

Supplementary Files (Tables and Figures)

Supplementary Tables

Table S1. Summary of the Box-cox transformation procedures' results (field and growth chamber conditions).

Trait	Probability Shapiro-Wilk test for Normality		Levene tests (homogeneity of variance)		Box-Cox transformation, lambda estimate (95% confidence interval) [†]	Box-Cox transformation parameter
	Original dataset	Transformed dataset	Original dataset	Transformed dataset		
Field conditions						
E	0.002	0.04	***	✓	0.6877 (0.5418, 0.8621)	0.75
Controlled conditions						
An_35	0.181	0.719	***,****	***	1.339 (-0.5493, 3.29)	1.25
Chla/Chlb_15	0.679	0.138	***	✓	unable to calculate	4
TChl_15	0.104	0.581	***	✓	0.4406 (-0.2062, 1.115)	0.5
FB_15	<0.001	0.023	***	✓	0.4089 (0.1455, 0.6776)	0.5
DB_15	0.086	0.322	***,****	***	0.2811 (-0.117, 0.6939)	0.25
RWC_15	0.007	0.272	***,****	***,****	3.648 (2.464, *)	3.75
PH_15	0.485	0.915	***,****	***	0.2561 (-0.6562, 1.202)	0.25

[†] If the confidence interval includes the value 1, no transformation is necessary

*** Non-homogeneity of residual variance

**** Error variance not constant

Table S2. Generalised linear model (GLM) for fifteen morpho-physiological parameters measured under field conditions and after harvest. The statistical model included as factors the four maize populations, the treatment (WW vs WD), the time point (when applicable) and the interaction between population and treatment and population and time point.

Trait	Analysis of variance - Source of variation				
	Population	Treatment	Time point	Population x Treatment	Population x Time point
An_sqrt	<0.001	<0.001	<0.001	<0.001	0.006
An/E	<0.001	<0.001	<0.001	0.058	<0.001
E_tran	<0.001	<0.001	<0.001	<0.001	<0.001
gs_sqrt	<0.001	<0.001	<0.001	<0.001	<0.001
Fv/Fm	0.003	<0.001	<0.001	<0.001	0.157
PI_{ABS}_sqrt	0.119	<0.001	<0.001	0.006	0.244
LN	<0.001	0.012	<0.001	0.033	<0.001
PH	<0.001	<0.001	<0.001	0.008	<0.001
RWC_sqrt	<0.001	<0.001	<0.001	<0.001	0.063
FB_sqrt	<0.001	<0.001	-	0.003	-
DB	<0.001	<0.001	-	<0.001	-
EW	<0.001	<0.001	-	<0.001	-
EL_sqrt	<0.001	<0.001	-	0.003	-
KNR	<0.001	<0.001	-	0.055	-
KW	<0.001	<0.001	-	0.401	-

Table S3. Regression analysis, per population and time point, fitting the treatment term (WW vs WD) for variables measured in the field experiment from T1 to T4 (T1: 21st July, T2: 7th August, T3: 14th August, T4: 21st August), and after harvest.

Trait	Timepoint ¹	BL	CA	FN	PG
		F pr. (WW vs WD)	F pr. (WW vs WD)	F pr. (WW vs WD)	F pr. (WW vs WD)
An	T1	0.108	0.868	0.639	0.004
	T2	0.864	0.007	0.122	0.489
	T3	0.024	0.026	0.626	0.051
	T4	0.007	<0.001	0.007	0.004
An/E	T1	0.640	0.787	0.924	0.148
	T2	0.153	0.979	0.894	0.451
	T3	0.212	0.811	0.957	0.098
	T4	0.143	0.011	0.083	0.013
E	T1	0.073	0.738	0.460	0.057
	T2	0.082	<0.001	0.037	0.079
	T3	0.019	0.014	0.455	0.005
	T4	0.002	<0.001	0.002	0.008
gs	T1	0.064	0.849	0.293	0.003
	T2	0.111	0.001	0.041	0.103
	T3	0.040	0.012	0.502	0.007
	T4	0.006	<0.001	0.002	0.018
FvFm	T1	0.086	<0.001	0.012	<0.001
	T2	0.062	0.601	0.150	0.023
	T3	0.597	0.002	0.154	0.038
	T4	<0.001	<0.001	<0.001	<0.001
PI _{ABS}	T1	0.032	0.193	0.043	0.345

	T2	0.652	0.785	0.370	0.912
	T3	0.589	<0.001	0.873	0.162
	T4	<0.001	<0.001	<0.001	<0.001
LN	T1	0.481	0.664	0.411	0.804
	T2	0.579	0.860	0.455	0.007
	T3	0.877	0.591	0.001	0.192
	T4	0.877	0.591	0.056	0.872
PH	T1	0.051	0.683	0.445	0.145
	T2	<0.001	<0.001	0.008	0.017
	T3	0.003	<0.001	0.001	<0.001
	T4	0.003	<0.001	<0.001	<0.001
RWC	T1	0.503	0.339	0.324	0.757
	T2	0.075	0.285	0.246	0.566
	T3	<0.001	<0.001	0.090	<0.001
	T4	<0.001	0.002	0.004	<0.001
FB_sqrt	T4	0.288	0.027	0.012	0.007
DB	after harvest	0.817	0.054	0.015	0.059
EW	after harvest	<0.001	<0.001	<0.001	<0.001
EL_sqrt	after harvest	<0.001	0.014	<0.001	<0.001
KNR	after harvest	0.008	0.282	0.015	0.002
KW	after harvest	<0.001	<0.001	<0.001	<0.001

Table S4. Relevant plant and leaf traits measured for four maize populations grown under field conditions, from time point T1 to T4 (T1: 21st July, T2: 7th August, T3: 14th August, T4: 21st August), under well-watered (WW) and water deficit (WD) conditions. For each time point and treatment, mean values in each column followed by the same letter are not significantly different at $P < 0.05$ (Tukey's multiple comparisons test). Legend: BL – 'Bilhó'; CA – 'Caniceira'; FN – 'Fandango'; PG – 'Pigarro'.

Population	Time point	Treat ment	Trait								
			An	An/E	E	Gs	FvFm	PI _{ABS}	LN	PH	RWC
BL	T1	WW	29.7 a	5.63 a	5.31 a	0.44 a	0.77 b	5.39 a	11.2 ab	184.8 bc	95.1 a
CA	T1	WW	25.8 a	5.49 a	4.71 a	0.34 a	0.75 a	5.09 a	10.1 a	123.5 a	97.5 a
FN	T1	WW	25.3 a	5.39 a	4.75 a	0.34 a	0.76 ab	5.59 a	12.1 b	159.3 b	98.3 a
PG	T1	WW	29.4 a	5.59 a	5.28 a	0.45 a	0.76 ab	5.74 a	12.1 b	189.2 c	96.7 a
BL	T2	WW	14.4 a	4.13 a	3.51 a	0.18 a	0.76 a	5.95 a	11.1 b	211.7 b	94.8 a
CA	T2	WW	26.9 c	5.30 b	5.11 b	0.44 b	0.77 ab	6.29 a	9.7 a	164.9 a	94.6 a
FN	T2	WW	20.2 b	5.18 b	4.02 a	0.24 a	0.78 b	6.95 a	13.7 c	221.3 bc	94.6 a
PG	T2	WW	15.0 ab	4.29 a	3.51 a	0.18 a	0.76 a	6.26 a	13.2 c	245.3 c	93.8 a
BL	T3	WW	17.5 a	4.58 a	3.93 ab	0.22 a	0.73 a	5.14 a	11.3 b	219.5 b	97.6 a
CA	T3	WW	21.7 a	4.41 a	5.15 b	0.47 b	0.76 b	6.07 a	9.8 a	160.9 a	97.4 a
FN	T3	WW	13.7 a	4.50 a	3.20 a	0.16 a	0.76 ab	5.03 a	14.8 d	274.8 c	93.7 a
PG	T3	WW	15.6 a	5.01 a	3.94 ab	0.21 a	0.75 ab	4.41 a	12.9 c	262.1 c	95.0 a
BL	T4	WW	13.8 b	3.69 a	3.76 b	0.19 b	0.75 ab	4.52 a	11.3 b	219.5 b	87.5 a
CA	T4	WW	24.6 c	4.36 a	5.69 c	0.54 c	0.78 b	6.99 a	9.8 a	160.9 a	90.2 a
FN	T4	WW	8.4 a	3.81 a	2.37 a	0.09 a	0.73 a	4.71 a	14.9 d	277.3 c	87.3 a
PG	T4	WW	6.8 a	3.43 a	2.08 a	0.07 a	0.75 ab	5.41 a	13.0 c	258.6 c	87.5 a
BL	T1	WD	24.2 ab	5.49 a	4.42 ab	0.29 ab	0.78 a	6.71 a	10.9 a	165.3 b	97.1 a
CA	T1	WD	25.0 b	5.56 a	4.53 ab	0.32 bc	0.78 a	6.01 a	10.2 a	127.3 a	99.8 a
FN	T1	WD	27.4 b	5.35 a	5.14 b	0.44 c	0.78 a	7.17 a	12.5 b	152.3 b	96.4 a

PG	T1	WD	18.2 a	5.02 a	4.10 a	0.19 a	0.79 a	6.61 a	12.0 b	173.3 b	97.4 a
BL	T2	WD	13.9 a	5.08 a	2.79 a	0.12 a	0.77 a	5.68 a	10.9 b	170.9 b	84.4 a
CA	T2	WD	16.1 a	5.29 a	3.05 a	0.14 a	0.78 a	6.07 ab	9.8 a	129.4 a	90.5 a
FN	T2	WD	13.6 a	5.09 a	2.76 a	0.12 a	0.79 a	7.79 b	13.3 d	184.9 bc	90.3 a
PG	T2	WD	12.6 a	4.72 a	2.69 a	0.12 a	0.77 a	6.34 ab	11.9 c	207.2 c	92.1 a
BL	T3	WD	6.4 ab	3.81 a	1.83 a	0.06 a	0.73 b	4.57 b	11.3 b	188.4 b	70.7 a
CA	T3	WD	9.7 ab	4.29 a	2.31 a	0.09 a	0.64 a	2.02 a	10.0 a	137.1 a	82.7 b
FN	T3	WD	12.0 b	4.53 a	2.71 a	0.12 a	0.73 b	4.87 b	13.3 c	224.1 c	82.9 b
PG	T3	WD	5.1 a	3.22 a	1.69 a	0.05 a	0.72 b	3.37 ab	12.3 bc	209.3 bc	79.4 b
BL	T4	WD	2.5 a	2.38 a	1.30 a	0.04 b	0.65 b	1.69 bc	11.3 b	188.4 b	60.2 a
CA	T4	WD	1.7 a	2.15 a	0.98 a	0.03 ab	0.53 a	0.65 a	10.0 a	137.1 a	70.6 b
FN	T4	WD	2.6 a	2.21 a	1.23 a	0.04 ab	0.66 b	2.27 c	14.0 c	198.4 b	70.4 b
PG	T4	WD	1.0 a	1.35 a	0.91 a	0.02 a	0.62 ab	1.09 ab	12.9 c	198.5 b	60.2 a

Table S5. Relevant plant and ear traits measured for four maize populations grown under field conditions at 21st August and after harvest, under well-watered (WW) water deficit (WD) conditions. For each treatment, mean values in each column followed by the same letter are not significantly different at $P < 0.05$ (Tukey's multiple comparisons test). Legend: BL – 'Bilhó'; CA – 'Caniceira'; FN – 'Fandango'; PG – 'Pigarro'.

Population	Treatment	Trait					
		FB	DB	EW	EL	KR	KW
BL	WW	657 a	125 a	137 a	17.0 b	27.2 a	340 a
CA	WW	724 a	140 a	106 a	14.8 a	28.3 a	341 a
FN	WW	1432 c	242 c	296 c	19.9 c	33.7 b	434 b
PG	WW	957 b	187 b	207 b	13.8 a	24.3 a	341 a
BL	WD	524 a	120 ab	74 a	14.1 b	23.9 b	200 a
CA	WD	420 a	96 a	62 a	13.7 b	27.1 b	193 a
FN	WD	863 b	162 c	133 b	14.2 b	26.1 b	307 b
PG	WD	507 a	123 b	92 a	9.9 a	18.9 a	226 a

Table S6. Generalised linear model (GLM) results for variables measured under growth chamber conditions at 16 DAG (35% soil water content), 21 DAG (25% soil water content), and 27 DAG (15% soil water content). The statistical model included a constant, the populations, the treatment and their interaction ($Y = \text{Constant} + \text{TREATMENT} + \text{POPULATION} + (\text{TREATMENT} \times \text{POPULATION})$). Y corresponds to the response variable (Trait), TREATMENT refers to ‘Well-Watered’ or ‘Water Deficit’, and POPULATION refers to ‘Fandango’ or ‘Pigarro’.

Trait_ % soil water content	estimate	s.e.	t	t pr.
An_15				
Constant	3.548	0.619	5.73	<.001
POPULATION	-1.259	0.859	-1.47	0.146
TREATMENT	6.824	0.845	8.08	<.001
TREATMENT x POPULATION	-0.18	1.20	-0.15	0.880
An_25				
Constant	13.411	0.802	16.72	<.001
POPULATION	-2.22	1.09	-2.04	0.045
TREATMENT	1.90	1.10	1.73	0.089
TREATMENT x POPULATION	-0.12	1.50	-0.08	0.939
An_35_Tran				
Constant	33.68	1.52	22.23	<.001
POPULATION	-11.09	2.14	-5.17	<.001
TREATMENT	1.53	3.03	0.50	0.622
TREATMENT x POPULATION	4.00	3.86	1.03	0.318
E_15				
Constant	0.6272	0.0847	7.40	<.001
POPULATION	-0.075	0.118	-0.64	0.523
TREATMENT	1.486	0.116	12.85	<.001
TREATMENT x POPULATION	-0.103	0.164	-0.63	0.532

E_25				
Constant	2.420	0.125	19.29	<.001
POPULATION	-0.401	0.168	-2.39	0.020
TREATMENT	0.489	0.172	2.84	0.006
TREATMENT x POPULATION	-0.094	0.232	-0.40	0.687

E_35				
Constant	3.384	0.113	29.91	<.001
POPULATION	-0.819	0.153	-5.35	<.001
TREATMENT	0.359	0.212	1.70	0.115
TREATMENT x POPULATION	-0.105	0.277	-0.38	0.710

gs_15				
Constant	0.1059	0.0169	6.27	<.001
POPULATION	-0.0457	0.0239	-1.91	0.058
TREATMENT	0.1462	0.0237	6.18	<.001
TREATMENT x POPULATION	0.0544	0.0338	1.61	0.110

gs_25				
Constant	0.2565	0.0145	17.74	<.001
POPULATION	-0.0209	0.0191	-1.09	0.280
TREATMENT	-0.0164	0.0198	-0.82	0.413
TREATMENT x POPULATION	0.0540	0.0268	2.02	0.047

gs_35				
Constant	0.18619	0.00736	25.29	<.001
POPULATION	-0.05370	0.00997	-5.39	<.001
TREATMENT	-0.05370	0.00997	-5.39	<.001
TREATMENT x POPULATION	0.0157	0.0167	0.94	0.366

An/E_15				
Constant	4.634	0.306	15.16	<.001

POPULATION	-1.547	0.432	-3.58	<.001
TREATMENT	0.120	0.413	0.29	0.772
TREATMENT x POPULATION	1.359	0.589	2.31	0.023
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An/E_25				
Constant	5.747	0.174	33.09	<.001
POPULATION	-0.336	0.238	-1.41	0.164
TREATMENT	-0.486	0.238	-2.04	0.046
TREATMENT x POPULATION	0.343	0.327	1.05	0.298
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An/E_35				
Constant	6.078	0.135	44.96	<.001
POPULATION	-0.314	0.175	-1.80	0.090
TREATMENT	-0.260	0.270	-0.96	0.350
TREATMENT x POPULATION	0.373	0.336	1.11	0.282
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Chla_15				
Constant	0.013331	0.000732	18.21	<.001
POPULATION	-0.00120	0.00102	-1.18	0.242
TREATMENT	-0.00149	0.00101	-1.48	0.142
TREATMENT x POPULATION	0.00130	0.00142	0.91	0.363
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Chlb_15				
Constant	0.004332	0.000229	18.95	<.001
POPULATION	-0.000523	0.000320	-1.63	0.105
TREATMENT	-0.000581	0.000312	-1.86	0.065
TREATMENT x POPULATION	0.000346	0.000445	0.78	0.439
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Chla/Chlb_15_Tran				
Constant	22.49	1.16	19.40	<.001
POPULATION	3.45	1.66	2.08	0.040
TREATMENT	5.39	1.60	3.37	0.001

TREATMENT x POPULATION	0.16	2.30	0.07	0.944
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Ccx_15				
Constant	0.003962	0.000144	27.45	<.001
POPULATION	-0.000408	0.000202	-2.02	0.046
TREATMENT	-0.000627	0.000197	-3.18	0.002
TREATMENT x POPULATION	0.000505	0.000281	1.80	0.075
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TChl_15_Tran				
Constant	-1.73704	0.00786	-221.13	<.001
POPULATION	-0.0066	0.0110	-0.60	0.548
TREATMENT	-0.0130	0.0107	-1.21	0.229
TREATMENT x POPULATION	0.0035	0.0153	0.23	0.820
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TChl/Ccx_15				
Constant	4.648	0.144	32.24	<.001
POPULATION	-0.132	0.206	-0.64	0.522
TREATMENT	0.078	0.199	0.39	0.694
TREATMENT x POPULATION	-0.104	0.286	-0.36	0.718
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TLeaf_15				
Constant	24.619	0.163	150.98	<.001
POPULATION	0.044	0.231	0.19	0.853
TREATMENT	-0.619	0.231	-2.68	0.021
TREATMENT x POPULATION	-0.244	0.339	-0.72	0.488
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TLeaf_25				
Constant	23.883	0.114	209.66	<.001
POPULATION	-0.050	0.161	-0.31	0.765
TREATMENT	-0.433	0.180	-2.41	0.047
TREATMENT x POPULATION	0.142	0.242	0.59	0.576
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TLeaf_35				

Constant	Constant	22.692	0.885	25.64
POPULATION	0.68	1.25	0.55	0.600
TREATMENT	0.48	1.25	0.39	0.709
TREATMENT x POPULATION	-0.36	1.77	-0.20	0.845
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FB_15_Tran				
Constant	2.645	0.312	8.47	<.001
POPULATION	0.385	0.434	0.89	0.377
TREATMENT	1.929	0.438	4.41	<.001
TREATMENT x POPULATION	2.060	0.630	3.27	0.001
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DB_15_Tran				
Constant	-0.0301	0.0787	-0.38	0.703
POPULATION	0.181	0.108	1.67	0.099
TREATMENT	0.180	0.109	1.65	0.102
TREATMENT x POPULATION	0.317	0.156	2.04	0.044
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RWC_15_Tran				
Constant	3562528	318625	11.18	<.001
POPULATION	-1933453	455087	-4.25	<.001
TREATMENT	3164113	438795	7.21	<.001
TREATMENT x POPULATION	2133903	632175	3.38	0.001
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SL_15_Tran				
Constant	4.3624	0.0451	96.77	<.001
POPULATION	0.2879	0.0643	4.48	<.001
TREATMENT	0.3144	0.0663	4.75	<.001
TREATMENT x POPULATION	0.2019	0.0946	2.13	0.035
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SL_25				
Constant	16.921	0.571	29.64	<.001
POPULATION	3.949	0.771	5.12	<.001

TREATMENT	2.254	0.844	2.67	0.009
TREATMENT x POPULATION	-1.18	1.13	-1.04	0.299
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SL_35				
Constant	12.462	0.574	21.71	<.001
POPULATION	2.864	0.765	3.74	<.001
TREATMENT	0.073	0.822	0.09	0.929
TREATMENT x POPULATION	-0.31	1.12	-0.27	0.784
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Table S7. Analysis of variance and comparison of mean values for Fandango (FN) and Pigarro (PG) maize populations subjected to well-watered (WW) and water deficit (WD) regimes under growth chamber conditions. Legend: POP-Population; TREAT– Treatment.

Trait_% soil water content	Analysis of variance ¹			Comparison of Population per Treatment means ²			
	POP	TREAT	POP x TREAT	FNWW	FNWD	PGWW	PGWD
An_15	ns	***	ns	10.372 a	3.548 b	8.932 a	2.289 b
An_25	*	ns	ns	15.31 a	13.41 ab	12.98 bc	11.20 c
An_35	***	ns	ns	20.85 a	20.29 a	17.60 b	14.86 c
E_15	ns	***	ns	2.113 a	0.627 b	1.935 a	0.552 b
E_25	*	**	ns	2.908 a	2.420 b	2.413 b	2.019 c
E_35	***	ns	ns	3.704 a	3.384 b	2.821 c	2.565 d
gs_15	ns	***	ns	0.2521 a	0.1059 b	0.2608 a	0.0602 b
gs_25	ns	ns	*	0.2402 a	0.2564 a	0.2733 a	0.2357 a
gs_35	***	**	ns	0.2251 a	0.1862 b	0.1875 b	0.1325 c
An/E_15	***	ns	*	4.754 a	4.634 a	4.565 a	3.087 b
An/E_25	ns	*	ns	5.262 b	5.746 a	5.270 b	5.412 ab
An/E_35	ns	ns	ns	5.826 b	6.078 a	5.878 ab	5.764 b
Chla_15	ns	ns	ns	0.01184 a	0.01333 a	0.01194 a	0.01213 a
Chlb_15	ns	ns	ns	0.003751 a	0.004332 a	0.003574 a	0.003809 a
Chla/Chlb_15	*	**	ns	3.246 ab	3.068 c	3.347 a	3.199 bc
Ccx_15	*	**	ns	0.003335 b	0.003961 a	0.003431b	0.003553 ab
TChl_15	ns	ns	ns	0.01548 a	0.01766 a	0.01552 a	0.01594 a
TChl/Ccx_15	ns	ns	ns	4.727 a	4.648 a	4.491 a	4.516 a
TLeaf_15	ns	*	ns	24.00 ab	24.62 a	23.80 b	24.66 a
TLeaf_25	ns	*	ns	23.45 a	23.83 a	23.54 a	23.83 a
TLeaf_35	ns	ns	ns	23.18 a	22.69 a	23.50 a	23.38 a

FB_15	ns	***	**	10.63 b	5.92 c	19.19 a	6.74 c
DB_15	ns	ns	*	1.100 b	0.981 b	1.574 a	1.182 b
RWC_15	***	***	**	93.94 a	76.34 b	94.72 a	59.67 c
SL_15	***	***	*	22.26 b	19.17 c	27.19 a	21.93 b
SL_25	***	**	ns	19.18 b	16.92 c	21.94 a	20.87 a
SL_35	***	ns	ns	12.54 b	12.46 b	15.09 a	15.33 a

¹ Significance for analysis of variance between populations (Fandango and Pigarro), between water regimes (well-watered and water deficit) and interaction between populations and water regimes (Population x Treatment): ns – non-significant; * - significant at $P<0.05$; ** - significant at $P<0.01$; *** - significant at $P<0.001$

² Tukey's multiple comparisons test — mean values in each row followed by the same letter are not significantly different at $P<0.05$

Table S8. Leaf photosynthetic parameters derived from the plotted An/I curves for the two maize populations ‘Fandango’ and ‘Pigarro’ subjected to well-watered (WW, control) and water deficit (WD) conditions under growth chamber conditions. Curves were done at 16 DAG (<35% SWC), 21 DAG (25-15% SWC) and 27 DAG (<15% SWC). Values are means \pm SE (n=3-5). Legend: A_{\max} - maximum A; LSP - light saturation point; ϕ - photosynthetic apparent quantum yield; R_d - dark respiration; LCP - apparent light compensation point.

	FANDANGO		PIGARRO	
	WW	WD	WW	WD
16 DAG				
A_{\max} ($\mu\text{mol CO}_2 \text{ m}^{-2} \text{ s}^{-1}$)	21,3 \pm 3,2	23,4 \pm 1,6	19,6 \pm 2,3	17,9 \pm 1,8
LSP ($\mu\text{mol photons m}^{-2} \text{ s}^{-1}$)	1358 \pm 256	1594 \pm 145	1217 \pm 266	855 \pm 113
ϕ ($\mu\text{mol CO}_2 \mu\text{mol photons}^{-1}$)	0,04 \pm 0,01	0,05 \pm 0,00	0,04 \pm 0,00	0,04 \pm 0,00
R_d ($\mu\text{mol CO}_2 \text{ m}^{-2} \text{ s}^{-1}$)	0,10 \pm 0,17	0,00 \pm 0,07	-0,05 \pm 0,10	-0,04 \pm 0,05
LCP ($\mu\text{mol photons m}^{-2} \text{ s}^{-1}$)	-3,4 \pm 3,5	-0,2 \pm 1,4	0,7 \pm 2,7	0,9 \pm 1,3
21 DAG				
A_{\max} ($\mu\text{mol CO}_2 \text{ m}^{-2} \text{ s}^{-1}$)	14,2 \pm 0,8	10,6 \pm 1,3	12,4 \pm 1,5	6,3 \pm 2,0
LSP ($\mu\text{mol photons m}^{-2} \text{ s}^{-1}$)	1087 \pm 137	1174 \pm 189	1244 \pm 214	861 \pm 255
ϕ ($\mu\text{mol CO}_2 \mu\text{mol photons}^{-1}$)	0,03 \pm 0,00	0,04 \pm 0,00	0,03 \pm 0,00	0,02 \pm 0,00
R_d ($\mu\text{mol CO}_2 \text{ m}^{-2} \text{ s}^{-1}$)	-0,46 \pm 0,19	-0,44 \pm 0,23	-0,13 \pm 0,30	0,01 \pm 0,24
LCP ($\mu\text{mol photons m}^{-2} \text{ s}^{-1}$)	17,5 \pm 9,7	12,1 \pm 6,5	7,3 \pm 13,2	4,2 \pm 10,1
27DAG				
A_{\max} ($\mu\text{mol CO}_2 \text{ m}^{-2} \text{ s}^{-1}$)	10,8 \pm 1,3	4,3 \pm 0,8	8,2 \pm 0,8	2,6 \pm 0,6
LSP ($\mu\text{mol photons m}^{-2} \text{ s}^{-1}$)	1513 \pm 144	904 \pm 124	1113 \pm 161	617 \pm 153
ϕ ($\mu\text{mol CO}_2 \mu\text{mol photons}^{-1}$)	0,03 \pm 0,00	0,01 \pm 0,00	0,04 \pm 0,01	0,02 \pm 0,01
R_d ($\mu\text{mol CO}_2 \text{ m}^{-2} \text{ s}^{-1}$)	-0,36 \pm 0,03	0,21 \pm 0,16	-1,77 \pm 1,23	-0,70 \pm 0,29
LCP ($\mu\text{mol photons m}^{-2} \text{ s}^{-1}$)	11,1 \pm 0,9	-38,4 \pm 35,4	25,2 \pm 13,2	46,1 \pm 13,5

Table S9. Number of leaves (LN) for ‘Fandango’ and ‘Pigarro’ maize populations subjected to well-watered (WW) and water deficit (WD) regimes under growth chamber conditions. Means comparison using the non-parametric Mann-Whitney U (Wilcoxon rank-sum) test. Values are means \pm SD.

	LN at soil water content (%)	Mean \pm Standard Deviation		Mann-Whitney U test exact probability
		WW	WD	
Fandango	LN_15	4.034 \pm 0.421	3.862 \pm 0.351	0.180
	LN_25	3.412 \pm 0.507	3.211 \pm 0.419	0.344
	LN_35	2.300 \pm 0.470	2.524 \pm 0.680	0.402
Pigarro	LN_15	4.600 \pm 0.645	4.071 \pm 0.262	< 0.001
	LN_25	3.708 \pm 0.464	3.750 \pm 0.532	1.000
	LN_35	2.826 \pm 0.388	2.889 \pm 0.424	0.617

Supplementary Figures

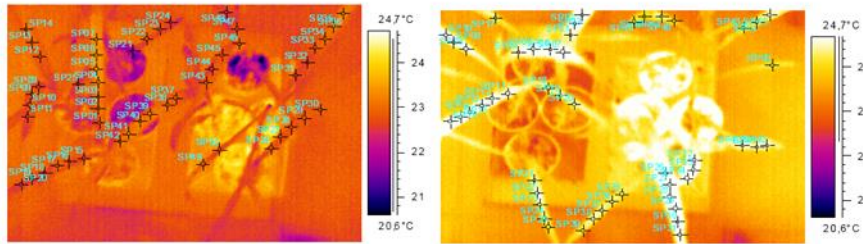


Figure S1. False colored infrared thermal images (ThermaCAM B20, 7.5- 13 μm , 320x240 pixels Flir), showing a group of four plants growing in well-watered conditions (left side image) and water-deficit conditions (WD) (right-side images), in controlled conditions, one week after water stress was imposed. Plants were grown under LED light, $T_{\text{air}}=26^{\circ}\text{C}$ and $\text{RH} = 47\%$. Images were analyzed by using the ThermaCAM Researcher software (Flir Systems, USA).

(a)



(b)

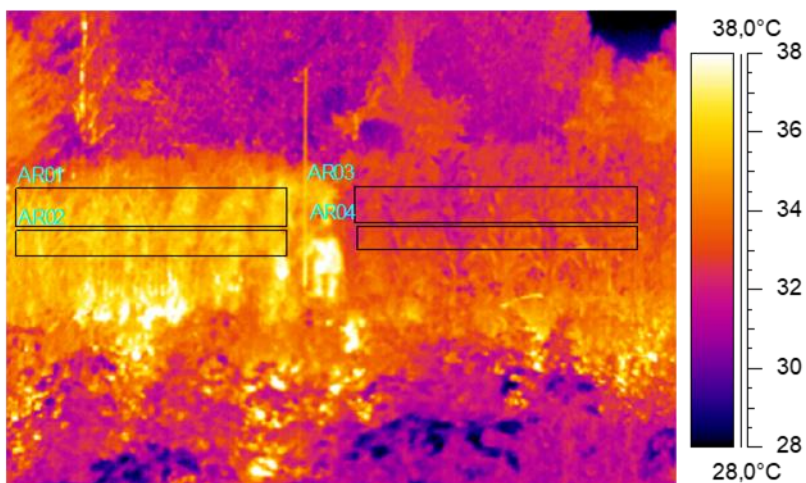


Figure S2. RGB (a) and false-colored infrared thermal (b) image (Flir E50bx, 7.5- 13 μm , 240x180 pixels), showing the control well-watered (WW) and the water-deficit plants (WD) in field conditions, 67 days after sowing (21 August 2018). Measurements were done at around 15:30, with $T_{\text{air}}=36^{\circ}\text{C}$; $\text{RH}=70\%$) and the temperature difference between WW and WD plants ($\Delta T_{\text{ww-wd}}$) was equal to -2.8°C .

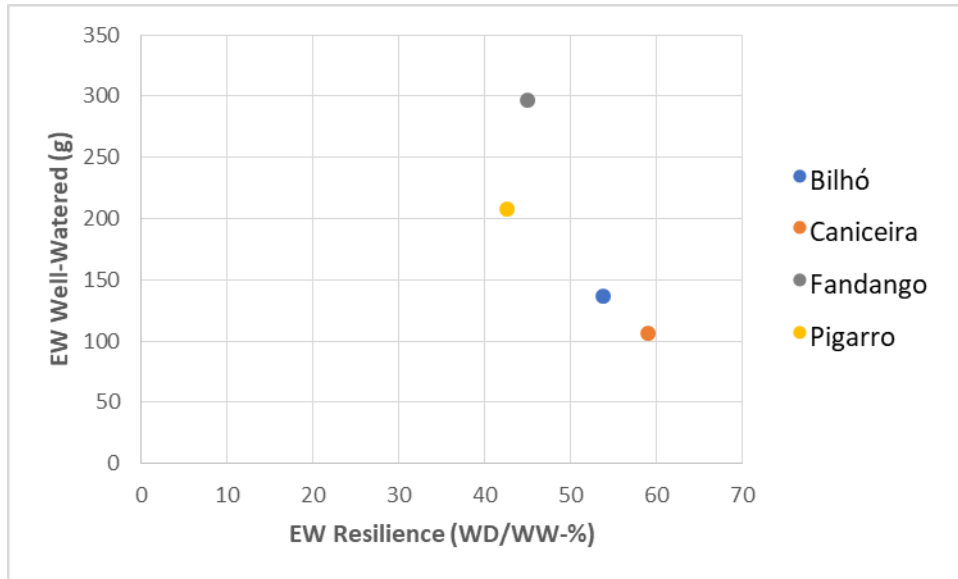


Figure S3. Potential ear weight (EW under well-watered conditions (WW)) vs. ear weight resilience (EW under water deficit (WD) /EW under WW) measured after harvest on four maize populations ('Bilhó' in blue, 'Caniceira' in orange, 'Fandango' in grey and 'Pigarro' in yellow).

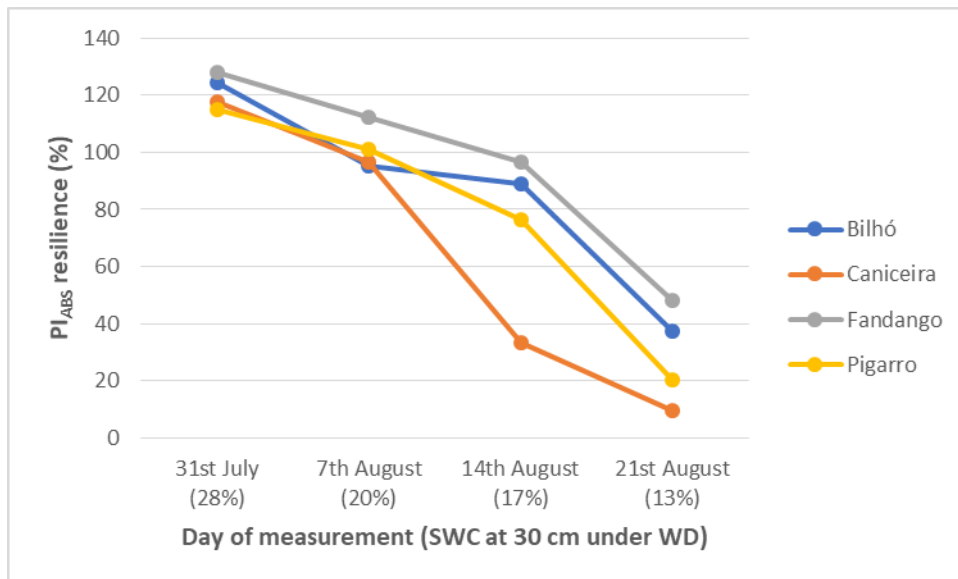


Figure S4. PI_{ABS} resilience (PI_{ABS} under water deficit (WD) / PI_{ABS} under WW) variation in field conditions along the trial (24th July (38 days after sowing) until 21st August (66 days after sowing)) for the four maize populations ('Bilhó' in blue, 'Caniceira' in orange, 'Fandango' in grey and 'Pigarro' in yellow).

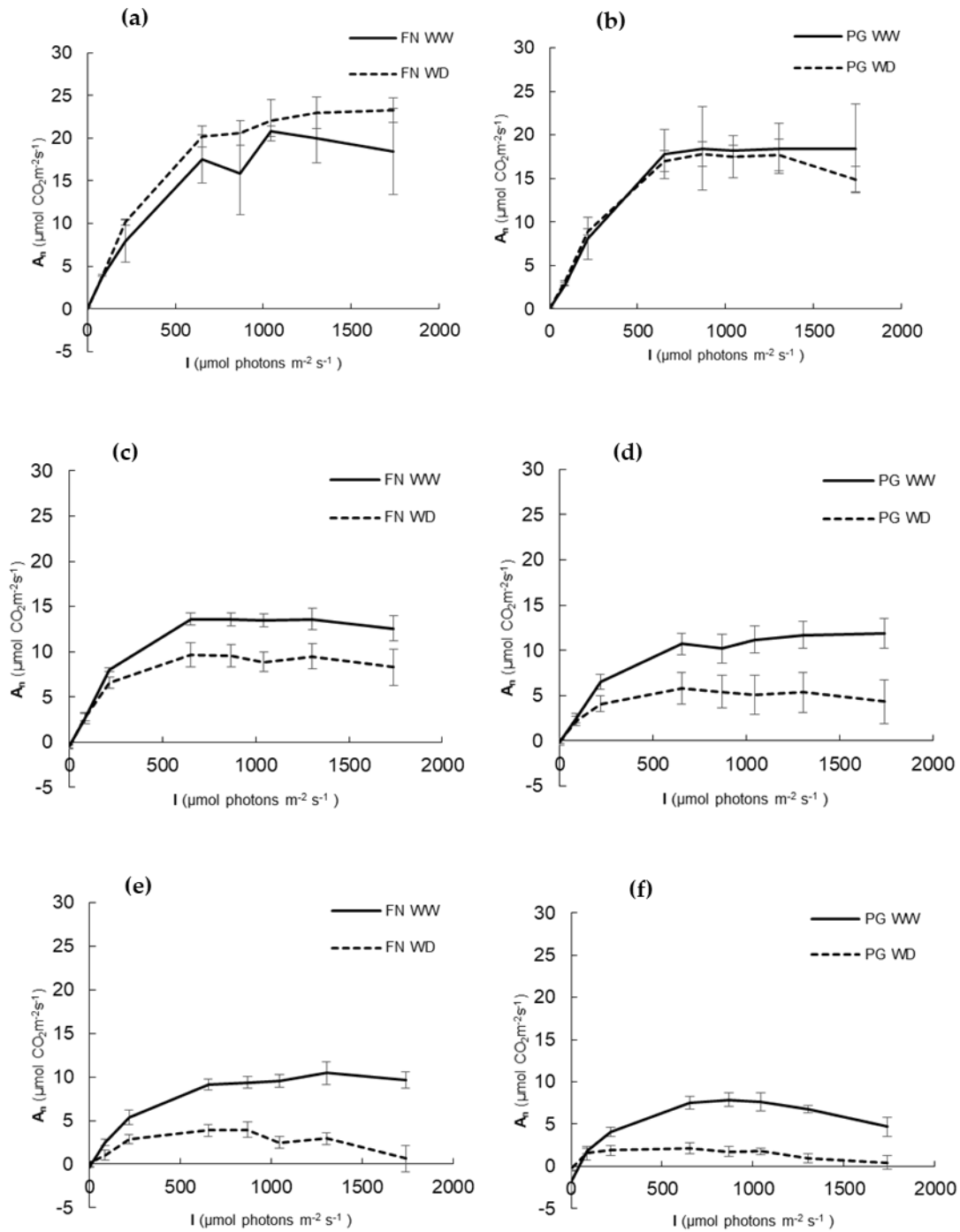


Figure S5. Photosynthetic light response curves (A_n/I) established under controlled conditions by IRGA (LCpro+, ADC BioScientific Ltd., Hertfordshire, UK) at 16 (a, b), 21 (c, d) and 27 (e, f) days after germination for two maize populations 'Fandango'(FN) and 'Pigarro' (PG) and two irrigation treatments (Well-Watered - WW (solid line) and Water Deficit - WD (dashed line)). Values are means \pm standard error ($n=3-5$).