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*Symbiotic nitrogen fixation reduces belowground biomass carbon costs of nitrogen acquisition under low, but not high, nitrogen availability*

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This study investigates how nitrogen fixation and soil nitrogen fertilization interact to influence plant carbon costs of nitrogen acquisition. We found that inoculation with symbiotic nitrogen-fixing bacteria reduced carbon costs to acquire nitrogen; however, this effect was only apparent in the low soil nitrogen fertilization treatment. In the low nitrogen fertilization treatment, plants invested more strongly in symbiotic nitrogen-fixing bacteria, leading to greater nitrogen uptake despite no change in belowground carbon allocation. These findings help explain the competitive advantage that plants who form associations with symbiotic nitrogen-fixing bacteria have in less fertile soils. Findings also provide insight into how different nitrogen acquisition strategies modulate plant responses to nitrogen availability.

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**Evan Perkowski**: @EvanPerkowski on Twitter and @eaperkowski.bsky.social on Bluesky

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