

Supplementary Materials

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Root exudation index: screening organic acid exudation and phosphorus acquisition efficiency in soybean genotypes

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Supplementary Table 1S. List of 116 diverse soybean genotypes used to screen for root exudation potential and phosphorus acquisition efficiency

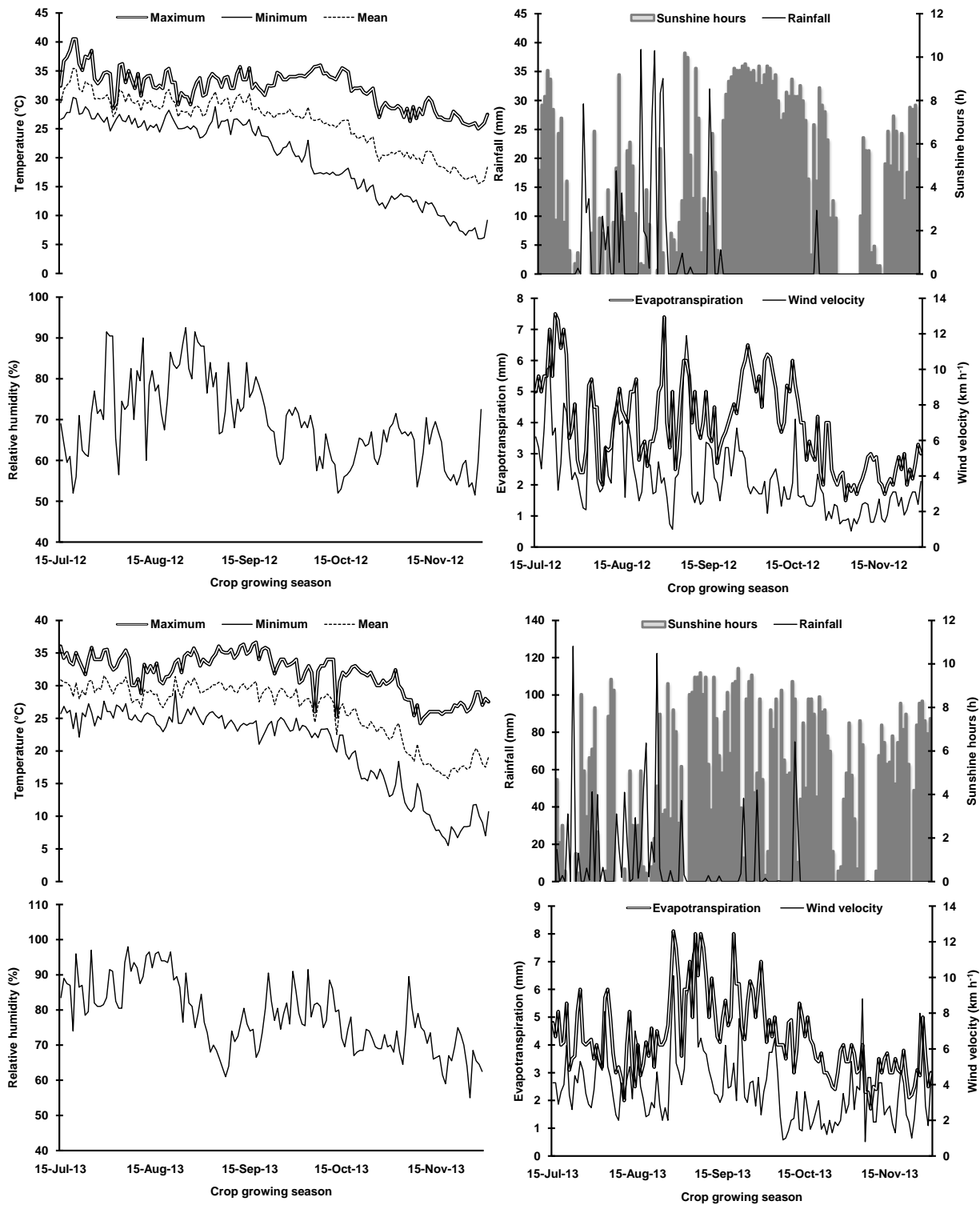
ID	Genotype name	ID	Genotype name	ID	Genotype name	ID	Genotype name
1	EC-109514	31	EC-481309	61	G-2133	91	CSB-0804
2	EC-109536	32	EC-481518	62	G-2215	92	HIMSO-1521
3	EC-109565	33	EC-481571	63	G-2252	93	JS-20-01
4	EC-112827	34	EC-490302	64	G-2265	94	JS-20-09
5	EC-113396	35	EC-528622	65	G-2344	95	JS-335
6	EC-113398(B)	36	EC-528623	66	G-2601	96	JS-93-05
7	EC-13969	37	EC-528628	67	G-2602	97	JS-95-60
8	EC-14427	38	EC-528639	68	G-2603	98	JS-97-52
9	EC-2253	39	EC-528674	69	G-2608	99	JS-98-63
10	EC-232019	40	EC-538805	70	G-2614	100	JS(SH)-2001-14
11	EC-251761	41	EC-538807	71	G-2631	101	KB-249
12	EC-251850	42	EC-542431	72	G-2650	102	Lee-1
13	EC-274683	43	EC-542434	73	G-2651	103	Lee-54
14	EC-287754	44	EC-547464	74	G-2656	104	MACS-450
15	EC-308314	45	EC-550830	75	G-390	105	MAUS-2
16	EC-325117	46	EC-572027	76	G-395	106	MAUS-39
17	EC-36816	47	EC-572050	77	G-406	107	MAUS-61
18	EC-37939	48	EC-572060	78	G-482	108	NRC-2007-A-23
19	EC-391339	49	EC-581521	79	ADT-1	109	NRC-37
20	EC-39854	50	EC-590224	80	AMSS-34	110	NRC-7
21	EC-41273	51	EC-590225	81	AVRDC-5	111	NRC-84
22	EC-456534	52	EC-592195	82	AVRDC-516	112	PKS-52
23	EC-457214(B)	53	EC-615156	83	BJJF-8	113	PUSA-9712
24	EC-45724	54	EC-638228	84	BR-11	114	SKV/AK-1403
25	EC-467282(A)	55	EC-644408	85	BR-2	115	SL-795
26	EC-467282(B)	56	EC-644409	86	BR-4	116	TNAU-20024
27	EC-467283	57	EC-95286	87	BS-1		
28	EC-468438(B)	58	DS-1433	88	Clark		
29	EC-468447	59	DS-61	89	CO-1		
30	EC-468597	60	DSB-2	90	CO-3		

Genotypes with ID 1 to 57 are exotic collections, 58 to 78 are indigenous collections/breeding lines, 79 to 116 are released varieties

Supplementary Table 2S. Concentration of total organic acids, proteins, phenols, sugars and free amino acids in root exudates of 20 selected soybean genotypes grown at sufficient (250 μ M) and low (4 μ M) P

Genotype	Total organic acids		Proteins		Phenols		Sugars (μ mol g ⁻¹ RFW)		Free amino acids	
	(μ mol g ⁻¹ RFW)		(μ mol g ⁻¹ RFW)		(μ mol g ⁻¹ RFW)				(μ mol g ⁻¹ RFW)	
	Sufficient P	Low P	Sufficient P	Low P	Sufficient P	Low P	Sufficient P	Low P	Sufficient P	Low P
EC-232019	172.8 \pm 9.0	274.6 \pm 14.3	91.2 \pm 38.8	231.3 \pm 3.7	5.53 \pm 1.79	11.30 \pm 0.3	4.5 \pm 0.4	2.6 \pm 0.1	42.5 \pm 15.4	4.4 \pm 1.8
EC-528622	41.4 \pm 2.2	22.5 \pm 1.2	93.8 \pm 27.2	19.1 \pm 5.1	6.98 \pm 2.33	2.27 \pm 0.48	7.8 \pm 2.0	5.4 \pm 2.4	0.3 \pm 0.1	0.2 \pm 0.1
EC-528639	97.6 \pm 5.1	192.6 \pm 10.0	5.7 \pm 2.0	1.8 \pm 0.3	0.08 \pm 0.02	0.03 \pm 0.01	3.9 \pm 0.4	2.2 \pm 0.4	69.1 \pm 17.5	5.4 \pm 1.8
EC-592195	18.0 \pm 0.9	21.1 \pm 1.1	153.2 \pm 78.5	63.3 \pm 7.7	16.33 \pm 8.24	26.52 \pm 9.81	2.5 \pm 0.7	1.6 \pm 0.1	24.6 \pm 7.8	0.1 \pm 0.0
G-2344	43.8 \pm 2.3	13.9 \pm 0.7	12.8 \pm 2.4	206.0 \pm 10.4	0.95 \pm 0.11	10.40 \pm 0.52	3.1 \pm 0.6	0.4 \pm 0.3	86.2 \pm 0.7	7.6 \pm 1.0
CSB-0804	25.7 \pm 1.3	40.0 \pm 2.1	3.8 \pm 0.9	2.0 \pm 0.9	0.05 \pm 0.02	0.11 \pm 0.07	6.6 \pm 1.7	4.9 \pm 0.7	52.1 \pm 7.3	13.4 \pm 4.3
EC-456534	200.2 \pm 10.4	214.2 \pm 11.1	3.8 \pm 2.2	18.7 \pm 2.0	0.28 \pm 0.11	0.83 \pm 0.09	1.2 \pm 0.7	2.8 \pm 0.6	1.3 \pm 0.5	0.7 \pm 0.4
CO-1	14.8 \pm 0.8	9.7 \pm 0.5	5.7 \pm 0.9	6.2 \pm 1.3	0.04 \pm 0.01	0.06 \pm 0.02	2.2 \pm 0.4	3.0 \pm 0.8	20.4 \pm 2.1	67.3 \pm 11.6
HIMSO-1521	392.8 \pm 20.4	246.7 \pm 12.8	29.9 \pm 19.1	2.9 \pm 0.1	1.87 \pm 1.27	0.25 \pm 0.01	16.0 \pm 10.1	3.0 \pm 0.3	0.5 \pm 0.0	0.2 \pm 0.1
JS-93-05	38.5 \pm 2.0	30.5 \pm 1.6	6.1 \pm 0.6	1.6 \pm 1.0	0.58 \pm 0.06	0.59 \pm 0.44	2.3 \pm 0.8	1.0 \pm 0.4	7.6 \pm 0.9	2.0 \pm 0.7
EC-109514	29.7 \pm 1.5	54.4 \pm 2.8	86.0 \pm 44.3	89.3 \pm 4.9	10.7 \pm 5.67	8.23 \pm 0.52	7.2 \pm 3.0	2.1 \pm 0.8	0.5 \pm 0.1	2.7 \pm 0.9
EC-325117	32.0 \pm 1.7	24.5 \pm 1.3	222.5 \pm 25.5	25.0 \pm 3.7	23.00 \pm 3.69	2.34 \pm 0.51	5.2 \pm 0.8	7.5 \pm 2.9	1.7 \pm 0.2	0.3 \pm 0.1
G-2656	25.9 \pm 1.3	57.8 \pm 3.0	18.6 \pm 10.8	12.8 \pm 8.1	0.91 \pm 0.16	0.27 \pm 0.09	2.1 \pm 0.3	9.3 \pm 6.9	4.8 \pm 1.5	2.0 \pm 1.0
NRC-7	9.0 \pm 0.5	13.8 \pm 0.7	49.2 \pm 38.5	214.1 \pm 8.4	2.91 \pm 2.23	10.13 \pm 0.33	3.6 \pm 0.3	0.6 \pm 0.2	51.6 \pm 14.1	4.5 \pm 1.5
EC-113396	171.3 \pm 8.9	110.8 \pm 5.8	4.9 \pm 0.4	2.6 \pm 0.8	1.44 \pm 0.96	0.14 \pm 0.04	4.1 \pm 0.4	2.0 \pm 0.5	5.2 \pm 1.8	1.5 \pm 0.6
EC-2253	51.3 \pm 2.7	54.9 \pm 2.9	3.6 \pm 0.6	12.8 \pm 3.9	0.09 \pm 0.08	0.59 \pm 0.16	2.3 \pm 1.1	2.6 \pm 0.9	0.6 \pm 0.5	3.7 \pm 0.6
EC-467282(B)	25.1 \pm 1.3	18.8 \pm 1.0	4.8 \pm 0.8	3.6 \pm 1.0	0.46 \pm 0.08	0.35 \pm 0.19	2.9 \pm 0.7	1.4 \pm 0.4	6.7 \pm 0.4	1.1 \pm 0.3
EC-572050	21.8 \pm 1.1	36.0 \pm 1.9	16.0 \pm 6.7	19.1 \pm 2.4	0.68 \pm 0.32	0.54 \pm 0.15	1.5 \pm 0.4	1.7 \pm 0.5	20.3 \pm 2.4	0.1 \pm 0.0
MAUS-61	44.7 \pm 2.3	42.8 \pm 2.2	3.2 \pm 1.6	26.4 \pm 2.9	0.61 \pm 0.11	1.15 \pm 0.15	1.6 \pm 0.6	0.9 \pm 0.5	4.7 \pm 0.6	2.7 \pm 0.9
TNAU-20024	25.1 \pm 1.3	31.8 \pm 1.7	4.8 \pm 0.9	9.6 \pm 6.4	0.31 \pm 0.09	0.54 \pm 0.27	7.4 \pm 6.3	1.0 \pm 0.1	5.5 \pm 0.4	3.8 \pm 1.0
Mean	74.1 \pm 20.5	75.6 \pm 18.4	41.0 \pm 4.7	48.4 \pm 0.7	3.66 \pm 0.49	3.83 \pm 0.48	4.4 \pm 0.5	2.8 \pm 0.3	20.3 \pm 1.3	6.2 \pm 0.6
F value										
P	12.4		1.6		0.05		4.6*		76.5***	
G	8376.3***		17.0***		10.9***		1.7		19.3***	
P X G	719.2***		10.7***		3.4***		1.3		14.9***	

Data correspond to mean \pm SE (n=12). Phosphorus (P) and genotypes (G) are the treatment effects. *, ** and *** denote significance at 0.05, 0.01 and 0.001 probability levels respectively. RFW: Root fresh weight.



Supplementary Fig. 1S. Weather parameters recorded during the cropping growing season from July to November 2012 and 2013.