wine.

Appendix 1 - Ant Mackenzie's Tasting notes

Chardonnay	Aroma	Taste	Preference (1 being 1 st)
Control	Lean, citrus, apple	Rich, round, pure, long	3
Treatment 8 (HML32 plus Silco sprayed once)	Lean, citrus, apple	Vibrant palate, full rich long	2
Treatment 19 (HML32 sprayed once)	Leaner, slightly grubby	Bright vibrant palate	4
Treatment 26 (HML32 sprayed twice)	Mineral, citrus, pure	Richer palate but vibrant, slightly salty	1

Syrah	Colour/Aroma	Taste	Preference (1 being 1 st)
Control	Pepper, spice, fruit	Coarse, edgier palate, some tannin	4
Treatment 4a (HML32 plus Silco sprayed once)	Spice, meaty, gamey	Finer, front palate tannins, vibrant, bright	3
Treatment 13a (HML32 sprayed once)	Plush florals, spice, pretty fruit notes	Finer, front palate tannins, rich round	2
Treatment 22a (HML32 sprayed twice)	More dark, fruit, plum, spice notes	Rich, pure, sweeter, supple, front palate, riper notes	1

Merlot	Colour/Aroma	Taste	Preference (1 being 1 st)
Control	Meaty	Slightly greener, coarser palate	4
Treatment 4a (HML32 plus Silco sprayed once)	Finer florals, plums, cassis	Sweeter, richer, front phenolics	2
Treatment 13a (HML32 sprayed once)	Meaty, dense, a greener edge	Graphite, broader tannins	3
Treatment 22a (HML32 sprayed twice)	Fine pure rose, aromatic	Sweet, rich, mouth coating tannins	1