Table S1. Names and pedigree of the 25 bread wheat genotypes (7 cultivars and 18 doubled haploid lines (DHLs)) used in this study.

Name	Pedigree
Giza-168	MRL/BUC//SERICM 93046-8 M-OY-OM-2Y-OB-OGZ.
Gemmeiza-9	Ald“s”/Huac//CMH74 .630/SxCGM 4583 -5GM- 1GM- OGM
Gemmeiza-12	OTUS/3/SARA/THB//VEEMSS97Y00227S-5y-010M-010Y-010M-2Y-1M-0Y-OGM
Sakha-93	Sakha 92/TR810328 S8871-IS-2S-IS-0S
Misr1	OASSIS / SKAUZ//4*BCN/3/2*PATOR CMSS00Y01881T-050M-030Y-030M-030WGY-33M-0Y-0S
Pavone-76	Vcm//Cno/7C/3/Kal/Bb
KSU106	Barouk/R1474-75-3-53-3-3
DHLs (21,22,23,25)	Derived from the cross (Line-115 × Gemmeiza-7) (El-Hennawy et al. 2011)
DHLs (5,7,8,11)	Derived from the cross (Line-115 × Giza-164) (El-Hennawy et al. 2011)
DHLs (12,14,15,26,29, 30)	Derived from the cross (Gemmeiza-7× Giza-164) (El-Hennawy et al. 2011)
DHLs (1,2,3,6)	Derived from the cross (Giza-164× Giza-168) (El-Hennawy et al. 2011)

Table S2. Analysis of variance for 28 measured traits of 25 wheat genotypes (G) in two seasons (S) under two irrigation regimes (I).

Source	DF		LWC			RWC			CT		
	S	Comb.	S1	S2	Comb.	S1	S2	Comb.	S1	S2	Comb.
S		1			302.284**			68.392*			0.589**
rep(S)	2	4	13.836	0.706	7.271	25.686	5.626	15.656	0.095	0.147	0.121
I	1	1	566.248**	529.934**	1095.882**	1119.79**	2776.25**	3711.21**	209.52**	311.70**	516.17**
S*I		1			0.301			184.836**			5.057**
rep*I	2	4	8.093	20.749	5.983	1.962	0.912	13.827	0.165	0.141	0.214
G	24	24	98.288**	71.869**	82.303**	70.330**	143.972**	124.998**	1.422**	2.356**	2.985**
S*G		24			87.854**			89.304**			0.793**
I*G	24	24	27.579**	15.189**	19.435**	18.976**	40.462**	20.881**	0.787**	1.919**	1.692**
S*I*G		24			23.334**			38.558**			1.014**
Error	96	192	9.898	9.187	9.543	10.347	14.970	12.659	0.109	0.047	0.078

Table S2. Cont.

Source	DF		LEWT			Pn			Gs		
	S	Comb.	S1	S2	Comb.	S1	S2	Comb.	S1	S2	Comb.
S		1			0.00010**			37.002**			0.0047**
rep(S)	2	4	0.000002	0.00000	0.00000	0.006	0.191	0.098	0.0002	0.0000	0.0001
I	1	1	0.000005**	0.00019**	0.00007**	1.737	1.162	2.869*	0.0933**	0.0722**	0.1647**
S*I		1			0.00013**			0.029			0.0007**
rep*I	2	4	0.000000	0.00000	0.00000	0.829	0.386	0.573	0.0000	0.0000	0.0001
G	24	24	0.000146**	0.00014**	0.00026**	11.983**	12.605**	24.174**	0.0038**	0.0039**	0.0074**
S*G		24			0.00002**			0.414			0.0003**
I*G	24	24	0.000025**	0.00002**	0.00003**	2.332**	2.611**	4.500**	0.0024**	0.0026**	0.0000**
S*I*G		24			0.00002**			0.443			0.0049**
Error	96	192	0.000001	0.00000	0.00000	0.642	0.611	0.627	0.0001	0.0001	0.0001

Table S2. Cont.

Source	DF		Ci			E			WUE		
	S	Comb.	S1	S2	Comb.	S1	S2	Comb.	S1	S2	Comb.
S		1			16593.14**			2.869**			5.763**
rep(S)	2	4	809.603	2668.615**	1739.11**	0.075	0.098	0.087*	0.055	0.043	0.049
I	1	1	69140.700**	56458.27**	125277.99**	15.785**	14.267**	30.033**	21.698**	10.041**	30.630**
S*I		1			320.974			0.019			1.109**
rep*I	2	4	50.168	72.300	1588.760	0.022	0.047	0.069	0.003	0.075	0.036
G	24	24	2869.005**	1561.602**	4028.503**	0.715**	0.758**	1.400**	1.468**	2.157**	2.856**
S*G		24			402.104*			0.072**			0.769**
I*G	24	24	1250.061**	1206.907**	2244.551**	0.486**	0.401**	0.835**	0.883**	0.936**	1.163**
S*I*G		24			212.418			0.052			0.655**
Error	96	192	310.220	279.733	294.977	0.037	0.038	0.038	0.060	0.060	0.060

Table S2. Cont.

Source	DF		WUEi			Ls			GLN		
	S	Comb.	S1	S2	Comb.	S1	S2	Comb.	S1	S2	Comb.
S		1			3923.432**			0.1079**			4.844**
rep(S)	2	4	3.826	22.182	13.004	0.0004	0.0012	0.0008	0.030	0.340**	0.185**
I	1	1	17654.469**	3138.862**	17840.787**	0.2456**	0.2321**	0.4776**	1.893**	3.426**	5.206**
S*I		1			2952.544**			0.0001			0.113
rep*I	2	4	2.733	28.366	16.515	0.0007	0.0001	0.0008	0.046	0.032	0.100
G	24	24	778.105**	599.293**	1089.461**	0.0112**	0.0096**	0.0185**	1.147**	0.797**	1.457**
S*G		24			287.937**			0.0023**			0.487**
I*G	24	24	548.023**	276.521**	649.685**	0.0095**	0.0068**	0.0154**	0.179**	0.107**	0.135**
S*I*G		24			174.860**			0.0009**			0.151**
Error	96	192	16.508	16.877	16.693	0.000	0.001	0.000	0.061	0.016	0.039

Table S2. Cont.

Source	DF		FLA			GLA			LAI		
	S	Comb.	S1	S2	Comb.	S1	S2	Comb.	S1	S2	Comb.
S		1			2.519			4633.313**			11.13**
rep(S)	2	4	2.033	1.622	1.827	35.369*	134.767**	85.068**	0.021	0.050	0.035
I	1	1	432.718**	276.951**	701.016**	32649.13**	14737.16**	45628.40**	229.006**	87.967**	300.42**
S*I		1			8.653**			1757.888**			16.55**
rep*I	2	4	2.182	2.673	3.993	2.103	56.578	56.419	0.038	0.127	0.107
G	24	24	86.596**	113.911**	190.585**	1339.196**	1513.739**	2308.828**	6.942**	5.084**	9.163**
S*G		24			9.922**			544.106**			2.863**
I*G	24	24	12.127**	9.383**	16.613**	129.302**	209.964**	205.589**	1.231**	1.756**	1.771**
S*I*G		24			4.897**			133.676**			1.216**
Error	96	192	1.174	1.194	1.184	11.921	17.157	14.539	0.041	0.026	0.034

Table S2. Cont.

Source	DF		DSW			DWL			TDW		
	S	Comb.	S1	S2	Comb.	S1	S2	Comb.	S1	S2	Comb.
S		1			1.371*			0.019**			1.718**
rep(S)	2	4	0.689	0.348	0.518	0.005	0.010	0.008*	0.583	0.260	0.421
I	1	1	25.627**	15.811**	40.848**	0.433**	0.284**	0.710**	32.723**	20.358**	52.350**
S*I		1			0.590			0.008			0.730
rep*I	2	4	0.139	0.217	0.648	0.017	0.010	0.021	0.229	0.252	0.612
G	24	24	24.520**	23.512**	48.008**	0.272**	0.265**	0.537**	26.901**	25.745**	52.620**
S*G		24			0.023			0.000			0.026
I*G	24	24	1.280**	1.170**	2.416**	0.037**	0.035**	0.071**	1.467**	1.327**	2.753**
S*I*G		24			0.035			0.001			0.041
Error	96	192	0.270	0.325	0.298	0.003	0.004	0.004	0.292	0.349	0.321

Table S2. Cont.

Source	DF		DH			DM			GFD		
	S	Comb.	S1	S2	Comb.	S1	S2	Comb.	S1	S2	Comb.
S		1			8.670**			6.750**			5.880*
rep(S)	2	4	0.427	0.027	0.227	2.407	4.207	3.307*	1.207	0.407	0.807
I	1	1	74.907**	70.727**	145.603**	695.527**	657.307**	1352.563**	328.560**	294.000**	622.080**
S*I		1			0.030			0.270			0.480
rep*I	2	4	5.787	6.907	6.293	3.207	3.847	6.553	0.380	1.620	1.527
G	24	24	81.087**	83.868**	164.834**	75.649**	75.154**	150.727**	19.709**	18.490**	38.056**
S*G		24			0.121			0.076			0.144
I*G	24	24	1.448	1.352**	2.721**	3.138**	2.557**	5.501**	3.129*	3.056**	5.844**
S*I*G		24			0.079			0.194			0.341
Error	96	192	1.030	0.821	0.926	1.432	1.249	1.341	1.800	1.583	1.692

Table S2. Cont.

Source	DF		NSP			PH			SL		
	S	Comb.	S1	S2	Comb.	S1	S2	Comb.	S1	S2	Comb.
S		1			590875.32**			21.870			137.78**
rep(S)	2	4	545.807	278.167	411.987	12.713	22.622	17.667	0.159	0.093	0.126
I	1	1	729550.14**	262504.17**	933645.65**	2277.60**	401.80**	2296.33**	17.54**	10.62**	27.731**
S*I		1			58408.65**			383.070**			0.431
rep*I	2	4	889.940	2202.167	1698.70	23.533	68.682	25.438	0.701	0.653	0.375
G	24	24	54457.79**	17506.44**	53328.17**	278.954**	245.01**	440.145**	6.954**	7.246**	7.170**
S*G		24			18636.06**			83.814**			7.029**
I*G	24	24	14722.50**	6366.56**	10219.66**	36.544**	17.607**	33.791**	0.489**	0.765**	0.861**
S*I*G		24			10869.40**			20.360**			0.394**
Error	96	192	833.846	527.000	680.423	12.323	9.079	10.701	0.167	0.225	0.196

Table S2. Cont.

Source	DF		NSS			NG		
	S	Comb.	S1	S2	Comb.	S1	S2	Comb.
S		1			173.949**			367.369**
rep(S)	2	4	1.618**	1.074	1.346**	2.465	7.047	4.756
I	1	1	21.904**	44.303**	64.255**	2881.603**	6.320	1578.91**
S*I		1			1.952*			1309.01**
rep*I	2	4	3.361	1.672	1.066	13.672	16.290	4.504
G	24	24	10.705**	20.916**	18.001**	108.797**	163.744**	227.460**
S*G		24			13.620**			45.081**
I*G	24	24	0.639**	1.307**	0.597	65.001**	14.545**	38.455**
S*I*G		24			1.348**			41.090**
Error	96	192	0.322	0.436	0.379	4.614	4.203	4.409

Table S2. Cont.

Source	DF		HW			GY		
	S	Comb.	S1	S2	Comb.	S1	S2	Comb.
S		1			2363.38**			3.272**
rep(S)	2	4	5.796	4.620	5.208	0.070	0.191	0.130
I	1	1	1816.212**	246.375**	1700.23**	50.425**	42.347**	92.596**
S*I		1			362.362**			0.536**
rep*I	2	4	3.909	0.294	1.594	0.035	0.011	0.057
G	24	24	212.467**	155.558**	314.603**	6.903**	5.775**	11.965**
S*G		24			53.422**			0.713**
I*G	24	24	28.195**	21.414**	29.064**	0.839**	1.177**	1.714**
S*I*G		24			20.545**			0.302**
Error	96	192	5.508	3.285	4.390	0.066	0.095	0.080

Table S3. Principal component analysis of 25 wheat genotypes, eigenvalues, proportion, and cumulative variance for the first seven components for 27 measured traits of 100 treatments.

Value	PC1	PC2	PC3	PC4	PC5	PC6	PC7
Eigenvalue	10.04	3.10	2.93	2.21	1.49	1.32	0.94
Variability (%)	37.18	11.48	10.84	8.17	5.53	4.89	3.49
Cumulative %	37.18	48.66	59.50	67.67	73.20	78.09	81.58
Component loading*							
DH	0.07	0.22	**0.39**	0.08	0.01	0.05	0.00
GFD	**0.37**	0.16	0.01	0.02	0.06	0.17	0.02
DSW	0.26	0.10	**0.55**	0.01	0.00	0.00	0.02
DLW	0.29	**0.40**	0.00	0.10	0.01	0.03	0.03
TDW	0.29	0.14	**0.47**	0.02	0.00	0.00	0.03
NSP	**0.33**	0.01	0.11	0.02	0.20	0.10	0.04
PH	**0.39**	0.18	0.00	0.07	0.05	0.00	0.02
GLN	0.24	0.24	**0.26**	0.02	0.01	0.01	0.00
FLA	**0.44**	0.01	0.24	0.03	0.05	0.05	0.00
GLA	**0.62**	0.02	0.00	0.21	0.02	0.04	0.00
LAI	**0.70**	0.03	0.03	0.03	0.02	0.09	0.01
SL	0.21	0.14	0.00	**0.35**	0.00	0.00	0.00
NSS	**0.25**	0.20	0.05	0.18	0.02	0.04	0.06
LWC	0.23	0.18	0.05	0.03	0.06	0.00	0.08
RWC	**0.57**	0.01	0.00	0.00	0.00	0.00	0.08
NG	0.14	0.08	0.17	0.04	0.06	0.01	0.02
HW	0.24	0.00	**0.27**	0.22	0.06	0.02	0.02
CT	**0.70**	0.02	0.01	0.01	0.00	0.04	0.00
LEWT	0.00	0.08	0.05	0.28	0.04	0.00	**0.33**
Pn	0.05	0.12	0.03	0.12	**0.52**	0.00	0.10
Gs	**0.70**	0.05	0.00	0.02	0.09	0.05	0.02
Ci	**0.66**	0.06	0.00	0.05	0.07	0.00	0.01
E	**0.67**	0.03	0.00	0.04	0.04	0.06	0.04
WUE	**0.32**	0.24	0.00	0.06	0.04	0.19	0.00
WUEi	**0.44**	0.23	0.00	0.08	0.00	0.12	0.00
Ls	**0.61**	0.08	0.02	0.08	0.04	0.05	0.00
GY	**0.23**	0.09	0.21	0.02	0.00	0.19	0.00

* values ≥ 0.30 are presented in bold face and indicates traits important for PC definition; days to heading number (DH),

Table S4. Total canonical structure of eigenvalue, canonical discriminant function and class means of drought group to canonical discriminant function.

parameters		Can1	Can2	Can3
Eigenvalue		21.299	3.552	1.656
Discrimination (%)		79.366	13.235	6.172
Cumulative %		79.366	92.601	98.773
Variable				
GLA	S1	0.83	0.33	-0.31
	S2	0.73	0.11	-0.46
LAI	S1	0.86	-0.04	-0.47
	S2	0.74	-0.29	-0.26
RWC	S1	0.79	0.24	0.40
	S2	0.70	0.11	0.45
CT	S1	0.72	-0.63	0.09
	S2	0.73	-0.61	0.02
Drought Group				
HS		-3.49	-2.03	1.12
HT		6.67	-0.35	-0.06
I		-5.04	-0.87	-3.40
S		-3.41	3.71	0.80
T		0.15	0.61	-0.25

First season (S1), Second season (S2), green leaves area (GLA), leaf area index (LAI), relative water content (LAI), canopy temperature (CT) highly tolerant (HT), tolerant (T), intermediate (I), sensitive (S) and highly sensitive (HS).

Table S5. Summary (LS means) of all pairwise comparisons for Class (Duncan)

Contrast	GLA (S1)	GLA (S2)	LAI (S1)	LAI (S2)	RWC (S1)	RWC (S2)	CT (S1)	CT (S2)
HT	0.834 a	0.864 a	0.834 a	0.875 a	0.856 a	0.842 a	0.915 a	0.879 a
T	0.757 b	0.809 a	0.684 b	0.739 b	0.683 b	0.712 b	0.791 b	0.776 b
I	0.533 c	0.572 b	0.549 c	0.528 c	0.582 c	0.615 c	0.558 c	0.522 c
S	0.434 d	0.454 c	0.350 d	0.380 d	0.431 d	0.531 c	0.422 d	0.391 d
HS	0.342 e	0.377 d	0.272 e	0.289 e	0.368 d	0.353 d	0.311 e	0.249 e
Pr > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Significant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes