

Supplementary material. Quantification, spatial distribution and persistence of root-derived carbon for 12 cover crops.

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1 Supplementary Section S1. Tables

Table S1. Mean root decay rate constants (k) from literature reviews. % at day 524 is the % of dry mass remaining at day 524 calculated with the provided k ($\% = e^{-k(524/365.25)}$).

Functional Group	Root Size	k	% at Day 524	Study
Graminoids	All	1.49	12	Silver and Miya, 2001
Graminoids	<5mm	1.27	16	Zhang and Wang, 2015
Annual Graminoids	<2mm	1.24	17	See et al., 2019
Annual Forbs	<2mm	3.5	1	See et al., 2019

2 Supplementary Section S2. Figures

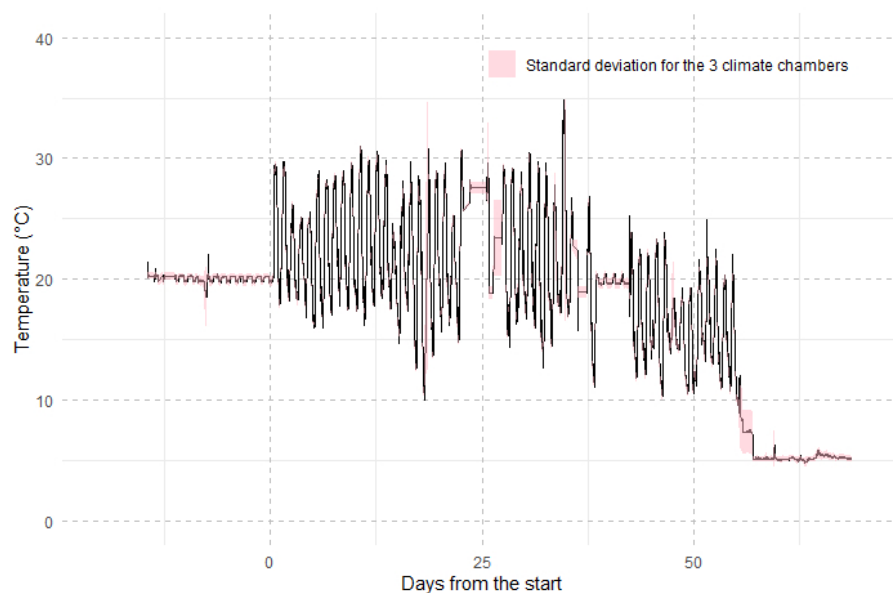


Figure S1. Mean temperature of the 3 climate chambers. Day 0 indicates the start of the climate simulation. Before the start, temperature was set to 20°C to ensure optimal seed emergence conditions. After harvest, temperature was set to 4°C to restrict mesocosms evolution while sampling.

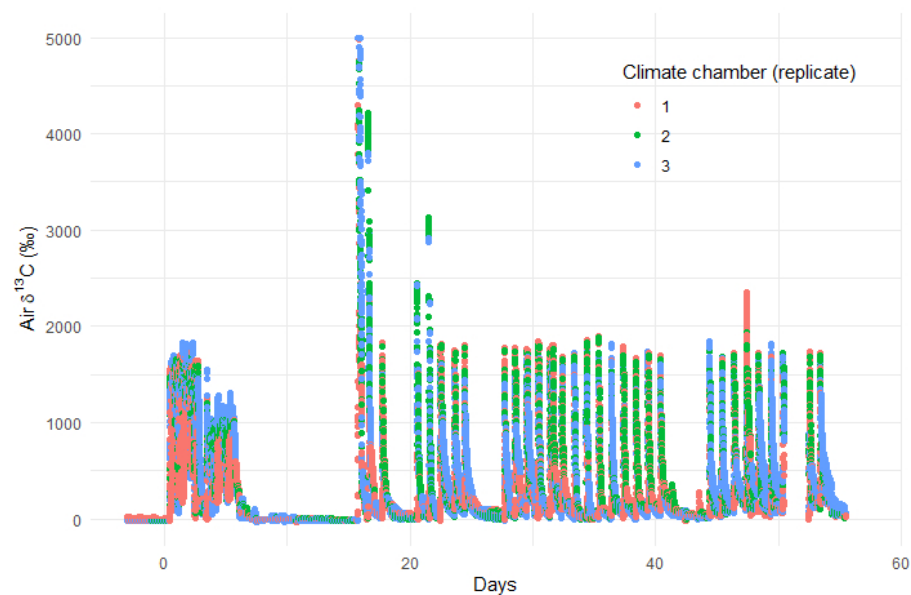


Figure S2. Isotopic signature of the ^{13}C -CO₂ enriched air in the 3 climate chambers. Day 0 indicates the start of the climate simulation.

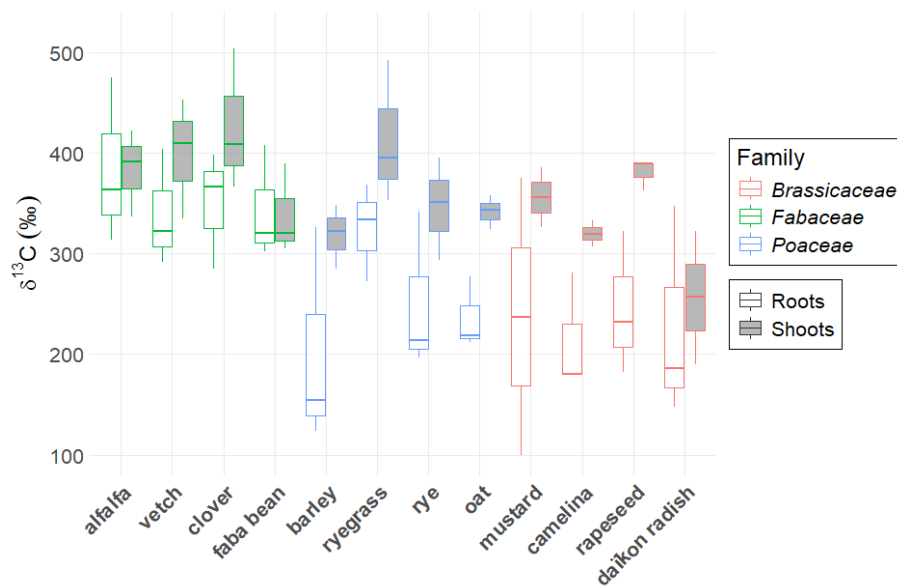


Figure S3. Isotopic signature of belowground (blank boxes) and aboveground (plain boxes) plant material for the 12 plants. The horizontal lines of the boxes display the 75th, the 50th and the 25th percentiles. The vertical lines in the centre of the boxes display the smallest and largest values within 1.5 times the interquartile range below the 25th and the 75th percentile respectively.

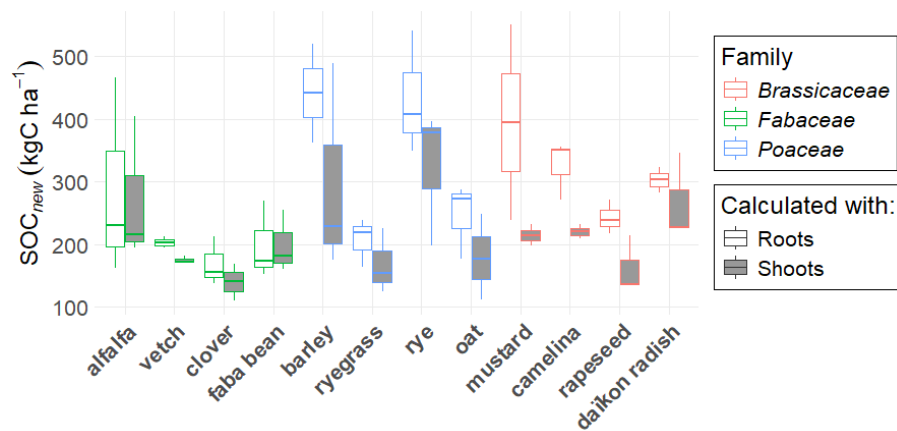


Figure S4. Comparison of SOC_{new} values calculated with the isotopic signature of roots (blank boxes) and shoots (plain boxes) as the plant end-member. The horizontal lines of the boxes display the 75th, the 50th and the 25th percentiles. The vertical lines in the centre of the boxes display the smallest and largest values within 1.5 times the interquartile range below the 25th and the 75th percentile respectively.

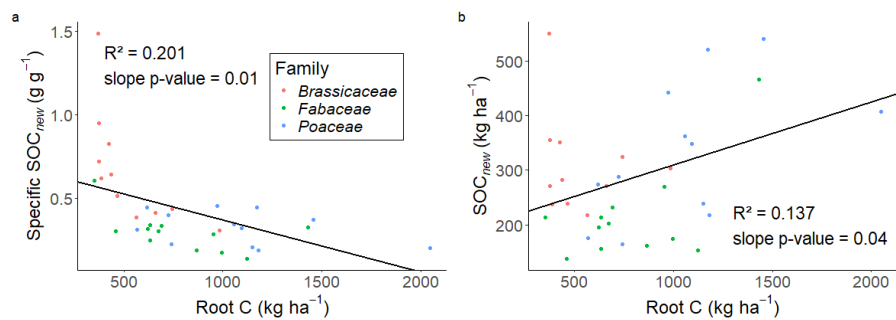


Figure S5. Linear correlations between a) specific SOC_{new} and Root C amounts, b) SOC_{new} and Root C amounts. The slope was obtained with a mixed-effects model with species as a random effect, to let the intercept vary. The R^2 are marginal R^2 .