

Table S1. Soil properties at the depth of 0-5 cm and herbaceous biomass in interplant (IP) and beneath shrubs (BS) of the study site.

Site Treatment	SWC (v/v)	ST (°C)	DOC (g kg <sup>-1</sup> )	In-N (g kg <sup>-1</sup> )	pH	Herbaceous-biomass (g m <sup>-2</sup> )
IP N0	3.7 (0.3)	34.9 (0.3)	0.34 (0.04)	26.5 (3.67)	10.08 (0.32)	30.31 (4.14)
N1	3.4 (0.4)	35.0 (0.3)	0.41 (0.04)	43.22 (4.51)	9.82 (0.42)	37.44 (4.84)
N2	3.2 (0.4)	35.0 (0.2)	0.45 (0.06)	55.58 (6.18)	9.43 (0.43)	43.77 (7.07)
ANOVA	F <sub>52,2</sub> = 1.03 ns	F <sub>52,2</sub> = 0.45 ns	F <sub>52,2</sub> = 1.03 ns	F <sub>52,2</sub> = 6.75*	F <sub>52,2</sub> = 2.77 ns	F <sub>52,2</sub> = 1.5 ns
BS N0	4.0 (0.2)	34.7 (0.5)	0.63 (0.07)	31.24 (5.81)	10.43 (0.42)	22.38 (4.66)
N1	3.3 (0.1)	35.0 (0.4)	0.48 (0.06)	50.13 (9.42)	10.21 (0.42)	33.19 (8.52)
N2	3.2 (0.2)	34.9 (0.4)	0.45 (0.08)	74.79 (13.07)	10.03 (0.36)	36.55 (7.26)
ANOVA	F <sub>52,2</sub> =3.54*	F <sub>52,2</sub> =0.41 ns	F <sub>52,2</sub> =1.54 ns	F <sub>52,2</sub> =5.10*	F <sub>52,2</sub> =2.43 ns	F <sub>52,2</sub> =1.12 ns

*SWC* soil water content, *ST* soil temperature in 0-5 cm, *DOC* dissolved organic carbon, *DN* dissolved nitrogen, *In-N* inorganic nitrogen, *B-biomass* belowground biomass. *N0* no nitrogen addition, *N1* 2.5 gN m<sup>-2</sup> yr<sup>-1</sup> addition, *N2* 5 gN m<sup>-2</sup> yr<sup>-1</sup> addition.

Values are means (with 1S.E. in parentheses). Statistical significance was determined at  $P < 0.05$ , with ns indicating no significant difference and \* indicating difference at  $P < 0.05$  between treatments using ANOVA.

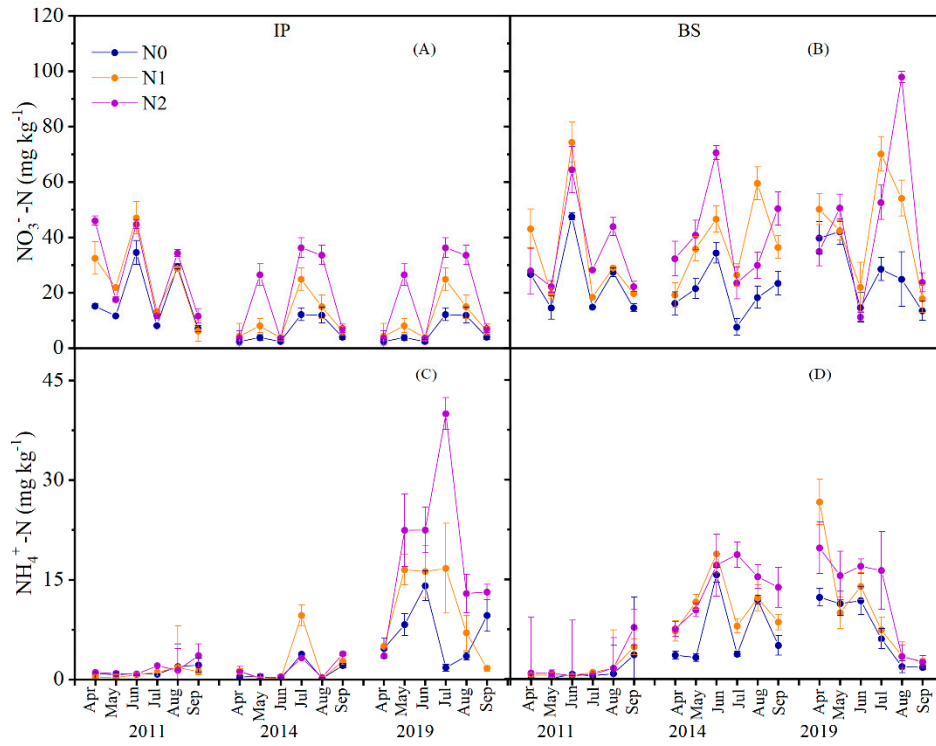


Figure S1. Soil nitrate ( $\text{NO}_3^- \text{-N}$ ) and ammoniacal ( $\text{NH}_4^+ \text{-N}$ ) content in two microsites of interplant space and beneath shrub under three levels of N treatments (N0, N1 and N2). Different small letters indicate significant differences among N treatments at  $p = 0.05$  level. N0: control; N1: 2.5  $\text{gN m}^{-2}\text{yr}^{-1}$  addition; N2: 5  $\text{gN m}^{-2}\text{yr}^{-1}$  addition.

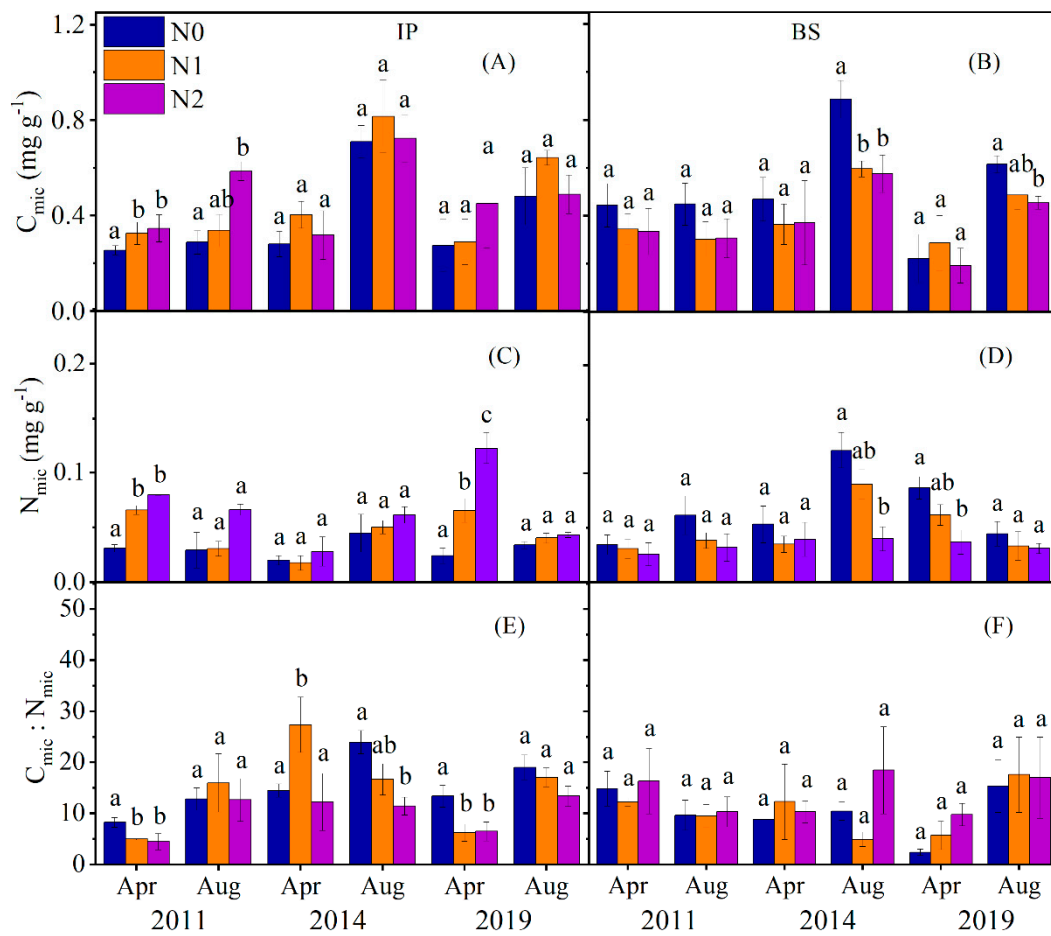


Figure S2. Soil microbial biomass carbon ( $C_{mic}$ ), nitrogen ( $N_{mic}$ ), the ratio of soil microbial biomass carbon to nitrogen ( $C_{mic} : N_{mic}$ ) in two microsites of interplant space and beneath shrub under three levels of N treatments (N0, N1 and N2). Different small letters indicate significant differences among N treatments at  $P = 0.05$  level. N0: control; N1: 2.5 gN m<sup>-2</sup>yr<sup>-1</sup> addition; N2: 5 gN m<sup>-2</sup>yr<sup>-1</sup> addition.

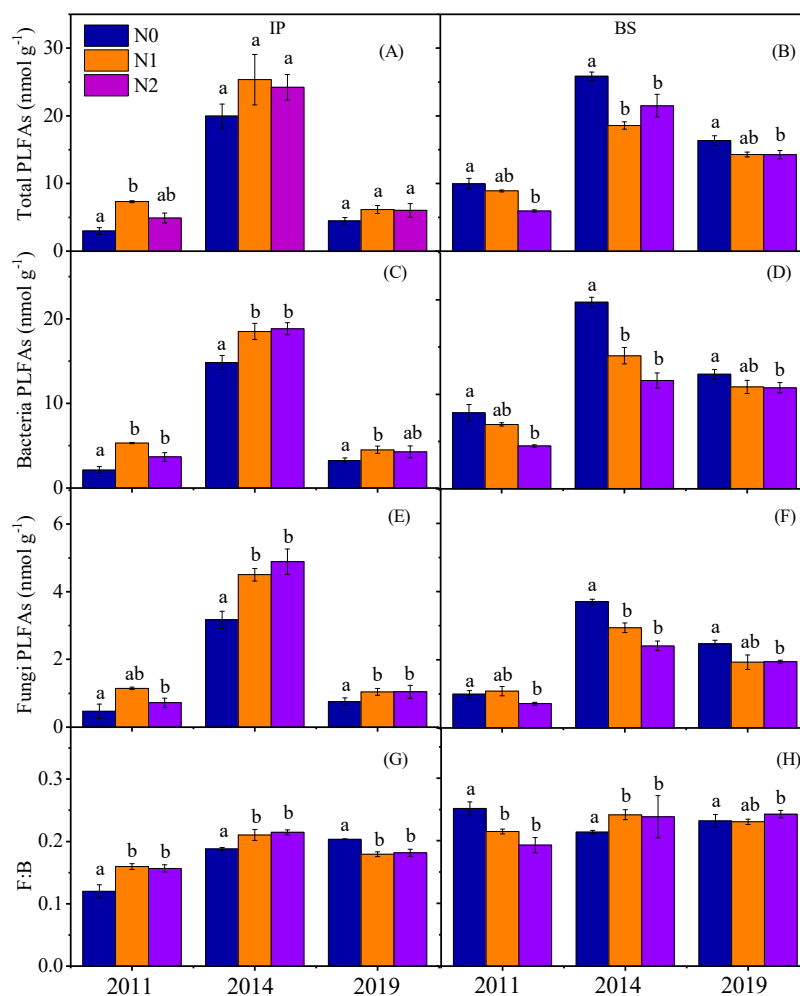


Figure S3. Soil microbial phospholipid fatty acids (PLFAs), bacterial PLFAs, fungal PLFAs and soil fungal to bacterial PLFAs (F:B) in two microsites of interplant space and beneath shrub under three levels of N treatments (N0, N1 and N2). Different small letters indicate significant differences among N treatments at p = 0.05 level. N0: control; N1: 2.5 gN m<sup>-2</sup>yr<sup>-1</sup> addition; N2: 5 gN m<sup>-2</sup>yr<sup>-1</sup> addition.

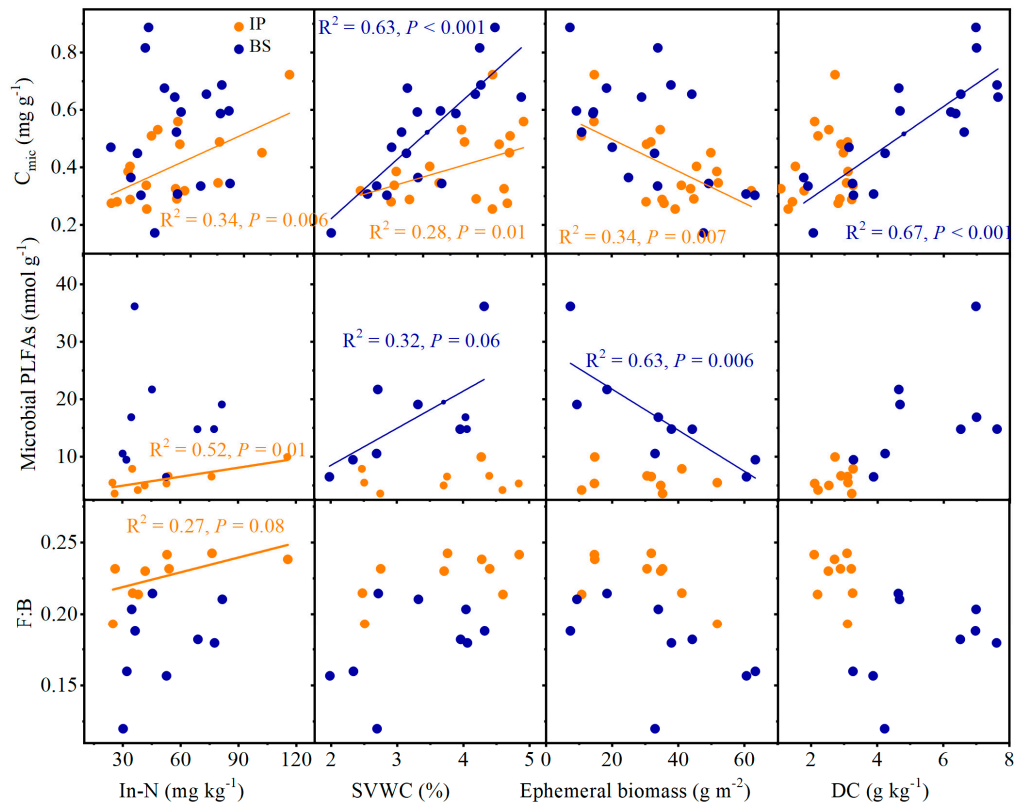


Figure S4. Correlations of soil inorganic nitrogen (In-N), soil volumetric water content (SVWC), ephemeral biomass and soil dissolved carbon (DC) with microbial biomass C ( $C_{mic}$ ), microbial PLFAs and the ratio of fungal to bacterial PLFAs (F:B). Correlation coefficients and associated  $P$  values were based on Pearson correlation tests.