The Effect of Grape Temperature at Pressing on Phenolic Extraction and Evolution in Méthode Cap Classique Wines Throughout Winemaking

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Appendix A: Vinification and oenological parameters

TABLE A1
Oenological data of 2014 juice samples for Robertson and Darling farms.

	Chardonnay				Pinot noir			
Robertson	**0°C**	**10°C**	**25°C**	**30°C**	**0°C**	**10°C**	**25°C**	**30°C**
pH	3.08	3.09	3.18	3.17	3.22	3.17	3.20	3.19
TA	7.34	8.81	4.15	6.77	5.52	6.56	5.43	8.53
Sugar	19.3	18.2	22.6	17.8	22.2	21.1	24.2	15.1
SO_2 (total)	6	6	6	6	6	7	11	12
SO_2 (free)	4	3	3	3	3	3	3	2
Darling	**0°C**	**10°C**	**25°C**	**30°C**	**0°C**	**10°C**	**25°C**	**30°C**
pH	3.06	3.12	3.25	3.18	3.14	3.21	3.28	3.26
TA	10.79	12.80	12.84	13.61	13.47	11.98	11.69	12.91
Sugar (ºB)	17.5	18.8	16.6	16.5	18.5	17.5	16.3	15.8
SO_2 (total)	6	7	15	10	11	14	19	12
SO_2 (free)	3	3	3	3	3	2	3	3

Note: samples were taken without replicates; hence, no statistical values indicated. SO_2 (mg/L); TA - titratable acidity (g/L).

TABLE A2
Oenological data of the 2014 Robertson and Darling blends, the wines after the second fermentation (T2M), and the final wines aged for nine months (T9M).

	Blends				T2M				T9M			
Darling	**0°C**	**10°C**	**25°C**	**30°C**	**0°C**	**10°C**	**25°C**	**30°C**	**0°C**	**10°C**	**25°C**	**30°C**
pH	2.79i	2.82i	2.97efg	2.95fgh	2.87hi	2.91gh	3.14c	3.04de	3.03def	3.10cd	3.35a	3.24b
TA	11.87ab	10.49bc	10.08bc	9.25c	12.02ab	12.63a	10.14bc	11.93ab	11.88ab	10.50abc	9.46c	9.98bc
VA	0.20d	0.24cd	0.26cd	0.40ab	0.24cd	0.41ab	0.46ab	0.44ab	0.23cd	0.28cd	0.49a	0.34bc
RS	2.47a	2.30a	2.23ab	2.30a	1.62cd	1.66cd	1.89bc	1.69c	1.02e	1.06e	1.32de	1.24e
SO_2 (total)	68a	33cd	44b	35c	66a	34c	25d	34c	35c	34c	35c	35c
SO_2 (free)	9b	4de	3e	5cde	6c	6cd	9b	6c	12a	13a	14a	13a
Alcohol	9.89de	9.49e	9.00f	9.04f		10.83a	10.37cd	10.37bc	10.60ab	10.05cd	10.01cd	9.68bc
Robertson	**0°C**	**10°C**	**25°C**	**30°C**	**0°C**	**10°C**	**25°C**	**30°C**	**0°C**	**10°C**	25°C	30°C
pH	2.89def	2.82ef	3.00cde	3.01cde	2.75f	2.94ed	2.99cde	3.06bcd	3.21ab	3.14abc	3.29a	3.33a
TA	8.13bcd	8.22bcd	7.29d	7.23d	9.56a	9.55a	8.91ab	8.62abc	9.41a	9.62a	7.70cd	7.51d
VA	0.27cde	0.20f	0.23def	0.21ef	0.28cde	0.26def	0.29bcd	0.35ab	0.41a	0.38a	0.34abc	0.35ab
RS	1.66bc	1.50bc	1.74bc	2.05bc	1.33bc	1.45bc	1.66bc	2.60b	1.12c	1.10c	2.43bc	4.43a
SO_2 (total)	36abc	35abc	31bc	28c	40a	38ab	30c	29c	31bc	36abc	33abc	38ab
SO_2 (free)	8d	8cd	7d	8d	10cd	10cd	9cd	9cd	14ab	14ab	11bc	15a
Alcohol	10.93bc	10.78c	10.45c	10.70c	12.18a	12.07a	11.60ab	12.01a	11.65a	11.54ab	11.90a	11.98a

Note: Values are averages over triplicate samples, with statistical differences calculated at $p < 0.05$ across treatments and winemaking stages. TA - titratable acidity (g/L), VA - volatile acidity (g/L), RS - residual sugar (g/L), SO_2 (mg/L), alcohol (% v/v ethanol).

TABLE A3
Oenological data of the 2015 Robertson and Darling blends, the wines after the second fermentation (T2M), and the final wines aged for nine months (T9M).

	Blends				T2M				T9M			
Robertson	**0°C**	**10°C**	**25°C**	**30°C**	**0°C**	**10°C**	**25°C**	**30°C**	**0°C**	**10°C**	**25°C**	**30°C**
pH	3.18cd	3.29c	3.24cd	3.31c	3.60ab	3.63ab	3.41bc	3.05d	3.69a	3.75a	3.34c	3.26cd
TA	7.62bc	7.21bc	8.45ab	7.16bc	7.78bc	7.45bc	9.17a	8.18ab	7.52bc	6.47c	7.67bc	7.19bc
VA	0.44ed	0.57cd	0.76ab	0.51ed	0.22f	0.43e	0.64bc	0.20fg	0.08g	0.26f	0.83a	0.28f
RS	1.04cd	1.22cd	2.15abc	1.50cd	2.03bcd	2.87ab	3.20a	1.03d	1.15cd	1.07cd	1.01d	1.07cd
TSO2	33bcd	29cde	38ab	31cde	42a	37abc	34abcd	25de	33bcd	23e	32bcde	28de
FSO2	15a	8ef	7fg	8fg	11cd	12bc	9def	6g	12bc	13ab	10de	8ef
Alcohol	11.71cd	11.65de	10.98g	11.33ef	12.11b	11.84bcd	11.11fg	10.98g	12.47a	12.07b	11.30fg	12.00bc
Darling	**0°C**	**10°C**		**30°C**	**0°C**	**10°C**		**30°C**	**0°C**	**10°C**		**30°C**
pH	3.34d	3.48cd		3.45cd	3.56bc	3.69ab		3.72a	3.57bc	3.66ab		3.78a
TA	9.16ab	8.33c		8.62bc	9.56a	8.70bc		9.07ab	9.21ab	8.76bc		7.03d
VA	0.42d	0.54c		0.73a	0.46cd	0.48cd		0.65b	0.13e	0.16e		0.66ab
RS	1.05d	1.07d		1.40cd	2.63b	3.77a		3.00b	1.40cd	1.15cd		1.73c
TSO2	16bcd	14d		12d	21ab	23a		14d	20abc	22a		14cd
FSO2	6bcd	5de		4e	5de	6cde		5de	7abc	8a		7ab
Alcohol	11.24cd	11.28cd		11.01d	11.48abc	11.37bc		11.27cd	11.70ab	11.70a		11.53abc

Note: Values are averages over triplicate samples, with statistical differences calculated at $p < 0.05$ across treatments and winemaking stages. TA - titratable acidity (g/L), VA - volatile acidity (g/L), RS - residual sugar (g/L), SO_2 (mg/L), alcohol (% v/v ethanol).

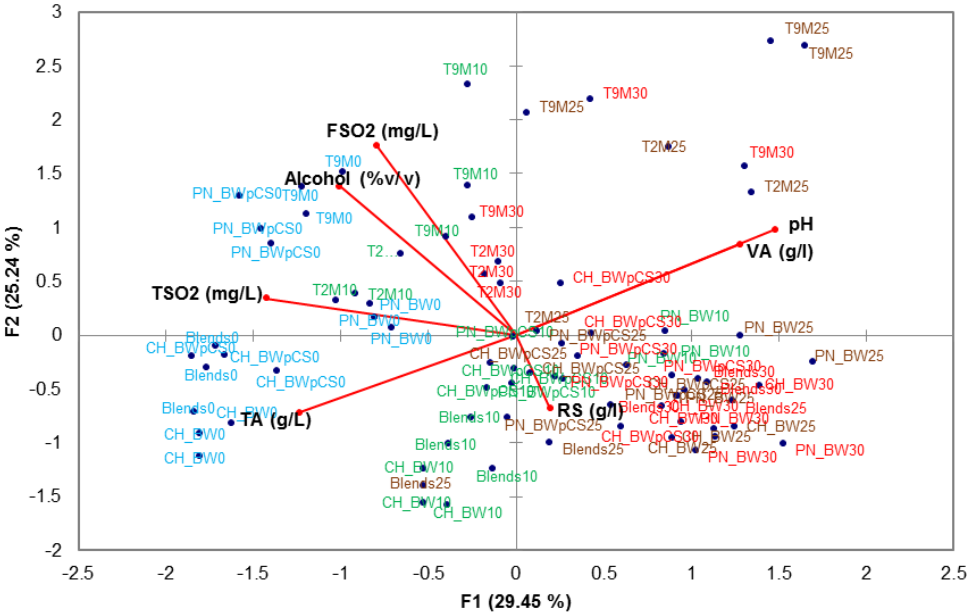

FIGURE A1

Principal component analysis (PCA) biplot of the 2014 Darling oenological parameters (total sulphur dioxide - TSO2, free sulphur dioxide - FSO2, titratable acidity - TA, volatile acidity - VA, residual sugar - RS, pH and alcohol) for Chardonnay (CH) and Pinot Noir (PN) wine samples. Wines sampled before (CH_BW and PN_ BW) and after (CH_BWpCS and PN_BWpCS) cold stabilisation, after the second fermentation (T2M), and the final wines aged for nine months (T9M).

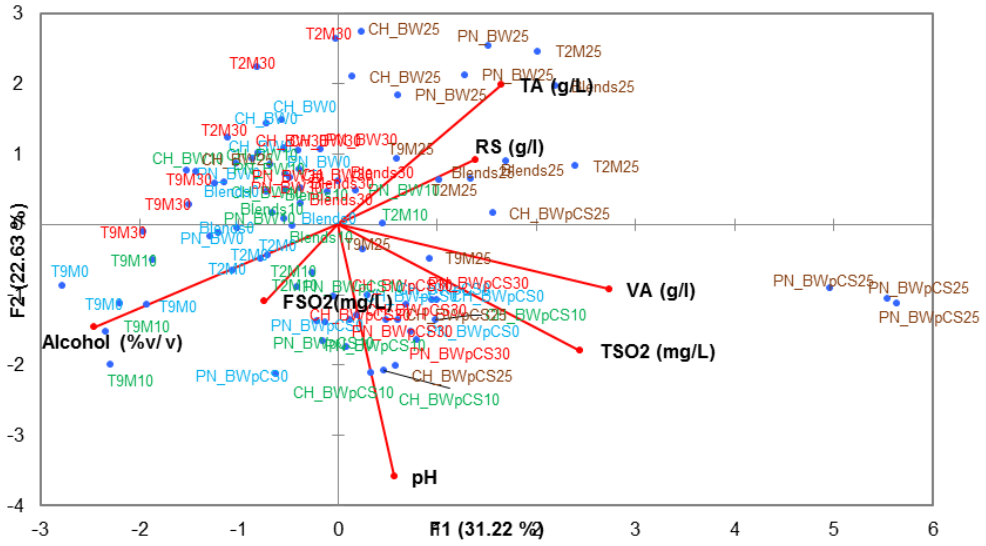

FIGURE A2

PCA biplot of the 2015 Robertson oenological parameters (total sulphur dioxide - TSO2, free sulphur dioxide - FSO2, titratable acidity - TA, volatile acidity - VA, residual sugar - RS, pH and alcohol) for Chardonnay (CH) and Pinot Noir (PN) wine samples. Wines sampled before (CH_BW and PN_ BW) and after (CH_BWpCS and PN_BWpCS) cold stabilisation, after the second fermentation (T2M), and the final wines aged for nine months (T9M).

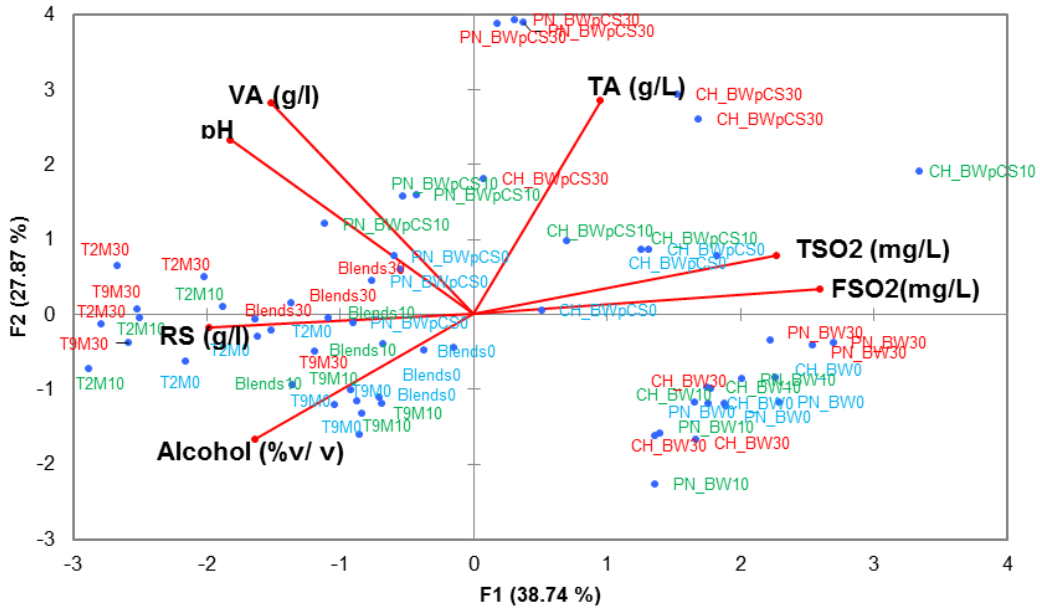

FIGURE A3

Principal component analysis (PCA) biplot of the 2015 Darling oenological parameters (total sulphur dioxide - TSO2, free sulphur dioxide - FSO2, titratable acidity - TA, volatile acidity - VA, residual sugar - RS, pH and alcohol) for Chardonnay (CH) and Pinot Noir (PN) wine samples. Wines sampled before (CH_BW and PN_ BW) and after (CH_BWpCS and PN_BWpCS) cold stabilisation, after the second fermentation (T2M), and the final wines aged for nine months (T9M).

Appendix B: Phenolic analysis

TABLE B1
Colorimetric results for Chardonnay and Pinot noir harvested at Robertson in 2014.

	BW				BWpCS			
Chardonnay	**0°C**	**10°C**	**25°C**	**30°C**	**0°C**	**10°C**	**25°C**	**30°C**
TP	80.32b	95.77ab	81.60b	96.53ab	84.23b	96.37ab	106.11a	101.41a
CI	0.062cd	0.070bcd	0.060d	0.082b	0.103a	0.087ab	0.079bc	0.080b
CH	4.86a	4.28ab	4.85a	3.86bc	2.91d	3.03cd	3.61bcd	3.90b
TH	0.540b	1.17a	1.12a	1.25a	0.74b	1.12a	1.31a	1.27a
Pinot noir	**0°C**	**10°C**	**25°C**	**30°C**	**0°C**	**10°C**	**25°C**	**30°C**
TP	83.76bc	86.85bc	125.57a	121.39a	82.47c	93.58b	121.28a	121.51a
CI	0.109d	0.138cd	0.246ab	0.211b	0.130cd	0.164c	0.269a	0.243ab
CH	1.73a	1.37b	1.01c	1.09c	1.67a	1.40b	1.06c	1.12c
TH	0.422c	0.959b	2.180a	2.120a	0.370c	1.167b	2.201a	2.145a

Note: Values are averages over triplicate samples that were taken separately for each farm at pressing, after temperature treatments, with statistical differences calculated at $p < 0.05$ across treatments and winemaking stages. Total phenolics (TP, in mg/L GAE), total hydroxycinnamates (TH, A_{320} - 2.5 in absorbance units), colour intensity (CI, $A_{420} + A_{520}$ in absorbance units) and colour hue (CH, A_{420}/A_{520} in absorbance units) of Chardonnay and Pinot Noir base wines.

TABLE B2
Colorimetric results for grapes harvested at Robertson and Darling in 2015.

	Blends			T2M			T9M		
Robertson	**0°C**	**10°C**	**30°C**	**0°C**	**10°C**	**30°C**	**0°C**	**10°C**	**30°C**
TP	110.16bcd	107.33cd	143.16a	123.54b	115.56bc	123.01b	108.89bcd	96.09d	115.63bc
CI	0.191cde	0.230c	0.411a	0.169de	0.213cd	0.33b	0.134e	0.134e	0.211cd
CH	3.00a	2.54cd	1.90e	3.03a	2.75bc	2.42d	2.60bcd	2.76b	1.58f
TH	0.992cd	1.250c	2.218b	0.602e	0.767de	0.871de	2.124b	2.245b	2.94a
Darling	**0°C**	**10°C**	**30°C**	**0°C**	**10°C**	**30°C**	**0°C**	**10°C**	**30°C**
TP	120.06e	143.45cde	145.30cd	154.86c	182.26ab	204.04a	128.61de	163.50bc	199.04a
CI	0.389cd	0.524b	0.630a	0.357d	0.520b	0.646a	0.282e	0.440c	0.602a
CH	2.45b	2.21c	2.74a	2.95a	2.45b	2.46b	2.06c	1.65d	1.70d
TH	1.292d	1.529cd	1.206d	1.177d	1.672cd	2.033c	2.793b	3.389a	3.903a

Note: Values are averages over triplicate samples that were taken separately for each farm at pressing, after temperature treatments, with statistical differences calculated at $p < 0.05$ across treatments and winemaking stages. Total phenolics (TP, in mg/L GAE), total hydroxycinnamates (TH, A_{320} - 2.5 in absorbance units), colour intensity (CI, $A_{420} + A_{520}$ in absorbance units) and colour hue (CH, A_{420}/A_{520} in absorbance units) of Chardonnay/Pinot Noir base wines after blending, and bottle aged for two and nine months (T2M and T9M).

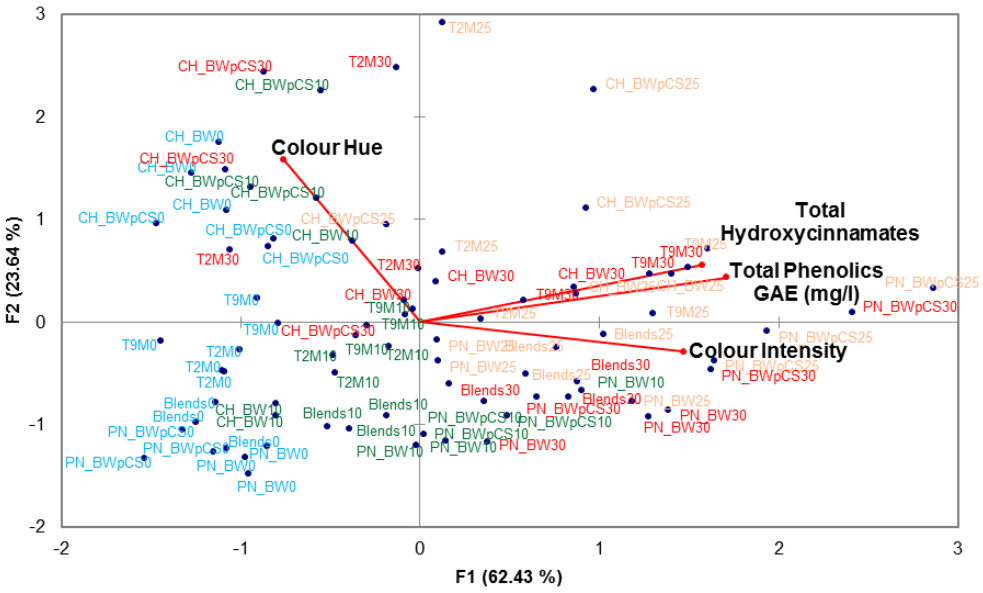

FIGURE B1

Results of the PCA biplot of the colorimetric analysis of the Darling 2014 wine (colour hue, colour intensity, total phenolics in mg/l GAE, total hydroxycinnamates). Wines sampled before (CH_BW and PN_BW) and after (CH_BWpCS and PN_BWpCS) cold stabilisation, after the second fermentation (T2M), and the final wines aged for nine months (T9M).

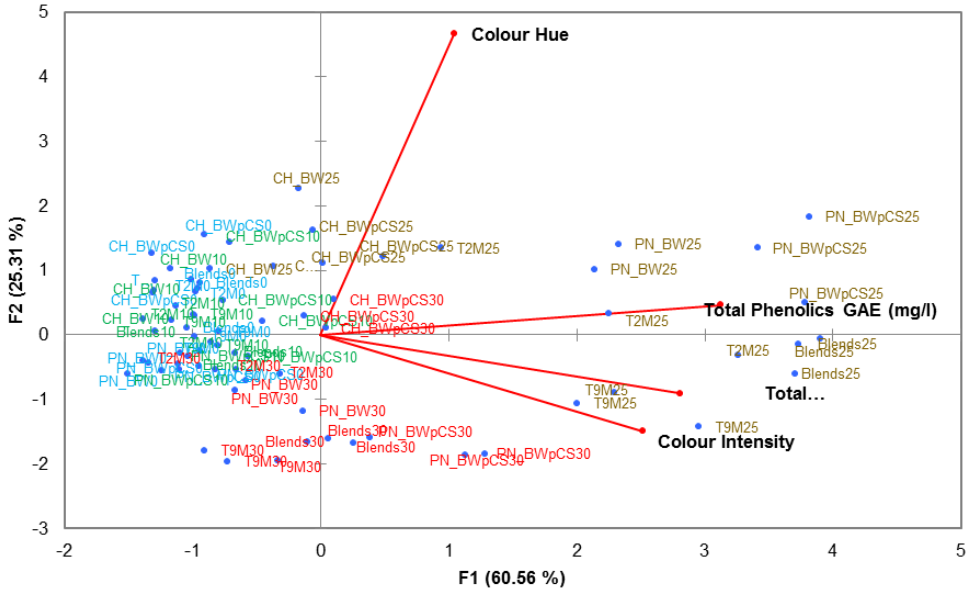

FIGURE B2

Results of the PCA biplot of the colorimetric analysis of the Robertson 2015 wine (colour hue, colour intensity, total phenolics in mg/l GAE, and total hydroxycinnamates). Wines sampled before (CH_BW and PN_BW) and after (CH_BWpCS and PN_BWpCS) cold stabilisation, after the second fermentation (T2M), and the final wines aged for nine months (T9M).