Supplements

Guasconi et al. - Spatial and temporal variability in soil and vegetation carbon dynamics under experimental drought and soil amendments
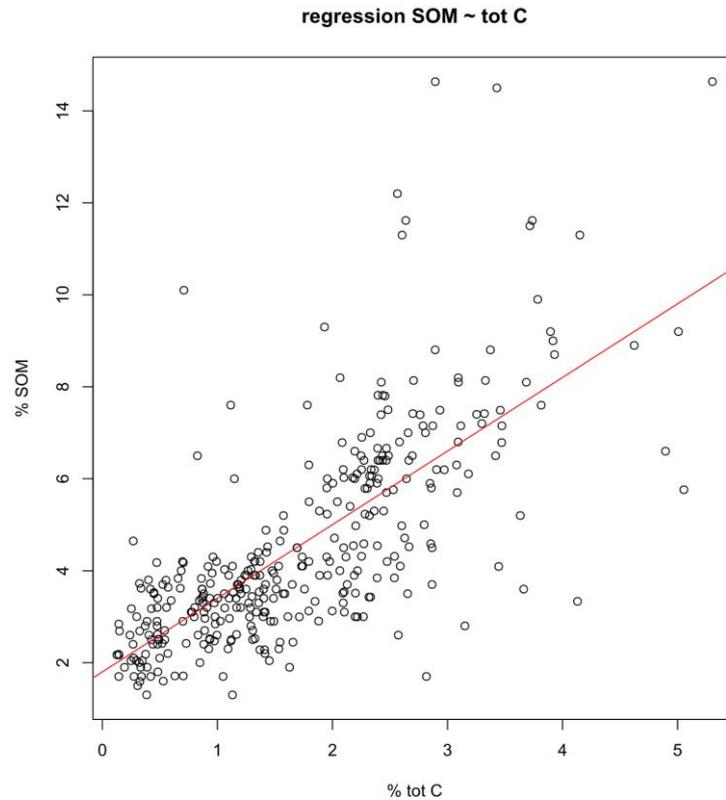
Fig S1. Regression plot SOM ~ tot C in the study system.

Table T1. Details of the sampling design

	2019	2022
Soil bulk density	3 cores per site (12 cores in total)	1 core per plot (48 cores in total)
Total C and N and $\delta^{13}C$	6 cores per site (24 cores in total)	1 core per plot (48 cores in total)
pH	0-10 cm, 10-20 cm, 20-30 cm and 40-50 cm. All plots (n = 48)	0-10 cm, 10-20 cm, 20-30 cm and 40-50 cm. All plots (n = 48)
P, Ca, Mg, K	0-30 cm. All plots (n = 48)	10-20 cm. All plots (n = 48)
Soil moisture	All plots (n = 48)	All plots (n = 48)
Root biomass	All plots (n = 48)	All plots (n = 48)
Aboveground biomass	All plots (n = 48)	All plots (n = 48)

Table T2. Effect of the treatments, F and P values from the mixed linear model

variable		F-value	P-value
Tot C%	compost	3.92	0.04
	drought	0.11	0.74
	depth	381.34	< 0.001
	compost*drought	0.09	0.75
	compost*depth	4.71	0.03
	drought*depth	0.07	0.78
	compost*drought*depth	0.18	0.67
Soil C stock	compost	2.55	0.11
	drought	0.02	0.88
	depth	318.82	< 0.001
	compost*drought	0.45	0.49
	compost*depth	1.58	0.21
	drought*depth	0.75	0.38
	compost*drought*depth	0.14	0.70
Bulk Density	compost	4.43	0.03
	drought	0.53	0.46
	depth	133.90	< 0.001
	compost*drought	0.01	0.91
	compost*depth	3.42	0.06
	drought*depth	2.60	0.10
	compost*drought*depth	1.24	0.26
Root biomass	compost	0.01	0.97
	drought	0.26	0.60
	depth	742.50	< 0.001
	compost*drought	0.28	0.59
	compost*depth	0.03	0.84
	drought*depth	0.01	0.97
	compost*drought*depth	0.51	0.47
Root:shoot	compost	0.26	0.60
	drought	1.44	0.23
	depth	730.55	< 0.001
	compost*drought	0.54	0.46
	compost*depth	0.04	0.84
	drought*depth	0.01	0.93
	compost*drought*depth	0.20	0.65
Aboveground biomass	compost	43.47	< 0.001
	drought	61.29	< 0.001
	compost*drought	32.77	< 0.001

Table T3. Spatial variability, F and P values from the mixed linear model

variable		F-value	P-value
Tot C%	grassland	6.12	0.01
	catenary position	88.07	< 0.01
	depth	1031.73	< 0.01
	grass*cat pos	43.19	< 0.01
	grass*depth	42.61	< 0.01
	cat pos*depth	2.44	0.12
	grass*cat pos*depth	3.85	0.04
Soil C stock	grassland	3.80	0.05
	catenary position	59.62	< 0.01
	depth	697.73	< 0.01
	grass*cat pos	9.98	< 0.01
	grass*depth	44.45	< 0.01
	cat pos*depth	0.28	0.59
	grass*cat pos*depth	0.75	0.38
Bulk Density	grassland	5.82	0.01
	catenary position	16.51	< 0.01
	depth	261.30	< 0.01
	grass*cat pos	44.24	< 0.01
	grass*depth	4.00	0.04
	cat pos*depth	4.60	0.03
	grass*cat pos*depth	10.94	< 0.01
Root biomass	grassland	0.72	0.39
	catenary position	3.89	0.04
	depth	581.87	< 0.01
	grass*cat pos	5.61	0.02
	grass*depth	1.83	0.17
	cat pos*depth	12.94	< 0.01
	grass*cat pos*depth	0.04	0.83
Root:shoot	grassland	0.42	0.51
	catenary position	3.96	0.04
	depth	748.09	< 0.01
	grass*cat pos	1.26	0.26
	grass*depth	2.60	0.11
	cat pos*depth	12.17	< 0.01
	grass*cat pos*depth	0.49	0.48
Aboveground biomass	grassland	9.58	< 0.01
	catenary position	0.24	0.62
	grass*cat pos	38.14	< 0.01

Table T4. Temporal variability, F and P values from the mixed linear model

variable		F-value	P-value
Tot C%	year	12.22	< 0.01
	depth	969.92	< 0.01
	year*depth	0.79	0.37
Soil C stock	year	5.00	0.02
	depth	659.01	< 0.01
	year*depth	0.001	0.96
Bulk Density	year	6.83	< 0.01
	depth	254.08	< 0.01
	year*depth	0.27	0.59
Root biomass	year	7.27	< 0.01
	depth	581.70	< 0.01
	year*depth	9.13	< 0.01
Root:shoot	year	22.62	< 0.01
	depth	575.76	< 0.01
	year*depth	8.99	< 0.01
Aboveground biomass	year	102.75	< 0.01