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Supplementary Material

Impact of crop load on nitrogen uptake and reserve mobilisation in *Vitis vinifera*

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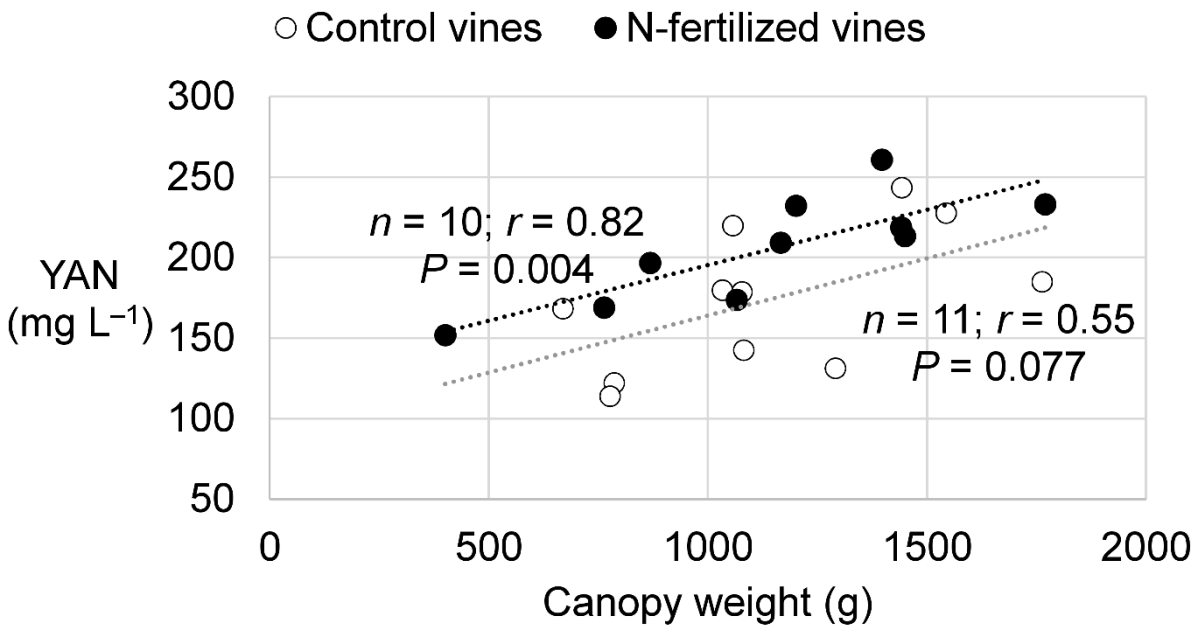

Fig. S1. Effect of canopy weight on YAN concentration in grape must, with and without foliar-N fertilization. Chasselas vines, 2017, Pully, Switzerland.

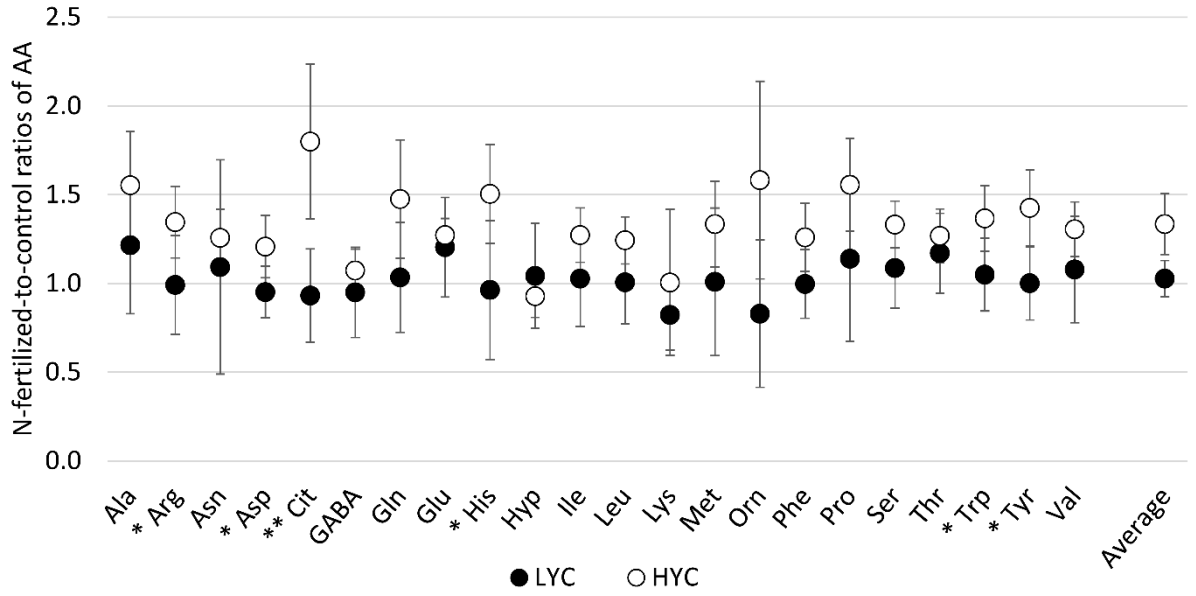

Fig. S2. N-fertilized-to-control ratios of amino acid concentrations in the must under both high yield (HYC, $n = 12$) and low-yield (LYC, $n = 9$) conditions. Values ± 1 SD, * $P < 0.05$; ** $P < 0.01$.

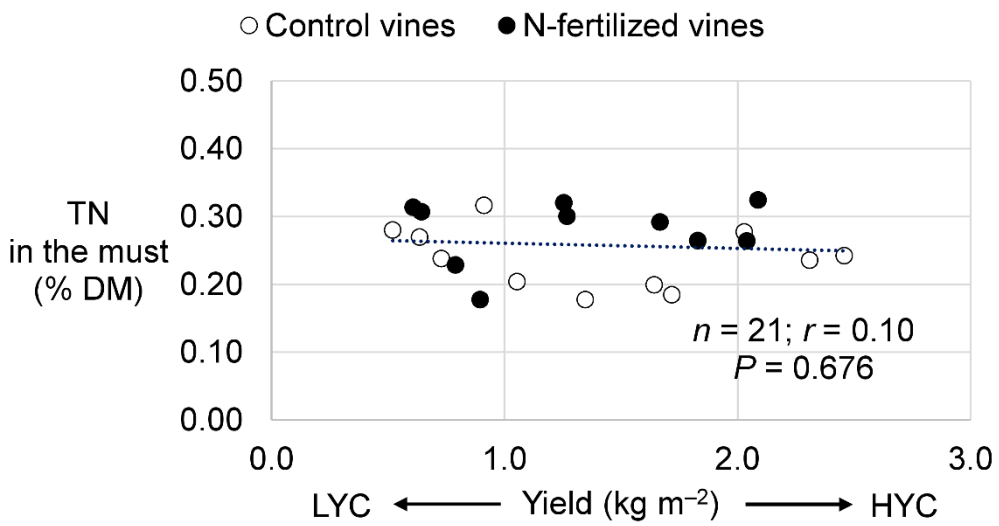

Fig. S3. Effect of crop load on total nitrogen (TN) concentration in grape must (% dry weight), in both control and urea treatments. LYC low yield condition; HYC high yield condition. Chasselas vines, 2017, Pully, Switzerland.

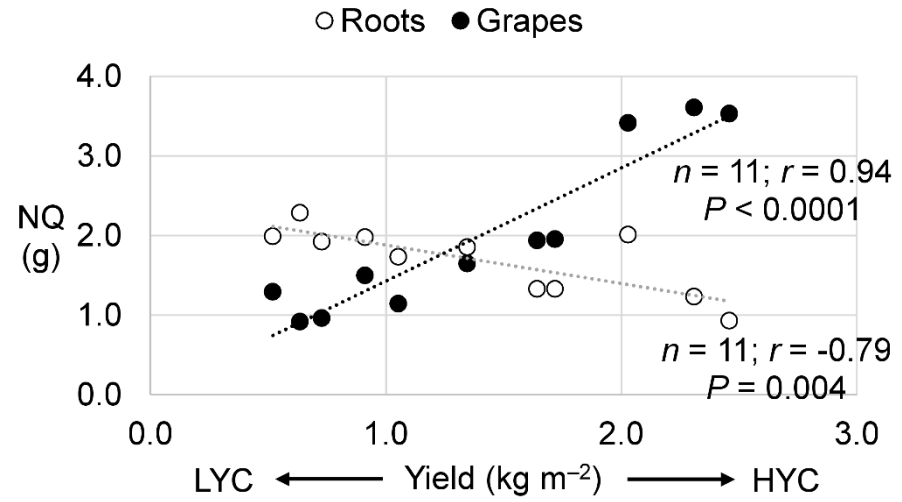

Fig. S4. Effect of crop load on N quantity (g) in grapes and in roots. LYC low yield condition; HYC high yield condition. Chasselas vines, 2017, Pully, Switzerland

Table S1. Effect of crop load on the leaf gas exchanges, i.e. photosynthesis (A), transpiration (E), stomatal conductance (gsw), ambient CO_2 concentration (Ca) and internal CO_2 concentration (Ci) Average ± 1 s.d. Chasselas vines, 2017, Pully, Switzerland. HYC, high-yielding conditions; LYC, low-yielding conditions; ns, non significant

Variable	Control vines (n = 11)	N-fertilized vines (n = 10)	P-value	LYC (n = 9)	HYC (n = 12)	P-value	Interaction yield condition × fertilisation
E (mmol m^{-2} s^{-1})	5.6 ± 0.4	5.8 ± 0.6	ns	5.8 ± 0.6	5.6 ± 0.3	ns	ns
A (µmol m^{-2} s^{-1})	15.2 ± 0.8	15.4 ± 1.0	ns	15.3 ± 1.0	15.2 ± 0.9	ns	ns
C_a (µmol mol^{-1})	331.2 ± 2.5	330.4 ± 3.5	ns	330.7 ± 3.5	331 ± 2.7	ns	ns
C_i (µmol mol^{-1})	231.3 ± 4.3	229 ± 7.5	ns	230.9 ± 8.0	229.4 ± 4.4	ns	ns
gws (mol m^{-2} s^{-1})	0.302 ± 0.032	0.304 ± 0.043	ns	0.309 ± 0.051	0.297 ± 0.022	ns	ns

Table S2. Dry weights (DW), total nitrogen (TN), nitrogen isotope composition ($\delta^{15}N$), nitrogen quantity (NQ), total organic carbon (TOC), carbon isotope composition ($\delta^{13}C$), and C/N ratio, in the different plants parts at harvest without urea supply (control treatment) under both low and high yield conditions (LYC and HYC)

Chasselas vines, Pully, 2017. HYC, high-yielding conditions; LYC, low-yielding conditions; mean values (average ± 1 s.d.) within the same row followed by different letters are significantly different (Newman-Keuls, $P < 0.05$). ns, non significant; * $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$

Harvest - LYC						
	Roots	Trunk	Canopy	Pomace	Must	*P*-value
DW (g)	260 ± 25 b	291 ± 36 b	382 ± 122 a	75 ± 28 c	117 ± 26 c	***
DW (%)	59.8 ± 2.1 a	58.2 ± 1 a	35.2 ± 1.6 b	26 ± 1.7 c	20.6 ± 1.1 d	***
TN (% DW)	0.8 ± 0.1 c	0.3 ± 0.1 d	1.4 ± 0.1 a	1.1 ± 0.3 b	0.3 ± 0 d	***
$\delta^{15}N$ (mUr)	10.8 ± 4.8	12.7 ± 5.2	12.9 ± 4.3	24.3 ± 9.6	19.5 ± 11.1	ns
NQ (g)	2 ± 0.2 b	0.9 ± 0.1 b	5.4 ± 2.1 a	0.8 ± 0.2 b	0.4 ± 0.2 b	***
TOC (%DW)	48.3 ± 0.9 a	46.7 ± 0.4 b	45.4 ± 0.6 c	45.1 ± 0.5 c	38.5 ± 0.4 d	***
$\delta^{13}C$ (mUr)	–28.6 ± 0.3 ab	–28.2 ± 0.2 a	–29.2 ± 0.7 b	–28.8 ± 0.5 ab	–28.1 ± 0.6 a	*
Ratio C/N	64 ± 7 b	159 ± 39 a	33 ± 3 b	44 ± 11 b	150 ± 26 a	***

Harvest - HYC						
	Roots	Trunk	Canopy	Pomace	Must	*P*-value
DW (g)	216 ± 59 b	277 ± 49 b	413 ± 112 a	240 ± 61 b	249 ± 53 b	***
DW (%)	58.7 ± 2 a	55.9 ± 6.3 a	35.2 ± 0.9 b	23.8 ± 0.6 c	20.2 ± 1 d	***
TN (% DW)	0.7 ± 0.1 c	0.4 ± 0 d	1.3 ± 0.2 a	0.9 ± 0.1 b	0.2 ± 0 e	***
$\delta^{15}N$ (mUr)	6.6 ± 4.1 b	12 ± 9.6 ab	15.1 ± 9.3 ab	27 ± 20.2 ab	33.7 ± 20 a	*
NQ (g)	1.4 ± 0.4 b	1.1 ± 0.2 b	5.6 ± 2.3 a	2.1 ± 0.7 b	0.6 ± 0.2 b	***
TOC (%DW)	49.5 ± 0.9 a	47.3 ± 0.5 b	45.7 ± 0.4 c	43.2 ± 1 d	37.4 ± 0.8 e	***
$\delta^{13}C$ (mUr)	–28.4 ± 0.3	–28 ± 0.1	–28.9 ± 0.7	–28.9 ± 0.8	–28.1 ± 0.8	ns
Ratio C/N	74 ± 7 c	118 ± 7 b	35 ± 4 d	50 ± 6 d	175 ± 32 a	***