SUPPLEMENTARY DATA

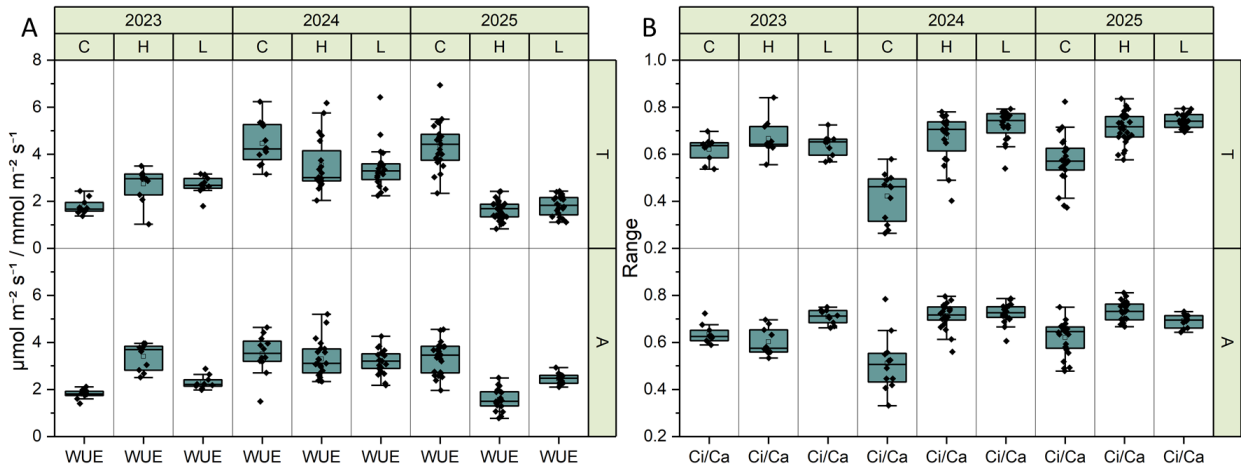


Figure S1. Physiological response to Albariño and Tannat – Physiological response assessed through measurements of [A] water use efficiency (WUE) and [B] internal to ambient CO_2 concentration ratio (Ci/Ca), for Tannat (T) and Albariño (A) cultivars for high and exposed oceanic plots (H), low and less exposed oceanic plot (L), and traditional inland plot (C) across the 2023 (La Niña), 2024 (El Niño), and 2025 (Neutral) growing seasons.

Table S1. Physiological response of Albariño – Evaluation of agronomic parameters for Albariño across the high and exposed oceanic plots (H), low and less exposed oceanic plots (L), and traditional inland region (C), during 2023 (La Niña), 2024 (El Niño), and 2025 (Neutral) growing seasons.

	Sites			Growing season				Interactions	In land site	Difference (oceanic plots mean – inland plot)	
	H	L	*p*-value	2023	2024	2025	*p*-value	(Site x GS)	C	Value	%
ShootN	16	17	ns	14 a	16 a	19 b	0.02	ns	12	5	28
PRw (kg/ha)	3,748	4,055	ns	3,366	4,047	4,292	ns	ns	2,084	1,818	47
ShootW	52	46	ns	49	52	47	ns	ns	44	5	10
BF	1.5	1.6	ns	1.6	1.5	1.5	ns	ns	1.9	–0.3	–19

Abbreviations: ShootN: number of shoots per plant, PRw: pruning weight, ShootW: shoot weight, BF: bud fertility. Different letters indicate significant differences between conditions according to Tukey's test ($p < 0.05$). ns: not significant.

Table S2. Physiological and metabolic response of Tannat – Evaluation of agronomic parameters and berry metabolite composition at harvest for Tannat across the high and exposed oceanic plots (H), low and less exposed oceanic plots (L), and traditional inland region (C), during 2023 (La Niña), 2024 (El Niño), and 2025 (Neutral) growing seasons.

	Oceanic sites			Growing season				Interactions	Inland reference (descriptive)	Δ = Oceanic mean – C	
	H	**L**	***p*-value**	**2023**	**2024**	**2025**	***p*-value**	**(Site x GS)**	C	Value	%
ShootN	11	12	ns	10	12	12	ns	ns	9.7	1.8	16
PRw (kg/ha)	1,826	1,467	ns	1,742	1,683	1,396	ns	ns	1,100	547	33
ShootW	29	24	ns	36 a	29 a	12 b	<.0001	ns	21	5.5	21
BF	1.6	1.6	ns	1.7	1.6	1.6	ns	ns	1.6	0	0
A pH 1 (kg/ha)	38	42	ns	24 b	60 a	36 b	<.0001	ns	16	24	60

Abbreviations: ShootN: number of shoots per plant, PRw: pruning weight, ShootW: shoot weight, BF: bud fertility, A pH 1: extractable anthocyanins at pH 1. Different letters indicate significant differences between conditions according to Tukey's test ($p < 0.05$). ns: not significant.