

Supplementary Material SM4 Genotypic and environmental variation

Table S2 Variance components for a) continuous and b) score traits in intensity 1 as percent of total sum of components using basic model given by Eq. (1) assuming a non-linear trend in the genotype effect G_i (Eq. (4)) and linear trend in the year effect Y_k (Eq. (5)).

Crop	WW					WTI					WR Hyb					WR Pop					Mean
Var	YLD	EAD	EAY	HGT	EAE	YLD	EAD	EAY	HGT	EAE	YLD	EAD	EAY	HGT	EAE	YLD	EAD	EAY	HGT	EAE	
G	7	7	7	43	2	2	6	6	31	2	1	3	3	7	0	1	2	1	10	0	6
Y	11	8	8	15	24	9	6	5	13	15	9	4	5	16	20	9	4	6	15	22	12
L	18	19	16	8	46	28	30	17	23	56	29	39	24	24	42	24	46	24	25	42	28
YxL	46	41	42	25	27	41	38	44	24	25	49	35	45	46	36	55	31	46	44	35	40
GxY	3	1	1	1	0	3	1	2	1	0	1	1	0	1	0	1	0	1	1	0	1
GxL	2	1	1	1	0	3	1	3	1	0	1	0	0	0	0	1	1	1	0	0	1
Resid	13	24	25	7	1	14	19	24	6	1	9	18	21	6	1	9	16	21	6	1	12

Crop	WB 2r					WB 6r					SB					Mean
Var	YLD	EAD	EAY	HGT	EAE	YLD	EAD	EAY	HGT	EAE	YLD	EAD	EAY	HGT	EAE	
G	2	8	7	10	3	1	4	4	9	2	2	5	3	11	1	6
Y	9	9	6	17	29	10	10	5	18	28	11	3	7	8	35	12
L	20	22	19	25	42	25	23	20	24	45	27	22	24	27	20	28
YxL	54	39	44	41	23	48	39	42	41	23	49	49	45	45	41	40
GxY	2	1	1	1	1	2	1	1	1	0	1	1	1	1	0	1
GxL	1	1	1	0	0	1	0	0	0	0	1	1	1	0	0	1
Resid	12	20	22	7	2	13	23	28	6	2	8	20	20	8	2	12

Crop	WW						WTI					WR Hyb					WR Pop					Mean
Var	LDG	MLD	BNR	STB	SNB	YLR	LDG	SBL	MLD	BNR	RYS	LDG	SBL	MLD	BNR	RYS	LDG	MLD	BNR	STB	YLR	
G	9	15	15	6	6	14	12	16	18	4	10	4	4	7	3	2	7	4	5	10	2	9
Y	5	3	7	2	0	5	2	5	1	1	7	7	5	6	10	1	5	5	6	7	1	4
L	7	20	10	14	27	10	5	8	5	14	4	14	35	16	15	22	14	37	18	17	25	15
YxL	49	30	30	48	36	23	51	24	24	50	32	57	36	50	54	58	56	39	50	50	58	43
GxY	2	2	4	2	1	6	2	10	8	2	7	1	2	2	2	1	1	1	0	1	0	2
GxL	2	4	4	4	8	8	3	5	4	3	8	1	2	2	2	1	1	1	1	1	1	3
Resid	26	27	29	23	22	34	26	31	39	27	33	16	17	17	14	16	15	14	19	14	13	23

Crop	WB 2r							WB 6r							SB							Mean
Var	LDG	SBL	EBL	MLD	NTB	RHY	DLR	LDG	SBL	EBL	MLD	NTB	RHY	DLR	LDG	SBL	EBL	MLD	NTB	RHY	DLR	
G	5	10	12	14	3	11	10	4	10	12	10	5	8	14	8	8	7	19	3	5	9	9
Y	5	8	4	3	2	5	4	2	5	6	4	2	3	11	2	7	5	1	0	4	1	4
L	9	12	14	16	17	18	10	12	12	16	17	14	19	7	8	11	32	12	23	13	18	15
YxL	59	45	37	35	50	33	46	62	45	35	36	47	39	37	57	47	33	21	49	50	45	43
GxY	1	2	2	1	1	2	2	1	2	2	3	2	1	2	1	1	1	6	1	1	2	2
GxL	1	2	5	5	3	4	4	1	3	4	4	5	3	4	0	2	5	9	3	2	4	3
Resid	20	21	26	25	24	27	24	18	24	25	25	25	26	25	23	23	18	33	22	25	21	23

G Genotype; *Y* Year; *L* Location; *YxL*: Year by location; *GxY*, *GxL*: Genotype by year, location; *Res* Residual

WW Winter wheat, *WTI* Winter triticale; *WR* Winter rye, *Hyb* Hybrid, *Pop* Population varieties; *WB* Winter barley, *2r* two-row, *6r* six row-varieties; *SB* Spring barley
YLD Grain yield; *EAR* Ear density; *EAY* Ear yield; *HGT* Plant height; *EAE* Days to ear emergence; *LDG* Lodging; *SBL* Stem buckling; *EBL* Ear buckling; *MLD* Powdery mildew; *BNR* Brown rust; *STB* Septoria leaf blotch; *RYS* Rhynchosporium; *YLR* Yellow rust; *SNB* Septoria nodorum blotch; *NTB* Net blotch; *DLR* Dwarf leaf rust;