Genetic variation for photosynthetic capacity and efficiency in spring wheat

SUPPLEMENTARY TABLES

Table S1 List of wheat genotypes used for early vigour set.

Early Vigour (EV)		
Gen	**Name**	**Type**
V1	Bencubbin	BW
V2	Halberd	BW
V3	K1056	BW
V4	Nacozari	BW
V5	Oasis	BW
V6	Sunstar	BW
V7	W010311	BW
***V8**	W020308	BW
***V9**	W100104	BW
V10	W130114	BW
V11	W170316	BW
V12	W210308	BW
V13	W610501	BW
V14	W650208	BW
V75	Quarrion	BW
V76	Pitic	BW

T, Triticale genotypes. DW, Durum wheat. BW, Bread wheat. *Genotypes measured in the field in Australia (Aus3).

Table S2 List of wheat genotypes used for BYP set.

Gen	Name	Type
*V15	Abacus	T
*V16	Axe	BW
*V17	Bogong	T
*V18	Bolac	BW
*V19	Canobolas	T
*V20	Caparoi	DW
*V21	Chopper	T
*V22	Derrimut	BW
*V23	Drysdale	BW
*V24	Emu Rock	BW
*V25	Espada	BW
V26	H45	BW
*V27	Hawkeye	T
*V28	Hunter	BW
*V29	Hyperno	DW
*V30	Jaywick	T
*V31	Kosciusko	T
*V32	Mace	BW
*V33	Magenta	BW
*V34	Merinda	BW
*V35	Pastor	BW
*V36	Scout	BW
*V37	Speedee	T
*V38	Spitfire	BW
*V39	Super Seri	BW
*V40	Tahara	T
*V41	Weebil	BW
V42	Yenda	BW
V43	Zebu	BW
V44	Zulu	DW

T, Triticale genotypes. DW, Durum wheat. BW, Bread wheat. *Genotypes measured in the field in Australia (Aus3).

Table S3 List of wheat genotypes used for C set.

	CIMCOG Subset II (C)	
Gen	**Type**	**Name**
*V45	BW	BABAX/LR42//BABAX/3/VORB
V46	BW	BACANORA T 88
*V47	BW	BCN/RIALTO
V48	BW	BECARD/KACHU
V49	BW	BRBT1*2/KIRITATI
*V50	BW	SAUAL/4/CROC_1/AE.SQUARROSA (205)//KAUZ/3/ATTILA/5/SAUAL
V51	BW	SAUAL/WHEAR//SAUAL
*V52	BW	CMH79A.955/4/AGA/3/4*SN64/CNO67//INIA66/5/NAC/6/RIALTO
*V53	DW	CIRNO C 2008
*V54	BW	CNO79//PF70354/MUS/3/PASTOR/4/BAV92*2/5/FH6-1-7
*V55	BW	CROC_1/AE.SQUARROSA(205)//BORL95/3/PRL/SARA//TSI/VEE#5/4/FRET2
V56	BW	KINGBIRD #1//INQALAB 91*2/TUKURU
*V57	BW	MILAN/KAUZ//PRINIA/3/BAV92
V58	BW	PAVON F 76
*V59	BW	PBW343*2/KUKUNA*2//FRTL/PIFED
*V60	BW	PFAU/SERI.1B//AMAD/3/WAXWING
*V61	BW	SERI M 82
*V62	BW	SIETE CERROS T66
*V63	BW	SOKOLL//PBW343*2/KUKUNA/3/ATTILA/PASTOR
*V64	BW	TACUPETO F2001/SAUAL/4/BABAX/LR42//BABAX*2/3/KURUKU
*V65	BW	TACUPETO F2001/BRAMBLING*2//KACHU
*V66	BW	TC870344/GUI//TEMPORALERA M 87/AGR/3/2*WBLL1
*V67	BW	TRAP#1/BOW/3/VEE/PJN//2*TUI/4/BAV92/RAYON/5/KACHU
*V68	BW	UP2338*2/4/SNI/TRAP#1/3/KAUZ*2/TRAP//KAUZ/5/MILAN/KAUZ// CHIL/CHUM18/6/UP2338*2/4/SNI/TRAP#1/3/KAUZ*2/TRAP//KAUZ
*V69	BW	BECARD
V70	BW	WBLL1*2/KURUKU*2/5/REH/HARE//2*BCN/3/CROC_1/AE.SQUARROSA(213) //PGO/4/HUITES
*V71	BW	YAV_3/SCO//JO69/CRA/3/YAV79/4/AE.SQUARROSA(498)/5/LINE1073/6/ KAUZ*2/4/CAR//KAL/BB/3/NAC/5/KAUZ/7/KRONSTAD F2004/8/KAUZ /PASTOR//PBW343
*V72	BW	BECARD
*V73	BW	KFA/3/PFAU/WEAVER//BRAMBLING/4/PFAU/WEAVER*2//BRAMBLING
V74	BW	WBLL1*2/4/BABAX/LR42//BABAX/3/BABAX/LR42//BABAX

T, Triticale genotypes. DW, Durum wheat. BW, Bread wheat. *Genotypes measured in Australia (Aus3).

Table S4 Model terms for each analysis

Experiment	Fixed	Random	Spatial
EVA_Aus1	Fert	Gen Row Col Block	
BYPB_Aus2	Fert	Gen Row Col Li-Cor[#] Bench Block Pot	
BYPB_Aus3		Gen Block Plot Row Col	
CA_Aus3		Gen Block Plot Row Col Li-Cor[#]	ar1(Col):ar1(Row)
CB_Mex1		Gen Rep Row Col Li-Cor[#]	ar1(Col):ar1(Row)
CA_Mex1		Gen Rep Row Col Li-Cor[#]	ar1(Col):ar1(Row)

Li-Cor[#] = Li-Cor for traits measured with different Li-Cor machines (not used for traits N_{mass}, N_{area}, SPAD, LMA). Li-Cor aligned with Block at BYPB_Aus3. Only 1 Li-Cor machine used at EVA_Aus1. Fert: fertilizer treatment; Gen: genotypes; Col: column.

Table S5 Genetic and phenotypic correlations of electron transport rate from gas exchange (J) with chlorophyll fluorescence measured in experiment CA_Mex1.

	Genetic correlation	Phenotypic correlation
Electron transport rate (ETR)	0.66	0.59
Photochemical efficiency of photosystem II (ΦPSII)	0.70	0.60

Table S6 Phenotypic correlation of yield with V_{cmax25}, V_{cmax25}/ N_{area} and J measured before anthesis (88-103 DAE) from Mex1 experiment (CA_Mex1).

Trait	Yield
A (µmol CO_2 m^{-2} s^{-1})	-0.02
V_{cmax25} (µmol CO_2 m^{-2} s^{-1})	0.13
V_{cmax25}/ N_{area} (µmol CO_2 s^{-1}(g N^{-1}))	-0.09
J (µmol e$^-$ m^{-2} s^{-1})	0.13