

Table S1. Estimates of the effects of specific combining ability (SCA) and mean values of agronomic and root architecture traits of 15 popcorn hybrids under water-stress (WS) and well-watered (WW) conditions.

Traits	WS		WW		Hybrids	WS		WW		Traits
	SCA	Averages	SCA	Averages		SCA	Averages	SCA	Averages	
Grain yield	0.88	2.06	1.11	2.80	L61/L75	0.02	64.17	-1.22	57.50	Support root angle
	0.34	2.28	0.47	3.35	L61/P2	-0.16	60.83	-1.58	55.00	
	0.43	2.08	0.39	3.03	L61/P6	-0.99	60.00	0.81	56.67	
	0.47	2.49	0.72	3.56	L63/P2	-3.69	53.33	-2.04	50.00	
	0.53	2.25	0.65	3.25	L63/P6	-2.02	55.00	-3.81	47.50	
	0.9	2.87	0.66	3.69	L63/L76	0.39	60.00	0.71	58.33	
	0.36	1.83	0.48	3.23	L65/P6	-1.91	57.50	-1.25	51.67	
	0.69	2.41	1.42	4.61	L65/L76	-2.01	60.00	-4.94	61.67	
	0.44	1.91	0.84	3.88	L65/P3	-0.17	55.00	-1.25	55.00	
	0.95	2.85	1.01	4.31	L71/L76	-1.26	60.83	-1.12	55.00	
	-0.04	1.61	0.66	3.80	L71/P3	-6.10	49.17	-5.47	50.00	
	0.47	2.12	1.18	4.03	L71/P7	0.30	60.00	-3.68	56.67	
	0.04	1.41	-0.13	2.23	L75/P3	-2.28	56.67	-1.27	59.17	
	0.18	1.55	0.08	2.14	L75/P7	-0.05	63.33	3.25	56.67	
	0.07	2.2	-0.03	3.21	P2/P7	-2.73	57.50	3.62	61.67	
Popping expansion	2.42	28.22	1.63	30.28	L61/L75	-0.04	73.33	-2.11	66.67	Cown root angle
	-0.71	24.33	-0.21	27.73	L61/P2	-0.99	70.00	1.96	68.33	
	-2.65	23.94	1.64	32.00	L61/P6	0.27	69.17	0.44	65.83	
	0.83	22.39	-0.20	22.03	L63/P2	-1.55	66.67	-0.43	61.67	
	2.00	25.11	0.02	24.67	L63/P6	-1.96	64.17	-4.46	56.67	
	-0.71	20.28	0.17	22.53	L63/L76	0.01	70.00	1.42	69.17	
	-0.26	22.22	4.60	28.93	L65/P6	-1.96	66.67	-4.69	61.67	
	-0.59	19.78	-2.05	19.99	L65/L76	-4.99	67.50	-1.32	71.67	
	1.47	21.00	1.60	23.93	L65/P3	-1.56	64.17	-1.50	65.00	
	0.49	24.50	-0.45	25.27	L71/L76	0.12	71.67	-5.62	64.17	
	-1.11	22.06	-2.35	23.67	L71/P3	-5.61	59.17	-3.30	60.00	
	-6.22	19.61	-7.62	21.88	L71/P7	-0.14	68.33	0.28	66.67	
	-0.19	19.00	-1.53	20.14	L75/P3	0.25	68.33	3.33	69.17	
	0.14	22.00	-0.28	24.87	L75/P7	-0.95	70.83	-3.08	65.83	
	0.46	21.56	0.08	24.53	P2/P7	-1.06	68.33	-3.01	63.50	
Popcorn volume	27.51	59.04	33.65	84.77	L61/L75	0.13	7.83	-0.59	7.17	Number of support root
	10.09	55.97	16.29	93.19	L61/P2	-0.24	7.67	-0.13	8.17	
	6.03	48.06	18.56	96.90	L61/P6	1.26	9.00	0.57	9.00	
	11.81	55.54	15.25	78.69	L63/P2	-0.19	8.00	0.05	8.17	
	17.08	56.96	14.47	79.35	L63/P6	-0.52	7.50	0.08	8.33	
	16.03	58.24	16.03	83.41	L63/L76	-0.66	7.33	0.00	8.00	
	7.67	40.85	24.44	93.55	L65/P6	0.40	7.50	-0.43	7.83	
	11.82	47.35	22.21	93.81	L65/L76	-1.40	5.67	1.32	9.33	
	12.17	40.46	23.93	93.38	L65/P3	-0.43	6.83	-0.08	7.33	
	26.12	69.34	30.15	108.60	L71/L76	-0.23	6.83	0.57	8.17	
	-0.51	35.47	13.52	89.80	L71/P3	-1.25	6.00	-0.16	6.83	
	1.99	41.93	11.04	88.28	L71/P7	0.03	6.83	0.41	8.33	
	-0.43	27.11	-7.86	44.55	L75/P3	1.13	8.33	0.08	7.17	
	3.17	34.67	-1.09	52.27	L75/P7	-1.25	5.50	-0.34	7.67	
	1.99	47.82	0.05	79.19	P2/P7	-0.11	6.83	0.45	9.00	

100- Grain weight	1.32	14.44	1.47	15.58	L61/L75	-0.12	13.67	-0.53	13.17	Number of crown root
	0.49	14.51	0.31	15.48	L61/P2	1.54	16.33	-0.79	15.17	
	1.06	13.49	0.20	13.78	L61/P6	1.22	15.50	1.67	18.00	
	0.01	14.44	0.56	16.06	L63/P2	-0.33	14.00	-0.92	14.50	
	-0.73	12.11	1.82	15.73	L63/P6	0.35	14.17	0.54	16.33	
	1.31	15.31	0.57	15.58	L63/L76	-0.54	14.83	0.89	17.17	
	1.1	14.92	0.23	14.82	L65/P6	-1.43	12.83	-0.91	15.67	
	0.95	15.94	1.82	17.51	L65/L76	-0.31	15.50	2.94	20.00	
	1.61	16.84	1.10	17.75	L65/P3	0.63	14.83	0.95	16.33	
	-0.13	15.02	0.52	16.51	L71/L76	-0.46	14.50	-0.94	15.33	
	-0.92	14.47	0.70	17.64	L71/P3	0.48	13.83	-0.26	14.33	
	0.94	14.93	1.33	17.57	L71/P7	-0.98	14.50	2.03	16.67	
	-1.21	13.1	-0.18	15.28	L75/P3	-1.24	10.17	1.17	14.17	
	0.59	13.5	1.29	16.04	L75/P7	-1.19	9.83	-1.20	11.83	
	0.12	13.93	1.01	16.83	P2/P7	-1.69	10.33	1.54	16.83	
Ear width	2.58	29.19	3.83	32.86	L61/L75	-0.10	5.67	0.34	6.17	Density of support roots
	1.82	31.37	2.17	34.81	L61/P2	0.46	5.33	0.08	5.50	
	2.06	29.90	1.26	31.89	L61/P6	0.18	4.67	0.23	6.00	
	-0.02	30.03	0.81	33.82	L63/P2	0.53	5.50	-0.07	5.33	
	1.23	29.57	2.50	33.49	L63/P6	0.25	4.83	0.08	5.83	
	0.06	29.51	2.00	34.30	L63/L76	0.11	5.17	0.90	6.33	
	2.79	29.28	2.04	31.81	L65/P6	0.00	3.33	0.78	5.50	
	3.93	31.53	3.20	34.28	L65/L76	0.86	4.67	0.93	5.33	
	1.60	28.41	1.78	32.30	L65/P3	0.68	4.67	0.08	4.67	
	2.56	31.26	0.76	33.76	L71/L76	0.35	5.17	0.66	6.00	
	1.10	29.02	2.28	34.71	L71/P3	-0.16	4.83	-0.03	5.50	
	2.89	30.85	2.27	34.04	L71/P7	0.40	5.00	0.25	5.50	
	1.04	27.60	1.44	30.95	L75/P3	-0.14	5.67	0.19	6.33	
	0.99	27.60	1.44	30.28	L75/P7	0.75	6.17	0.14	6.00	
	-0.34	29.21	1.32	33.76	P2/P7	-0.36	4.17	0.05	5.50	
Ear length	3.13	12.64	3.24	13.89	L61/L75	-0.10	4.00	-0.31	4.17	Density of crown root
	-0.04	10.02	0.26	11.88	L61/P2	-0.09	3.33	0.33	4.50	
	-0.93	9.09	0.01	11.50	L61/P6	0.24	3.50	0.66	5.17	
	0.62	11.07	1.38	13.63	L63/P2	-0.23	3.17	-0.06	4.00	
	1.21	11.63	1.21	13.33	L63/P6	-0.06	3.17	-0.39	4.00	
	0.10	10.74	1.10	13.63	L63/L76	0.23	4.00	0.35	4.50	
	0.93	11.68	1.40	13.58	L65/P6	0.15	2.67	0.74	4.33	
	1.57	12.54	1.96	14.55	L65/L76	0.53	3.58	1.32	4.67	
	1.27	12.88	0.43	13.25	L65/P3	0.42	3.50	0.33	3.50	
	1.10	11.65	-0.07	12.08	L71/L76	0.03	3.67	0.35	4.67	
	1.33	12.51	1.56	13.95	L71/P3	0.01	3.67	-0.47	3.67	
	1.40	12.09	1.21	13.75	L71/P7	0.05	3.50	0.04	4.00	
	-1.30	9.83	0.92	13.07	L75/P3	-0.22	4.00	0.44	4.83	
	0.95	11.59	-0.01	12.29	L75/P7	-0.34	3.67	0.46	4.67	
	0.10	11.29	-0.30	12.97	P2/P7	-0.34	3.00	-0.90	3.00	