

Supplementary files:

Table S1. Results of Two-Way ANOVA variance test for all studied traits

Season	Source	Type III Sum of Squares	df	Mean Square	F	Sig.
<b>Plant Height</b>						
1	Corrected Model	4448.507	8	556.063	7.752	<0.001
	Intercept	419328.853	1	419328.853	5846.025	<0.001
	Cultivar	3746.729	2	1873.364	26.117	<0.001
	Sowing Date	333.396	2	166.698	2.324	0.127
	Cultivar * Sowing Date	368.382	4	92.096	1.284	0.313
	Error	1291.120	18	71.729		
2	Corrected Model	4448.507	8	556.063	7.364	<0.001
	Intercept	422813.021	1	422813.021	5599.287	<0.001
	Cultivar	3746.729	2	1873.364	24.809	<0.001
	Sowing Date	333.396	2	166.698	2.208	0.139
	Cultivar * Sowing Date	368.382	4	92.096	1.220	0.337
	Error	1359.215	18	75.512		
<b>Flag Leaf Area</b>						
1	Corrected Model	715.745	8	89.468	4.072	0.006
	Intercept	3857.221	1	3857.221	175.558	<0.001
	Cultivar	583.438	2	291.719	13.277	<0.001
	Sowing Date	107.323	2	53.661	2.442	0.115
	Cultivar * Sowing Date	24.984	4	6.246	0.284	0.884
	Error	395.482	18	21.971		
2	Corrected Model	715.745	8	89.468	4.084	0.006
	Intercept	4009.291	1	4009.291	183.008	<0.001
	Cultivar	583.438	2	291.719	13.316	<0.001
	Sowing Date	107.323	2	53.661	2.449	0.115
	Cultivar * Sowing Date	24.984	4	6.246	0.285	0.884
	Error	394.339	18	21.908		
<b>Number of Spikes per m<sup>2</sup></b>						
1	Corrected Model	566885.185	8	70860.648	1.234	0.335
	Intercept	9582489.815	1	9582489.815	166.934	<0.001
	Cultivar	35112.963	2	17556.481	0.306	0.740
	Sowing Date	286290.741	2	143145.370	2.494	0.111
	Cultivar * Sowing Date	245481.481	4	61370.370	1.069	0.401
	Error	1033250.000	18	57402.778		
2	Corrected Model	403773.185	8	50471.648	1.303	0.303
	Intercept	9279897.815	1	9279897.815	239.628	<0.001
	Cultivar	54563.630	2	27281.815	0.704	0.507
	Sowing Date	221702.741	2	110851.370	2.862	0.083
	Cultivar * Sowing Date	127506.815	4	31876.704	0.823	0.527
	Error	697074.000	18	38726.333		
<b>Number of Grains per Spike</b>						
1	Corrected Model	2057.630	8	257.204	4.418	0.004
	Intercept	44733.370	1	44733.370	768.321	<0.001
	Cultivar	1642.296	2	821.148	14.104	<0.001
	Sowing Date	213.630	2	106.815	1.835	0.188
	Cultivar * Sowing Date	201.704	4	50.426	0.866	0.503

	Error	1048.000	18	58.222		
2	Corrected Model	2057.630	8	257.204	4.534	0.004
	Intercept	42633.867	1	42633.867	751.571	<0.001
	Cultivar	1642.296	2	821.148	14.476	<0.001
	Sowing Date	213.630	2	106.815	1.883	0.181
	Cultivar * Sowing Date	201.704	4	50.426	0.889	0.491
	Error	1021.073	18	56.726		
<b>Length of Spike</b>						
1	Corrected Model	81.199	8	10.150	2.293	0.069
	Intercept	6928.009	1	6928.009	1565.324	<0.001
	Cultivar	49.894	2	24.947	5.637	0.013
	Sowing Date	31.241	2	15.620	3.529	0.051
	Cultivar * Sowing Date	0.065	4	.016	0.004	1.000
	Error	79.667	18	4.426		
2	Corrected Model	84.676	8	10.584	2.438	0.056
	Intercept	7486.673	1	7486.673	1724.230	<0.001
	Cultivar	53.370	2	26.685	6.146	0.009
	Sowing Date	31.241	2	15.620	3.597	0.048
	Cultivar * Sowing Date	0.065	4	.016	0.004	1.000
	Error	78.157	18	4.342		
<b>Thousand Grains Weight</b>						
1	Corrected Model	551.667	8	68.958	1.783	0.147
	Intercept	15552.000	1	15552.000	402.014	<0.001
	Cultivar	168.222	2	84.111	2.174	0.143
	Sowing Date	15.389	2	7.694	0.199	0.821
	Cultivar * Sowing Date	368.056	4	92.014	2.379	0.090
	Error	696.333	18	38.685		
2	Corrected Model	641.385	8	80.173	2.184	0.080
	Intercept	14877.868	1	14877.868	405.326	<0.001
	Cultivar	231.843	2	115.921	3.158	0.067
	Sowing Date	13.659	2	6.829	0.186	0.832
	Cultivar * Sowing Date	395.884	4	98.971	2.696	0.064
	Error	660.707	18	36.706		
<b>Grain Yield</b>						
1	Corrected Model	128.453	8	16.057	4.839	0.003
	Intercept	631.185	1	631.185	190.224	<0.001
	Cultivar	82.300	2	41.150	12.402	<0.001
	Sowing Date	36.561	2	18.281	5.509	0.014
	Cultivar * Sowing Date	9.592	4	2.398	0.723	0.588
	Error	59.726	18	3.318		
2	Corrected Model	79.488	8	9.936	4.604	0.003
	Intercept	583.789	1	583.789	270.508	<0.001
	Cultivar	56.334	2	28.167	13.052	<0.001
	Sowing Date	21.097	2	10.549	4.888	0.020
	Cultivar * Sowing Date	2.057	4	.514	0.238	0.913
	Error	38.846	18	2.158		
<b>Above Ground Biomass</b>						
1	Corrected Model	1327.833	8	165.979	4.376	0.004
	Intercept	7056.750	1	7056.750	186.067	<0.001
	Cultivar	706.722	2	353.361	9.317	0.002

	Sowing Date	512.667	2	256.333	6.759	0.006
	Cultivar * Sowing Date	108.444	4	27.111	0.715	0.593
	Error	682.667	18	37.926		
2	Corrected Model	967.703	8	120.963	4.380	0.004
	Intercept	7092.718	1	7092.718	256.833	<0.001
	Cultivar	531.931	2	265.966	9.631	0.001
	Sowing Date	376.392	2	188.196	6.815	0.006
	Cultivar * Sowing Date	59.380	4	14.845	0.538	0.710
	Error	497.090	18	27.616		
<b>Harvest Index</b>						
1	Corrected Model	904.677	8	113.085	2.206	0.078
	Intercept	26152.447	1	26152.447	510.219	<0.001
	Cultivar	603.196	2	301.598	5.884	0.011
	Sowing Date	23.562	2	11.781	0.230	0.797
	Cultivar * Sowing Date	277.919	4	69.480	1.356	0.288
	Error	922.631	18	51.257		
2	Corrected Model	620.526	8	77.566	1.508	0.223
	Intercept	23476.141	1	23476.141	456.325	<0.001
	Cultivar	451.269	2	225.635	4.386	0.028
	Sowing Date	7.197	2	3.599	0.070	0.933
	Cultivar * Sowing Date	162.059	4	40.515	0.788	0.548
	Error	926.030	18	51.446		

Table S2. Analysis of variance test: effect of cultivars

ANOVA							
Date of sowing			Sum of Squares	df	Mean Square	F	Sig.
1	Plant height	Between Groups	3736,444	2	1868,222	41,731	<,001
		Within Groups	671,526	15	44,768		
		Total	4407,971	17			
	Flag leaf area	Between Groups	479,610	2	239,805	9,261	,002
		Within Groups	388,425	15	25,895		
		Total	868,034	17			
	spike /m <sup>2</sup>	Between Groups	163893,000	2	81946,500	2,410	,124
		Within Groups	510029,000	15	34001,933		
		Total	673922,000	17			
	grains/spike	Between Groups	595,111	2	297,556	33,954	<,001
		Within Groups	131,452	15	8,763		
		Total	726,563	17			
	spike length	Between Groups	34,588	2	17,294	2,924	,085
		Within Groups	88,728	15	5,915		
		Total	123,316	17			
	TGW	Between Groups	700,804	2	350,402	9,612	,002

		Within Groups	546,833	15	36,456		
		Total	1247,638	17			
	grains yield	Between Groups	79,534	2	39,767	10,667	,001
		Within Groups	55,921	15	3,728		
		Total	135,455	17			
	AGB	Between Groups	759,581	2	379,790	7,802	,005
		Within Groups	730,225	15	48,682		
		Total	1489,806	17			
	HI	Between Groups	404,863	2	202,432	3,825	,045
		Within Groups	793,793	15	52,920		
		Total	1198,656	17			
2	Plant height	Between Groups	3084,924	2	1542,462	19,867	<,001
		Within Groups	1164,580	15	77,639		
		Total	4249,504	17			
	Flag leaf area	Between Groups	358,253	2	179,127	19,101	<,001
		Within Groups	140,665	15	9,378		
		Total	498,919	17			
	spike /m <sup>2</sup>	Between Groups	83049,333	2	41524,667	,734	,496
		Within Groups	848103,167	15	56540,211		
		Total	931152,500	17			
	grains/spike	Between Groups	1459,111	2	729,556	7,987	,004
		Within Groups	1370,185	15	91,346		
		Total	2829,296	17			
	spike length	Between Groups	35,954	2	17,977	6,546	,009
		Within Groups	41,195	15	2,746		
		Total	77,149	17			
	TGW	Between Groups	281,693	2	140,847	4,932	,023
		Within Groups	428,367	15	28,558		
		Total	710,060	17			
	grains yield	Between Groups	43,057	2	21,529	21,085	<,001
		Within Groups	15,316	15	1,021		
		Total	58,373	17			
	AGB	Between Groups	398,103	2	199,051	11,323	,001
		Within Groups	263,686	15	17,579		
		Total	661,788	17			
	HI	Between Groups	1034,971	2	517,486	12,772	<,001

		Within Groups	607,761	15	40,517		
		Total	1642,732	17			
3	Plant height	Between Groups	1408,853	2	704,427	12,920	<,001
		Within Groups	817,833	15	54,522		
		Total	2226,686	17			
	Flag leaf area	Between Groups	378,981	2	189,490	10,871	,001
		Within Groups	261,466	15	17,431		
		Total	640,446	17			
	spike /m <sup>2</sup>	Between Groups	199617,333	2	99808,667	3,818	,046
		Within Groups	392163,167	15	26144,211		
		Total	591780,500	17			
	grains/spike	Between Groups	1633,778	2	816,889	21,125	<,001
		Within Groups	580,052	15	38,670		
		Total	2213,829	17			
	spike length	Between Groups	32,821	2	16,411	7,382	,006
		Within Groups	33,345	15	2,223		
		Total	66,166	17			
	TGW	Between Groups	178,093	2	89,047	3,430	,059
		Within Groups	389,367	15	25,958		
		Total	567,460	17			
	grains yield	Between Groups	23,684	2	11,842	5,360	,018
		Within Groups	33,140	15	2,209		
		Total	56,825	17			
	AGB	Between Groups	236,980	2	118,490	8,705	,003
		Within Groups	204,166	15	13,611		
		Total	441,146	17			
	HI	Between Groups	15,051	2	7,526	,215	,809
		Within Groups	525,810	15	35,054		
		Total	540,861	17			

Table S3. LSD Post Hoc test: effect of cultivars

LSD								
Date of sowing	Dependent Variable	(I) variety	(J) variety	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
1	Plant height	1	2	5,66667	3,86300	,163	-2,5671	13,9005

			3	-27,33333*	3,863 00	<,001	-35,5671	-19,0995
		2	1	-5,66667	3,863 00	,163	-13,9005	2,5671
			3	-33,00000*	3,863 00	<,001	-41,2338	-24,7662
		3	1	27,33333*	3,863 00	<,001	19,0995	35,5671
			2	33,00000*	3,863 00	<,001	24,7662	41,2338
	Flag leaf area	1	2	,4801	2,938 0	,872	-5,782	6,742
			3	-10,7021*	2,938 0	,002	-16,964	-4,440
		2	1	-,4801	2,938 0	,872	-6,742	5,782
			3	-11,1821*	2,938 0	,002	-17,444	-4,920
		3	1	10,7021*	2,938 0	,002	4,440	16,964
			2	11,1821*	2,938 0	,002	4,920	17,444
	spike /m²	1	2	-225,500	106,4 61	,051	-452,42	1,42
			3	-166,000	106,4 61	,140	-392,92	60,92
		2	1	225,500	106,4 61	,051	-1,42	452,42
			3	59,500	106,4 61	,584	-167,42	286,42
		3	1	166,000	106,4 61	,140	-60,92	392,92
			2	-59,500	106,4 61	,584	-286,42	167,42
	grain/spike	1	2	1,0000	1,709 1	,567	-2,643	4,643
			3	-11,6667*	1,709 1	<,001	-15,310	-8,024
		2	1	-1,0000	1,709 1	,567	-4,643	2,643
			3	-12,6667*	1,709 1	<,001	-16,310	-9,024
		3	1	11,6667*	1,709 1	<,001	8,024	15,310
			2	12,6667*	1,709 1	<,001	9,024	16,310
	spike length	1	2	,66667	1,404 19	,642	-2,3263	3,6596
			3	-2,55000	1,404 19	,089	-5,5430	,4430

		2	1	-,66667	1,404 19	,642	-3,6596	2,3263
			3	-3,21667*	1,404 19	,037	-6,2096	-,2237
		3	1	2,55000	1,404 19	,089	-,4430	5,5430
			2	3,21667*	1,404 19	,037	,2237	6,2096
	TGW	1	2	2,6667	3,486 0	,456	-4,763	10,097
			3	-11,7000*	3,486 0	,004	-19,130	-4,270
		2	1	-2,6667	3,486 0	,456	-10,097	4,763
			3	-14,3667*	3,486 0	<,001	-21,797	-6,937
		3	1	11,7000*	3,486 0	,004	4,270	19,130
			2	14,3667*	3,486 0	<,001	6,937	21,797
	grains yield	1	2	-1,780000	1,114 760	,131	-4,15606	,59606
			3	-5,074167*	1,114 760	<,001	-7,45022	-2,69811
		2	1	1,780000	1,114 760	,131	-,59606	4,15606
			3	-3,294167*	1,114 760	,010	-5,67022	-,91811
		3	1	5,074167*	1,114 760	<,001	2,69811	7,45022
			2	3,294167*	1,114 760	,010	,91811	5,67022
	AGB	1	2	,833333	4,028 303	,839	-7,75279	9,41946
			3	-13,344667*	4,028 303	,005	-21,93079	-4,75854
		2	1	-,833333	4,028 303	,839	-9,41946	7,75279
			3	-14,178000*	4,028 303	,003	-22,76412	-5,59188
		3	1	13,344667*	4,028 303	,005	4,75854	21,93079
			2	14,178000*	4,028 303	,003	5,59188	22,76412
	HI	1	2	-11,500597849461368*	4,199 98207 54002 41	,015	- 20,452647735 43233	- 2,5485479634 9040

			3	-7,170841367848176	4,199 98207 54002 41	,108	- 16,122891253 81914	1,7812085181 2279
			2	1	11,500597849461368*	4,199 98207 54002 41	,015	2,5485479634 9041
		3		4,329756481613192	4,199 98207 54002 41	,319	- 4,6222934043 5777	13,281806367 58416
		3	1	7,170841367848176	4,199 98207 54002 41	,108	- 1,7812085181 2279	16,122891253 81914
			2	-4,329756481613191	4,199 98207 54002 41	,319	- 13,281806367 58415	4,6222934043 5777
2	Plant height	1	2	9,46667	5,087 19	,082	-1,3764	20,3098
	3		-21,80000*	5,087 19	<,001	-32,6431	-10,9569	
	2		1	-9,46667	5,087 19	,082	-20,3098	1,3764
			3	-31,26667*	5,087 19	<,001	-42,1098	-20,4236
	3		1	21,80000*	5,087 19	<,001	10,9569	32,6431
			2	31,26667*	5,087 19	<,001	20,4236	42,1098
		Flag leaf area	1	2	-4,2142*	1,768 0	,031	-7,983
3				-10,8389*	1,768 0	<,001	-14,607	-7,070
2			1	4,2142*	1,768 0	,031	,446	7,983
			3	-6,6247*	1,768 0	,002	-10,393	-2,856
3			1	10,8389*	1,768 0	<,001	7,070	14,607
			2	6,6247*	1,768 0	,002	2,856	10,393
	spike /m²	1	2	118,667	137,2 83	,401	-173,95	411,28
			3	160,333	137,2 83	,261	-132,28	452,95
		2	1	-118,667	137,2 83	,401	-411,28	173,95



			3	41,667	137,283	,766	-250,95	334,28
		3	1	-160,333	137,283	,261	-452,95	132,28
			2	-41,667	137,283	,766	-334,28	250,95
	grain/spike	1	2	-12,3333*	5,5180	,041	-24,095	-,572
			3	-22,0000*	5,5180	,001	-33,761	-10,239
		2	1	12,3333*	5,5180	,041	,572	24,095
			3	-9,6667	5,5180	,100	-21,428	2,095
		3	1	22,0000*	5,5180	,001	10,239	33,761
			2	9,6667	5,5180	,100	-2,095	21,428
	spike length	1	2	,50000	,95679	,609	-1,5393	2,5393
			3	-2,71667*	,95679	,012	-4,7560	-,6773
		2	1	-,50000	,95679	,609	-2,5393	1,5393
			3	-3,21667*	,95679	,004	-5,2560	-1,1773
		3	1	2,71667*	,95679	,012	,6773	4,7560
			2	3,21667*	,95679	,004	1,1773	5,2560
	TGW	1	2	-6,8333*	3,0853	,043	-13,410	-,257
			3	-9,3667*	3,0853	,008	-15,943	-2,790
		2	1	6,8333*	3,0853	,043	,257	13,410
			3	-2,5333	3,0853	,424	-9,110	4,043
		3	1	9,3667*	3,0853	,008	2,790	15,943
			2	2,5333	3,0853	,424	-4,043	9,110
	grains yield	1	2	-,711667	,583393	,241	-1,95514	,53181
			3	-3,578333*	,583393	<,001	-4,82181	-2,33486
		2	1	,711667	,583393	,241	-,53181	1,95514
			3	-2,866667*	,583393	<,001	-4,11014	-1,62319

		3	1	3,578333*	,5833 93	<,001	2,33486	4,82181
			2	2,866667*	,5833 93	<,001	1,62319	4,11014
	AGB	1	2	5,503333*	2,420 678	,038	,34378	10,66289
			3	-6,012500*	2,420 678	,025	-11,17205	-,85295
		2	1	-5,503333*	2,420 678	,038	-10,66289	-,34378
			3	-11,515833*	2,420 678	<,001	-16,67539	-6,35628
		3	1	6,012500*	2,420 678	,025	,85295	11,17205
			2	11,515833*	2,420 678	<,001	6,35628	16,67539
	HI	1	2	-18,460006736912792*	3,675 02364 16973 79	<,001	- 26,293134207 93003	- 10,626879265 89555
			3	-11,008756588072988*	3,675 02364 16973 79	,009	- 18,841884059 09023	- 3,1756291170 5575
		2	1	18,460006736912792*	3,675 02364 16973 79	<,001	10,626879265 89556	26,293134207 93003
			3	7,451250148839804	3,675 02364 16973 79	,061	- ,38187732217 743	15,284377619 85704
		3	1	11,008756588072988*	3,675 02364 16973 79	,009	3,1756291170 5575	18,841884059 09023
			2	-7,451250148839804	3,675 02364 16973 79	,061	- 15,284377619 85704	,38187732217 743
3	Plant height	1	2	14,93333*	4,263 11	,003	5,8467	24,0199
			3	-6,13333	4,263 11	,171	-15,2199	2,9533
		2	1	-14,93333*	4,263 11	,003	-24,0199	-5,8467
			3	-21,06667*	4,263 11	<,001	-30,1533	-11,9801
		3	1	6,13333	4,263 11	,171	-2,9533	15,2199

			2	21,06667*	4,263 11	<,001	11,9801	30,1533
	Flag leaf area	1	2	,0190	2,410 5	,994	-5,119	5,157
			3	-9,7242*	2,410 5	,001	-14,862	-4,586
		2	1	-,0190	2,410 5	,994	-5,157	5,119
			3	-9,7432*	2,410 5	,001	-14,881	-4,605
		3	1	9,7242*	2,410 5	,001	4,586	14,862
			2	9,7432*	2,410 5	,001	4,605	14,881
	spike /m <sup>2</sup>	1	2	-139,333	93,35 3	,156	-338,31	59,64
			3	-257,667*	93,35 3	,015	-456,64	-58,69
		2	1	139,333	93,35 3	,156	-59,64	338,31
			3	-118,333	93,35 3	,224	-317,31	80,64
		3	1	257,667*	93,35 3	,015	58,69	456,64
			2	118,333	93,35 3	,224	-80,64	317,31
	grain/spike	1	2	-12,0000*	3,590 3	,004	-19,652	-4,348
			3	-23,3333*	3,590 3	<,001	-30,986	-15,681
		2	1	12,0000*	3,590 3	,004	4,348	19,652
			3	-11,3333*	3,590 3	,007	-18,986	-3,681
		3	1	23,3333*	3,590 3	<,001	15,681	30,986
			2	11,3333*	3,590 3	,007	3,681	18,986
	spike length	1	2	,41667	,8608 1	,635	-1,4181	2,2514
			3	-2,63333*	,8608 1	,008	-4,4681	-,7986
		2	1	-,41667	,8608 1	,635	-2,2514	1,4181
			3	-3,05000*	,8608 1	,003	-4,8848	-1,2152
		3	1	2,63333*	,8608 1	,008	,7986	4,4681
			2	3,05000*	,8608 1	,003	1,2152	4,8848

	TGW	1	2	-6,0333	2,941 5	,058	-12,303	,236
			3	1,1333	2,941 5	,705	-5,136	7,403
		2	1	6,0333	2,941 5	,058	-,236	12,303
			3	7,1667*	2,941 5	,028	,897	13,436
		3	1	-1,1333	2,941 5	,705	-7,403	5,136
			2	-7,1667*	2,941 5	,028	-13,436	-,897
	grains yield	1	2	-,838333	,8581 65	,344	-2,66747	,99080
			3	-2,741667*	,8581 65	,006	-4,57080	-,91253
		2	1	,838333	,8581 65	,344	-,99080	2,66747
			3	-1,903333*	,8581 65	,042	-3,73247	-,07420
		3	1	2,741667*	,8581 65	,006	,91253	4,57080
			2	1,903333*	,8581 65	,042	,07420	3,73247
	AGB	1	2	-1,496667	2,130 029	,493	-6,03672	3,04338
			3	-8,335500*	2,130 029	,001	-12,87555	-3,79545
		2	1	1,496667	2,130 029	,493	-3,04338	6,03672
			3	-6,838833*	2,130 029	,006	-11,37888	-2,29878
		3	1	8,335500*	2,130 029	,001	3,79545	12,87555
			2	6,838833*	2,130 029	,006	2,29878	11,37888
	HI	1	2	-2,211012912430235	3,418 28363 27425 43	,528	- 9,4969120080 3367	5,0748861831 7321
			3	-,794981149170074	3,418 28363 27425 43	,819	- 8,0808802447 7351	6,4909179464 3337
		2	1	2,211012912430235	3,418 28363 27425 43	,528	- 5,0748861831 7321	9,4969120080 3368

			3	1,416031763260161	3,418 28363 27425 43	,685	- 5,8698673323 4328	8,7019308588 6360
		3	1	,794981149170074	3,418 28363 27425 43	,819	- 6,4909179464 3337	8,0808802447 7351
			2	-1,416031763260161	3,418 28363 27425 43	,685	- 8,7019308588 6360	5,8698673323 4328

\*. The mean difference is significant at the 0.05 level.

Table S4. Analysis of variance test: effect of sowing dates

ANOVA							
Cultivar			Sum of Squares	df	Mean Square	F	Sig.
1	Plant height	Between Groups	23,698	2	11,849	,231	,797
		Within Groups	769,753	15	51,317		
		Total	793,451	17			
	Flag leaf area	Between Groups	68,473	2	34,237	4,743	,025
		Within Groups	108,272	15	7,218		
		Total	176,745	17			
	spike /m <sup>2</sup>	Between Groups	395400,444	2	197700,222	3,751	,048
		Within Groups	790589,833	15	52705,989		
		Total	1185990,278	17			
	grains/spike	Between Groups	656,444	2	328,222	5,340	,018
		Within Groups	921,985	15	61,466		
		Total	1578,429	17			
	spike length	Between Groups	22,333	2	11,167	2,961	,082
		Within Groups	56,567	15	3,771		
		Total	78,900	17			
	TGW	Between Groups	20,111	2	10,056	,228	,798
		Within Groups	660,167	15	44,011		
		Total	680,278	17			
	grains yield	Between Groups	6,086	2	3,043	3,487	,057
		Within Groups	13,089	15	,873		
		Total	19,175	17			
	AGB	Between Groups	311,385	2	155,693	18,031	<,001
		Within Groups	129,523	15	8,635		

		Total	440,909	17			
	HI	Between Groups	331,586	2	165,793	3,028	,079
		Within Groups	821,433	15	54,762		
		Total	1153,019	17			
2	Plant height	Between Groups	159,093	2	79,547	2,619	,106
		Within Groups	455,633	15	30,376		
		Total	614,726	17			
	Flag leaf area	Between Groups	100,916	2	50,458	3,092	,075
		Within Groups	244,793	15	16,320		
		Total	345,710	17			
	spike /m <sup>2</sup>	Between Groups	332242,111	2	166121,056	3,984	,041
		Within Groups	625462,333	15	41697,489		
		Total	957704,444	17			
	grains/spike	Between Groups	115,111	2	57,556	2,089	,158
		Within Groups	413,185	15	27,546		
		Total	528,296	17			
	spike length	Between Groups	18,694	2	9,347	3,428	,059
		Within Groups	40,900	15	2,727		
		Total	59,594	17			
	TGW	Between Groups	383,738	2	191,869	8,119	,004
		Within Groups	354,500	15	23,633		
		Total	738,238	17			
	grains yield	Between Groups	17,197	2	8,599	3,316	,064
		Within Groups	38,892	15	2,593		
		Total	56,090	17			
	AGB	Between Groups	144,101	2	72,050	2,880	,087
		Within Groups	375,316	15	25,021		
		Total	519,417	17			
	HI	Between Groups	104,525	2	52,263	1,260	,312
		Within Groups	622,221	15	41,481		
		Total	726,746	17			
3	Plant height	Between Groups	1220,764	2	610,382	6,409	,010
		Within Groups	1428,553	15	95,237		
		Total	2649,317	17			
	Flag leaf area	Between Groups	95,224	2	47,612	1,632	,228
		Within Groups	437,490	15	29,166		

	spike /m <sup>2</sup>	Total	532,714	17			
		Between Groups	137433,333	2	68716,667	3,084	,076
		Within Groups	334243,167	15	22282,878		
	grains/spike	Total	471676,500	17			
		Between Groups	59,111	2	29,556	,594	,565
		Within Groups	746,518	15	49,768		
	spike length	Total	805,629	17			
		Between Groups	21,583	2	10,792	2,460	,119
		Within Groups	65,802	15	4,387		
	TGW	Total	87,385	17			
		Between Groups	388,000	2	194,000	8,317	,004
		Within Groups	349,900	15	23,327		
	grains yield	Total	737,900	17			
		Between Groups	42,018	2	21,009	6,015	,012
		Within Groups	52,395	15	3,493		
	AGB	Total	94,414	17			
		Between Groups	589,297	2	294,649	6,375	,010
		Within Groups	693,237	15	46,216		
	HI	Total	1282,534	17			
		Between Groups	,357	2	,178	,006	,994
		Within Groups	483,711	15	32,247		
		Total	484,067	17			

Table S5. LSD Post Hoc test: effect of sowing dates

LSD								
Cultivar	Dependent Variable	(I) Date of planting	(J) Date of planting	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
1	Plant height	1	2	-2,46667	4,13589	,560	-11,2821	6,3488
			3	-2,40000	4,13589	,570	-11,2154	6,4154
		2	1	2,46667	4,13589	,560	-6,3488	11,2821
			3	,06667	4,13589	,987	-8,7488	8,8821
		3	1	2,40000	4,13589	,570	-6,4154	11,2154
			2	-,06667	4,13589	,987	-8,8821	8,7488
	Flag leaf area	1	2	3,3022	1,5511	,050	-,004	6,608
			3	4,6411*	1,5511	,009	1,335	7,947
		2	1	-3,3022	1,5511	,050	-6,608	,004
			3	1,3389	1,5511	,402	-1,967	4,645
		3	1	-4,6411*	1,5511	,009	-7,947	-1,335
			2	-1,3389	1,5511	,402	-4,645	1,967

	spike /m²	1	2	-118,000	132,547	,387	-400,52	164,52
			3	238,333	132,547	,092	-44,18	520,85
		2	1	118,000	132,547	,387	-164,52	400,52
			3	356,333*	132,547	,017	73,82	638,85
		3	1	-238,333	132,547	,092	-520,85	44,18
			2	-356,333*	132,547	,017	-638,85	-73,82
	grain/spike	1	2	9,0000	4,5264	,065	-,648	18,648
			3	14,6667*	4,5264	,005	5,019	24,315
		2	1	-9,0000	4,5264	,065	-18,648	,648
			3	5,6667	4,5264	,230	-3,981	15,315
		3	1	-14,6667*	4,5264	,005	-24,315	-5,019
			2	-5,6667	4,5264	,230	-15,315	3,981
	spike length	1	2	,83333	1,12118	,469	-1,5564	3,2231
			3	2,66667*	1,12118	,031	,2769	5,0564
		2	1	-,83333	1,12118	,469	-3,2231	1,5564
			3	1,83333	1,12118	,123	-,5564	4,2231
		3	1	-2,66667*	1,12118	,031	-5,0564	-,2769
			2	-1,83333	1,12118	,123	-4,2231	,5564
	TGW	1	2	,6667	3,8302	,864	-7,497	8,831
			3	-1,8333	3,8302	,639	-9,997	6,331
		2	1	-,6667	3,8302	,864	-8,831	7,497
			3	-2,5000	3,8302	,524	-10,664	5,664
		3	1	1,8333	3,8302	,639	-6,331	9,997
			2	2,5000	3,8302	,524	-5,664	10,664
	grains yield	1	2	,510000	,539330	,359	-,63955	1,65955
			3	1,406667*	,539330	,020	,25711	2,55622
		2	1	-,510000	,539330	,359	-1,65955	,63955
			3	,896667	,539330	,117	-,25289	2,04622
		3	1	-1,406667*	,539330	,020	-2,55622	-,25711
			2	-,896667	,539330	,117	-2,04622	,25289
	AGB	1	2	,333333	1,696555	,847	-3,28279	3,94945
			3	8,985000*	1,696555	<,001	5,36888	12,60112
		2	1	-,333333	1,696555	,847	-3,94945	3,28279
			3	8,651667*	1,696555	<,001	5,03555	12,26779
		3	1	-8,985000*	1,696555	<,001	-12,60112	-5,36888
			2	-8,651667*	1,696555	<,001	-12,26779	-5,03555
	HI	1	2	3,642513474 217204	4,272476977 730404	,407	- 5,464055638 38078	12,74908258 681519
			3	- 6,719562151 053974	4,272476977 730404	,137	- 15,82613126 365196	2,387006961 54401
		2	1	- 3,642513474 217203	4,272476977 730404	,407	- 12,74908258 681519	5,464055638 38078
			3	- 10,36207562 5271178*	4,272476977 730404	,028	- 19,46864473 786916	- 1,255506512 67319



		3	1	6,719562151 053974	4,272476977 730404	,137	- 2,387006961 54401	15,82613126 365196
			2	10,36207562 5271178*	4,272476977 730404	,028	1,255506512 67319	19,46864473 786916
2	Plant height	1	2	1,33333	3,18201	,681	-5,4490	8,1156
			3	6,86667*	3,18201	,048	,0844	13,6490
		2	1	-1,33333	3,18201	,681	-8,1156	5,4490
			3	5,53333	3,18201	,103	-1,2490	12,3156
		3	1	-6,86667*	3,18201	,048	-13,6490	-,0844
			2	-5,53333	3,18201	,103	-12,3156	1,2490
	Flag leaf area	1	2	-1,3921	2,3323	,560	-6,363	3,579
			3	4,1800	2,3323	,093	-,791	9,151
		2	1	1,3921	2,3323	,560	-3,579	6,363
			3	5,5721*	2,3323	,030	,601	10,543
		3	1	-4,1800	2,3323	,093	-9,151	,791
			2	-5,5721*	2,3323	,030	-10,543	-,601
	spike /m²	1	2	226,167	117,895	,074	-25,12	477,45
			3	324,500*	117,895	,015	73,21	575,79
		2	1	-226,167	117,895	,074	-477,45	25,12
			3	98,333	117,895	,417	-152,95	349,62
		3	1	-324,500*	117,895	,015	-575,79	-73,21
			2	-98,333	117,895	,417	-349,62	152,95
	grain/spike	1	2	-4,3333	3,0302	,173	-10,792	2,125
			3	1,6667	3,0302	,590	-4,792	8,125
		2	1	4,3333	3,0302	,173	-2,125	10,792
			3	6,0000	3,0302	,066	-,459	12,459
		3	1	-1,6667	3,0302	,590	-8,125	4,792
			2	-6,0000	3,0302	,066	-12,459	,459
	spike length	1	2	,66667	,95336	,495	-1,3654	2,6987
			3	2,41667*	,95336	,023	,3846	4,4487
		2	1	-,66667	,95336	,495	-2,6987	1,3654
			3	1,75000	,95336	,086	-,2820	3,7820
		3	1	-2,41667*	,95336	,023	-4,4487	-,3846
			2	-1,75000	,95336	,086	-3,7820	,2820
	TGW	1	2	-8,8333*	2,8067	,007	-14,816	-2,851
			3	-10,5333*	2,8067	,002	-16,516	-4,551
		2	1	8,8333*	2,8067	,007	2,851	14,816
			3	-1,7000	2,8067	,554	-7,682	4,282
		3	1	10,5333*	2,8067	,002	4,551	16,516
			2	1,7000	2,8067	,554	-4,282	7,682
	grains yield	1	2	1,578333	,929662	,110	-,40319	3,55986
			3	2,348333*	,929662	,023	,36681	4,32986
		2	1	-1,578333	,929662	,110	-3,55986	,40319
			3	,770000	,929662	,421	-1,21153	2,75153
		3	1	-2,348333*	,929662	,023	-4,32986	-,36681
			2	-,770000	,929662	,421	-2,75153	1,21153

	AGB	1	2	5,003333	2,887968	,104	-1,15223	11,15889
			3	6,655000*	2,887968	,036	,49944	12,81056
		2	1	-5,003333	2,887968	,104	-11,15889	1,15223
			3	1,651667	2,887968	,576	-4,50389	7,80723
		3	1	-6,655000*	2,887968	,036	-12,81056	-,49944
			2	-1,651667	2,887968	,576	-7,80723	4,50389
	HI	1	2	- 3,316895413 234221	3,718483877 817776	,386	- 11,24265618 478020	4,608865358 31176
			3	2,570022785 977159	3,718483877 817776	,500	- 5,355737985 56882	10,49578355 752314
		2	1	3,316895413 234221	3,718483877 817776	,386	- 4,608865358 31175	11,24265618 478020
			3	5,886918199 211379	3,718483877 817776	,134	- 2,038842572 33460	13,81267897 075736
		3	1	- 2,570022785 977158	3,718483877 817776	,500	- 10,49578355 752313	5,355737985 56882
			2	- 5,886918199 211379	3,718483877 817776	,134	- 13,81267897 075735	2,038842572 33460
3	Plant height	1	2	3,06667	5,63433	,594	-8,9426	15,0759
			3	18,80000*	5,63433	,005	6,7907	30,8093
		2	1	-3,06667	5,63433	,594	-15,0759	8,9426
			3	15,73333*	5,63433	,014	3,7241	27,7426
		3	1	-18,80000*	5,63433	,005	-30,8093	-6,7907
			2	-15,73333*	5,63433	,014	-27,7426	-3,7241
	Flag leaf area	1	2	3,1654	3,1180	,326	-3,480	9,811
			3	5,6189	3,1180	,092	-1,027	12,265
		2	1	-3,1654	3,1180	,326	-9,811	3,480
			3	2,4535	3,1180	,444	-4,192	9,099
		3	1	-5,6189	3,1180	,092	-12,265	1,027
			2	-2,4535	3,1180	,444	-9,099	4,192
	spike /m²	1	2	208,333*	86,184	,029	24,64	392,03
			3	146,667	86,184	,109	-37,03	330,36
		2	1	-208,333*	86,184	,029	-392,03	-24,64
			3	-61,667	86,184	,485	-245,36	122,03
		3	1	-146,667	86,184	,109	-330,36	37,03
			2	61,667	86,184	,485	-122,03	245,36
	grain/spike	1	2	-1,3333	4,0730	,748	-10,015	7,348
			3	3,0000	4,0730	,473	-5,681	11,681
		2	1	1,3333	4,0730	,748	-7,348	10,015
			3	4,3333	4,0730	,304	-4,348	13,015
		3	1	-3,0000	4,0730	,473	-11,681	5,681
			2	-4,3333	4,0730	,304	-13,015	4,348

	spike length	1	2	,66667	1,20924	,590	-1,9108	3,2441
			3	2,58333*	1,20924	,050	,0059	5,1608
		2	1	-,66667	1,20924	,590	-3,2441	1,9108
			3	1,91667	1,20924	,134	-,6608	4,4941
		3	1	-2,58333*	1,20924	,050	-5,1608	-,0059
			2	-1,91667	1,20924	,134	-4,4941	,6608
	TGW	1	2	3,0000	2,7885	,299	-2,943	8,943
			3	11,0000*	2,7885	,001	5,057	16,943
		2	1	-3,0000	2,7885	,299	-8,943	2,943
			3	8,0000*	2,7885	,012	2,057	13,943
		3	1	-11,0000*	2,7885	,001	-16,943	-5,057
			2	-8,0000*	2,7885	,012	-13,943	-2,057
	grains yield	1	2	2,005833	1,079045	,083	-,29410	4,30576
			3	3,739167*	1,079045	,003	1,43924	6,03910
		2	1	-2,005833	1,079045	,083	-4,30576	,29410
			3	1,733333	1,079045	,129	-,56660	4,03326
		3	1	-3,739167*	1,079045	,003	-6,03910	-1,43924
			2	-1,733333	1,079045	,129	-4,03326	,56660
	AGB	1	2	7,665500	3,924955	,070	-,70034	16,03134
			3	13,994167*	3,924955	,003	5,62832	22,36001
		2	1	-7,665500	3,924955	,070	-16,03134	,70034
			3	6,328667	3,924955	,128	-2,03718	14,69451
		3	1	-13,994167*	3,924955	,003	-22,36001	-5,62832
			2	-6,328667	3,924955	,128	-14,69451	2,03718
	HI	1	2	- ,1954017460 07608	3,278586481 971535	,953	- 7,183543413 08419	6,792739921 06898
			3	- ,3437019323 75872	3,278586481 971535	,918	- 7,331843599 45246	6,644439734 70071
		2	1	,1954017460 07608	3,278586481 971535	,953	- 6,792739921 06898	7,183543413 08419
			3	- ,1483001863 68264	3,278586481 971535	,965	- 7,136441853 44485	6,839841480 70832
		3	1	,3437019323 75872	3,278586481 971535	,918	- 6,644439734 70071	7,331843599 45246
			2	,1483001863 68264	3,278586481 971535	,965	- 6,839841480 70832	7,136441853 44485

\*. The mean difference is significant at the 0.05 level.