

Supplementary Materials

Table S1. Accessions included in the study.

Cultivar*	Country of Origin	Genetic Subpopulation
Sinai No.8	Egypt	Eastern Mediterranean
Etith	Israel	Eastern Mediterranean
Hati	Israel	Eastern Mediterranean
IG-83920	Italy	Eastern Mediterranean
Hymera	Italy	Eastern Mediterranean
Aziziah 17/45	Italy	Eastern Mediterranean
Safra Jerash	Jordan	Eastern Mediterranean
Harani Auttma	Jordan	Eastern Mediterranean
Horani Howawi	Jordan	Eastern Mediterranean
Zugbieh Sutra	Jordan	Eastern Mediterranean
Zoghbiyeh Safra	Jordan	Eastern Mediterranean
Safra Maan	Jordan	Eastern Mediterranean
PI-420946	Jordan	Eastern Mediterranean
PI-182667	Lebanon	Eastern Mediterranean
PI-182669	Lebanon	Eastern Mediterranean
PI-182671	Lebanon	Eastern Mediterranean
Hourah	Lebanon	Eastern Mediterranean
Tripshiro	Libya	Eastern Mediterranean
IG-95812	Syria	Eastern Mediterranean
Vroulos	Cyprus	Eastern Balkans and Turkey
IG-82549	Cyprus	Eastern Balkans and Turkey
Mavraani	Greece	Eastern Balkans and Turkey
248-VII/7	Macedonia	Eastern Balkans and Turkey
259-VII/12	Macedonia	Eastern Balkans and Turkey
VII/13-X11	Macedonia	Eastern Balkans and Turkey
196/71	Macedonia	Eastern Balkans and Turkey
II/4	Macedonia	Eastern Balkans and Turkey
Belgrade 9	Serbia	Eastern Balkans and Turkey
PI-378303	Serbia	Eastern Balkans and Turkey
BGE-018192	Turkey	Eastern Balkans and Turkey
BGE018351	Turkey	Eastern Balkans and Turkey
BGE018353	Turkey	Eastern Balkans and Turkey
BGE-018354	Turkey	Eastern Balkans and Turkey
BGE019262	Turkey	Eastern Balkans and Turkey
BGE-019263	Turkey	Eastern Balkans and Turkey
BGE019264	Turkey	Eastern Balkans and Turkey
BGE019265	Turkey	Eastern Balkans and Turkey
BGE019266	Turkey	Eastern Balkans and Turkey
BGE-019270	Turkey	Eastern Balkans and Turkey
Dalmatia 1	Croatia	Western Balkans and Egypt

Dalmatia 3	Croatia	Western Balkans and Egypt
440-IX/96	Croatia	Western Balkans and Egypt
441-IX/97	Croatia	Western Balkans and Egypt
Milagro	Egypt	Western Balkans and Egypt
D-2	Egypt	Western Balkans and Egypt
5P4	Egypt	Western Balkans and Egypt
1P1	Egypt	Western Balkans and Egypt
Giza 2	Egypt	Western Balkans and Egypt
PI-559973	Egypt	Western Balkans and Egypt
MG 26429	Egypt	Western Balkans and Egypt
PI-60726	Egypt	Western Balkans and Egypt
PI-60727	Egypt	Western Balkans and Egypt
Mishriki	Egypt	Western Balkans and Egypt
Girgeh	Egypt	Western Balkans and Egypt
356-I/9	Montenegro	Western Balkans and Egypt
PI-435024	Montenegro	Western Balkans and Egypt
PI-435034	Montenegro	Western Balkans and Egypt
PI-435038	Montenegro	Western Balkans and Egypt
PI-435043	Montenegro	Western Balkans and Egypt
Zoco Yebel Hebil	Morocco	Western Balkans and Egypt
Dezassete	Portugal	Western Balkans and Egypt
Durazio Rijo Glabro	Portugal	Western Balkans and Egypt
Alentejo	Portugal	Western Balkans and Egypt
Caxudo de sete espigas	Portugal	Western Balkans and Egypt
Blanco de Corella	Spain	Western Balkans and Egypt
Blanquillo	Spain	Western Balkans and Egypt
Gros de Cerdaña	Spain	Western Balkans and Egypt
Heraldo del Rhin	Spain	Western Balkans and Egypt
Pisana cañihueca	Spain	Western Balkans and Egypt
Blanquillón de Boñar	Spain	Western Balkans and Egypt
IG-92895	Algeria	Western Mediterranean
IG-92967	Algeria	Western Mediterranean
IG-93030	Algeria	Western Mediterranean
IG-93621	Algeria	Western Mediterranean
IG-94009	Algeria	Western Mediterranean
Dur de Medeah	Algeria	Western Mediterranean
Tchirpan	Bulgaria	Western Mediterranean
Lozen 76	Bulgaria	Western Mediterranean
IG-96802	Greece	Western Mediterranean
IG-96851	Greece	Western Mediterranean
Muri	Cyprus	Western Mediterranean
Reading	Egypt	Western Mediterranean
Beladi Rouge	France	Western Mediterranean
Tounse	France	Western Mediterranean
Trigo Glutinoso	France	Western Mediterranean

Rubio enlargo d'Atlemteje	France	Western Mediterranean
Rapsani	Greece	Western Mediterranean
Carlantino	Italy	Western Mediterranean
Cicirelo	Italy	Western Mediterranean
IG-83905	Italy	Western Mediterranean
Carlo jucci	Italy	Western Mediterranean
Senatore Capelli	Italy	Western Mediterranean
Trinakria	Italy	Western Mediterranean
Razza 208	Italy	Western Mediterranean
Balilla Falso	Italy	Western Mediterranean
Milazzo	Italy	Western Mediterranean
Razza 181	Italy	Western Mediterranean
Razza 96	Italy	Western Mediterranean
Reyati	Lebanon	Western Mediterranean
Maghoussa	Morocco	Western Mediterranean
Merzaga	Morocco	Western Mediterranean
Red Beard	Morocco	Western Mediterranean
Morocco	Morocco	Western Mediterranean
Saffi	Morocco	Western Mediterranean
Ble Dur 250	Morocco	Western Mediterranean
Oned Zenati	Morocco	Western Mediterranean
Mahmoudi C	Morocco	Western Mediterranean
Maghoussa Amizmiz	Morocco	Western Mediterranean
Cobros	Morocco	Western Mediterranean
Raposinho	Portugal	Western Mediterranean
Durazio Rijo	Portugal	Western Mediterranean
Raspinegro	Portugal	Western Mediterranean
Anafil	Portugal	Western Mediterranean
Espanhol	Portugal	Western Mediterranean
Amarelo Barba Preta	Portugal	Western Mediterranean
Tremes rijo	Portugal	Western Mediterranean
Arisnegro de Tenerife	Spain	Western Mediterranean
Basto Duro	Spain	Western Mediterranean
Candeal de Salamanca	Spain	Western Mediterranean
Colorado de Jerez	Spain	Western Mediterranean
Enano de Andújar	Spain	Western Mediterranean
Fartó	Spain	Western Mediterranean
Pinet	Spain	Western Mediterranean
Raspinegro Canario	Spain	Western Mediterranean
Raspinegro de Alcalá Guadaira	Spain	Western Mediterranean
Recio de Almería	Spain	Western Mediterranean
Verdial	Spain	Western Mediterranean
Alonso	Spain	Western Mediterranean
Andalucía 344	Spain	Western Mediterranean
Azulejo de Villa del Río	Spain	Western Mediterranean

Blancal	Spain	Western Mediterranean
Claro de Balazote	Spain	Western Mediterranean
Entrelargo de Montijo	Spain	Western Mediterranean
Farto cañifino	Spain	Western Mediterranean
Rubio de Montijo	Spain	Western Mediterranean
Semental	Spain	Western Mediterranean
Recio de Cañete	Spain	Western Mediterranean
Souri	Tunisia	Western Mediterranean
Realforte	Tunisia	Western Mediterranean
Biskri	Tunisia	Western Mediterranean
Mindium	Turkey	Western Mediterranean
Akathiotico Naurotheri	Cyprus	Non-classified
FAO 29.912	Cyprus	Non-classified
De Santa Marta	France	Non-classified
Iumillo	France	Non-classified
Abu Fashit	Israel	Non-classified
Juljulith	Israel	Non-classified
JM-3987	Israel	Non-classified
JM-3989	Israel	Non-classified
Salti na Zinia	Jordan	Non-classified
IG-84856	Lebanon	Non-classified
PI-182666	Lebanon	Non-classified
Haj Mouline	Morocco	Non-classified
Marques	Portugal	Non-classified
Lobeiro de grao escuro	Portugal	Non-classified
18/71	Serbia	Non-classified
IG-95841	Syria	Non-classified
IG-95931	Syria	Non-classified
Louri AP 5	Tunisia	Non-classified
Hamira	Tunisia	Non-classified
Gallareta	CIMMYT	Modern
Jupare	CIMMYT	Modern
Sula	CIMMYT	Modern
Vitron	CIMMYT	Modern
Arment	France	Modern
Claudio	Italy	Modern
Meridiano	Italy	Modern
Simeto	Italy	Modern
Svevo	Italy	Modern
Amilcar	Spain	Modern
Astigi	Spain	Modern
Boabdil	Spain	Modern
Bolido	Spain	Modern
Bolo	Spain	Modern
Ancalei (PNTD/1)	Spain/CIMMYT	Modern

Hispasano (PNTD/3)	Spain/CIMMYT	Modern
Kronos	USA	Modern
Ocotillo	USA	Modern

*IG numbers are codes from the ICARDA Germplasm Bank, PI numbers are codes from the USDA Germplasm Bank and BGE numbers are codes from the Centro de Recursos Fitogenéticos (INIA, Madrid).

Table S2. Statistics of the seminal RSA traits.

		TRN	SRA	PRL	LRL	PRS	LRS	PRV	LRV	PRD	LRD
Total	N	159	159	159	159	159	159	159	159	159	159
	Mean	4.86	89.10	11.67	21.24	2.20	3.91	33.45	58.92	0.58	0.58
	SD	0.66	12.77	2.82	6.88	0.52	1.23	8.73	19.24	0.05	0.04
	Min	3.00	55.62	5.50	3.40	1.08	0.63	14.80	10.80	0.44	0.48
	Max	6.10	124.24	18.50	46.00	4.55	7.41	89.80	117.50	0.78	0.74
EB+T	N	20	20	20	20	20	20	20	20	20	20
	Mean	4.75	98.24	10.29	17.21	1.90	3.16	28.47	47.63	0.57	0.58
	SD	0.47	12.94	2.40	4.51	0.43	0.87	6.51	14.28	0.05	0.04
	Min	3.50	71.11	5.90	8.80	1.13	1.45	17.50	21.30	0.44	0.50
	Max	5.50	118.11	16.20	28.50	2.69	5.23	40.90	79.10	0.61	0.67
EM	N	19	19	19	19	19	19	19	19	19	19
	Mean	4.82	94.69	13.78	25.09	2.55	4.56	38.32	67.21	0.57	0.57
	SD	0.32	11.59	2.53	7.70	0.39	1.16	5.63	15.43	0.05	0.03
	Min	4.30	69.32	9.70	15.00	1.88	2.91	27.70	39.40	0.47	0.50
	Max	5.30	112.65	18.10	46.00	3.11	7.41	47.70	97.60	0.63	0.60
Modern	N	18	18	18	18	18	18	18	18	18	18
	Mean	4.49	93.92	12.77	20.83	2.36	3.71	35.24	54.50	0.56	0.57
	SD	0.79	10.22	1.95	6.32	0.41	1.09	7.01	15.57	0.04	0.03
	Min	3.00	78.99	7.20	13.00	1.14	1.91	14.80	25.00	0.47	0.51
	Max	5.90	109.33	15.90	39.80	3.03	7.01	46.30	101.10	0.62	0.61
WB+E	N	31	31	31	31	31	31	31	31	31	31
	Mean	4.34	87.64	10.43	16.48	2.09	3.24	33.65	52.32	0.61	0.62
	SD	0.76	10.85	2.88	7.11	0.66	1.43	12.96	24.42	0.05	0.04
	Min	3.00	71.53	5.50	3.40	1.08	0.63	16.00	10.80	0.50	0.54
	Max	5.50	104.85	18.50	31.90	4.55	6.52	89.80	117.50	0.78	0.74
WM	N	71	71	71	71	71	71	71	71	71	71
	Mean	5.22	84.45	11.75	23.53	2.19	4.29	33.01	63.89	0.58	0.58
	SD	0.45	12.29	2.75	5.54	0.48	1.04	7.34	17.33	0.05	0.04
	Min	4.30	55.62	6.10	10.10	1.17	1.85	18.10	27.80	0.47	0.48
	Max	6.10	124.24	18.30	35.20	3.21	6.67	49.60	103.20	0.69	0.65

EM, eastern Mediterranean; EB+T, eastern Balkans and Turkey; WB+E, western Balkans and Egypt; WM, western Mediterranean; TRN, total root number; SRA, seminal root angle, °; PRL, primary root length, cm; LRL, total lateral root length, cm; PRS, primary root surface, cm²; LRS, total lateral root surface, cm²; PRV, primary root volume, cm³; LRV, total lateral root volume, cm³; PRD, primary root diameter, cm; LRD, mean lateral root diameter, cm.

Table S3. Means comparison of seminal root system architecture traits for the east Balkan (EB) and Turkish durum wheat landraces. Means within columns with different letters are significantly different at $P < 0.05$ following a Tukey test.

	TRN	SRA	PRL	LRL	PRS	LRS	PRV	LRV	PRD	LRD
EB	4.7 ^a	91.8 ^b	9.2 ^b	15.5 ^a	1.7 ^b	2.8 ^b	25.7 ^b	40.7 ^b	0.57 ^a	0.56 ^a
Turkey	4.8 ^a	104.7 ^a	11.3 ^a	19.0 ^a	2.1 ^a	3.5 ^a	31.3 ^a	54.6 ^a	0.57 ^a	0.60 ^a

TRN, total root number; SRA, seminal root angle, °; PRL, primary root length, cm; LRL, total lateral root length, cm; PRS, primary root surface, cm²; LRS, total lateral root surface, cm²; PRV, primary root volume, cm³; LRV, total lateral root volume, cm³; PRD, primary root diameter, cm; LRD, mean lateral root diameter, cm.

Table S4. Linkage disequilibrium decay plots. (A) Genome A. (B) Genome B. The LOESS curve is represented in blue. The horizontal red line corresponds to the r^2 mean for each genome.

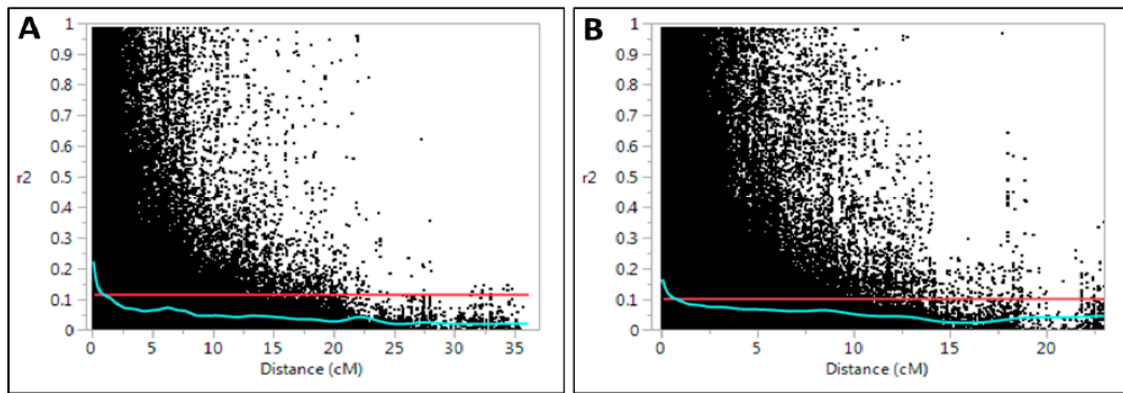


Table S5. Significant markers associated with seminal root system architecture traits obtained in 160 durum wheat Mediterranean landraces.

Marker*	Chromosome	Position (cM)	$-\log(P)$	Marker R^2	Trait
1092630_PAV	1A	9.24	3.13	0.09	SRA
3934728_SNP	1A	29.71	5.02	0.13	PRS
3934728_SNP	1A	29.71	8.67	0.25	PRV
3934728_SNP	1A	29.71	3.43	0.08	LRV
3934728_SNP	1A	29.71	3.50	0.08	PRD
3029825_PAV	1A	88.15	4.03	0.11	PRD
4409755_PAV	1A	135.37	3.18	0.09	LRS
4409755_PAV	1A	135.37	3.41	0.10	LRV
1109174_PAV	1A	160.75	3.73	0.09	PRV
1178799_PAV	1A	162.38	3.71	0.09	PRV
1109244_SNP	1A	163.11	3.91	0.14	PRV
2278118_SNP	1A	173.41	4.41	0.18	PRS
2278118_SNP	1A	173.41	7.75	0.32	PRV
2278118_SNP	1A	173.41	4.82	0.21	PRD

1210090_SNP	1A	231.76	3.33	0.12	LRL
2278416_SNP	1A	246.3	3.11	0.09	PRD
997799_SNP	1B	31.69	3.45	0.12	PRV
1056247_PAV	1B	45.68	3.09	0.08	TRN
4005012_PAV	1B	51.29	3.36	0.10	PRD
2289061_PAV	1B	90.37	3.65	0.09	TRN
4411072_PAV	1B	196.56	4.14	0.12	LRL
4411072_PAV	1B	196.56	4.36	0.12	LRS
4411072_PAV	1B	196.56	4.21	0.12	LRV
3021564_SNP	1B	199.9	3.43	0.12	LRS
3021564_SNP	1B	199.9	4.04	0.14	LRV
3950164_PAV	1B	201.49	3.02	0.07	PRD
1075258_PAV	1B	223.51	3.01	0.08	PRD
1073790_PAV	1B	223.81	3.48	0.09	PRV
1073790_PAV	1B	223.81	3.85	0.11	PRD
3949642_PAV	1B	224.1	3.12	0.08	PRD
1064357_SNP	1B	225.6	3.24	0.10	PRL
3942385_PAV	1B	225.87	3.26	0.08	PRV
3937873_PAV	1B	226.81	3.80	0.10	PRS
3937873_PAV	1B	226.81	4.84	0.13	PRV
3952671_SNP	1B	226.81	3.65	0.11	PRS
3952671_SNP	1B	226.81	4.13	0.13	PRV
1003552_SNP	1B	227.36	3.20	0.10	PRS
1003552_SNP	1B	227.36	4.00	0.12	PRV
3064800_SNP	2A	31.13	3.79	0.12	PRD
1671331_PAV	2A	46.78	3.00	0.07	PRV
1083104_SNP	2A	68.39	3.00	0.10	LRL
1085277_SNP	2A	68.57	4.25	0.13	PRV
4395232_PAV	2A	68.96	4.14	0.11	PRS
4395232_PAV	2A	68.96	5.16	0.14	PRV
1125557_PAV	2A	115.8	3.41	0.09	SRA
3951962_PAV	2A	115.89	3.61	0.09	SRA
1023273_SNP	2A	117.05	3.18	0.10	PRD
1117775_PAV	2A	118.32	3.62	0.10	SRA
1075469_SNP	2B	6.7	3.95	0.13	PRD
1075469_SNP	2B	6.7	4.36	0.14	PRD
1085637_PAV	2B	75.09	3.10	0.09	LRV
1097495_PAV	2B	75.09	3.04	0.08	LRS

3025526_PAV	2B	75.09	3.01	0.08	LRS
3025526_PAV	2B	75.09	3.07	0.08	LRV
1228022_PAV	2B	75.13	3.31	0.09	LRS
1228022_PAV	2B	75.13	3.56	0.10	LRV
1228066_PAV	2B	75.13	3.19	0.08	LRL
1228066_PAV	2B	75.13	3.72	0.10	LRS
1228066_PAV	2B	75.13	3.90	0.10	LRV
4408713_PAV	2B	75.13	3.48	0.10	LRS
4408713_PAV	2B	75.13	3.57	0.10	LRV
4409433_PAV	2B	75.13	3.48	0.10	LRS
4409433_PAV	2B	75.13	3.57	0.10	LRV
4003966_PAV	2B	80.79	3.03	0.08	LRS
4003966_PAV	2B	80.79	3.20	0.09	LRV
1100853_PAV	2B	81.99	3.25	0.09	LRS
1100853_PAV	2B	81.99	3.20	0.09	LRV
1101528_PAV	2B	81.99	3.41	0.10	LRS
1101528_PAV	2B	81.99	3.61	0.11	LRV
1233571_PAV	2B	82.89	3.35	0.09	LRS
1233571_PAV	2B	82.89	3.50	0.09	LRV
4410631_PAV	2B	83.07	3.31	0.09	LRS
4410631_PAV	2B	83.07	3.57	0.10	LRV
1283802_PAV	2B	83.84	3.03	0.07	LRL
1283802_PAV	2B	83.84	3.23	0.08	LRS
1283802_PAV	2B	83.84	3.04	0.08	LRV
3945071_PAV	2B	83.84	3.06	0.08	LRL
3945071_PAV	2B	83.84	3.60	0.10	LRS
3945071_PAV	2B	83.84	3.76	0.11	LRV
1269612_PAV	2B	106.98	3.39	0.08	TRN
1123898_PAV	2B	107.03	3.05	0.08	LRS
1201756_PAV	2B	107.03	4.43	0.13	PRL
1201756_PAV	2B	107.03	4.70	0.14	LRL
1201756_PAV	2B	107.03	4.63	0.14	PRS
1201756_PAV	2B	107.03	5.21	0.15	LRS
1201756_PAV	2B	107.03	4.06	0.11	PRV
1201756_PAV	2B	107.03	4.92	0.15	LRV
3025158_SNP	3A	3.32	3.61	0.13	PRV
1138254_PAV	3A	3.56	3.13	0.08	PRV
1256467_PAV	3A	3.58	3.32	0.08	PRV

1082068_PAV	3A	11.88	3.06	0.08	PRD
3949406_PAV	3A	12.93	3.51	0.09	TRN
995117_SNP	3A	18.37	4.37	0.14	PRV
2278222_SNP	3A	20.2	4.24	0.14	PRV
4008834_PAV	3A	20.3	3.00	0.08	SRA
1227755_SNP	3A	23.99	3.01	0.09	TRN
1130621_PAV	3A	40.97	3.92	0.11	PRD
3384751_PAV	3A	48.06	3.20	0.09	PRV
1218674_PAV	3A	48.76	4.02	0.11	PRV
4003172_PAV	3A	49.67	3.39	0.08	PRD
987263_PAV	3A	61.57	3.56	0.10	LRS
987263_PAV	3A	61.57	3.78	0.10	LRV
3022843_PAV	3B	24.98	3.57	0.08	TRN
2329632_PAV	3B	25	3.26	0.08	TRN
1862738_SNP	3B	50.7	3.67	0.14	LRL
1091190_SNP	3B	68.36	3.41	0.11	PRS
1091190_SNP	3B	68.36	3.72	0.12	PRV
1091190_SNP	3B	68.36	3.15	0.10	LRV
1209246_SNP	3B	68.36	3.10	0.11	LRV
1101009_SNP	3B	96.48	3.05	0.09	PRD
2277868_PAV	3B	100.07	3.05	0.08	PRS
2277868_PAV	3B	100.07	3.85	0.10	PRV
4009912_PAV	3B	101.44	3.34	0.09	PRV
1398611_PAV	3B	112.86	3.06	0.07	PRD
3936927_PAV	3B	112.86	3.36	0.08	PRD
3937908_PAV	3B	112.86	3.36	0.08	PRD
985734_PAV	3B	112.86	3.06	0.07	PRD
4408225_PAV	3B	115.61	3.68	0.10	PRL
4408225_PAV	3B	115.61	3.27	0.09	PRS
4408225_PAV	3B	115.61	3.38	0.09	PRV
4411501_PAV	4A	20.42	3.13	0.09	LRS
4411501_PAV	4A	20.42	3.15	0.09	LRV
4009227_SNP	4A	26.03	3.65	0.09	LRL
1235986_PAV	4A	28.85	3.10	0.08	SRA
3026807_PAV	4A	28.87	3.41	0.09	SRA
1090952_PAV	4A	74.09	3.44	0.09	PRV
1121399_PAV	4A	74.09	3.33	0.08	PRV
1052277_PAV	4A	96.08	3.38	0.09	PRV

3956812_PAV	4A	96.08	3.60	0.09	PRV
3034109_PAV	4A	109.72	3.10	0.08	PRS
3939358_PAV	4A	127.56	3.33	0.10	LRL
1725682_SNP	4A	131.42	3.06	0.09	PRD
995839_SNP	4A	132.72	3.24	0.12	LRL
3030758_PAV	4B	2.79	3.41	0.09	PRS
4406631_PAV	4B	31.93	3.12	0.09	PRS
4406631_PAV	4B	31.93	3.29	0.09	PRV
4406980_PAV	4B	31.93	3.12	0.09	PRS
4406980_PAV	4B	31.93	3.29	0.09	PRV
1250077_PAV	4B	51.22	3.48	0.10	PRL
1250077_PAV	4B	51.22	3.33	0.09	PRS
1048339_SNP	4B	70.04	3.64	0.12	LRL
1030720_PAV	5A	38.83	3.38	0.10	PRL
3021302_PAV	5A	40.51	3.35	0.08	PRD
1121041_PAV	5A	48.57	3.09	0.09	LRV
3944359_PAV	5A	48.65	3.42	0.09	TRN
1215213_SNP	5A	69.82	3.51	0.10	TRN
1113225_SNP	5A	84.51	3.04	0.09	PRD
2280804_SNP	5A	84.51	3.18	0.12	PRL
2280804_SNP	5A	84.51	3.31	0.12	PRS
3940216_PAV	5A	84.51	3.03	0.08	SRA
3944867_PAV	5A	84.51	3.03	0.08	SRA
1670747_PAV	5A	112.96	3.21	0.08	PRD
1107268_PAV	5A	155.41	3.15	0.09	PRD
1126050_SNP	5B	33.99	3.07	0.07	LRV
3064939_SNP	5B	40.83	3.84	0.12	PRV
4004816_PAV	5B	65.51	3.84	0.10	PRV
4004816_PAV	5B	65.51	3.32	0.08	LRV
1670401_PAV	5B	111.15	3.05	0.07	PRD
1289021_PAV	5B	120.34	3.40	0.10	LRS
1289021_PAV	5B	120.34	3.32	0.10	LRV
4410828_PAV	5B	135.45	3.25	0.09	LRV
3026929_SNP	5B	138.69	3.40	0.11	PRL
3026929_SNP	5B	138.69	3.02	0.09	PRS
3029405_SNP	5B	138.69	3.87	0.13	PRL
3029405_SNP	5B	138.69	3.56	0.12	PRS
1024149_PAV	5B	142.12	3.69	0.11	PRV

1349377_PAV	6A	7.11	3.11	0.07	TRN
1119697_PAV	6A	11.95	3.30	0.09	LRS
1119697_PAV	6A	11.95	3.14	0.08	LRV
1199117_PAV	6A	13.49	3.45	0.09	LRS
1199117_PAV	6A	13.49	3.76	0.10	LRV
3945798_PAV	6A	14.24	3.00	0.09	PRV
3950812_PAV	6A	14.24	3.00	0.09	PRV
3951753_PAV	6A	14.24	3.00	0.09	PRV
3954683_PAV	6A	14.24	3.00	0.09	PRV
1240561_PAV	6A	27.82	3.24	0.09	SRA
1047867_PAV	6A	27.85	3.18	0.08	PRS
1020590_SNP	6A	28.69	3.33	0.12	PRV
2281386_PAV	6A	42.36	3.14	0.08	SRA
3938278_PAV	6A	43.27	3.28	0.09	PRV
3951134_PAV	6A	43.27	3.28	0.09	PRV
4008119_PAV	6A	48.39	3.83	0.10	SRA
1105573_PAV	6A	50.08	3.20	0.08	SRA
1124192_SNP	6A	98.51	3.47	0.13	TRN
989287_PAV	6A	98.82	3.04	0.08	PRS
1129380_PAV	6B	2.41	3.08	0.08	SRA
4408432_PAV	6B	3.31	3.15	0.09	LRL
4408432_PAV	6B	3.31	3.22	0.09	LRS
4408958_PAV	6B	3.31	3.15	0.09	LRL
4408958_PAV	6B	3.31	3.22	0.09	LRS
4398207_PAV	6B	14.26	3.05	0.08	TRN
3021216_PAV	6B	31.49	3.11	0.08	LRV
2247936_SNP	6B	31.67	3.61	0.11	PRD
1864057_SNP	6B	33.46	3.04	0.07	PRD
1098568_PAV	6B	53.66	3.10	0.08	LRL
1083470_SNP	7A	5.7	4.03	0.14	PRD
4404485_PAV	7A	6.1	3.37	0.08	PRD
4409504_PAV	7A	6.1	3.37	0.08	PRD
2253648_PAV	7A	6.46	4.31	0.12	PRD
2276039_PAV	7A	6.46	3.30	0.09	PRD
1056137_SNP	7A	7.05	3.00	0.11	LRV
4004420_PAV	7A	7.13	4.14	0.13	PRD
1130796_PAV	7A	7.6	4.27	0.12	PRD
1076865_PAV	7A	7.84	3.29	0.09	SRA

1139027_PAV	7A	7.91	4.75	0.14	PRD
2325140_PAV	7A	8.08	3.07	0.08	SRA
1279734_PAV	7A	9.08	3.63	0.09	SRA
1121865_PAV	7A	9.22	3.25	0.09	SRA
1064039_PAV	7A	9.43	3.26	0.08	SRA
1071972_PAV	7A	9.43	3.36	0.09	SRA
3956667_PAV	7A	16.28	3.16	0.09	LRL
1059554_SNP	7A	47.85	3.18	0.10	LRS
1059554_SNP	7A	47.85	3.16	0.10	LRV
1059554_SNP	7A	47.85	3.18	0.09	TRN
1665955_PAV	7A	92.69	3.19	0.08	TRN
1383059_PAV	7A	94.34	3.27	0.08	PRL
1281820_PAV	7A	145.94	3.07	0.08	TRN
1049073_SNP	7A	146.59	3.57	0.11	TRN
2260740_SNP	7A	148.38	3.04	0.09	TRN
3935539_PAV	7A	149.28	3.31	0.08	TRN
3942214_PAV	7A	149.28	3.31	0.08	TRN
3960976_PAV	7A	149.28	3.31	0.08	TRN
1107401_PAV	7A	149.56	3.26	0.08	TRN
4405659_PAV	7A	149.56	4.58	0.13	TRN
4410160_PAV	7A	149.56	4.58	0.13	TRN
3935561_SNP	7A	149.67	3.91	0.11	TRN
3956725_PAV	7A	150.31	5.36	0.17	TRN
1149356_PAV	7B	24.48	3.18	0.08	PRV
1149356_PAV	7B	24.48	3.09	0.08	LRV
1075278_SNP	7B	74.86	3.39	0.12	LRL
3959480_PAV	7B	75.24	3.03	0.08	SRA
1108025_PAV	7B	97.45	3.24	0.09	PRV
1252655_PAV	7B	97.45	4.44	0.11	TRN

*Markers in bold are significant for $-\log_{10}(P) > 4.6$. TRN, total root number; SRA, seminal root angle; PRL, primary root length; LRL, total lateral root length; PRS, primary root surface; LRS, total lateral root surface; PRV, primary root volume; LRV, total lateral root volume; PRD, primary root diameter; LRD, mean lateral root diameter.