

Table S1. Chemical-physical properties of the soil used to fill the pots in trial.

pH _{H2O}	8,235
Total carbonates (%)	32,5
Organic matter (%)	0,825
Organic carbon (%)	0,48
Total nitrogen (g/kg)	0,615
CEC (meq/100g)	14,35
Sand (%)	51
Silt (%)	32,5
Clay (%)	16,5
Available P (ppm)	23
Available P ₂ O ₅ (ppm)	53
Exchangeable K ⁺ (ppm)	77
Exchangeable K ₂ O (ppm)	92,5
Exchangeable Na ⁺ (ppm)	45,5
Exchangeable Ca ²⁺ (ppm)	2392,5
Exchangeable Mg ²⁺ (ppm)	426
Soluble Cl ⁻ (ppm)	22
Soluble K ⁺ (ppm)	5,7
Soluble Na ⁺ (ppm)	17,1
Soluble Ca ²⁺ (ppm)	55,25
Soluble Mg ²⁺ (ppm)	18,25

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Table S2. Vegetation indices used in the study.

Original index name	Base formula	Acronym	Modified formula
SR ^[34]	$\frac{NIR}{RED}$	SR783_S2.665_S2	$\frac{783nm}{665nm}$
		SR740_S2.665_S2	$\frac{740nm}{665nm}$
NDVI ^[39]	$\frac{NIR - RED}{NIR + RED}$	NDVI740.665_S2	$\frac{740nm - 665nm}{740nm + 665nm}$
		NDVI783.665_S2	$\frac{783nm - 665nm}{783nm + 665nm}$
		NDVI842.665_S2	$\frac{842nm - 665nm}{842nm + 665nm}$
GNDVI ^[40]	$\frac{NIR - GREEN}{NIR + GREEN}$	GNDVI740.560_S2	$\frac{740nm - 560nm}{740nm + 560nm}$
		GNDVI783.560_S2	$\frac{783nm - 560nm}{783nm + 560nm}$
CIre ^[41]	$\left(\frac{NIR}{Red\ Edge}\right) - 1$	CIre740.705_S2	$\left(\frac{740nm}{705nm}\right) - 1$
		CIre783.705_S2	$\left(\frac{783nm}{705nm}\right) - 1$
ReNDVI ^[40]	$\frac{750nm - 710nm}{750nm + 710nm}$	RENDVI740.705_S2	$\frac{740nm - 705nm}{740nm + 705nm}$
		RENDVI783.705_S2	$\frac{783nm - 705nm}{783nm + 705nm}$
OSAVI ^[42]	$(1 + 0.16) \frac{800nm - 670nm}{800nm + 670nm + 0.16}$	OSAVI740_S2	$(1 + 0.16) \frac{740nm - 705nm}{740nm + 705nm + 0.16}$
		OSAVI783_S2	$(1 + 0.16) \frac{783nm - 705nm}{783nm + 705nm + 0.16}$

Tab S1 (continued)

Original index name	Base formula	Acronym	New configuration
GCI ^[41]	$\left(\frac{NIR}{GREEN}\right) - 1$	GCI740.560_S2	$\left(\frac{740nm}{560nm}\right) - 1$
		GCI783.560_S2	$\left(\frac{783nm}{560nm}\right) - 1$
CVI ^[43]	$\frac{NIR}{GREEN} \cdot \frac{RED}{GREEN}$	CVI705_S2	$\frac{705nm}{560nm} \cdot \frac{665nm}{560nm}$
		CVI740_S2	$\frac{740nm}{560nm} \cdot \frac{665nm}{560nm}$
		CVI783_S2	$\frac{783nm}{560nm} \cdot \frac{665nm}{560nm}$
MTCI ^[38]	$\frac{754nm - 709nm}{709nm - 681nm}$	MTCI740.705_S2	$\frac{740nm - 705nm}{705nm - 665nm}$
		MTCI783.705_S2	$\frac{783nm - 705nm}{705nm - 665nm}$
MCARI ^[44]	$[(700 - 670nm) - 0.2(700 - 550nm)] \cdot \frac{700nm}{670nm}$	MCARI783_S2	$[(783nm - 705nm) - 0.2(783nm - 560nm)] \cdot \frac{783nm}{705nm}$
TCARI ^[44]	$3 * [(700 - 670nm) - 0.2(700 - 550nm)] \cdot \left(\frac{700nm}{670nm}\right)$	TCARI740_S2	$3 * [(740nm - 705nm) - 0.2(740nm - 560nm)] \cdot \left(\frac{740nm}{705nm}\right)$
		TCARI783_S2	$3 * [(783nm - 705nm) - 0.2(783nm - 560nm)] \cdot \left(\frac{783nm}{705nm}\right)$

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Tab S1 (continued)

Original index name	Base formula	Acronym	New configuration
MCARI_OSAVI ^[38]	$\frac{[(700 - 670nm) - 0.2(700 - 550nm)] \frac{700nm}{670nm}}{(1 + 0.16) \frac{800 - 670}{800 + 670 + 0.16}}$	MCARI_OSAVI740_S2	$\frac{[(740nm - 705nm) - 0.2(740nm - 560nm)] \frac{740nm}{705nm}}{(1 + 0.16) \frac{740nm - 705nm}{740nm + 705nm + 0.16}}$
		MCARI_OSAVI783_S2	$\frac{[(783nm - 705nm) - 0.2(783nm - 560nm)] \frac{783nm}{705nm}}{(1 + 0.16) \frac{783nm - 705nm}{783nm + 705nm + 0.16}}$
TCARI_OSAVI ^[38]	$\frac{3 * [(700 - 670nm) - 0.2(700 - 550nm)] \frac{700nm}{670nm}}{(1 + 0.16) \frac{800 - 670nm}{800 + 670nm + 0.16}}$	TCARI_OSAVI740_S2	$\frac{3 * [(740nm - 705nm) - 0.2(740nm - 560nm)] \frac{740nm}{705nm}}{(1 + 0.16) \frac{740nm - 705nm}{740nm + 705nm + 0.16}}$
		TCARI_OSAVI783_S2	$\frac{3 * [(783nm - 705nm) - 0.2(783nm - 560nm)] \frac{783nm}{705nm}}{(1 + 0.16) \frac{783nm - 705nm}{783nm + 705nm + 0.16}}$
REP ^[38]	$700nm + 40 \frac{(670 - 780nm)}{2} - 700nm$	REP740_S2	$705nm + 40 \frac{(665nm - 740nm)}{2} - 705nm$
		REP783_S2	$705nm + 40 \frac{(665nm - 783nm)}{2} - 705nm$

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Figure S1. Daily maximum (red line), mean (green line), and minimum (blue line) air temperature for 1 April to 30 Sept recorded in 2016 (A), 2017 (B), and 2018 (C) at a weather station near the experimental center. Histograms show daily rainfall, DOY: Day of year.

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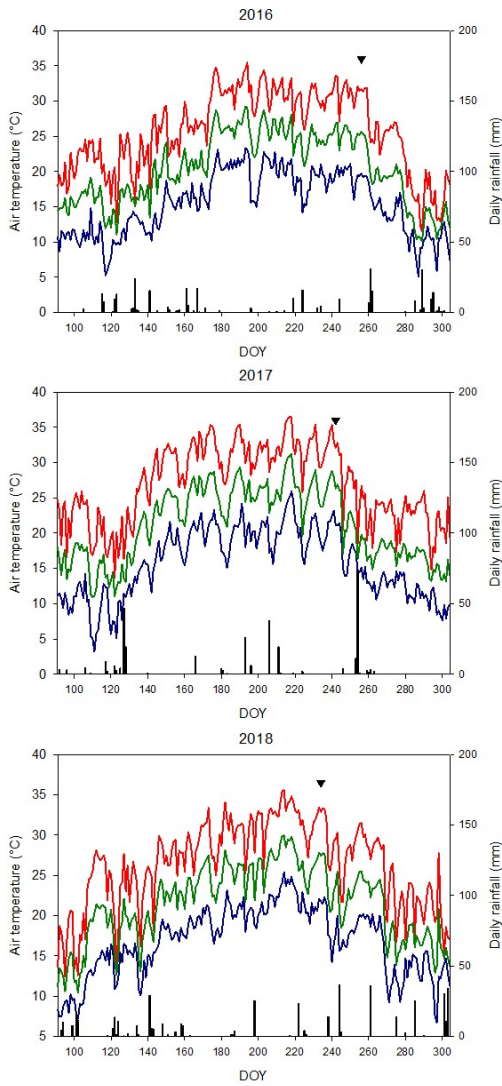
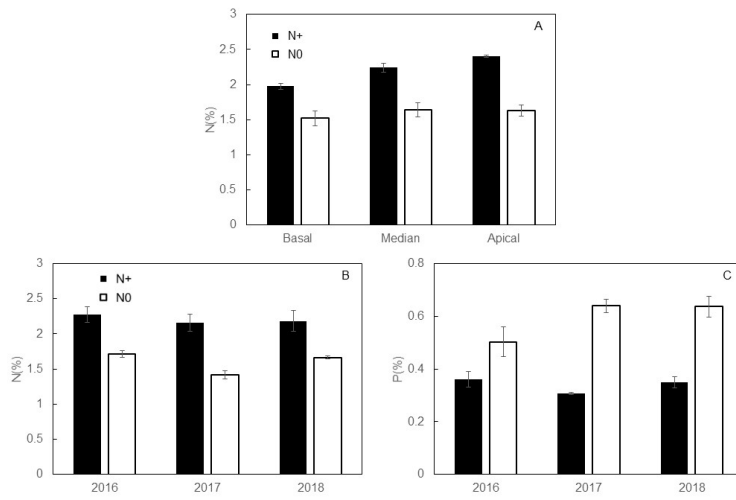


Figure S2. Partitioning of the interaction between leaf position (basal, median, apical) and fertilization treatment (N0, N+) for leaf nitrogen (N) concentration (% DM) at veraison (panel A). Each treatment combination mean is calculated over the years and sub-replicates (n = 36). Vertical bars of each column represent standard error (SE). Partitioning of the interaction between years (2016, 2017, 2018) and fertilization treatment (N0, N+) for leaf N and P concentration (% DM) at veraison (panels B, C). Each treatment combination mean is calculated over leaf position and sub-replicates (n = 36). Vertical bars of each column represent standard error (SE).



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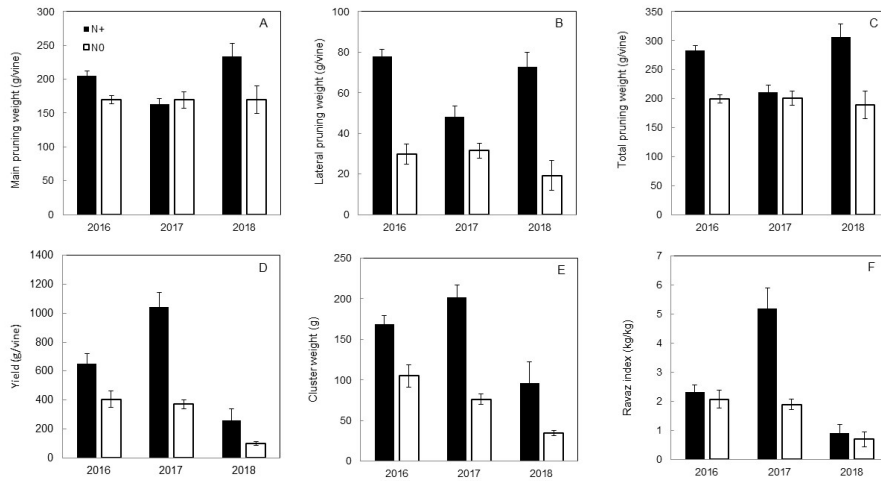
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Figure S3. Partitioning of the interaction between years (2016, 2017, 2018) and fertilization treatment (N0, N+) for main, lateral and total pruning weight per vine (panels A, B, C), yield per vine (panel D), cluster weight (panel E), and Ravaz index (panel F). Each treatment combination mean is calculated over sub-replicates (n = 8). Vertical bars of each column represent standard error (SE).



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Figure S4. Partitioning of the interaction between years (2016, 2017, 2018) and fertilization treatment (N0, N+) for skin weight, flesh weight and total seed weight per berry (panels A, B, C) and seed number per berry (panel D). Each treatment combination mean is calculated over sub-replicates (n = 8). Vertical bars of each column represent standard error (SE).

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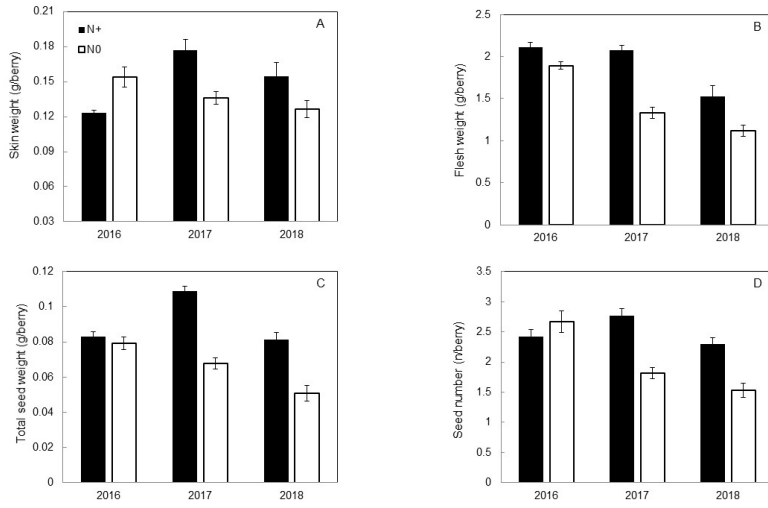


Figure S5. Partitioning of the interaction between years (2016, 2017, 2018) and fertilization treatment (N0, N+) for total soluble solids (TSS, panel A), tartaric and malic acid concentration (panels B, C) and total anthocyanins (panel D). Each treatment combination mean is calculated over sub-replicates (n = 8). Vertical bars of each column represent standard error (SE).

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