

Supplementary Materials:

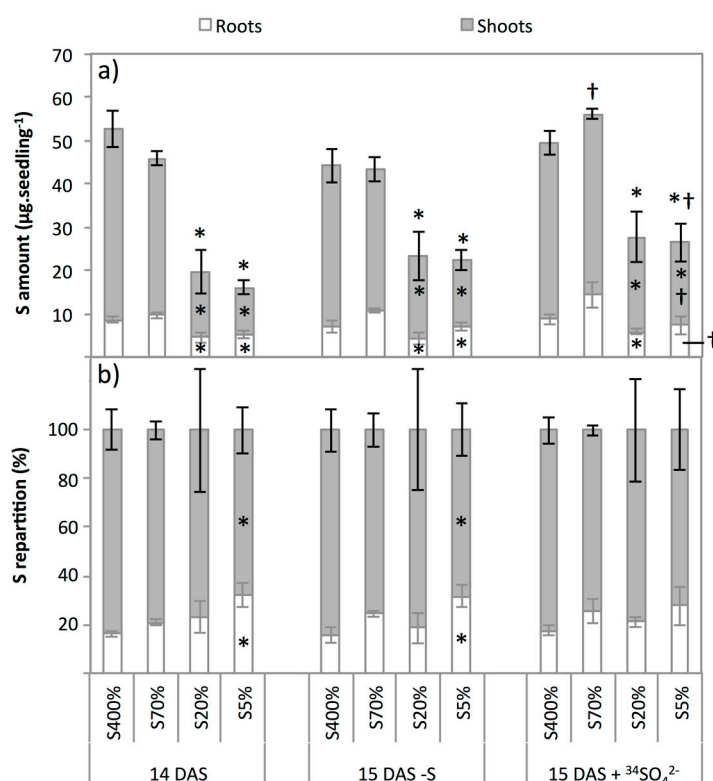


Figure S1: S amount (a) and S repartition (b) of *Brassica napus* cv. Yudal green seedlings, 14 days after sowing on water (14 DAS) and after 24 h treatment of 14 DAS green seedlings with 508.7 μM $^{34}\text{SO}_4^{2-}$ at 5 atom% excess (15 DAS + $^{34}\text{SO}_4^{2-}$) and with 8.7 μM SO_4^{2-} (15 DAS -S). * Significant difference from the value of S400% green seedlings ($p < 0.05$). † Significant difference from the corresponding value at 14 DAS ($p < 0.05$). Signs (* and/or †) on the top of the bars are for the whole plant (shoot and root) while signs inside the bar are for root or shoot specifically.

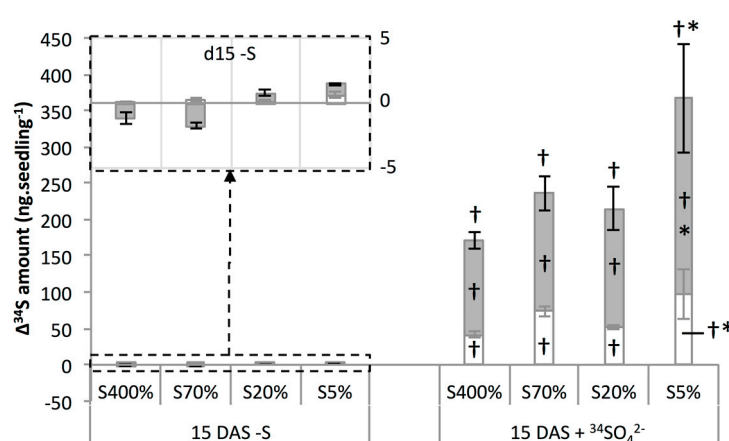


Figure S2: Differences in ^{34}S amount in excess in roots and shoots of oilseed rape green seedlings (cv. Yudal) between 14 and 15 DAS -S and between 14 and 15 DAS + $^{34}\text{SO}_4^{2-}$. * Significant difference from the value of S400% green seedlings ($p < 0.05$). † Significant difference from the corresponding value with 15 DAS -S ($p < 0.05$). Signs (* and/or †) on the top of the bars are for the whole plant (shoot and root) while signs inside the bar are for root or shoot specifically.

Table S1: Plant dry weight, seed yield, number of seeds per plant and seed dry weight at harvest for plants well supplied with S and grown under S-limited conditions. Values correspond to means \pm SE ($n = 3$). Plants were either grown under plethoric S nutrition (400% of plant S needs provided, S400% seeds) or subjected to a S limitation from the beginning of plant growth with 70%, 20% and 5% of plant S needs provided (S70%, S20% and S5% seeds respectively). Seed yield was determined without any sorting. The slight discrepancy observed between the calculation of seed yield from ‘seed dry weight’ \times ‘number of seeds per plant’ and the reported values of seed yield is due to the manual removal of some seed fragments when seeds were counted and weighted. * Significant difference from the value of S400% ($p < 0.05$).

	Plant dry weight (gDW·plant ⁻¹)	Seed yield (gDW·plant ⁻¹)	Number of seeds per plant	Seed dry weight (mg·seed ⁻¹)
S400%	25.37 \pm 0.69	3.82 \pm 0.63	1034 \pm 220	3.95 \pm 0.24
S70%	23.53 \pm 0.86	3.53 \pm 0.49	893 \pm 173	4.12 \pm 0.07
S20%	20.35 \pm 1.2	3.76 \pm 0.55	967 \pm 189	4.01 \pm 0.25
S5%	16.34 \pm 1.32*	1.13 \pm 0.16*	304 \pm 58*	3.85 \pm 0.43