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Soil Research

Supplementary Material

Gypsum form and rate can affect soil physicochemical properties and crop productivity in soils of low electrical conductivity that have been enriched by sodium due to supplementary irrigation

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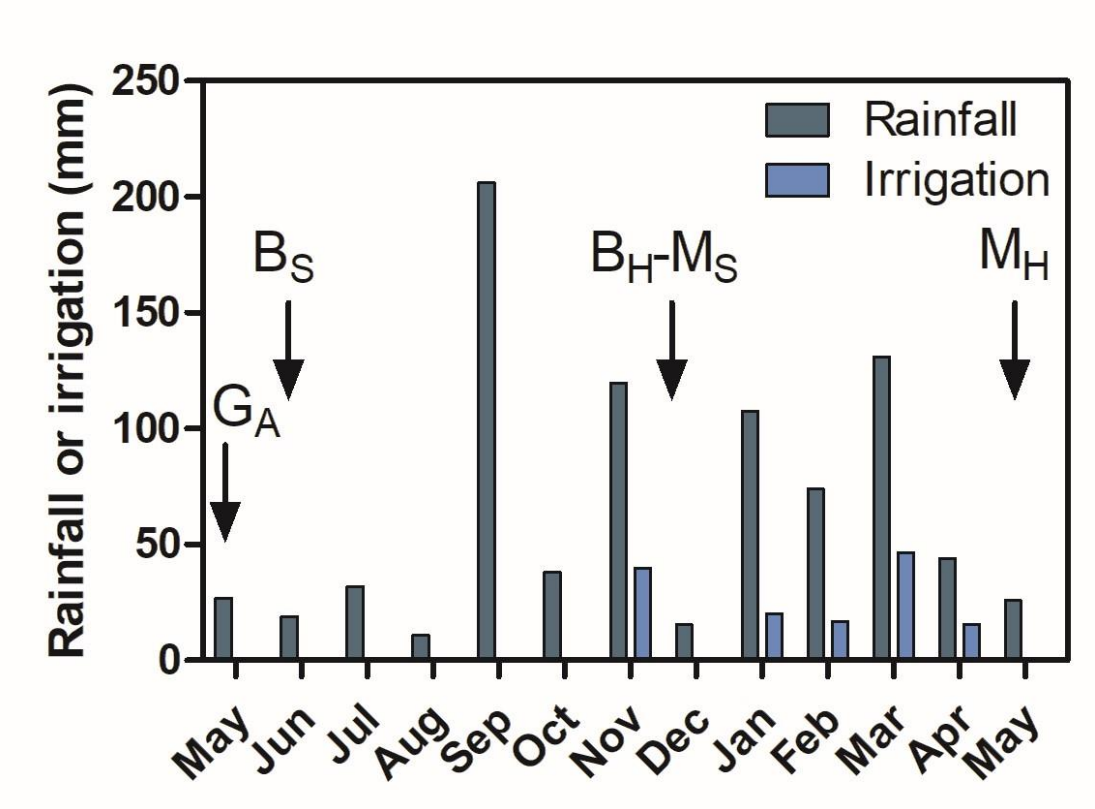

Figure S1. Rainfall and irrigation applied in each month during the barley/maize sequence. Arrows denoted the gypsum application (G_A), barley sowing (B_S), barley harvest and maize sowing (B_H-M_S), and maize harvest (M_H) time.

Table S1. Standard error of soil chemical properties [pH, exchangeable sodium percentage (ESP), exchangeable calcium to sodium ratio (Ca^{2+}/Na^{+}), exchangeable cation ratio (ECR), and dispersive charge (DC)] affected by gypsum forms and rates in two field experiments and two times (barley and maize harvest).

Treatment [1]	Variable	pH			ESP (%)			Ca^{2+} / Na^{+}			ECR (%)			DC ($cmol_c$ kg^{-1})		
	Depth (m)	0-0.1	0.1-0.2	0.2-0.4	0-0.1	0.1-0.2	0.2-0.4	0-0.1	0.1-0.2	0.2-0.4	0-0.1	0.1-0.2	0.2-0.4	0-0.1	0.1-0.2	0.2-0.4
Barley harvest																
Experiment 1																
C		0.06	0.03	0.09	0.12	0.70	0.41	0.23	2.54	1.18	1.46	4.21	3.11	6.44	13.76	1.50
GR-2		0.08	0.03	0.08	0.79	0.22	0.15	3.40	1.41	0.37	1.68	3.11	0.35	3.57	4.92	1.95
PE-2		0.05	0.07	0.05	0.28	0.41	0.55	1.04	1.43	2.14	1.58	2.63	1.55	4.30	5.91	3.29
PE-3		0.01	0.02	0.08	0.56	0.05	0.41	2.51	0.49	2.04	0.60	2.11	0.68	2.04	4.25	1.30
PO-2		0.04	0.03	0.03	0.33	0.22	0.38	1.16	0.80	2.36	1.44	1.26	0.45	1.83	2.91	3.49
PO-3		0.06	0.05	0.05	0.67	0.20	0.14	3.69	0.89	0.82	0.07	1.64	1.32	1.48	3.91	5.19
Experiment 2																
C		0.11	0.08	0.04	0.15	0.25	0.36	0.70	0.18	1.21	1.71	1.03	0.52	5.58	2.72	1.26
GR-2		0.14	0.02	0.11	0.34	0.43	0.29	1.64	1.13	1.23	1.63	1.26	0.49	3.70	3.09	8.94
PE-2		0.04	0.06	0.09	0.34	0.69	0.65	1.65	2.15	4.26	1.22	0.70	1.25	6.58	1.99	3.08
PO-2		0.15	0.05	0.07	0.34	0.26	0.09	1.92	0.97	0.54	2.23	1.66	0.64	9.24	3.96	0.67
Maize harvest																
Experiment 1																
C		0.04	0.06	0.04	0.13	0.22	0.33	0.24	0.45	1.32	2.11	2.75	2.49	6.04	2.19	0.70
GR-2		0.05	0.05	0.06	0.25	0.44	0.19	0.56	0.68	0.86	0.57	0.34	1.20	5.08	3.58	2.57
PE-2		0.08	0.04	0.02	0.08	0.14	0.08	0.23	0.27	0.52	1.80	1.68	1.76	3.61	3.24	2.51
PE-3		0.04	0.04	0.03	0.17	0.18	0.28	0.35	0.25	0.92	0.43	0.62	0.91	2.55	1.17	1.16
PO-2		0.02	0.05	0.03	0.20	0.27	0.44	0.65	0.53	1.24	0.71	0.41	0.57	9.91	4.10	2.02
PO-3		0.02	0.02	0.03	0.36	0.40	0.22	0.86	0.73	0.77	1.83	1.56	0.80	3.81	2.94	6.80
Experiment 2																
C		0.03	0.03	0.11	0.23	0.30	0.08	0.36	0.64	0.30	1.10	0.44	1.13	8.67	0.93	3.81
GR-2		0.10	0.05	0.10	0.19	0.25	0.27	0.51	0.53	0.77	1.06	0.72	0.31	8.44	2.42	7.14
PE-2		0.08	0.04	0.05	0.18	0.30	0.32	0.36	0.50	0.77	0.54	0.71	0.69	4.20	1.14	6.92
PO-2		0.07	0.09	0.09	0.23	0.30	0.14	0.61	0.62	0.32	0.45	0.80	0.43	8.91	2.02	3.81

[1] C, control (no gypsum application); GR-2, granulated gypsum at 2 Mg ha^{-1} rate; PE-2, pelletized gypsum at 2 Mg ha^{-1} rate; PE-3, pelletized gypsum at 3 Mg ha^{-1} rate; PO-2, powdered gypsum at 2 Mg ha^{-1} rate; PO-3, powdered gypsum at 3 Mg ha^{-1} rate.

Table S2. Standard error of soil physical properties [bulk density (BD), infiltration rate (IR), and macroaggregates (MA)] affected by gypsum forms and rates in two field experiments. BD and MA were determined at 0.0-0.1 m depth.

Treatment [1]	Experiment 1			Experiment 2		
	BD ($Mg\ m^{-3}$)	IR ($mm\ h^{-1}$)	MA ($g\ 100g^{-1}$)	BD ($Mg\ m^{-3}$)	IR ($mm\ h^{-1}$)	MA ($g\ 100g^{-1}$)
Barley harvest						
C	0.03	536	2.17	0.04	114	4.36
GR-2	0.01	75	2.06	0.02	475	2.24
PE-2	0.02	139	3.72	0.01	268	2.25
PE-3	0.01	533	2.28	-	-	-
PO-2	0.04	548	1.39	0.01	279	3.14
PO-3	0.00	165	1.95	-	-	-
Maize harvest						
C	0.03	143	3.72	0.04	22	7.26
GR-2	0.02	325	6.78	0.01	20	2.02
PE-2	0.01	425	5.60	0.02	47	3.43
PE-3	0.03	225	3.99	-	-	-
PO-2	0.02	141	2.75	0.02	28	4.63
PO-3	0.02	168	2.42	-	-	-

[1] C, control (no gypsum application); GR-2, granulated gypsum at 2 Mg ha^{-1} rate; PE-2, pelletized gypsum at 2 Mg ha^{-1} rate; PE-3, pelletized gypsum at 3 Mg ha^{-1} rate; PO-2, powdered gypsum at 2 Mg ha^{-1} rate; PO-3, powdered gypsum at 3 Mg ha^{-1} rate.