

### Supplementary material

**Table S1. Degrees of freedom (df), *P*-values and significance of the effects of drought (D), temperature (T), genotype (G) and their interactions on physiological, growth and yield traits of four synthetic hexaploid wheat and two spring wheat cultivars subjected to stresses at anthesis (Experiment I)**

<sup>NS</sup>, non-significant; \*\*,  $P < 0.01$ ; \*\*\*,  $P < 0.001$

Effects	(D)	(T)	(G)	D × T	D × G	T × G	D × T × G
df	1	1	5	1	5	5	5
Traits	<i>P</i> -values						
Leaf chlorophyll (SPAD units) <sup>A</sup>	< 0.001 <sup>***</sup>	< 0.001 <sup>***</sup>	< 0.001 <sup>***</sup>	< 0.001 <sup>***</sup>	0.02 <sup>*</sup>	< 0.001 <sup>***</sup>	0.02 <sup>*</sup>
Plant height (cm)	0.8 <sup>NS</sup>	0.6 <sup>NS</sup>	< 0.001 <sup>***</sup>	0.5 <sup>NS</sup>	0.6 <sup>NS</sup>	0.2 <sup>NS</sup>	0.1 <sup>NS</sup>
Tiller number (plant <sup>-1</sup> )	0.4 <sup>NS</sup>	0.1 <sup>NS</sup>	< 0.001 <sup>***</sup>	0.1 <sup>NS</sup>	0.1 <sup>NS</sup>	0.05 <sup>NS</sup>	0.6 <sup>NS</sup>
Fertile tiller number (plant <sup>-1</sup> )	0.3 <sup>NS</sup>	0.2 <sup>NS</sup>	< 0.001 <sup>***</sup>	0.5 <sup>NS</sup>	0.3 <sup>NS</sup>	0.4 <sup>NS</sup>	0.5 <sup>NS</sup>
Vegetative biomass (g plant <sup>-1</sup> )	0.3 <sup>NS</sup>	0.4 <sup>NS</sup>	< 0.001 <sup>***</sup>	0.3 <sup>NS</sup>	0.05 <sup>NS</sup>	0.8 <sup>NS</sup>	0.1 <sup>NS</sup>
Grain number (spike <sup>-1</sup> )	< 0.001 <sup>***</sup>	< 0.001 <sup>***</sup>	< 0.001 <sup>***</sup>	0.02 <sup>*</sup>	0.5 <sup>NS</sup>	< 0.001 <sup>***</sup>	0.001 <sup>**</sup>
Individual grain weight (mg)	< 0.001 <sup>***</sup>	< 0.001 <sup>***</sup>	< 0.001 <sup>***</sup>	< 0.001 <sup>***</sup>	< 0.001 <sup>***</sup>	< 0.001 <sup>***</sup>	< 0.001 <sup>***</sup>
Grain yield (g plant <sup>-1</sup> )	< 0.001 <sup>***</sup>	< 0.001 <sup>***</sup>	< 0.001 <sup>***</sup>	< 0.001 <sup>***</sup>	< 0.001 <sup>***</sup>	< 0.001 <sup>***</sup>	< 0.001 <sup>***</sup>

<sup>A</sup>The main effect of day (Y) and interaction effects of day with other treatment variables; D × Y, T × Y, G × Y, D × T × Y, D × G × Y, T × G × Y and D × T × G × Y; on leaf chlorophyll content were highly significant with  $P < 0.001$  and degrees of freedoms 7, 7, 7, 35, 7, 35, 35 and 35 respectively.

**Table 2. Degrees of freedom (df), *P*-values and significance of the effects of drought (D), temperature (T), genotype (G) and their interactions on physiological, growth and yield traits of four synthetic hexaploid wheat genotypes and two spring wheat cultivars subjected to stresses at 21 days after anthesis (Experiment II)**

<sup>NS</sup>, non-significant; \*, *P* < 0.05, \*\*, *P* < 0.01; \*\*\*, *P* < 0.001

Effects	Drought (D)	Temperature (T)	Genotype (G)	D × T	D × G	T × G	D × T × G
df	1	1	5	1	5	5	5
Traits	<i>P</i> -values						
Leaf chlorophyll (SPAD units) <sup>A</sup>	< 0.001 <sup>***</sup>	< 0.001 <sup>***</sup>	< 0.001 <sup>***</sup>	0.006 <sup>**</sup>	0.02 <sup>*</sup>	< 0.001 <sup>***</sup>	< 0.001 <sup>***</sup>
Maximum quantum yield of PS II ( $F_v/F_m$ ) <sup>A</sup>	< 0.001 <sup>***</sup>	< 0.001 <sup>***</sup>	< 0.001 <sup>***</sup>	< 0.001 <sup>***</sup>	< 0.001 <sup>***</sup>	< 0.001 <sup>***</sup>	< 0.001 <sup>***</sup>
Plant height (cm)	0.1 <sup>NS</sup>	0.9 <sup>NS</sup>	< 0.001 <sup>***</sup>	0.9 <sup>NS</sup>	0.9 <sup>NS</sup>	1.0 <sup>NS</sup>	0.6 <sup>NS</sup>
Tiller number (plant <sup>-1</sup> )	0.4 <sup>NS</sup>	0.3 <sup>NS</sup>	< 0.001 <sup>***</sup>	0.3 <sup>NS</sup>	0.1 <sup>NS</sup>	0.1 <sup>NS</sup>	0.01 <sup>*</sup>
Fertile tiller number (plant <sup>-1</sup> )	0.8 <sup>NS</sup>	1.0 <sup>NS</sup>	< 0.001 <sup>***</sup>	0.5 <sup>NS</sup>	0.5 <sup>NS</sup>	0.7 <sup>NS</sup>	0.8 <sup>NS</sup>
Vegetative biomass (g plant <sup>-1</sup> )	0.8 <sup>NS</sup>	0.9 <sup>NS</sup>	< 0.001 <sup>***</sup>	0.2 <sup>NS</sup>	0.1 <sup>NS</sup>	0.2 <sup>NS</sup>	0.9 <sup>NS</sup>
Individual grain weight (mg)	< 0.001 <sup>***</sup>	< 0.001 <sup>***</sup>	< 0.001 <sup>***</sup>	0.02 <sup>*</sup>	< 0.001 <sup>***</sup>	< 0.001 <sup>***</sup>	< 0.001 <sup>***</sup>
Grain yield (g plant <sup>-1</sup> )	0.005 <sup>**</sup>	< 0.001 <sup>***</sup>	< 0.001 <sup>***</sup>	0.004 <sup>**</sup>	< 0.001 <sup>***</sup>	0.04 <sup>*</sup>	0.04 <sup>*</sup>

<sup>A</sup>The main effect of day (Y) and interaction effects of day with other treatment variables; D × Y, T × Y, G × Y, D × T × Y, D × G × Y, T × G × Y and D × T × G × Y; on leaf chlorophyll content and maximum quantum yield of PS II were highly significant with *P* < 0.001 and degrees of freedoms 7, 7, 7, 35, 7, 35, 35 and 35 respectively.