

Supplementary materials B

Table B.1: Results for XRF, carbonate content and CEC for bulk samples. Samples with * are those selected for the acetic acid extraction. A1 to T10 are soil samples. FS-NO1 and FS-NO2 are carbonate nodules collected at the soil surface of profile F. NS-NO1, NS-NO2 and NS-NO3 are carbonate nodules collected at the soil surface of profile N. ¹ Data from Diaz et al., 2016a.

	Depth	Al2O3	CaO	Na2O	K2O	Fe2O3	MgO	MnO	TiO2	SiO2	P2O5	L.O.I	CaCO3	Al3+	Ca2+	Mg2+	K+	Na+	CEC totale	Skeleton ¹
	cm	wt-%	wt-%	wt-%	wt-%	wt-%	wt-%	wt-%	wt-%	wt-%	wt-%	wt-%	%	cmol+/kg	cmol+/kg	cmol+/kg	cmol+/kg	cmol+/kg	cmol+/kg	%
A1	0-5	15.06	1.80	0.69	4.09	3.75	0.99	0.09	1.38	67.94	0.05	3.74	1.1	0.00	8.66	0.94	0.21	0.39	18.15	2.1
A2	5-10	18.81	1.75	0.64	3.48	5.69	1.40	0.09	1.23	60.50	0.04	6.03	1.4	0.00	13.61	1.87	0.27	1.67	24.94	1.1
A3	10-20	19.48	1.53	0.69	3.38	6.18	1.53	0.08	1.18	59.35	0.04	6.29	3.3	0.00	15.91	2.49	0.32	2.37	32.09	0.1
A4	20-30	19.48	1.37	0.72	3.41	6.01	1.49	0.08	1.14	60.18	0.05	5.78	5.8	0.00	14.45	2.69	0.33	2.20	27.57	0.2
A6	40-50	19.87	1.42	0.65	3.41	5.97	1.52	0.09	1.13	59.66	0.04	5.95	3.0	0.00	14.90	2.89	0.33	2.03	29.35	0.0
B1	0-5	19.67	1.65	0.51	3.20	6.45	1.59	0.10	1.20	58.53	0.05	6.76	4.1	0.00	19.32	2.35	0.49	1.14	32.67	1.6
B2	5-10	19.41	1.65	0.59	3.24	6.30	1.55	0.10	1.19	58.65	0.05	7.00	3.9	0.00	18.11	2.55	0.36	1.94	35.08	0.0
B3	10-20	19.51	1.82	0.61	3.31	6.14	1.61	0.08	1.17	58.97	0.05	6.46	3.7	0.00	16.98	2.60	0.30	2.33	29.97	0.0
B4	20-30	19.49	1.43	0.67	3.39	6.25	1.54	0.12	1.19	59.46	0.05	6.12	3.5	0.00	14.94	2.66	0.30	2.30	31.32	0.1
B6	50-60	19.06	1.44	0.67	3.43	5.84	1.47	0.08	1.16	60.12	0.05	6.40	3.1	0.00	14.31	2.84	0.23	1.87	33.54	0.3
C1	0-5	19.20	1.51	0.51	3.38	6.14	1.53	0.09	1.15	59.69	0.05	6.46	3.6	0.00	17.66	2.62	0.41	0.91	36.22	0.6
C2	5-10	19.05	1.60	0.56	3.28	6.19	1.54	0.09	1.21	58.93	0.05	7.23	4.0	0.00	17.63	2.94	0.31	1.74	33.84	4.9
C3	10-20	19.07	1.65	0.64	3.33	6.33	1.57	0.09	1.18	59.18	0.05	6.64	4.2	0.00	16.32	3.03	0.33	2.48	36.84	0.5
C4	20-30	19.72	1.70	0.60	3.28	6.31	1.62	0.09	1.20	58.71	0.05	6.42	3.8	0.00	17.67	3.12	0.35	2.85	25.78	0.4
C6	40-50	19.39	1.44	0.67	3.44	5.86	1.54	0.09	1.18	60.01	0.06	6.02	3.2	0.00	14.49	3.06	0.27	1.77	25.65	0.0
C8	60-70	19.50	1.46	0.71	3.47	5.97	1.53	0.09	1.16	60.06	0.05	5.70	3.2	0.00	13.92	3.23	0.35	1.68	24.26	0.4
D1	0-5	19.03	2.41	0.53	3.21	5.80	1.49	0.10	1.16	59.06	0.04	6.86	5.1	0.00	18.60	2.48	0.41	1.68	29.45	7.0
D2	5-10	19.00	1.93	0.57	3.24	6.06	1.51	0.09	1.17	59.38	0.05	6.72	3.6	0.00	16.41	2.92	0.38	2.53	33.29	1.8
D3	10-20	18.84	2.08	0.62	3.21	6.12	1.56	0.10	1.16	59.01	0.05	6.97	4.0	0.00	17.27	3.22	0.43	2.83	36.67	5.6
D4	20-30	19.11	1.85	0.58	3.24	6.28	1.58	0.09	1.18	58.27	0.04	7.48	3.7	0.00	15.90	3.33	0.31	2.95	33.50	4.0
D6	40-50	19.18	1.66	0.63	3.33	6.27	1.58	0.09	1.21	59.29	0.05	6.44	3.3	0.00	16.45	3.45	0.36	2.05	29.16	0.5
D8	60-70	19.71	1.53	0.65	3.43	6.14	1.55	0.07	1.17	59.58	0.05	5.83	2.8	0.00	14.40	3.38	0.35	1.62	27.79	2.5

D10	80-90	19.15	1.40	0.67	3.51	5.86	1.57	0.08	1.21	60.14	0.06	6.05	2.6	0.00	13.46	3.56	0.27	1.51	27.36	0.0
E1	0-5	18.79	2.64	0.43	3.10	5.94	1.49	0.11	1.14	58.27	0.04	7.77	4.7	0.00	19.90	2.41	0.40	0.25	35.66	15.6
E2	5-10	18.55	2.54	0.46	3.22	6.05	1.50	0.12	1.19	58.76	0.04	7.29	4.9	0.00	18.16	2.90	0.40	1.09	37.90	12.1
E3	10-20	18.65	2.59	0.50	3.20	6.12	1.54	0.12	1.16	58.76	0.04	7.02	5.5	0.00	17.07	3.25	0.32	1.75	41.09	8.2
E4	20-30	18.99	1.96	0.57	3.24	6.19	1.55	0.10	1.13	58.08	0.04	7.87	4.3	0.00	15.29	3.25	0.39	2.57	39.48	2.9
E6	40-50	19.38	1.75	0.55	3.33	6.24	1.60	0.08	1.18	58.21	0.05	7.35	4.1	0.00	16.18	3.64	0.32	2.26	26.09	9.6
E8	60-70	19.29	1.56	0.64	3.33	6.00	1.60	0.08	1.18	59.78	0.05	6.19	3.5	0.00	15.12	3.76	0.33	1.88	27.61	1.8
E10	80-90	19.28	1.52	0.67	3.45	5.84	1.57	0.08	1.15	60.54	0.05	5.56	3.1	0.00	13.43	3.43	0.35	1.75	26.97	0.2
E12	100-110	19.41	1.49	0.71	3.50	5.92	1.55	0.09	1.17	60.26	0.05	5.56	3.0	0.00	12.48	3.56	0.35	1.71	27.48	0.0
F1*	0-5	18.34	3.69	0.38	3.04	6.11	1.59	0.16	1.18	57.16	0.05	8.00	3.2	0.00	21.67	2.76	0.00	0.81	41.35	8.0
F2	5-10	18.56	2.90	0.45	3.13	5.96	1.55	0.14	1.16	58.47	0.04	7.37	5.6	0.00	19.04	3.32	0.00	1.57	41.72	15.5
F3	10-20	18.39	3.04	0.48	3.04	5.87	1.57	0.14	1.16	56.97	0.05	9.00	6.1	0.00	18.67	3.31	0.46	1.65	35.05	11.8
F4*	20-30	18.69	2.76	0.55	3.21	6.20	1.61	0.12	1.20	58.10	0.04	7.24	4.1	0.00	17.48	3.38	0.44	2.43	35.18	14.7
F6	40-50	18.85	1.70	0.57	3.30	6.08	1.57	0.10	1.17	59.04	0.05	7.27	5.5	0.00	15.92	3.72	0.32	2.39	32.23	7.5
F8*	60-70	19.17	1.76	0.58	3.34	6.31	1.66	0.10	1.21	58.31	0.05	7.21	1.1	0.00	14.99	3.93	0.33	2.11	31.41	5.5
F10	80-90	19.41	1.36	0.65	3.52	6.10	1.61	0.09	1.22	60.01	0.05	5.69	4.8	0.00	13.07	3.82	0.39	1.60	29.26	0.9
F12	100-110	19.41	1.71	0.67	3.49	6.07	1.63	0.09	1.18	59.56	0.08	5.80	3.6	0.00	13.33	3.86	0.38	1.68	30.54	0.4
G1	0-5	18.23	3.57	0.45	3.08	5.77	1.52	0.11	1.20	57.98	0.04	7.76	6.2	0.00	20.15	2.98	0.47	0.73	38.20	6.9
G2	5-10	18.08	3.06	0.47	3.18	5.93	1.53	0.11	1.18	57.88	0.04	8.24	5.4	0.00	19.35	3.28	0.37	1.30	29.74	7.5
G3	10-20	19.36	2.23	0.64	2.79	4.27	1.67	0.08	0.89	59.99	0.04	7.84	4.6	0.00	17.82	3.44	0.38	2.05	27.54	16.3
G4	20-30	18.65	2.58	0.53	3.19	6.10	1.59	0.11	1.18	57.81	0.04	7.89	5.4	0.00	17.65	3.67	0.40	2.54	29.47	12.0
G6	40-50	18.91	1.82	0.50	3.30	6.28	1.62	0.10	1.20	58.06	0.05	7.88	4.2	0.00	15.91	4.19	0.34	2.06	27.71	4.1
G8	60-70	19.18	1.59	0.64	3.48	6.09	1.59	0.09	1.14	59.88	0.05	5.99	3.4	0.00	13.80	4.00	0.41	1.55	26.16	5.4
G10	80-90	19.48	1.32	0.64	3.50	6.00	1.57	0.08	1.18	60.21	0.06	5.67	2.9	0.00	13.05	3.79	0.39	1.41	22.09	0.8
G12	100-110	19.38	1.72	0.69	3.44	5.87	1.59	0.08	1.17	59.88	0.05	5.86	3.3	0.00	13.25	3.73	0.37	1.41	29.21	3.6
G14	120-130	19.38	1.55	0.66	3.31	6.21	1.60	0.07	1.19	59.32	0.06	6.39	3.4	0.00	14.87	4.57	0.40	1.57	21.01	9.9
H1	0-5	18.77	2.44	0.57	3.20	6.12	1.58	0.12	1.21	58.55	0.05	7.10	4.8	0.00	17.04	3.12	0.42	2.78	33.41	1.9
H2	5-10	18.77	2.46	0.59	3.17	6.01	1.58	0.09	1.15	58.67	0.05	7.17	4.3	0.00	16.53	3.20	0.43	2.99	35.57	14.2
H3	10-20	18.95	2.11	0.56	3.23	6.08	1.61	0.10	1.20	58.85	0.08	6.92	4.0	0.00	16.94	3.50	0.42	2.19	34.21	5.2
H4	20-30	19.17	1.71	0.55	3.29	6.20	1.61	0.10	1.15	58.78	0.05	7.11	3.7	0.00	15.96	3.90	0.34	2.16	27.81	2.7

H6	40-50	19.58	1.52	0.56	3.33	6.22	1.63	0.09	1.17	58.49	0.04	7.08	3.3	0.00	14.95	3.89	0.38	1.94	24.97	13.5
H8	60-70	19.43	1.66	0.64	3.49	6.07	1.57	0.09	1.20	59.53	0.06	5.95	4.9	0.00	13.41	3.77	0.41	1.48	30.41	10.1
H10	80-90	19.25	1.56	0.63	3.58	5.95	1.60	0.09	1.15	59.40	0.05	6.42	4.6	0.00	12.71	3.71	0.30	1.47	24.91	10.9
H12	100-110	19.50	1.50	0.63	3.35	6.00	1.61	0.08	1.16	59.88	0.05	5.98	5.1	0.00	13.62	4.14	0.38	1.54	27.59	1.2
I1	0-5	19.70	1.43	0.59	3.45	6.23	1.57	0.10	1.15	59.38	0.05	6.06	4.6	0.00	14.71	2.98	0.42	1.51	28.56	0.9
I2	5-10	19.97	1.58	0.66	3.41	6.15	1.58	0.08	1.18	58.97	0.05	6.07	4.6	0.00	14.02	3.15	0.38	1.94	29.98	0.6
I3	10-20	19.74	1.38	0.67	3.47	6.07	1.57	0.08	1.19	59.82	0.05	5.64	4.5	0.00	14.28	3.25	0.38	2.31	21.20	0.4
I4	20-30	19.16	1.41	0.69	3.51	5.88	1.52	0.08	1.19	59.96	0.05	6.25	4.5	0.00	12.69	3.38	0.24	1.49	25.83	1.0
I6	40-50	19.60	1.39	0.68	3.53	5.98	1.56	0.08	1.16	60.14	0.05	5.52	4.2	0.00	12.42	3.39	0.36	1.46	24.72	1.0
I8	60-70	19.53	1.53	0.64	3.45	6.11	1.56	0.09	1.21	59.55	0.05	6.01	4.5	0.00	13.76	3.64	0.34	1.40	22.33	0.0
I10	80-90	20.04	1.30	0.58	3.14	6.57	1.61	0.10	1.17	57.64	0.06	7.53	4.9	0.00	16.08	4.69	0.30	1.93	32.77	0.4
J0	0-5	19.43	1.37	0.65	3.54	6.03	1.50	0.08	1.21	60.25	0.04	5.63	4.4	0.00	13.71	2.91	0.35	1.30	29.89	0.0
J1	5-10	19.43	1.28	0.65	3.47	6.09	1.51	0.08	1.19	60.00	0.04	5.96	4.3	0.00	8.35	2.68	0.47	1.82	32.46	0.0
J2	10-20	19.48	1.26	0.67	3.48	6.04	1.51	0.08	1.15	60.19	0.04	5.83	4.6	0.00	13.64	3.19	0.35	1.81	20.14	0.1
J3	20-30	19.83	1.20	0.64	3.46	5.95	1.53	0.08	1.16	59.73	0.04	6.08	4.5	0.00	13.30	3.34	0.30	1.77	19.73	0.0
J5	40-50	19.64	1.45	0.60	3.42	6.15	1.54	0.07	1.20	58.84	0.05	6.74	4.8	0.00	9.63	2.48	0.18	1.12	38.36	1.1
J7	60-70	20.19	1.31	0.53	3.04	7.06	1.59	0.09	1.20	56.33	0.05	8.33	5.8	0.00	16.51	4.62	0.24	2.01	23.77	1.3
K1	0-5	19.71	1.31	0.65	3.45	6.12	1.48	0.09	1.20	59.91	0.05	5.72	3.0	0.00	14.18	3.19	0.31	1.49	24.04	0.7
K2	5-10	19.77	1.21	0.67	3.40	6.13	1.49	0.08	1.19	59.14	0.05	6.57	3.1	0.00	13.35	3.48	0.23	1.65	28.65	1.2
K3	10-20	20.11	1.23	0.61	3.24	6.39	1.55	0.08	1.21	58.65	0.05	6.61	3.5	0.00	14.97	3.98	0.32	2.15	29.94	0.2
K4	20-30	20.05	1.20	0.58	3.08	6.74	1.57	0.09	1.20	57.62	0.05	7.54	3.8	0.00	15.75	4.06	0.27	1.88	32.29	0.0
L1	0-5	20.16	1.23	0.60	3.27	6.23	1.48	0.07	1.16	59.18	0.05	6.30	3.3	0.00	14.83	3.65	0.28	1.63	34.16	1.1
L2	5-10	20.22	1.20	0.58	3.09	6.49	1.55	0.07	1.19	58.25	0.05	7.05	3.6	0.00	16.49	3.93	0.37	2.01	31.14	0.0
L3	10-20	20.45	1.20	0.58	3.02	6.87	1.58	0.08	1.20	57.42	0.05	7.29	3.9	0.00	16.31	4.40	0.00	3.36	43.39	0.1
L4	20-30	20.70	1.18	0.56	3.02	6.74	1.63	0.08	1.21	57.29	0.05	7.29	4.0	0.00	15.85	4.26	0.55	2.99	34.51	1.1
N1*	0-5	18.10	2.63	0.70	3.44	5.26	1.43	0.09	1.08	60.94	0.05	5.99	1.7	0.00	16.25	2.16	0.00	1.67	31.45	5.0
N2	5-10	17.55	2.69	0.75	3.52	5.00	1.47	0.10	1.00	60.90	0.05	6.71	5.4	0.00	15.09	2.36	0.00	2.55	30.77	5.1
N3	10-20	17.74	2.78	0.78	3.53	5.20	1.40	0.08	1.07	60.65	0.05	6.44	4.4	0.00	12.71	2.29	0.00	3.31	30.62	3.6
N4*	20-30	17.48	2.89	0.82	3.56	5.28	1.39	0.08	1.02	60.89	0.05	6.23	2.5	0.00	13.10	2.64	0.00	4.14	36.93	1.4
N6	40-50	17.95	2.59	0.82	3.50	5.35	1.43	0.08	1.12	60.34	0.05	6.44	4.3	0.00	11.56	3.20	0.00	4.53	31.28	1.0

N8*	60-70	18.10	1.91	0.88	3.55	5.18	1.44	0.08	1.06	61.55	0.04	5.90	1.8	0.00	11.39	3.54	0.00	4.96	35.01	2.0
N10	80-90	18.56	1.89	0.88	3.52	5.24	1.45	0.07	1.06	61.62	0.04	5.37	3.1	0.00	10.34	3.58	0.00	5.01	25.61	0.9
N12	100-110	18.04	1.63	0.91	3.59	5.15	1.30	0.07	1.02	62.31	0.04	5.63	3.4	0.00	10.03	3.80	0.00	4.98	36.58	3.4
O1	0-5	18.12	2.36	0.61	3.51	5.59	1.42	0.09	1.12	60.38	0.05	6.45	3.9	0.00	11.38	1.61	0.32	0.47	25.03	6.0
O2	5-10	17.75	3.36	0.62	3.56	5.38	1.41	0.09	1.12	59.71	0.05	6.63	5.0	0.00	11.42	1.84	0.30	0.93	26.07	8.1
O3	10-20	17.79	2.61	0.74	3.56	5.21	1.40	0.09	1.05	61.31	0.05	5.89	4.0	0.00	10.26	2.16	0.38	1.54	23.71	0.0
O4	20-30	17.79	3.00	0.78	3.54	5.12	1.43	0.07	1.04	61.13	0.05	5.75	4.0	0.00	9.42	2.45	0.35	2.47	18.63	2.7
O6	40-50	18.13	2.60	0.82	3.44	5.38	1.46	0.08	1.07	60.75	0.05	5.90	3.4	0.00	8.44	2.84	0.37	2.94	20.63	2.3
O8	60-70	18.14	2.25	0.80	3.51	5.59	1.48	0.08	1.11	60.32	0.04	6.36	3.4	0.00	9.01	3.71	0.35	3.34	25.09	1.2
O10	80-90	18.14	1.66	0.70	3.44	5.75	1.56	0.06	1.14	59.15	0.04	8.03	5.5	0.00	7.73	3.74	0.23	3.08	21.20	3.3
P1	0-5	17.99	2.73	0.58	3.50	5.26	1.45	0.08	1.03	60.48	0.07	6.55	3.8	0.00	12.49	0.98	0.34	0.00	23.11	3.9
P2	5-10	17.71	2.64	0.64	3.63	5.01	1.40	0.08	1.01	61.46	0.06	6.07	3.4	0.00	11.91	1.18	0.32	0.00	18.55	2.2
P3	10-20	17.13	2.02	0.76	4.21	4.37	1.17	0.09	0.85	64.57	0.05	4.49	2.1	0.00	7.99	0.86	0.27	0.36	19.34	8.9
P4	20-30	17.76	2.24	0.75	3.85	4.78	1.31	0.08	1.00	62.85	0.06	5.05	2.3	0.00	9.23	1.32	0.24	0.62	23.67	18.8
P6	40-50	17.14	1.95	0.84	4.01	4.56	1.19	0.08	0.83	64.44	0.05	4.64	2.4	0.00	12.08	1.91	0.30	1.17	24.06	38.3
P8	60-70	18.35	2.02	0.70	3.37	5.15	1.37	0.08	1.04	61.99	0.05	5.59	3.0	0.00	10.15	2.76	0.42	1.59	16.51	2.8
P10	80-90	17.68	1.95	0.66	3.48	5.05	1.22	0.06	1.04	62.08	0.03	6.44	3.0	0.00	9.88	2.85	0.27	1.56	20.53	6.0
Q1	0-5	16.38	1.28	0.74	4.01	3.64	1.04	0.07	0.66	67.37	0.05	4.52	1.8	0.00	8.81	0.94	0.29	0.00	13.84	19.3
Q2	5-10	16.60	1.47	0.82	4.55	4.02	0.99	0.07	0.76	66.66	0.05	3.75	1.3	0.00	7.35	0.64	0.21	0.00	17.06	16.8
Q3	10-20	16.77	1.75	0.77	4.36	4.05	1.01	0.06	0.72	66.19	0.05	4.01	1.7	0.00	8.58	0.76	0.24	0.00	14.28	16.3
Q4	20-30	17.03	1.69	0.79	4.29	4.43	1.04	0.07	0.77	65.59	0.05	4.00	1.5	0.00	8.04	0.61	0.22	0.00	12.46	25.9
Q6	40-50	15.66	1.39	0.79	4.33	4.03	0.92	0.10	0.66	68.59	0.05	3.21	3.7	0.00	7.46	0.74	0.24	0.26	13.18	29.5
Q8	60-70	17.55	1.56	0.65	3.83	5.26	1.20	0.09	0.98	63.89	0.05	4.66	2.0	0.00	9.34	1.21	0.28	0.40	16.13	21.1
Q10	80-90	18.59	1.97	0.61	3.46	5.65	1.40	0.06	1.12	60.28	0.05	6.50	3.0	0.00	11.74	1.54	0.37	0.54	24.34	1.6
R0*	0-5	17.85	1.33	0.70	4.14	4.62	1.07	0.10	0.79	64.26	0.05	4.81	0.8	0.00	11.40	1.70	0.00	0.10	19.61	21.7
R1	5-10	17.51	1.31	0.72	4.21	4.41	1.02	0.08	0.71	65.35	0.04	4.37	1.3	0.00	11.46	1.49	0.00	0.00	19.79	20.1
R2	10-20	18.06	1.39	0.69	4.43	5.06	1.07	0.08	0.85	63.91	0.05	4.14	4.0	0.00	9.88	1.15	0.00	0.00	15.06	33.9
R3*	20-30	16.05	1.09	0.77	4.46	3.67	0.85	0.07	0.56	69.02	0.04	3.18	0.6	0.00	8.98	0.94	0.00	0.13	14.59	26.2
R5	40-50	17.46	1.27	0.70	4.43	4.50	0.95	0.11	0.70	65.81	0.04	3.77	3.4	0.00	7.78	0.73	0.00	0.16	15.01	24.0
R7*	60-70	17.61	1.36	0.63	3.90	4.93	1.11	0.08	0.97	64.05	0.04	5.04	0.8	0.00	12.80	1.16	0.00	0.29	23.89	13.9

Table B.2: Elemental composition of the two fractions (acetic acid and residue) for selected soils and nodules. Concentrations are given in ppm. GR for granite, SD 50 for the median of Saharan dust, SD 25 for the 25 centiles of the Saharan dust, SD 75 for the 75 centiles of Saharan dust. ¹The composition of dust is a median from Moreno et al. (2006), Castillo et al. (2008), Abouchami et al. (2013), and Gross et al. (2016), 25 and 75 are the 25 and 75 centiles.

Acetic acid extraction on nodules																
	Na	K	Rb	Mg	Ca	Sr	Ba	Y	Ti	Zr	V	Mn	Fe	Al	U	
FSNO1	139.073	470.321	0.729	4187.137	295264.889	379.523	148.812	55.619	2.615	0.353	2.182	436.939	319.980	282.051	4.720	
FSNO2	147.049	522.117	0.733	4375.636	282632.002	343.387	123.793	45.980	2.641	0.405	1.600	253.164	308.062	313.019	4.222	
F1NO	225.606	452.772	0.541	7636.633	282793.003	788.479	294.118	68.058	3.652	0.353	2.343	435.804	254.510	216.297	8.762	
F4NO	337.078	511.271	0.690	5296.808	304320.039	504.886	186.707	65.256	2.711	0.485	1.974	271.563	263.903	176.648	5.780	
F8NO	375.281	540.083	0.645	5506.629	254257.278	474.306	204.711	79.441	3.359	0.443	1.937	549.658	293.561	263.103	4.838	
NSNO1	111.747	474.773	0.714	4073.005	266591.804	312.958	119.654	84.927	3.261	0.342	0.994	219.225	332.547	367.203	3.757	
NSNO2	94.608	352.403	0.550	4675.172	268921.668	337.968	121.415	86.567	2.091	0.244	0.940	171.752	289.885	304.764	3.390	
NSNO3	96.579	445.947	0.599	3923.073	257271.773	287.580	106.124	88.257	2.365	0.296	0.946	114.958	280.851	289.926	3.548	
N1NO	237.346	405.950	0.492	3655.179	287582.382	339.169	163.459	90.873	2.412	0.398	1.271	222.737	217.199	176.737	7.398	
N4NO	318.917	428.148	0.451	4160.633	308273.772	439.252	216.770	60.802	3.452	0.447	1.203	356.556	190.291	121.993	13.062	
N8NO	390.463	267.120	0.267	4874.008	195595.828	673.534	323.641	22.032	1.354	0.406	0.782	104.874	113.827	100.003	15.926	
Acetic acid extraction on soil																
	Na	K	Rb	Mg	Ca	Sr	Ba	Y	Ti	Zr	V	Mn	Fe	Al	U	
F1	236.934	695.502	1.197	666.625	15028.699	71.333	80.735	2.797	6.678	0.259	0.838	127.869	147.542	385.435	0.756	
F4	816.282	649.298	1.070	657.211	9670.809	62.443	69.827	1.639	4.657	0.345	1.115	117.469	141.206	312.345	1.151	
F8	724.255	632.404	0.789	554.474	4376.162	40.976	50.187	0.723	2.373	0.331	1.273	71.732	93.101	159.548	0.621	
N1	475.402	591.781	1.044	386.091	6748.175	33.355	59.625	0.946	3.637	0.394	1.581	109.094	187.931	268.584	0.307	
N4	965.603	481.162	0.732	442.229	7593.264	48.029	63.248	1.031	2.040	0.281	1.164	74.309	144.303	233.790	0.577	
N8	1164.128	536.216	0.747	489.967	3951.775	49.873	64.372	0.573	2.369	0.310	1.280	64.194	147.773	175.790	1.050	
T6	156.952	483.289	0.971	141.418	852.401	9.832	14.609	0.245	5.867	0.239	0.634	76.339	203.290	168.534	0.162	

T8	346.659	599.619	0.791	231.209	1585.211	19.237	34.720	0.485	3.855	0.261	0.665	79.643	121.000	128.941	0.186
T10	288.059	556.544	0.808	205.591	1388.257	16.825	31.943	0.331	5.244	0.259	0.805	73.448	140.626	173.379	0.156
R0	66.306	538.358	0.721	203.356	1905.974	10.176	24.965	0.329	2.135	0.218	0.596	118.907	84.794	110.000	0.140
R3	79.688	584.105	0.754	129.457	1322.799	7.721	20.842	0.249	3.112	0.283	0.475	56.449	99.209	112.962	0.137
R7	132.695	624.343	1.021	174.870	1772.219	10.664	28.205	0.380	4.954	0.316	0.699	60.742	179.088	157.465	0.178
A1	211.806	544.037	0.728	227.354	3485.786	21.465	32.050	0.612	10.945	0.248	0.444	91.686	102.509	154.699	0.311

Residue of nodules

	Na	K	Rb	Mg	Ca	Sr	Ba	Y	Ti	Zr	V	Mn	Fe	Al	U
FSNO1R	1392.137	5017.079	29.716	1299.616	2182.410	32.981	195.900	6.158	1180.139	64.684	19.587	1412.996	7464.921	15525.053	0.863
FSNO2R	1916.793	6588.849	36.930	1544.396	2456.220	40.509	199.629	6.120	1478.715	73.492	22.270	950.690	8573.462	18852.375	0.928
F1NOR	1776.644	6609.621	35.800	1705.689	2975.162	42.416	243.897	7.208	1376.583	72.839	22.042	1837.017	8743.041	19501.221	0.914
F4NOR	1141.952	4207.281	25.856	1175.046	1785.433	27.805	122.035	5.096	974.813	44.822	14.670	484.602	6501.334	12897.215	0.601
F8NOR	2316.644	7205.701	41.085	1732.702	4930.458	49.087	195.685	8.484	1507.599	70.743	21.246	380.960	8636.759	20698.678	0.815
NSNO1AR	2785.420	7163.740	36.007	1555.270	2744.362	52.479	262.611	7.409	1316.946	75.782	18.988	1757.877	7366.695	18762.594	0.732
NSNO2R	2021.557	5283.881	26.486	1137.311	2265.005	39.532	176.230	5.191	1049.671	58.337	13.362	700.022	5549.456	13726.549	0.551
NSNO3R	2838.810	7681.160	37.320	1611.490	2765.364	49.822	225.453	7.024	1493.785	75.447	18.471	673.689	7809.076	20250.211	0.768
N1NOR	3067.248	7861.796	37.947	1586.552	3573.184	53.353	220.721	7.075	1396.961	72.525	19.615	888.471	7463.197	20852.285	0.749
N4NOR	1181.268	3306.637	16.414	601.507	1671.919	25.835	119.125	2.918	547.347	28.719	8.371	955.411	3102.061	8293.882	0.412
N8NOR	1855.029	4923.261	24.135	1017.522	3556.215	45.941	147.116	3.635	959.985	45.461	10.864	458.925	5043.546	12709.958	1.197

Residue of soil

	Na	K	Rb	Mg	Ca	Sr	Ba	Y	Ti	Zr	V	Mn	Fe	Al	U
A1	8719.619	26007.329	104.776	2322.277	4705.011	175.128	738.681	37.881	3797.250	1395.301	47.506	1624.371	14626.336	55386.617	4.710
F1	6423.167	24033.627	120.128	5814.248	6385.054	140.437	677.591	26.405	4910.051	548.358	74.147	4301.825	34805.899	80980.651	2.981
F4	6781.397	23158.807	120.858	5346.104	5514.218	149.402	651.125	26.686	3763.582	510.485	69.555	2784.184	29583.825	76857.702	3.116
F8	8028.511	23242.929	125.395	4902.423	4879.708	171.893	670.394	27.196	4138.689	524.889	68.649	2097.400	29513.946	71932.003	2.941
N1	9704.186	25361.242	121.577	4362.708	5699.711	177.869	722.491	21.795	3812.355	471.276	57.150	1761.182	24756.021	73747.904	2.634
N4	9082.649	24515.744	117.870	4044.411	5684.946	180.974	730.307	21.923	3047.184	471.250	54.840	1651.389	23697.143	68758.209	2.552
N8	9914.470	25375.914	118.947	4412.931	5826.295	196.875	741.651	22.719	3028.904	505.844	56.388	1758.449	24825.845	75169.587	2.971
R0	9468.234	28394.130	123.033	2612.485	4132.005	175.540	838.635	17.867	2173.250	276.145	41.763	1656.388	17715.868	63780.034	1.889
R3	9820.178	31164.915	118.434	2133.360	3435.214	156.816	758.839	12.835	1842.160	152.340	34.531	1158.692	13239.774	61000.346	1.525

R7	8246.389	23833.887	122.716	2929.753	4097.384	159.049	757.145	20.038	2887.692	378.454	45.526	1277.546	17401.869	61267.133	2.540
T6	12331.379	35848.096	131.639	2119.053	5276.208	233.580	911.192	16.092	3301.016	759.874	38.875	1061.948	14917.276	68771.040	3.095
T8	10648.611	25110.405	118.569	4056.372	5443.519	217.919	733.488	28.069	4140.866	506.630	54.416	1626.921	25572.814	72520.720	2.694
T10	14886.474	28400.258	119.268	3207.263	6829.747	265.858	785.391	18.286	3051.781	446.760	45.681	1394.577	17028.564	71515.685	2.653
Bulk															
	Na	K	Rb	Mg	Ca	Sr	Ba	Y	Ti	Zr	V	Mn	Fe	Al	U
T1	10982.685	32219.897	112.810	1071.261	5015.215	207.603	856.209	20.854	2646.899	1075.329	34.880	1198.138	10528.416	52134.400	4.806
T2	10582.890	31666.258	113.386	1220.589	5060.737	205.019	860.238	19.867	3393.943	1022.805	36.384	1326.443	11020.169	54921.205	4.434
T3	10136.076	31732.298	114.150	1939.419	5173.490	192.275	814.263	22.711	2965.733	889.986	45.160	1631.467	15706.449	63210.468	3.970
T4	10191.585	31762.388	111.050	1973.223	5036.173	185.885	788.530	19.342	2886.963	763.439	43.143	1438.909	14835.686	64576.098	3.376
GR	30336.945	38366.832	216.398	1683.518	8381.613	248.734	621.874	11.111	1048.398	76.336	14.339	816.382	8191.819	77929.409	2.874
SD 50	3441.176	9878.769	54.000	4824.609	9928.571	104.000	391.000	24.000	4914.661	277.000	85.500	619.718	30635.316	61676.471	5.000
SD 25	1605.882	7056.263	52.975	3618.457	1928.571	66.000	382.000	20.500	3685.996	202.000	81.000	387.324	27907.514	54000.000	3.000
SD 75	4588.235	12452.229	59.000	7297.222	11714.286	136.000	489.000	27.500	6952.448	350.500	90.000	697.183	37419.850	70941.176	5.400

Table B.3: Elemental composition of the two fractions (acetic acid and residue) for selected soils and nodules. Concentrations are given in ppm. GR for granite, SD 50 for the median of Saharan dust, SD 25 for the 25 centiles of the Saharan dust, SD 75 for the 75 centiles of Saharan dust. ¹The composition of dust is a median from Moreno et al. (2006), Castillo et al. (2008), Abouchami et al. (2013), and Gross et al. (2016), 25 and 75 are the 25 and 75 centiles.

Acetic acid extraction on nodules														
	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
FSNO1	158.466	13.066	23.900	94.201	13.447	2.461	12.125	1.428	6.293	1.313	3.425	0.441	1.877	0.353
FSNO2	164.469	9.255	23.589	88.922	11.873	2.249	10.695	1.283	5.456	1.190	3.086	0.447	1.672	0.365
F1NO	170.444	21.707	31.007	122.518	18.699	3.530	16.813	1.978	9.034	1.773	4.640	0.572	2.726	0.419
F4NO	160.057	11.644	27.483	107.734	15.875	3.209	14.827	1.822	8.089	1.710	4.516	0.629	2.481	0.480
F8NO	381.191	11.802	66.935	237.545	32.166	5.555	25.110	2.758	11.485	2.206	5.604	0.688	2.768	0.512
NSNO1	182.887	10.063	28.058	109.963	16.678	3.258	16.574	1.986	9.325	1.956	5.199	0.662	2.676	0.469
NSNO2	175.640	8.148	27.171	102.806	15.514	2.990	16.125	1.867	9.116	1.847	4.923	0.579	2.538	0.405

NSNO3	202.698	8.709	29.792	116.464	17.055	3.277	17.136	1.979	9.141	1.882	4.928	0.617	2.451	0.411
N1NO	249.081	9.761	44.494	165.056	24.736	4.461	21.081	2.392	10.631	2.094	5.357	0.620	2.708	0.386
N4NO	115.685	19.759	16.569	67.477	10.499	2.107	11.041	1.350	6.037	1.322	3.491	0.451	1.695	0.300
N8NO	31.923	22.715	5.370	21.974	3.806	0.789	3.950	0.532	2.474	0.566	1.571	0.229	0.984	0.181

Acetic acid extraction on soil

	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
F1	6.500	2.016	2.000	8.627	1.627	0.305	1.247	0.139	0.639	0.113	0.294	0.037	0.248	0.040
F4	3.486	1.414	1.166	5.054	1.012	0.187	0.746	0.086	0.381	0.066	0.167	0.022	0.143	0.023
F8	1.239	0.660	0.430	1.937	0.409	0.080	0.297	0.034	0.153	0.026	0.065	0.009	0.055	0.009
N1	1.546	1.197	0.509	2.280	0.478	0.096	0.369	0.043	0.203	0.036	0.093	0.013	0.078	0.013
N4	1.835	1.338	0.592	2.633	0.559	0.107	0.431	0.049	0.232	0.039	0.106	0.013	0.091	0.014
N8	0.863	0.779	0.290	1.298	0.294	0.057	0.221	0.025	0.111	0.021	0.053	0.007	0.049	0.007
T6	0.699	1.297	0.207	0.822	0.164	0.027	0.139	0.013	0.056	0.010	0.027	0.003	0.021	0.003
T8	1.408	0.699	0.340	1.365	0.238	0.044	0.187	0.019	0.092	0.016	0.037	0.005	0.029	0.004
T10	0.828	0.941	0.231	0.954	0.180	0.035	0.136	0.015	0.071	0.013	0.033	0.004	0.025	0.004
R0	0.625	0.505	0.156	0.654	0.122	0.026	0.105	0.012	0.053	0.011	0.026	0.003	0.019	0.003
R3	0.404	0.530	0.102	0.424	0.079	0.017	0.071	0.008	0.043	0.008	0.018	0.002	0.014	0.002
R7	0.793	1.556	0.189	0.738	0.140	0.025	0.124	0.015	0.069	0.012	0.031	0.004	0.024	0.004
A1	1.360	1.042	0.381	1.621	0.305	0.058	0.236	0.028	0.123	0.022	0.059	0.008	0.048	0.007

Residue of nodules

	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
FSNO1R	14.147	32.023	2.541	9.436	1.575	0.304	1.525	0.203	1.100	0.221	0.691	0.109	0.647	0.098
FSNO2R	13.681	24.560	2.483	9.100	1.524	0.290	1.460	0.202	1.085	0.229	0.661	0.109	0.668	0.109
F1NOR	17.373	49.942	3.226	11.783	2.056	0.373	1.978	0.254	1.365	0.273	0.790	0.120	0.775	0.112
F4NOR	12.959	17.759	2.635	9.780	1.671	0.303	1.404	0.187	0.937	0.189	0.554	0.089	0.510	0.083
F8NOR	30.299	19.462	5.664	21.017	3.140	0.563	2.543	0.327	1.640	0.324	0.903	0.135	0.834	0.125
NSNO1AR	16.175	53.498	2.804	10.431	1.747	0.356	1.895	0.248	1.325	0.270	0.788	0.129	0.750	0.113
NSNO2R	10.032	23.366	1.909	7.055	1.250	0.240	1.245	0.169	0.899	0.187	0.561	0.088	0.527	0.084
NSNO3R	15.139	31.200	2.591	9.597	1.673	0.342	1.717	0.229	1.252	0.250	0.753	0.114	0.671	0.104
N1NOR	18.074	45.021	3.566	13.380	2.285	0.427	1.987	0.260	1.361	0.267	0.767	0.113	0.701	0.104
N4NOR	5.914	18.316	1.173	4.309	0.755	0.147	0.737	0.104	0.501	0.110	0.310	0.053	0.284	0.052
N8NOR	6.551	14.156	1.351	4.964	0.838	0.158	0.816	0.110	0.597	0.130	0.379	0.061	0.405	0.062

Residue of soil														
	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
A1	50.473	109.591	11.052	41.191	7.294	1.149	6.170	0.935	6.283	1.315	4.107	0.665	4.595	0.725
F1	47.832	144.340	10.551	38.590	6.763	1.209	5.301	0.767	4.837	0.950	2.789	0.433	3.029	0.446
F4	47.658	111.681	10.284	37.566	6.443	1.199	5.149	0.749	4.836	0.952	2.783	0.430	2.931	0.440
F8	48.057	98.812	10.717	39.939	6.856	1.289	5.606	0.773	4.948	0.943	2.814	0.406	2.963	0.421
N1	40.799	99.585	9.085	33.212	5.768	1.089	4.354	0.651	4.139	0.782	2.316	0.351	2.544	0.382
N4	39.210	97.162	8.665	31.572	5.420	1.029	4.382	0.606	3.997	0.770	2.277	0.347	2.426	0.369
N8	42.060	96.504	9.217	33.828	5.748	1.085	4.738	0.648	4.242	0.821	2.375	0.357	2.529	0.391
R0	37.070	80.171	7.813	29.076	5.104	0.950	3.919	0.523	3.178	0.621	1.717	0.257	1.832	0.263
R3	26.697	61.749	5.585	21.058	3.624	0.697	2.842	0.394	2.335	0.438	1.188	0.175	1.275	0.182
R7	40.215	75.709	8.418	31.092	5.299	0.950	4.184	0.561	3.455	0.676	1.988	0.283	2.081	0.321
T6	22.303	45.230	4.885	18.197	3.172	0.586	2.656	0.400	2.666	0.556	1.800	0.282	2.160	0.341
T8	60.333	76.333	11.871	43.038	7.068	1.318	5.470	0.730	4.695	0.908	2.618	0.371	2.617	0.379
T10	40.643	82.490	8.944	33.158	5.748	1.113	4.083	0.562	3.474	0.660	1.849	0.272	1.956	0.279
Bulk														
	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
T1	29.418	71.609	6.361	23.625	4.360	0.658	3.577	0.541	3.448	0.727	2.272	0.364	2.774	0.447
T2	24.713	59.708	5.581	20.198	3.795	0.642	3.079	0.474	3.306	0.682	2.135	0.353	2.670	0.425
T3	27.646	73.837	6.147	22.783	4.243	0.738	3.483	0.544	3.698	0.756	2.425	0.401	2.845	0.449
T4	24.782	65.537	5.417	20.246	3.688	0.688	3.175	0.465	3.322	0.678	2.109	0.339	2.462	0.380
GR	38.974	53.628	7.919	28.902	4.754	0.931	3.867	0.474	2.341	0.425	1.173	0.161	1.027	0.156
SD 50	46.000	93.290	11.000	43.550	7.550	1.410	6.730	1.000	5.570	1.000	3.000	0.490	3.000	0.470
SD 25	31.800	67.880	7.000	32.700	5.900	1.000	5.300	0.850	4.000	1.000	2.100	0.378	2.000	0.370
SD 75	51.660	99.000	11.150	50.000	8.000	1.870	8.980	1.000	7.000	1.080	3.870	0.593	3.760	0.580