

Appendix

Table 1: Mean ^{15}N enrichment of aboveground biomass by harvest and treatment (mean $\delta^{15}\text{N}$ in ‰ \pm SE, $n=96$ populations for each mean). Natural background (BG) $\delta^{15}\text{N}$ is given as well ($n=8$ for harvests 1 and 2, and $n=7$ at harvest 3).

Harvest	^{15}N treatment		BG	
	Shallow	Deep		
(1) August	2005	138.7 \pm 1.9	64.7 \pm 2.2	6.0 \pm 0.4
(2) September	2005	115.2 \pm 3.4	60.9 \pm 2.0	4.3 \pm 0.5
(3) May	2006	64.3 \pm 1.3	49.3 \pm 1.2	2.9 \pm 0.3

Table 2: Analysis of Variance for ^{15}N enrichment of aboveground biomass. A linear mixed effects model with the random factors treatment unit and compartment was used. Significance levels: . $P < 0.1$, * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$).

Source	^{15}N enrichment ($\delta^{15}\text{N}$)			
	Num. df	Den. df	F	p(>F)
Harvest	1	190	393.10	<.001 ***
^{15}N Treatment	1	94	545.50	<.001 ***
Harvest \times ^{15}N Treatment	1	190	169.13	<.001 ***

^a Harvests: August 2005, September 2005 and May 2006.

Table 3: Analysis of Variance for ^{15}N uptake from deep soil (DF) in monocultures. A linear mixed effects model with the random factors species pool and compartment pair was used. Significance levels: . $P < 0.1$, * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$).

Source	Deep Fraction DF			
	Num. df	Den. df	F	p(>F)
Species	7	7	1.39	0.34
Harvest ^a	2	16	17.79	<.001 ***
Species \times Harvest	14	16	1.07	0.44

^a Harvests: August 2005, September 2005 and May 2006.

Table 4: Analysis of Variance for the fraction of ^{15}N tracer taken up from deep soil (DF) by populations of individual species grown in mixture ($n=240$). A linear mixed effects model with the random factors species pool, species composition (see Table 1 in the original paper) and compartment pair was used. Significance levels: . $P<0.1$, * $P<0.05$, ** $P<0.01$, *** $P<0.001$). See Table 2 in the original paper for the same analysis but with species instead of functional group.

Deep Fraction DF					
Source	Num. df	Den. df	F	$P(>F)$	
Species richness (SR)	1	11	1.59	0.23	
Functional group (FG)	1	64	6.90	0.01	*
SR×FG	1	64	1.73	0.19	
Harvest (H) ^a	2	152	57.92	<.001	***
SR×H	2	152	2.34	0.10	
FG×H	2	152	15.53	<.001	***
SR×FG×H	2	152	0.97	0.38	

^a Harvests: August 2005, September 2005 and May 2006.

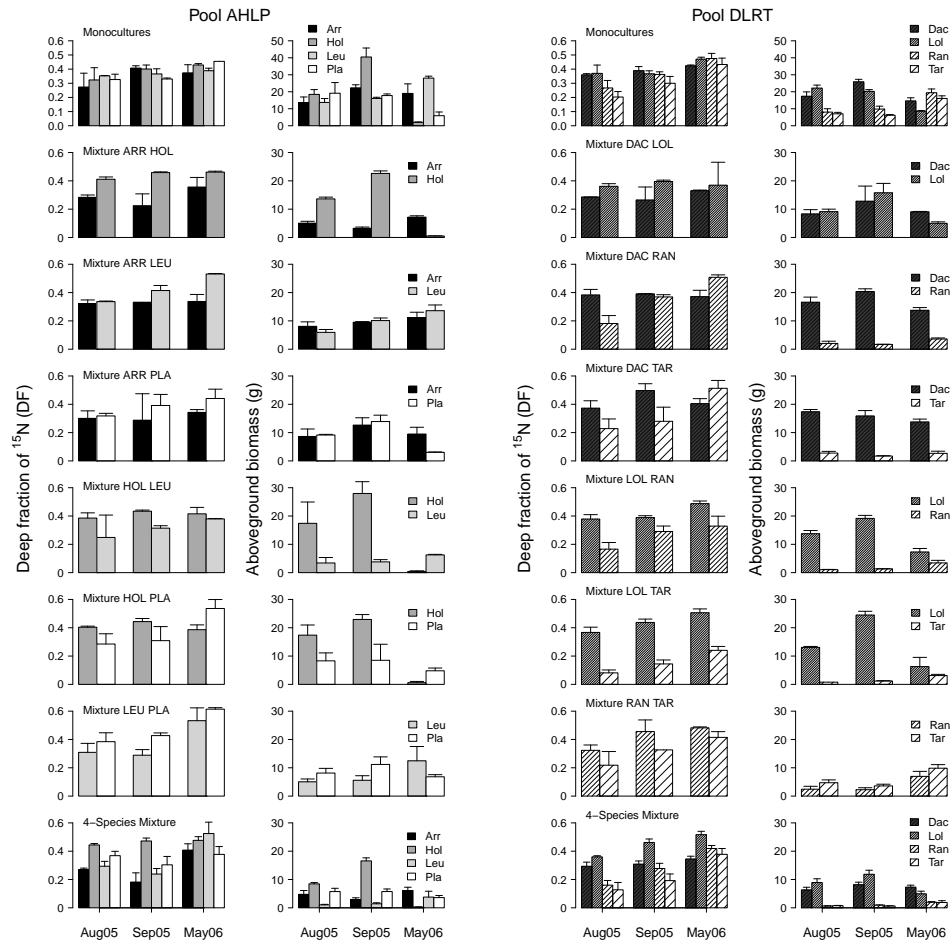


Fig. 1: Fraction of ¹⁵N uptake from deep soil (DF) and aboveground biomass per species in all monocultures and mixtures of pool AHLP (left panels) and pool DLRT (right panels). Error bars show standard errors of the mean, monocultures and 2-species mixtures: $n=2$, 4-species mixtures: $n=4$ for each bar. See Table 1 (in the main text) for full species names.

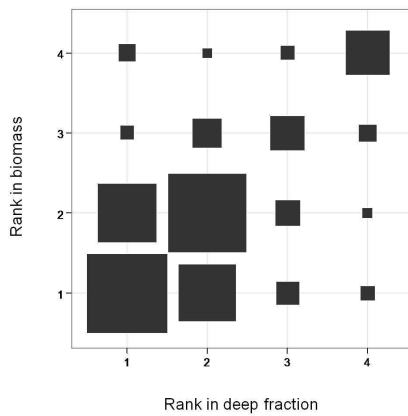


Fig. 2: Relationship between the rank of each species in aboveground biomass and its rank in the deep fraction DF (fraction of ^{15}N uptake from deep soil) within mixture. Example: A species contributes to the square-area in the lower left corner if it had the highest aboveground biomass within the mixture it belonged to, as well as the highest DF among all species in that mixture. The square-areas are proportional to the number of observations for each combination of ranks. The range of ranks is 1–2 and 1–4 in 2-species and 4-species mixtures, respectively.

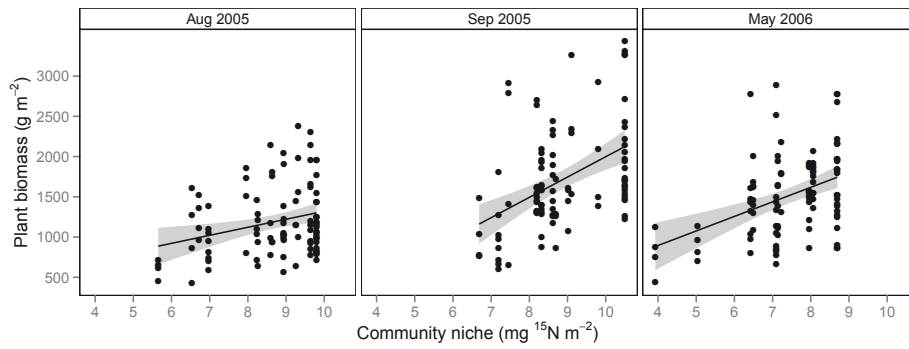


Fig. 3: Plant community biomass (above- and belowground) as a function of the calculated community niche for each harvest. The positive relationship is indicated by regression lines, including a 95 % confidence interval. Note that the community niche for the mixtures was determined *a priori* from ¹⁵N uptake by individual plant species from deep and shallow soil (see Eq. 6 in the main text), whereas for the monocultures, it equals ¹⁵N uptake from deep and shallow soil by one species only.