

**Table S4.** Prediction accuracy ( $\rho \pm$  standard error) of seven agronomic traits from genomic prediction (GP) for the scenario cLe obtained with GBLUP by simple validation (SV). The combination comprised  $N_i = 19$  lines from each of the six doubled-haploid libraries (DHL) and the prediction set of each DHL comprised the remaining lines.

Trait	EF	GB	SF	SM	WA	CG	RT
Early vigor	0.11±0.13	0.10±0.12	0.29±0.12	-0.02±0.11	-0.03±0.10	0.30±0.22	0.10±0.16
Female flowering	0.18±0.14	-0.01±0.13	-0.01±0.14	-0.21±0.09	0.13±0.10	0.03±0.21	0.06±0.20
Fusarium ear rot	0.22±0.13	0.10±0.15	0.11±0.15	0.28±0.08	-0.01±0.10	0.21±0.25	0.17±0.15
Plant height	-0.00±0.17	0.18±0.14	0.24±0.12	0.14±0.10	-0.16±0.11	-0.07±0.25	0.17±0.18
Grain yield	0.09±0.14	-0.04±0.14	0.19±0.13	-0.02±0.10	0.15±0.10	0.27±0.25	-0.10±0.16
Oil content	0.10±0.12	-0.03±0.14	0.20±0.12	0.21±0.10	0.22±0.10	0.29±0.22	-0.16±0.19
Protein content	-0.03±0.12	0.11±0.14	-0.02±0.14	-0.20±0.09	-0.01±0.10	-0.08±0.22	0.22±0.15