



Modelling the relative contribution of seed nitrogen reserves and external nitrogen uptake during heterotrophic growth in *Medicago truncatula*

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Résumé en anglais	<p>Background and aims Heterotrophic growth relies on remobilisation of seed reserves and mineral absorption. We used a compartmental model to investigate the fluxes of N absorption and remobilisation of N reserves in a legume seed with high protein content. Methods Seedling growth was studied during the heterotrophic stage in two genotypes of <i>Medicago truncatula</i> as a function of N supply. N absorption and seed remobilisation fluxes were distinguished in a 15 N labelling experiment. Results Remobilisation of seed N reserves was high during germination, but N uptake started as soon as the radicle protruded. Both sources contributed to high elongation rates of the radicle and hypocotyl. When organ lengths stabilised, there was an efflux of N from the cotyledons and roots indicating that seedling growth was limited by carbohydrate production. No significant differences between genotypes were observed except for early N uptake, which was lower in the genotype with the highest initial seed N content. Conclusions N fluxes were similar to those of other non-legume dicotyledonous species but differed from monocotyledonous species. These results improve our understanding of the effects of mineral fertilisation on crop establishment. The compartmental model is a useful tool to analyse N fluxes patterns within and between diverse species, in relation to seed characteristics and soil N availability.</p>
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Liens

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