Table S1. Analysis of variance (ANOVA) for soil organic carbon, total nitrogen and total phosphorus concentrations considering the main effects (crop and region) and their interaction (crop*region).

Organic carbon

Term	**Df**	**Sum Sq**	**Mean Sq**	***F***	***p***
Crop	1	9.18	9.18	4.613	0.050
Region	1	403.2	403.2	202.5	< 0.001
Crop*Region	1	8.99	8.99	4.517	0.052
Residuals	14	27.87	1.99		

Total nitrogen

Term	**Df**	**Sum Sq**	**Mean Sq**	***F***	***p***
Crop	1	0.176	0.176	0.286	0.601
Region	1	3.243	3.243	5.262	0.038
Crop*Region	1	1.291	1.291	2.095	0.169
Residuals	14	8.627	0.616		

Total phosphorus

Term	**Df**	**Sum Sq**	**Mean Sq**	***F***	***p***
Crop	1	1710	1710	0.575	0.461
Region	1	1246	1246	0.419	0.546
Crop*Region	1	2780	2780	0.935	0.349
Residuals	14	41618	2973		

Table S2. Analysis of variance (ANOVA) for enzyme activities considering the main effects (crop and region) and their interaction (crop*region).

ß-1,4-glucosidase (BG)

Term	**Df**	**Sum Sq**	**Mean Sq**	***F***	***p***
Crop	1	0.0046	0.0046	0.271	0.611
Region	1	0.0470	0.0470	2.755	0.119
Crop*Region	1	0.0289	0.0289	1.698	0.214
Residuals	14	0.2389	0.0171		

Polyphenol oxidase (POX)

Term	**Df**	**Sum Sq**	**Mean Sq**	***F***	***p***
Crop	1	0.0003	0.0003	0.009	0.924
Region	1	0.0112	0.0112	0.308	0.587
Crop*Region	1	0.1782	0.1782	4.885	0.044
Residuals	14	0.5108	0.0365		

Leucine aminopeptidase (LAP)

Term	**Df**	**Sum Sq**	**Mean Sq**	***F***	***p***
Crop	1	0.0175	0.0175	0.369	0.553
Region	1	0.0470	0.0470	0.992	0.336
Crop*Region	1	0.0022	0.0022	0.046	0.832
Residuals	14	0.6635	0.0474		

ß-1,4-N-acetylglucosaminidase (NAG)

Term	**Df**	**Sum Sq**	**Mean Sq**	***F***	***p***
Crop	1	0.0069	0.0069	0.267	0.613
Region	1	0.0800	0.0800	3.118	0.099
Crop*Region	1	0.0148	0.0148	0.578	0.459
Residuals	14	0.3592	0.0257		

Acid phosphatase (AP)

Term	**Df**	**Sum Sq**	**Mean Sq**	***F***	***p***
Crop	1	0.0020	0.0020	0.020	0.889
Region	1	0.0925	0.0925	0.944	0.348
Crop*Region	1	0.0002	0.0002	0.001	0.968
Residuals	14	1.3707	0.0979		

Table S3. Analysis of variance (ANOVA) for enzyme stoichiometry activity ratios considering the main effects (crop and region) and their interaction (crop*region).

(BG+POX) : (LAP+NAG)

Term	**Df**	**Sum Sq**	**Mean Sq**	***F***	***p***
Crop	1	0.103	0.103	0.172	0.685
Region	1	0.376	0.376	0.627	0.442
Crop*Region	1	3.646	3.646	6.083	0.027
Residuals	14	8.391	0.599		

(BG+POX) : AP

Term	**Df**	**Sum Sq**	**Mean Sq**	***F***	***p***
Crop	1	0.017	0.017	0.020	0.889
Region	1	0.098	0.098	0.116	0.738
Crop*Region	1	1.168	1.168	1.382	0.259
Residuals	14	11.83	0.845		

(LAP+NAG) : AP

Term	**Df**	**Sum Sq**	**Mean Sq**	***F***	***p***
Crop	1	0.077	0.077	0.179	0.679
Region	1	0.100	0.100	0.233	0.637
Crop*Region	1	0.106	0.106	0.246	0.627
Residuals	14	6.001	0.429		

Table S4. Analysis of variance (ANOVA) of soil microbial diversity considering the main effects (crop and region) and their interaction (crop*region).

Shannon Index *H* (Bacteria)

Term	**Df**	**Sum Sq**	**Mean Sq**	***F***	***p***
Crop	1	0.1452	0.1452	9.162	0.009
Region	1	0.6087	0.6087	38.41	< 0.001
Crop*Region	1	0.0611	0.0611	3.855	0.070
Residuals	14	0.2219	0.0158		

Shannon Index *H* (Fungi)

Term	**Df**	**Sum Sq**	**Mean Sq**	***F***	***p***
Crop	1	0.0253	0.0253	0.106	0.750
Region	1	0.3042	0.3042	1.273	0.278
Crop*Region	1	0.1664	0.1664	0.696	0.418
Residuals	14	3.3459	0.2390		

Simpson Index *D* (Bacteria)

Term	**Df**	**Sum Sq**	**Mean Sq**	***F***	***p***
Crop	1	1.77e-05	1.77e-05	6.472	0.023
Region	1	3.96e-05	3.96e-05	14.46	0.002
Crop*Region	1	1.26e-06	1.26e-06	0.460	0.509
Residuals	14	3.84e-05	2.74e-06		

Simpson Index *D* (Fungi)

Term	**Df**	**Sum Sq**	**Mean Sq**	***F***	***p***
Crop	1	0.0004	0.0004	0.247	0.627
Region	1	0.00001	0.00001	0.006	0.941
Crop*Region	1	0.0009	0.0009	0.522	0.482
Residuals	14	0.0243	0.0017		

Table S5. Analysis of deviance (ANODEV) of soil bacterial abundance considering the main effects (crop and region) and their interaction (crop*region).

Proteobacteria

Term	**Df**	**Deviance**	χ^2	p
Crop	1	0.0029	0.001	0.970
Region	1	389.64	194.8	< 0.001
Crop*Region	1	3.3416	1.671	0.196

Actinobacteria

Term	**Df**	**Deviance**	χ^2	p
Crop	1	0.1289	0.064	0.800
Region	1	135.60	67.80	< 0.001
Crop*Region	1	6.3086	3.154	0.076

Acidobacteria

Term	**Df**	**Deviance**	χ^2	p
Crop	1	0.1527	0.076	0.782
Region	1	737.02	368.5	< 0.001
Crop*Region	1	51.142	25.57	< 0.001

Gemmatimonadetes

Term	**Df**	**Deviance**	χ^2	p
Crop	1	12.111	6.056	0.014
Region	1	317.56	158.8	< 0.001
Crop*Region	1	12.934	6.467	0.011

Bacteroidetes

Term	**Df**	**Deviance**	χ^2	p
Crop	1	1.4072	0.704	0.402
Region	1	55.430	27.72	< 0.001
Crop*Region	1	0.0003	2.0e-04	0.989

Nitrospirae

Term	**Df**	**Deviance**	χ^2	p
Crop	1	0.2098	0.105	0.746
Region	1	295.16	147.6	< 0.001
Crop*Region	1	0.2195	0.110	0.740

Firmicutes

Term	**Df**	**Deviance**	χ^2	p
Crop	1	2.382	1.191	0.275
Region	1	288.48	144.2	< 0.001
Crop*Region	1	5.80e-05	0	0.996

Cyanobacteria

Term	**Df**	**Deviance**	χ^2	p
Crop	1	18.777	9.388	0.002
Region	1	146.16	73.08	< 0.001
Crop*Region	1	14.675	7.338	0.007

Armatimonadetes

Term	**Df**	**Deviance**	χ^2	p
Crop	1	5.7978	2.899	0.089
Region	1	61.174	30.59	< 0.001
Crop*Region	1	12.348	6.174	0.013

Table S6. Analysis of deviance (ANODEV) of soil fungi abundance considering the main effects (crop and region) and their interaction (crop*region).

Ascomycota

Term	**Df**	**Deviance**	χ^2	p
Crop	1	58.144	29.07	< 0.001
Region	1	0.0019	0.001	0.975
Crop*Region	1	0.3237	0.162	0.688

Basidiomycota

Term	**Df**	**Deviance**	χ^2	p
Crop	1	11.864	5.932	0.015
Region	1	143.40	71.70	< 0.001
Crop*Region	1	69.386	34.69	< 0.001

Mortierellomycota

Term	**Df**	**Deviance**	χ^2	p
Crop	1	9.8134	4.907	0.027
Region	1	63.946	31.97	< 0.001
Crop*Region	1	18.939	9.470	0.002

Table S7. Pearson correlations among soil carbon, nitrogen and phosphorus concentrations, soil enzyme activity and, bacterial and fungal abundances. The upper diagonal corresponds to the semiarid region and the lower diagonal refers to the arid region.

			OC	TN	TP	Bg	Pox	Lap	Nag	Cyano	Firmi	Gemma
Organic C (OC)			0.61	0.57	0.52	**0.77***	**-0.69***	0.51	**0.81****			-0.21
Total N (TN)		0.37		0.31	0.09	0.19	-0.14	0.06	0.43			0.43
Total P (TP)		-0.12	-0.38		**0.67***	**0.70***	-0.59	0.27	0.46			-0.17
ß-1,4-glucosidase (Bg)	0.06	0.01	0.01		**0.72***	**-0.87****	0.45	**0.67***	0.17		-0.24	-0.21
Polyphenol oxidase (Pox)	-0.58	0.21	-0.4	-0.4		**-0.87****	**0.70***	**0.72***	0.17		-0.31	-0.55
Leucine aminopeptidase (Lap)	0.15	0.24	0.35	-0.02	-0.05		**-0.67***	**-0.82****	0.09		0.12	0.32
N-acetyl glucosaminidase (Nag)	0.14	-0.17	0.37	0.65	-0.42	-0.17	**0.77***	-0.44	0.45	-0.17	-0.06	0.14
Acid phosphatase (Ap)	-0.24	-0.2	0.3	0.36	-0.11	-0.42	**0.68***		-0.28		-0.05	0.08
Acidobacteria (Acido)	-0.09	-0.08	0.4	-0.38	0.24	**0.74***	-0.13	-0.08			-0.5	-0.41
Actinobacteria (Actin)	**-0.66**	-0.23	0.13	-0.18	0.42	-0.28	-0.37	0.03	-0.23		0.48	0.34
Armatimonadetes (Armat)	-0.58	-0.22	0.19	0.45	-0.06	-0.46	0.21	0.43	-0.59		-0.51	-0.39
Ascomycota (Ascom)	0.44	-0.29	-0.11	-0.21	-0.3	-0.52	0.32	0.12	-0.22		-0.18	0.51
Bacteroidetes (Bacter)	**0.93****	0.63	-0.2	0.19	-0.42	0.24	0.15	-0.27	-0.14		**0.86****	0.06
Basidiomycota (Basid)	-0.65	-0.05	-0.28	0.22	0.38	-0.44	-0.25	0.19	-0.48		0.28	0.24
Cyanobacteria (Cyano)	-0.24	-0.01	0.1	0.44	-0.29	-0.32	0.03	0.11	**-0.72***			0.05
Firmicutes (Firmi)		0.43	0.39	-0.65	-0.07	0.26	-0.34	0.16	0.11			-0.56
Gemmatimonadetes (Gemma)	0.06	-0.24	0.18	0.05	-0.03	0.63	0.12	-0.01	**0.80****		**-0.71***	0.05
Mortierellomycota (Morti)	0.66	0.59	-0.51	0.07	0.08	-0.11	0.25	-0.02	-0.11		-0.47	**0.91*****
Nitrospirae (Nitro)		0.05	-0.33	0.13	-0.35	0.27	0.05	0.24	0.14			**-0.85****
Proteobacteria (Prote)	0.51	-0.22	-0.1	0.45	**-0.76***	-0.24	0.44	0.05	-0.44		0.12	0.14

Note. Significant correlation in bold; significance: *, $p < 0.05$; **, $p < 0.01$; ***, $p < 0.001$.