SUPPLEMENTARY DATA

Fig. S1 Percentage of ^{15}N translocation to the shoot after 5 minutes supply with 100 µM or 5 mM K[15]NO$_3$ for different times over daily period. **A**, Percentage of ^{15}N translocation to the shoot after 5 minutes of K[15]NO$_3$ treatment labeled at 99 atom %. **B**, Amount of ^{15}N accumulated in shoot tissues after 5 minutes exposition. Vertical bars when larger than the symbol indicate SD for n=3 corresponding of three batches of 50 seedlings.
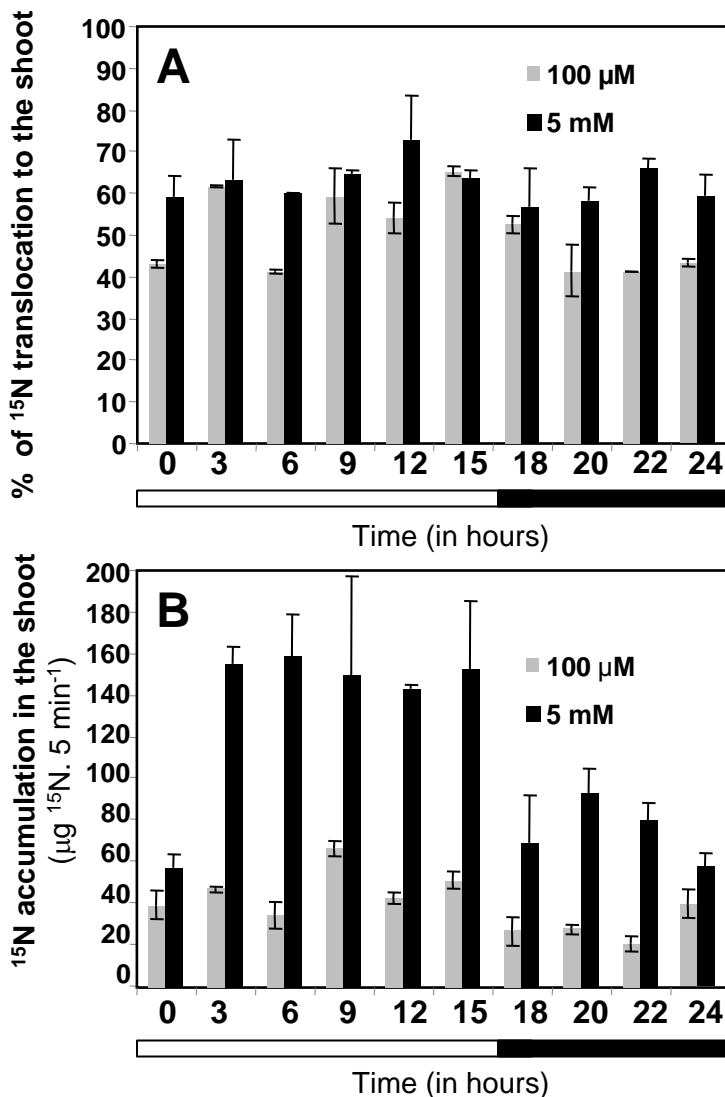
Fig. S2 Reinterpretation of the PAR effect on nitrate influx rate. **A,** Previous interpretation in the changes of nitrate influx rate as a function of root temperature (From Malagoli *et al.*, 2004). **B,** Three-dimensional plot of the PAR effect on nitrate influx variations based on reinterpretation in nitrate uptake kinetics according to Thellier's transformation (see Fig. 1c and d). Vertical bars indicate SD for n=3 when larger than the symbol.
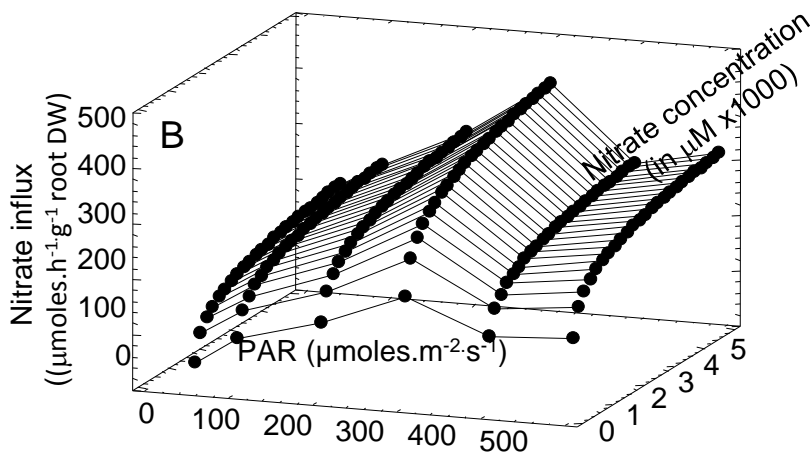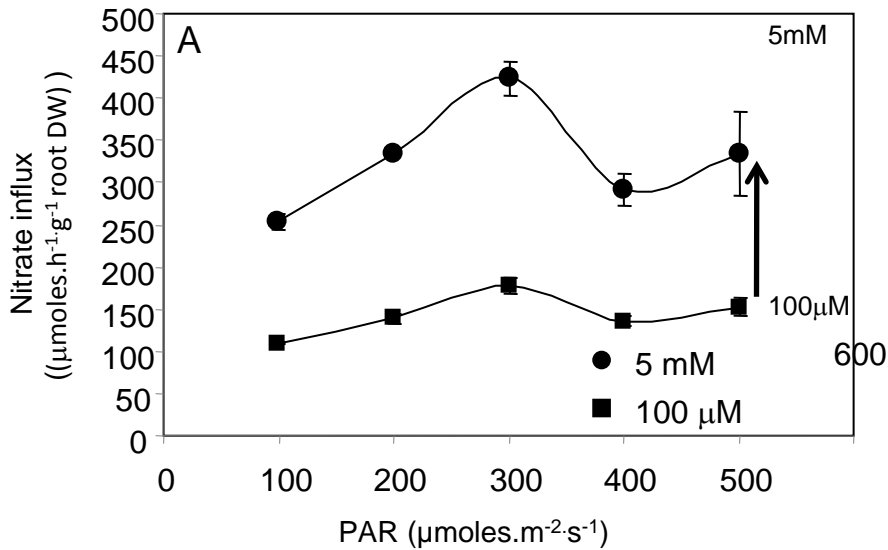
Fig. S3 Variations of NO_3^- influx simulated by the model in absence of regulations **(A)** and when day/night **(B**, temperature **(C)**, ontogenesis **(D)** and PAR effects **(E)** are cumulatively added under N0 (0 kg ha^{-1}) fertilization level.