

Supplementary Material

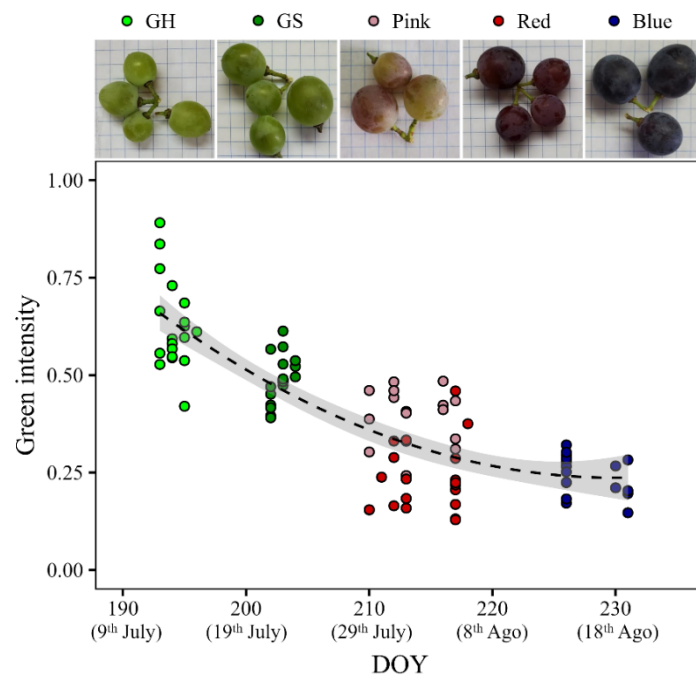


Figure S1. Progression of color change during veraison of Garnacha over successive days of year (DOY) as estimated from ImageJ. Measurements were made in experimental field of the University of Balearic Islands, Majorca during summer 2020 (from 9 July to 18 August). Colors indicate the stage of grape development: green hard (GH), green soft (GS), blush/pink (Pink), red/purple (Red) and blue (Blue), following Hernández-Montes et al (2020, Am J Enol Vitic 72:2).

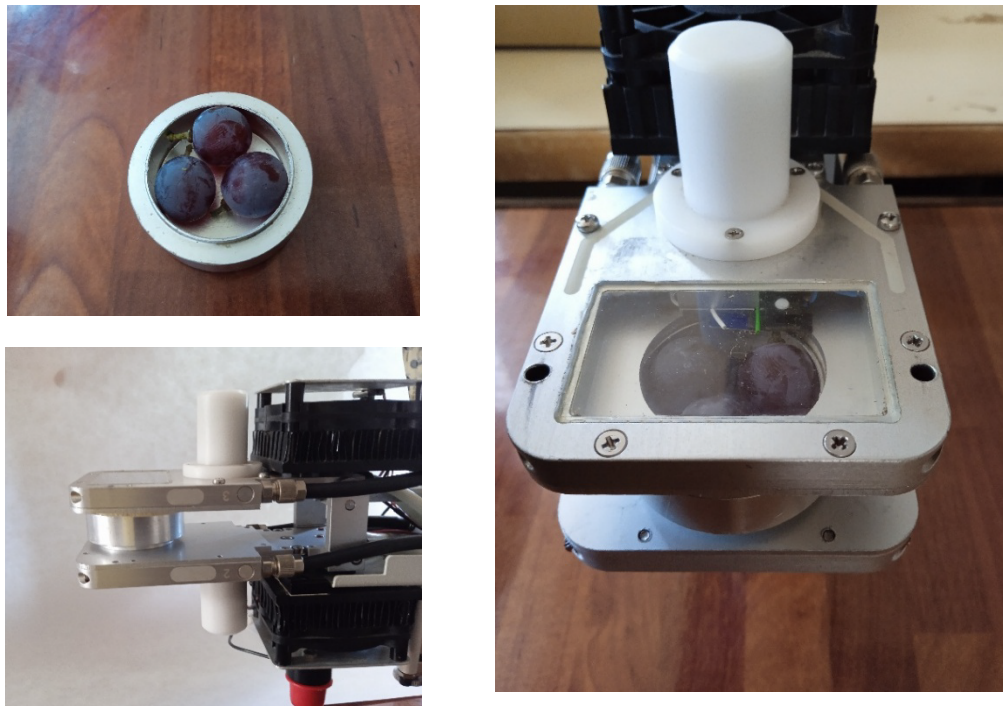


Figure S2. Setup of the GFS-3000 system (Heinz Walz, Effeltrich, Germany) for gas exchange measurements in grape berries. The fluorescence chamber was removed to facilitate illustration. Each sample consisted of 3–4 detached berries collected from the same plant. Berries were placed inside the 3010-P Petri dish cuvette. The chamber was positioned upside down to ensure proper contact between the thermocouple and the berry surface.

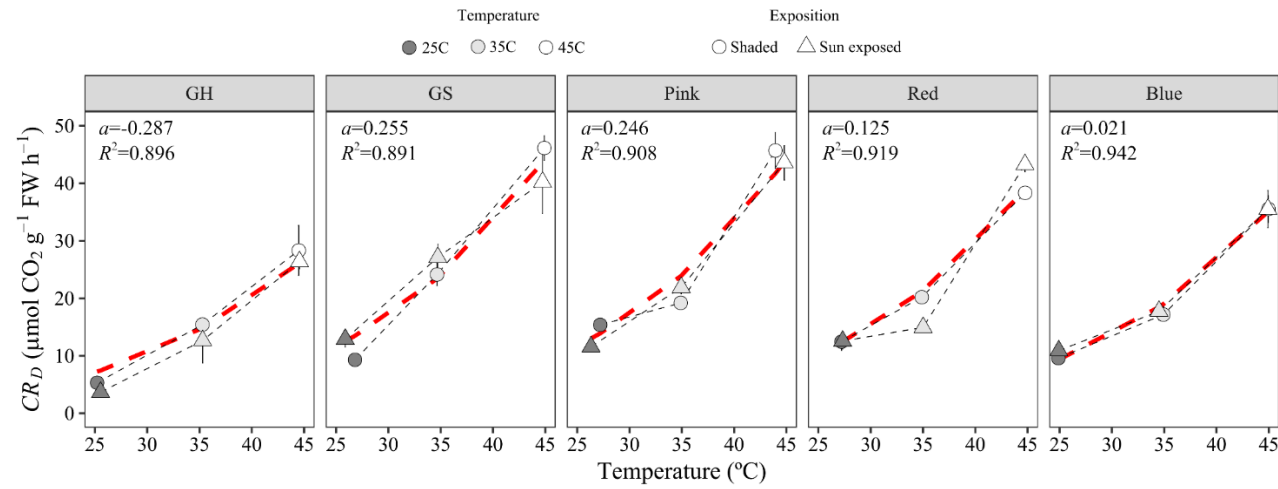


Figure S3. Exponential increase of CO₂ release under dark conditions (CR_D) in response to temperature rise in each stage of grape development. Parameter “ a ” was obtained by the adjustment of all data of each stage to Heskell *et al.* (2016) model: $CR_D = \exp(a + 0.1012T - 0.0005T^2)$, where T is berry temperature. Fittings were done combining data for shaded and sun exposed berries.

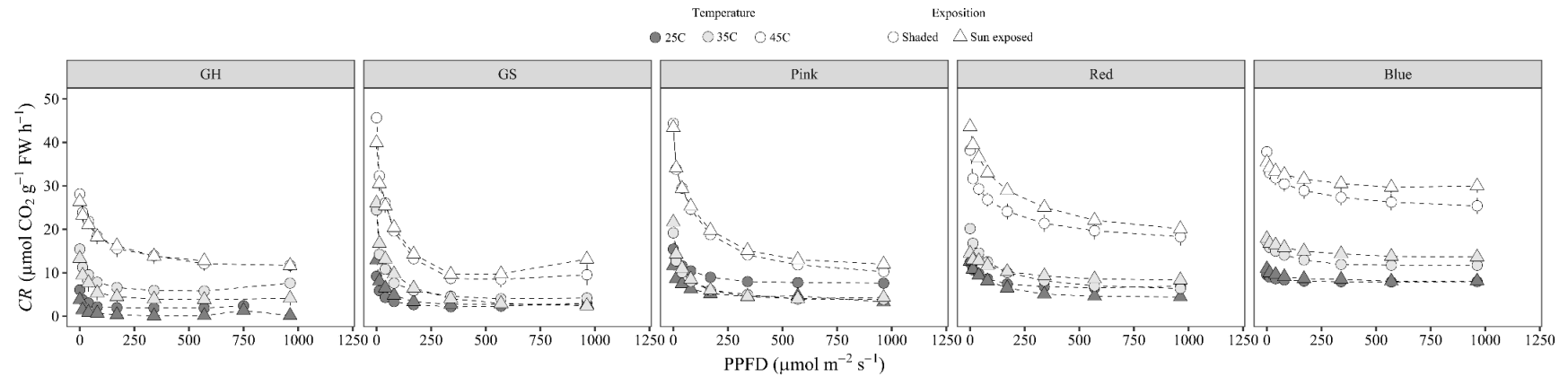


Figure S4. CO₂ release (CR) in response to photosynthetic photon flux density (PPFD) according to berry temperature during measurements and long-term acclimation to sun exposure.

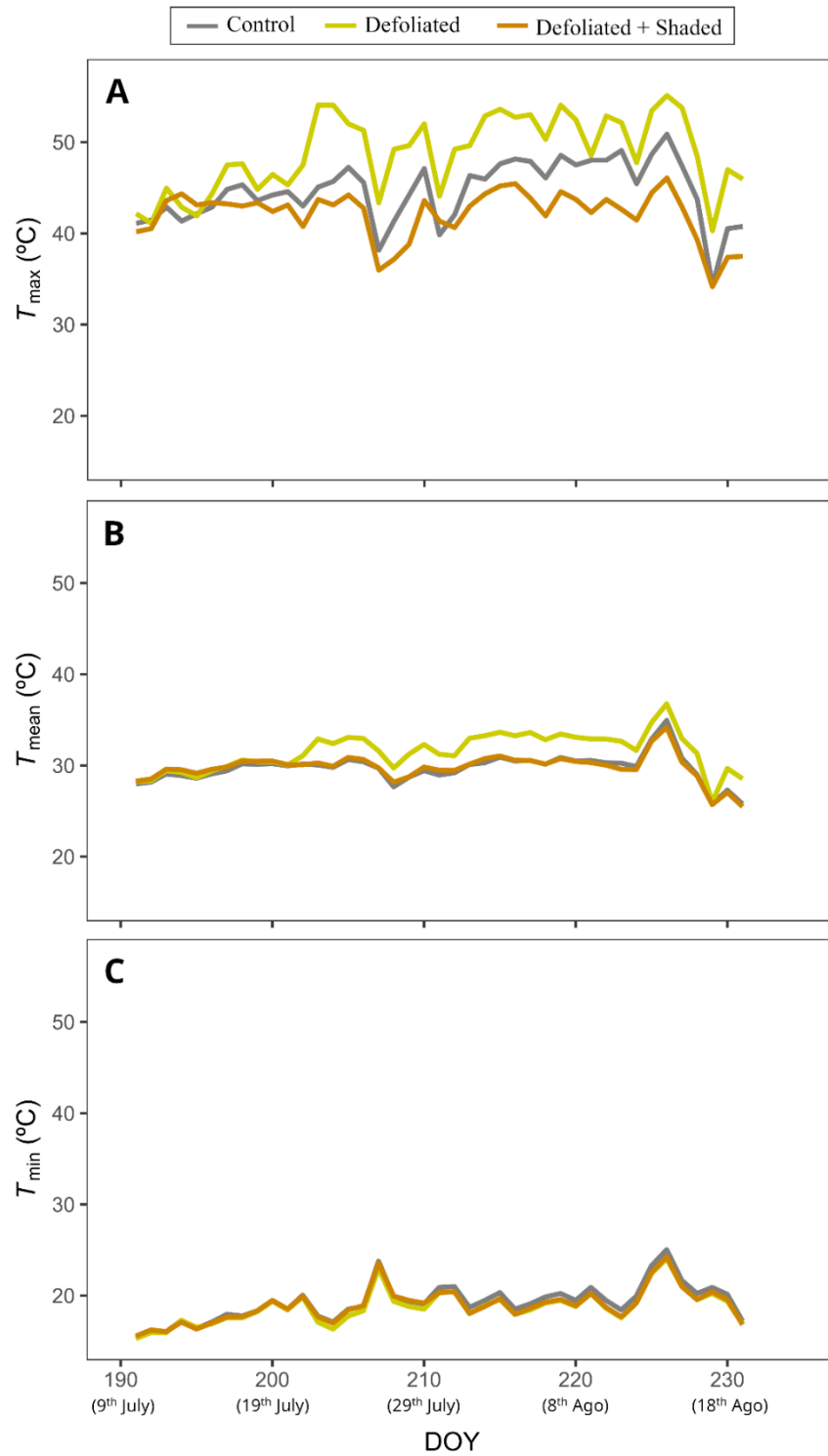


Figure S5. Progression of daily maximum temperature (T_{\max} , (A)) mean temperature (T_{mean} , (B)), and minimum temperature (T_{\min} , (C)) of Garnacha berries over successive days of year (DOY) along the period of grape ripening of Bodegas Ribas (from 9 July to 18 August 2020, 41 days). Exposure treatments consisted in: grape berries shaded by the plant leaves (Control), exposed grape berries after defoliation (Defoliated), and shaded grape berries after defoliation and covering using the plant's own shoots (Defoliated + Shaded).

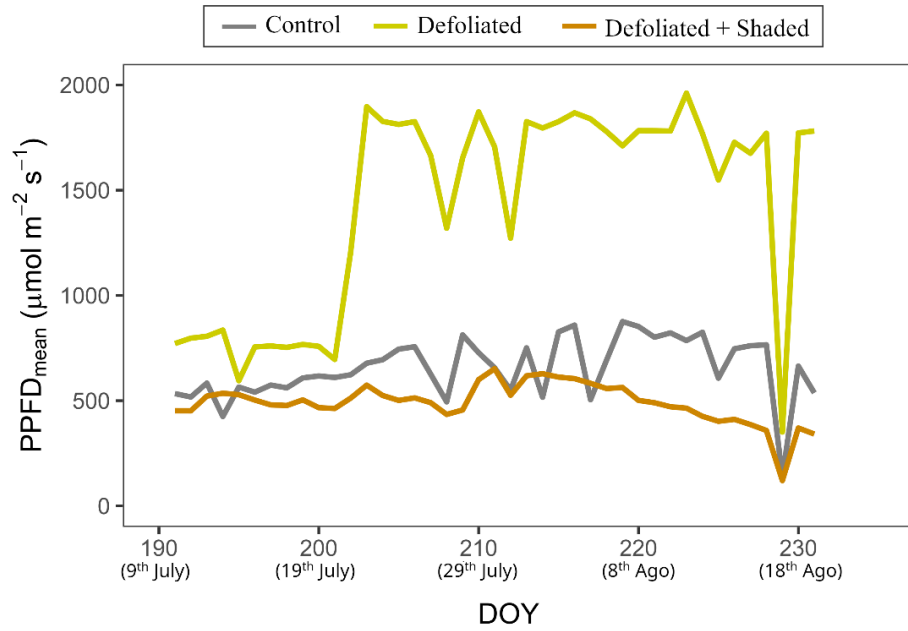


Figure S6. Progression of photosynthetic photon flux density (PPFD) on Garnacha berries over successive days of year (DOY) along the period of grape ripening of Bodegas Ribas (from 9 July to 18 August 2020, 41 days). Exposure treatments consisted in: grape berries shaded by the plant leaves (Control), exposed grape berries after defoliation (Defoliated), and shaded grape berries after defoliation and covering using the plant's own shoots (Defoliated + Shaded).

Table S1. Fitted parameters.

Model	Parameter	Mean	SD	P	R ²
CR_D	a	-0.0009912	0.0001627	<0.001	0.875
	b	0.4246	0.0691	<0.001	
	c	-45.25	7.328	<0.001	
CR_L	Y_{max}	2798.77	456900.00	0.995	0.764
	σ	0.1328	0.08579	0.125	
	DOY_{max}	269.98	1260	0.831	
	$CR_{L,min}$	-14.04	1.99	<0.001	
	d	0.5639	0.0543	<0.001	
AQE	e	0.0000119	0.0000020	0.570	0.796
	f	-0.0002045	0.0009168	0.824	
	g	-0.0010375	0.0003981	0.010	
	h	0.05020	0.01627	0.002	