

SUPPLEMENTARY DATA

Table S1. Summary of meteorological data in the two years of study.

	2021	2022
Min. Temperature Apr-Oct (°C)	13.7	14.0
Max. Temperature Apr-Oct (°C)	31.8	32.4
Mean Temperature Apr-Oct (°C)	23.1	23.5
Days with max. temperature > 30°C (n.)	133	143
Rainfall Apr-Oct (mm)	42	21
Average Relative Humidity Apr-Oct (%)	43	42

Table S2. Berry anthocyanins at harvest in 2021 and 2022.

Anthocyanin (mg/kg)	year	C	LR	P	T	sign.
Delphinidin	2021	3.4	3.2	3.6	3.0	ns
	2022	9.3	6.2	4.7	8.5	ns
Cyanidin	2021	3.3	3.3	3.6	3.1	ns
	2022	2.4	1.8	1.3	2.3	ns
Petunidin	2021	8.7	8.2	9.0	8.0	ns
	2022	5.2	3.9	3.7	4.8	ns
Peonidin	2021	15.4	15.1	14.8	13.9	ns
	2022	11.5	8.3	5.4	10.9	ns
Malvidin	2021	201.8	184.5	207.7	178.6	ns
	2022	128.0	93.7	67.5	124.6	ns
Total Glucosides	2021	122.3	112.8	120.8	108.4	ns
	2022	94.7	70.0	51.2	93.8	ns
Total Acetylated	2021	63.8	58.8	69.4	56.5	ns

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	2022	29.8	20.6	13.9	27.2	ns
	2021	46.5	42.6	48.6	41.7	ns
Total Coumarilated	2022	31.9	23.3	17.5	29.8	ns
	2021	18.8	18.3	18.5	17.0	ns
Total 3'4' Hydroxylated	2022	13.9	10.0	6.8	13.3	ns
	2021	213.9	195.9	220.3	189.6	ns
Total 3'4'5' Hydroxylated	2022	142.6	103.8	75.9	137.6	ns
	2021	11.5	10.6	11.9	11.2	ns
Ratio of 3'4'5'/3'4 hydroxylated	2022	10.6	10.5	11.4	10.5	ns
	2021	232.7	214.2	238.8	206.6	ns
Total Anthocyanins	2022	156.4	113.8	82.7	150.9	ns

**Berry anthocyanins content (mg/kg) at harvest in 2021 and 2022. In case of significant ANOVA, different letters across a column indicate significant difference between treatments with a p-value <= 0.05 (Tukey post hoc test). Delphinidin, Cyanidin, Petunidin, Peonidin, and Malvidin are the sum of all the corresponding compounds, including glucosides, acetylated and coumarilated (e.g. for Delphinidin is the sum of Delphinidin-3-glucoside, Delphinidin-3-(acetyl)-glucoside, and Delphinidin-3-(cou)-glucoside). Total Anthocyanins are reported as the sum of Delphinidin, Cyanidin, Petunidin, Peonidin, and Malvidin in all forms. C indicates control, LR indicates leaf removal, P indicates pinolene, and T indicates late topping.*

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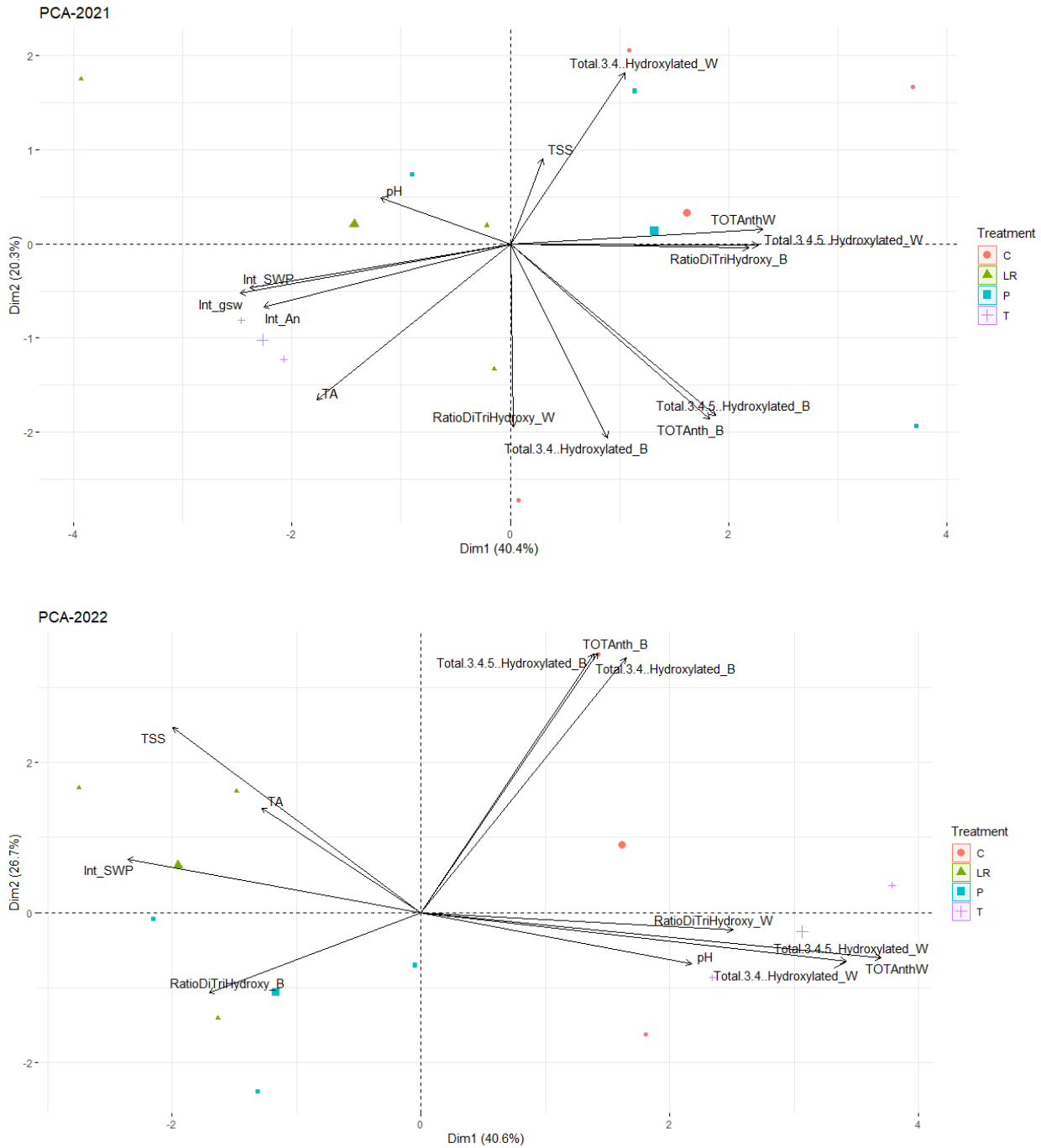


Figure S1. Principal Component Analysis (PCA) of vine physiology, grape characteristics at harvest, and wine properties in 2021 and 2022 for the four treatments: control (C), late above-cluster leaf removal (LR), pinolene (P) and late topping (T). Variables included: Int SWP (Stem Water Potential integrals), Int_gsw (stomatal conductance integrals), Int_An (net assimilation integrals), TSS (total soluble solids), TA (titratable acidity), pH (berry juice pH), Total.3.4..Hydroxylated_B (berry total 3'4' hydroxylated anthocyanins), Total.3.4.5..Hydroxylated_B (berry total 3'4'5' hydroxylated anthocyanins), RatioDiTriHydroxy_B (ratio of 3'4'5'/3'4' hydroxylated anthocyanins in the berries), TOTAnth_B (total anthocyanins in the berries), Total.3.4..Hydroxylated_W (wine total 3'4' hydroxylated anthocyanins), Total.3.4.5..Hydroxylated_W (wine total 3'4'5' hydroxylated anthocyanins), RatioDiTriHydroxy_W (ratio of 3'4'5'/3'4' hydroxylated anthocyanins in the wine), TOTAnth_W (total anthocyanins in the wine).

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Figure S2. Effect of pinolene spraying on epicuticular waxes. Pinolene seems to dissolve waxes; the left shows little yet noticeable effect, and the right shows a very strong effect. The right picture does not belong to the trial in this study, and it is used here for demonstration purposes only; it was obtained in a subsequent trial with higher volumes (same vineyard, variety and clone).