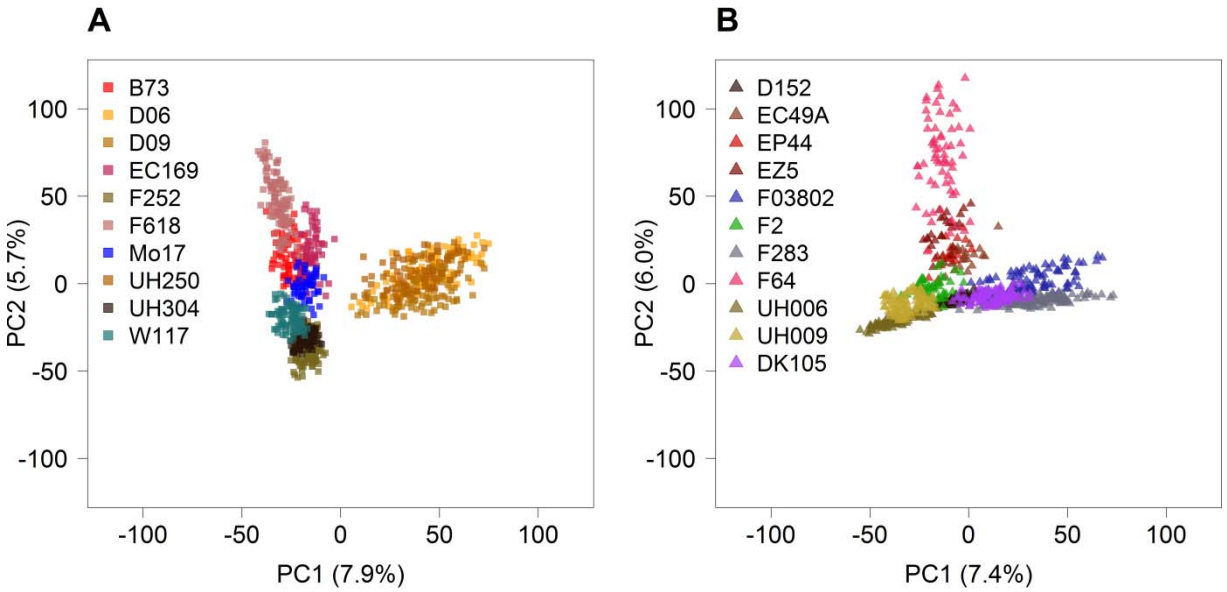

Figure S1 Principal component analysis of dent and flint lines. First and second principal component of dent lines (A) and of flint lines (B). Colors indicate DH lines belonging to different full-sib families.

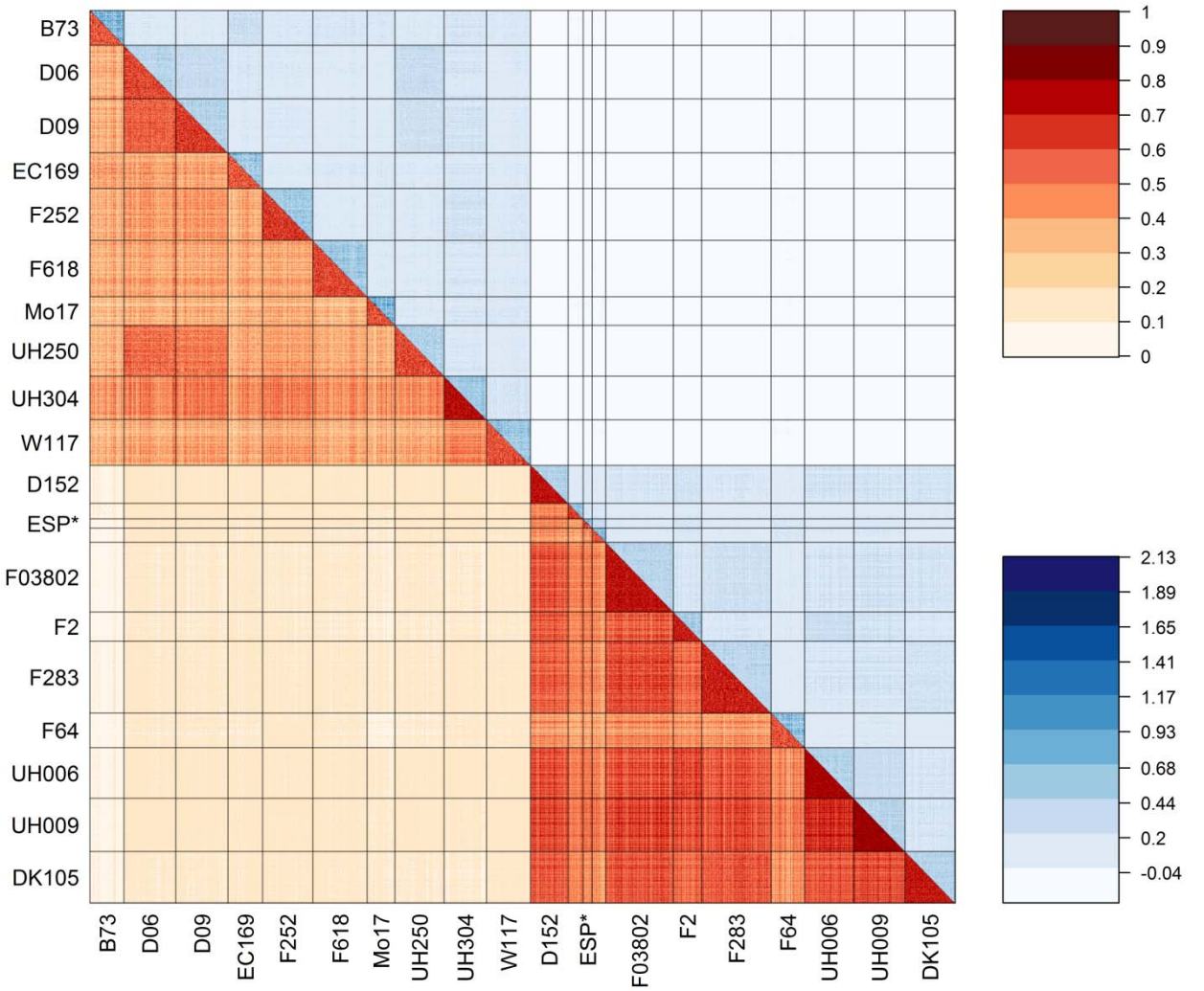

Figure S2 Heatmap of kinship **U** according to Habier *et al.* (2007) (blue, upper diagonal) and of simple matching coefficient (red, lower diagonal) among DH lines. * ESP denotes the three smallest families with Spanish origin (EC49A, EP44, EZ5). Lines separate different families.

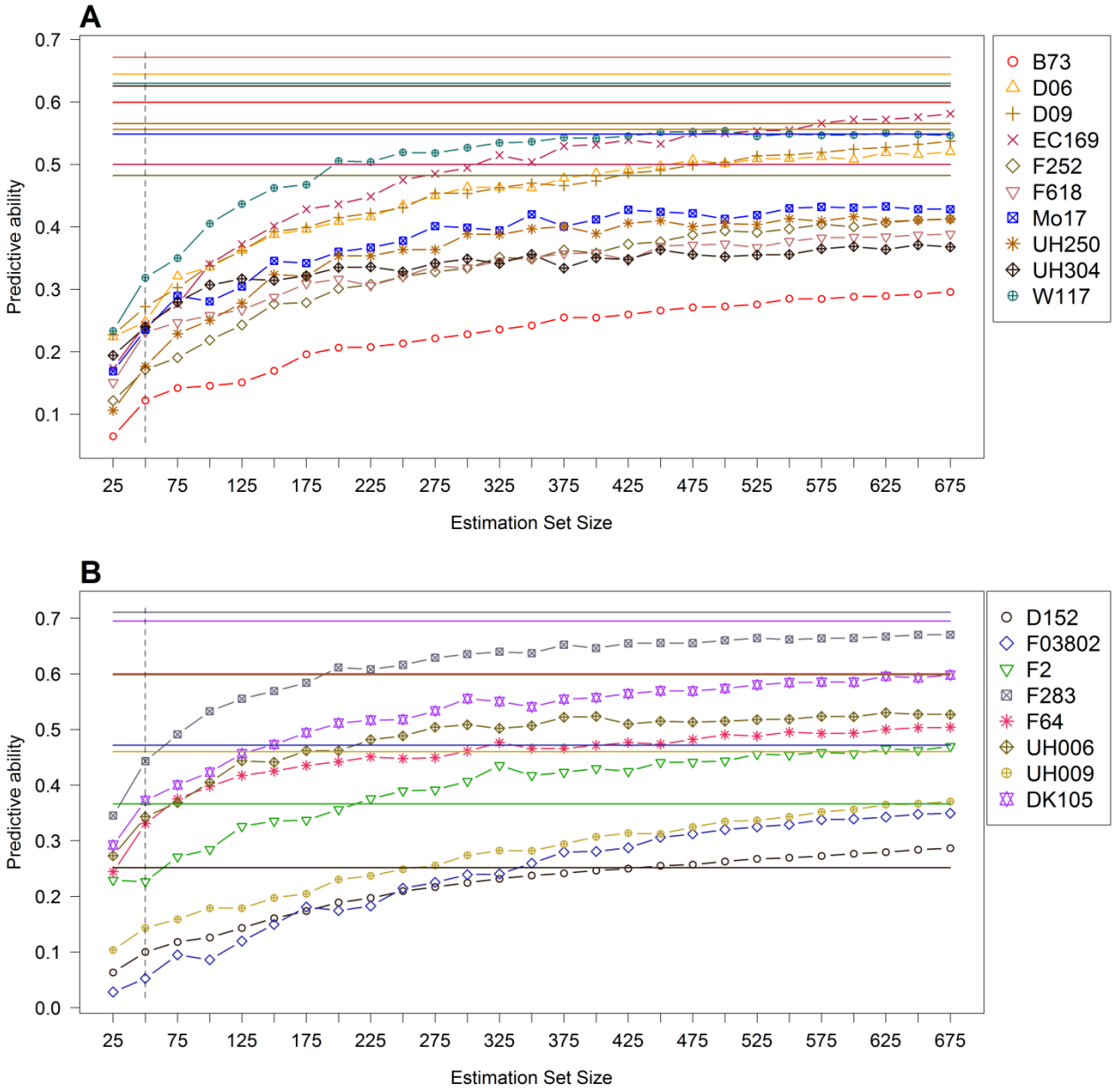

Figure S3 Mean predictive ability of dry matter content (DMC) from LOCO-CV for increasing estimation set size. Mean predictive ability from prediction within biparental families is shown by different colored horizontal lines. A) Dent. B) Flint. The dashed vertical lines label predictive abilities at an estimation set size of 50.

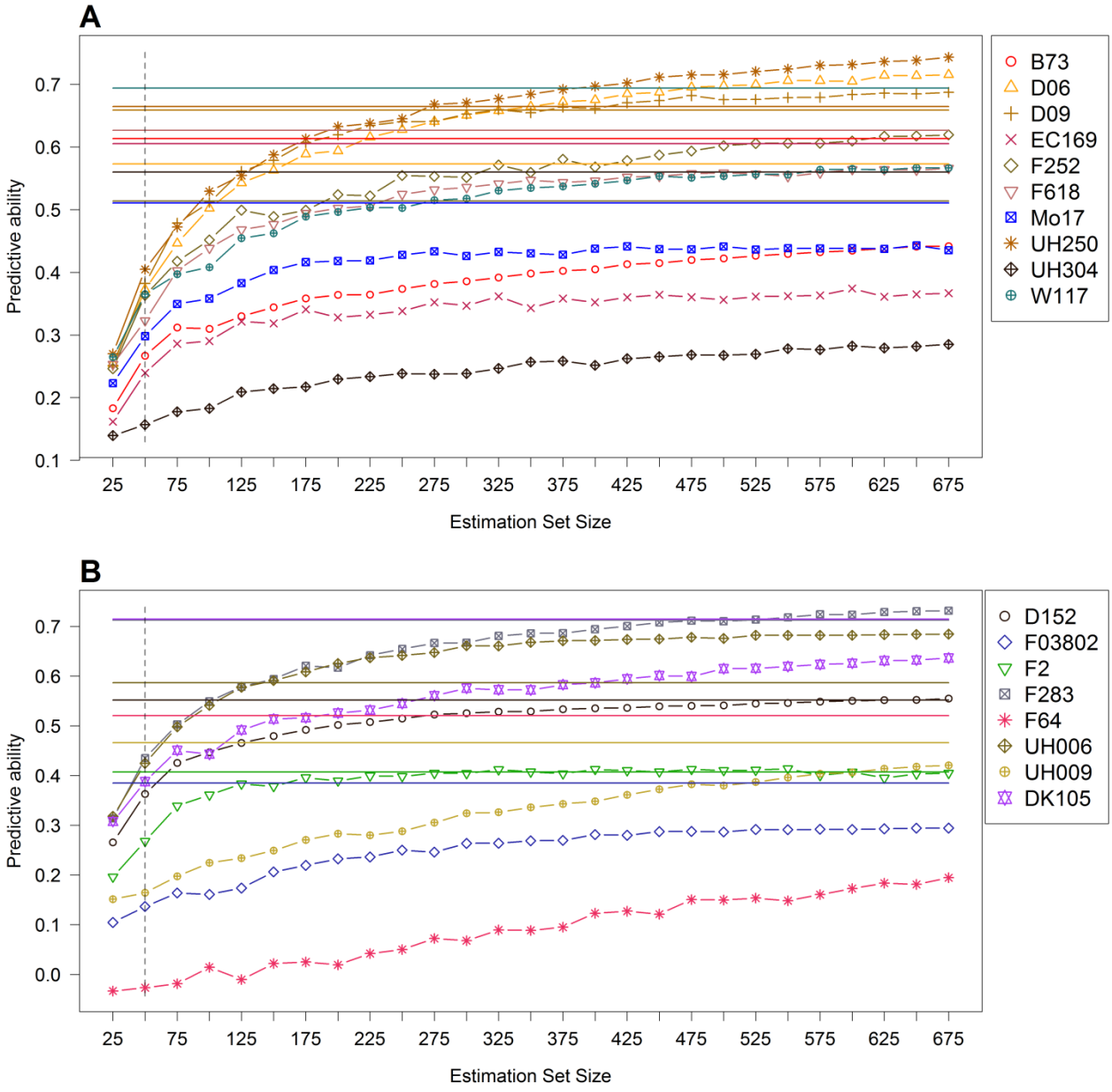

Figure S4 Mean predictive ability of plant height (PH) from LOCO-CV for increasing estimation set size. Mean predictive ability from prediction within biparental families is shown by different colored horizontal lines. A) Dent. B) Flint. The dashed vertical lines label predictive abilities at an estimation set size of 50.

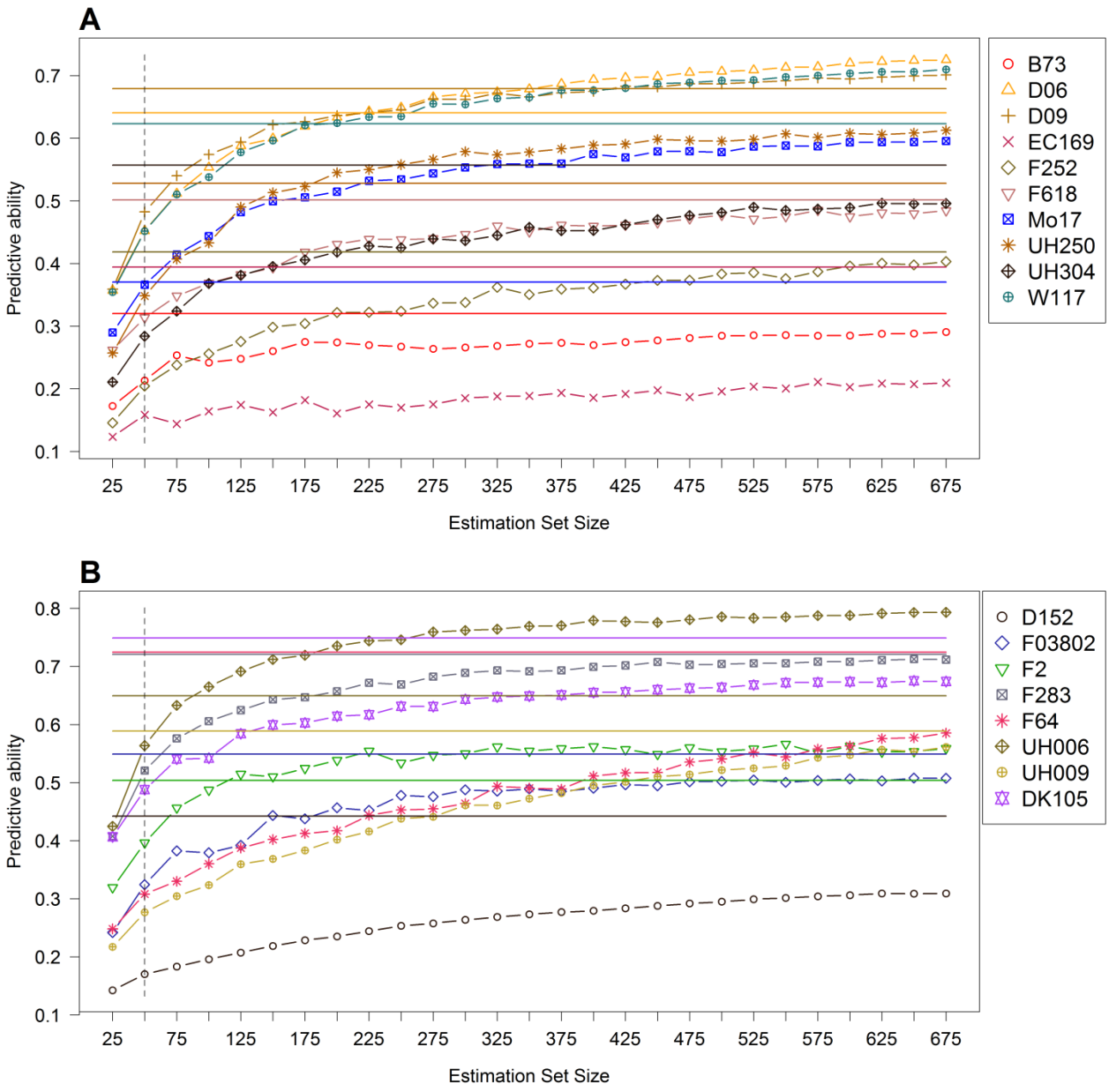

Figure S5 Mean predictive ability of days to tasseling (DtTAS) from LOCO-CV for increasing estimation set size. Mean predictive ability from prediction within biparental families is shown by different colored horizontal lines. A) Dent. B) Flint. The dashed vertical lines label predictive abilities at an estimation set size of 50.

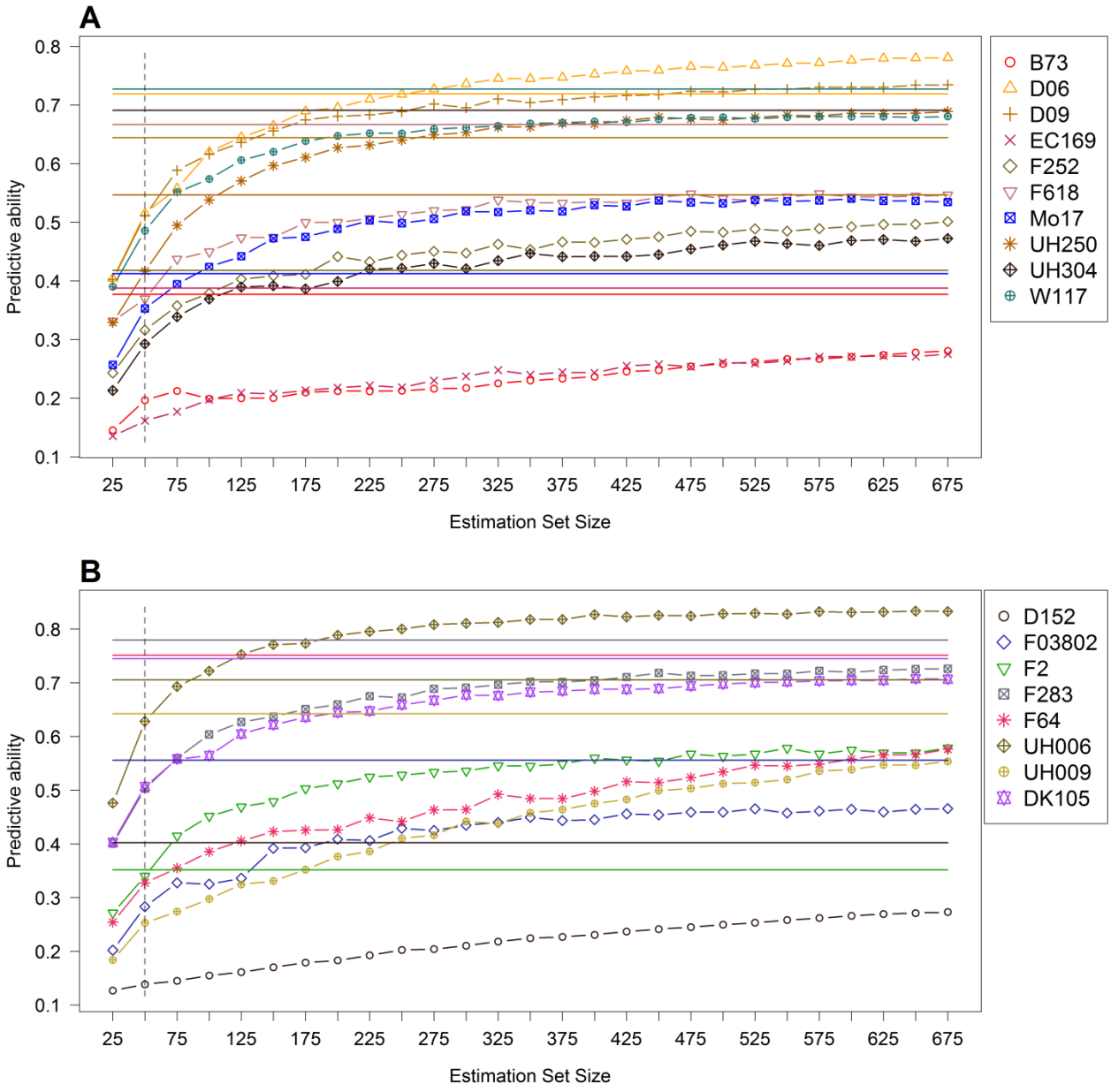

Figure S6 Mean predictive ability of days to silking (DtSILK) from LOCO-CV for increasing estimation set size. Mean predictive ability from prediction within biparental families is shown by different colored horizontal lines. A) Dent. B) Flint. The dashed vertical lines label predictive abilities at an estimation set size of 50.

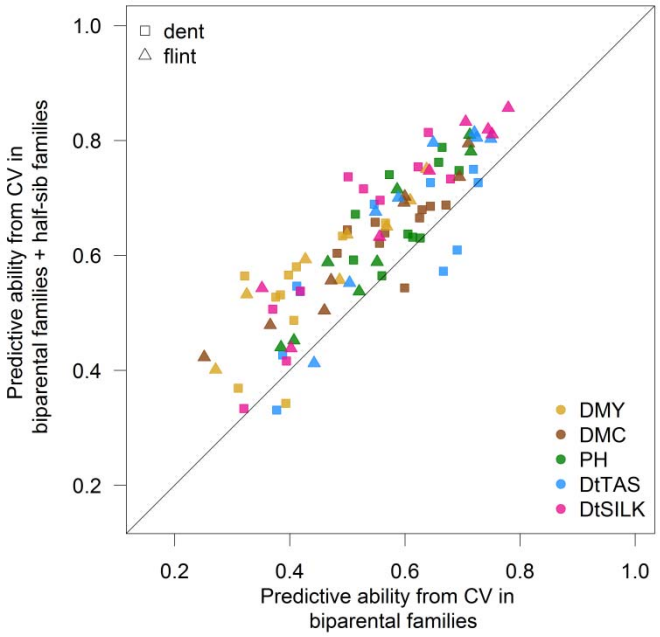

Figure S7 Mean predictive abilities from cross-validation within biparental families (R-CV) for all five traits compared to mean predictive abilities when additionally families of the same heterotic pool (all half-sib families) were included in the estimation set. Colors indicate different traits.

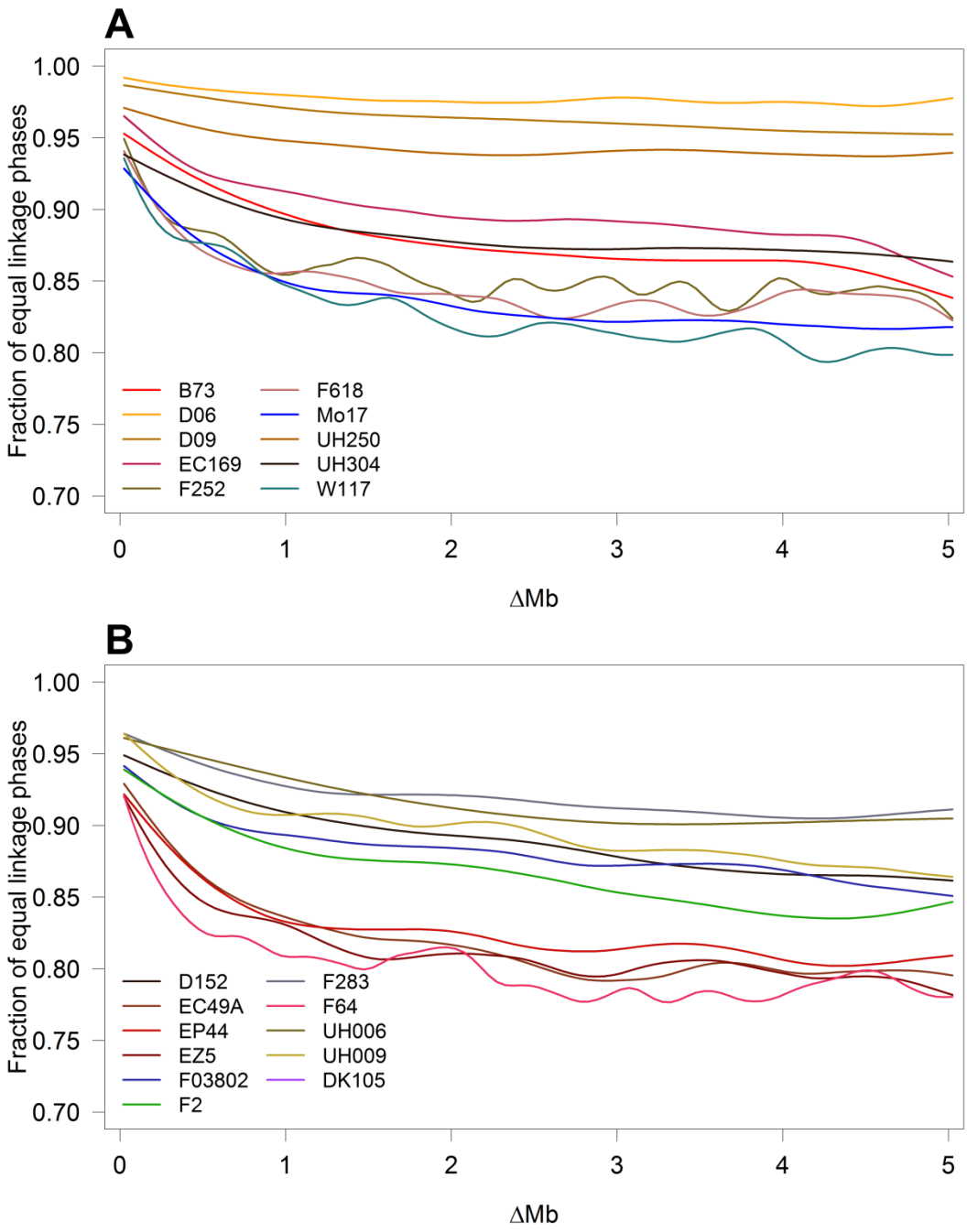

Figure S8 Fraction of equal linkage phases according to distance between SNP pairs in mega basepairs (Δ Mb). A: Each line shows the comparison of one dent family with the other 9 dent families. B: Each line shows the comparison of one flint family with the other 10 flint families.

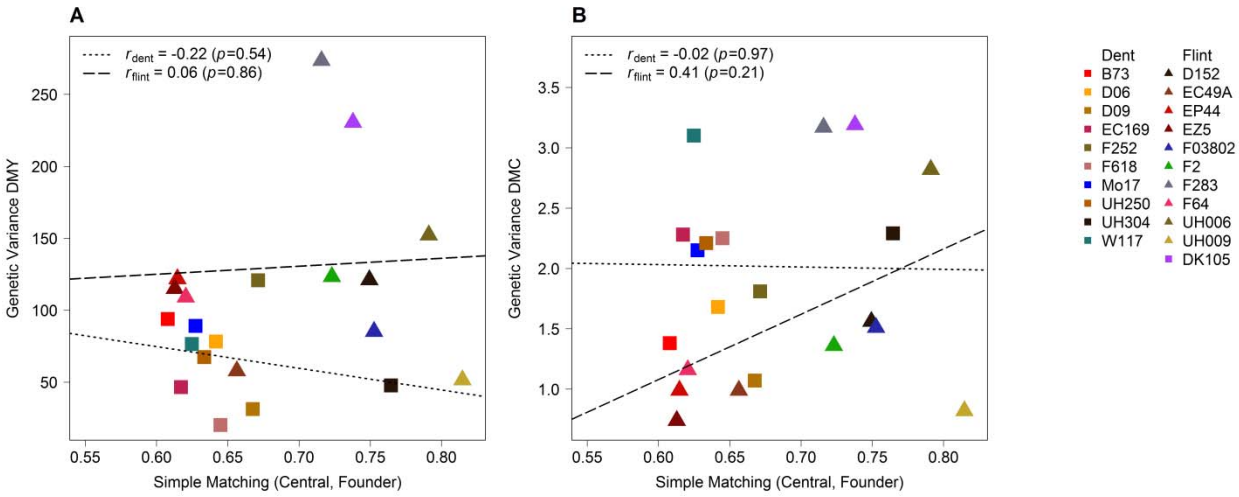

Figure S9 Genetic variance within biparental families compared to simple matching coefficient between central and founder line. A) Dry matter yield (DMY). B) Dry matter content (DMC).

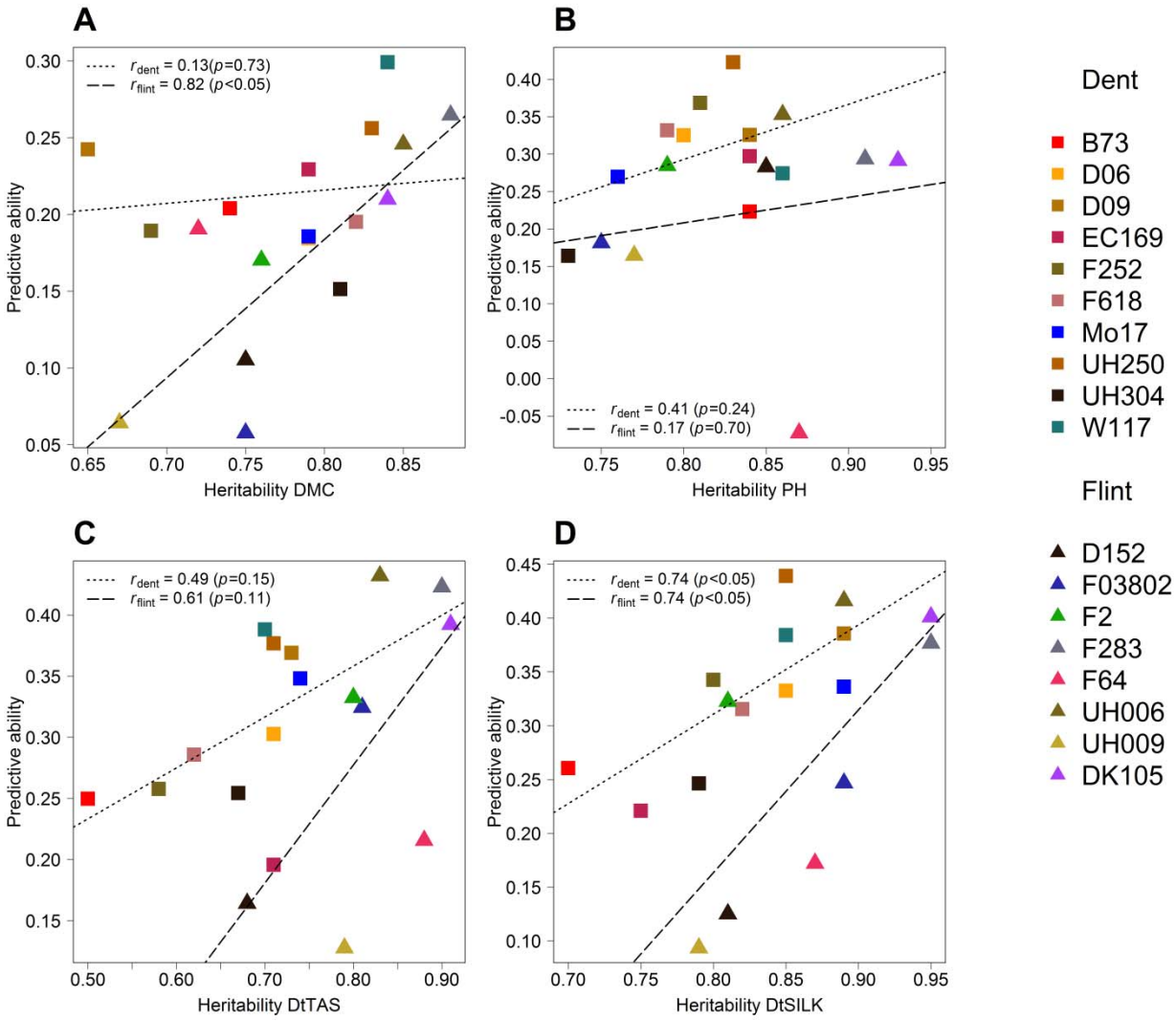

Figure S10 Predictive ability from cross-with-cross prediction (CwC) averaged over all combinations involving the same full-sib family in the estimation set compared to the heritability of this family. Colors indicate the founder line of the family in the estimation set. A) Dry matter content (DMC). B) Plant height (PH). C) Days to tasseling (DtTAS). D) Days to silking (DtSILK).

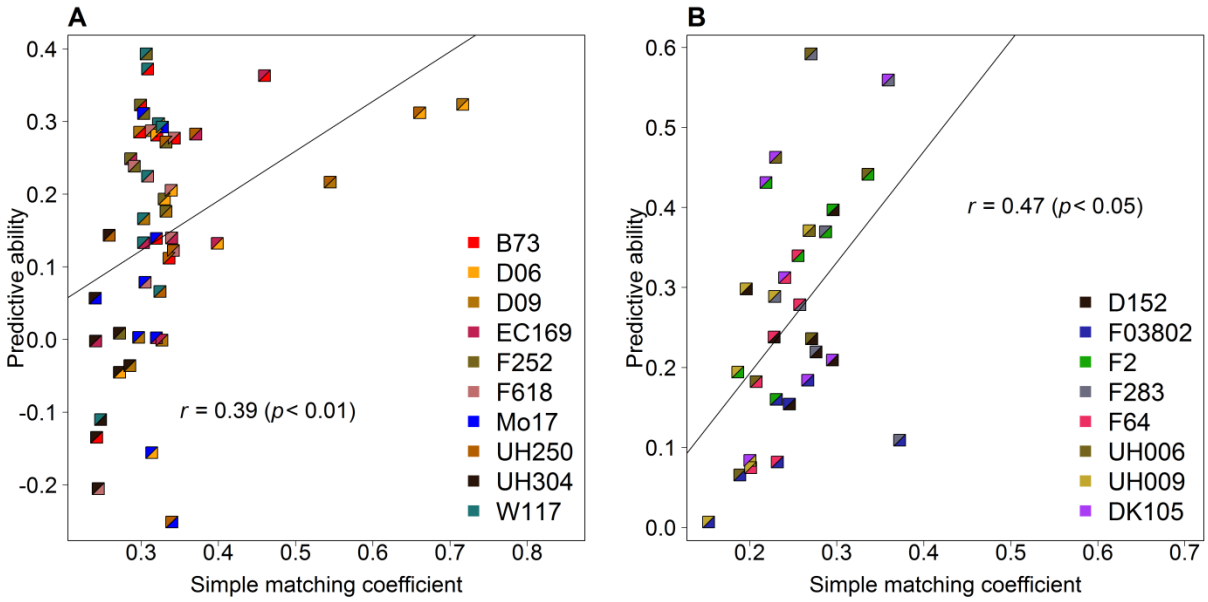

Figure S11 Predictive ability of dry matter yield (DMY) from cross-with-cross prediction (CwC) averaged over both reciprocal estimations compared to simple matching coefficient between founder lines of crosses. Colors indicate the founder line of the family in the estimation and test set, respectively. A) Dent. B) Flint.

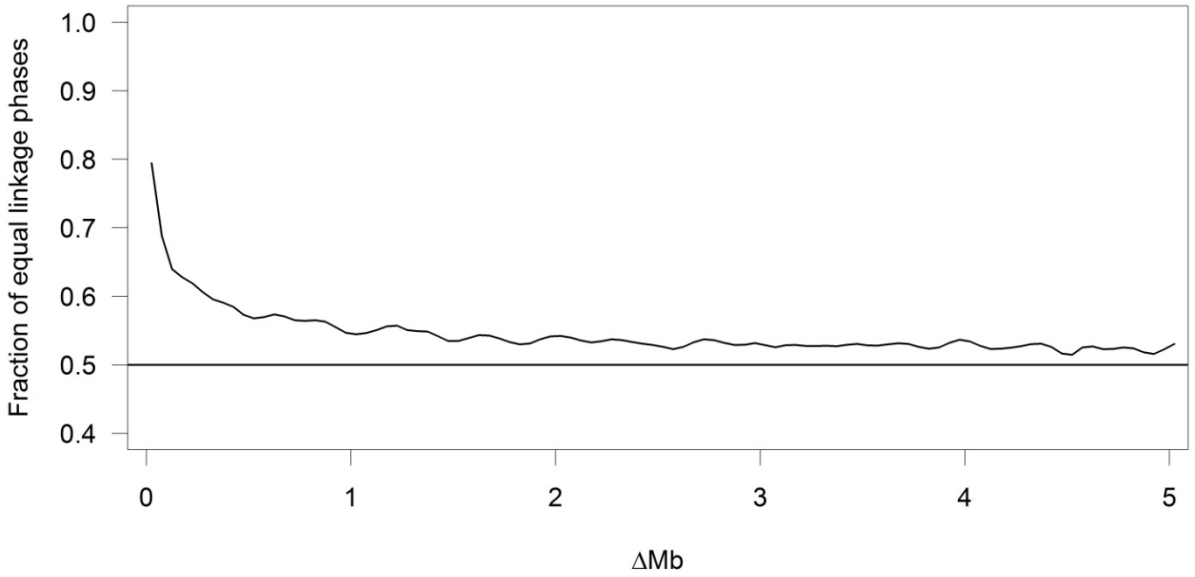

Figure S12 Fraction of equal linkage phases among dent and flint lines according to distance between SNP pairs in mega basepairs (Δ Mb).

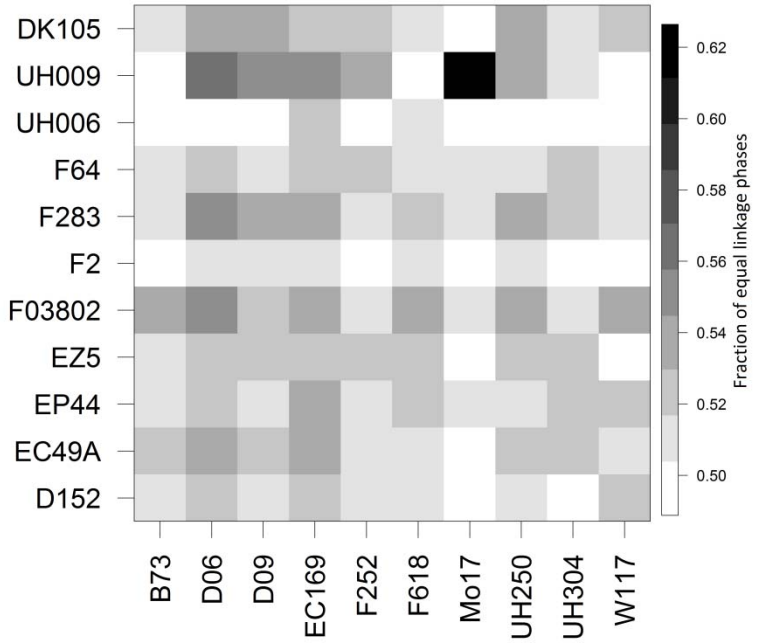

Figure S13 Heatmap showing the fraction of equal linkage phases of 5-10 Mb distant SNP pairs among dent and flint families.

File S1

Phenotypic Data

Available for download as a .zip file at http://www.genetics.org/lookup/suppl/doi:10.1534/genetics.114.161943/-/DC1

Table S1 Total number of lines (n) and simple matching coefficient (SM) between parental lines of 10 dent (F353 x founder) and 11 flint (UH007 x founder) families. Mean ($\overline{x}$), genetic variance component (σ_g^2), genotype by environment variance component (σ_{ge}^2), and heritability (h^2; ± standard error) of dent and flint families estimated for plant height (PH).

Founder	n	SM	$\overline{x}$	σ_g^2	σ_{ge}^2	h^2
B73	64	0.608	294.80 ± 1.09	60.66 ± 13.43	24.59 ± 7.66	0.84 ± 0.04
D06	99	0.642	292.18 ± 0.83	53.05 ± 9.78	19.15 ± 7.08	0.80 ± 0.04
D09	100	0.668	284.39 ± 0.92	69.51 ± 12.11	0	0.84 ± 0.02
EC169	66	0.617	283.51 ± 1.11	64.75 ± 14.05	8.26 ± 9.53	0.84 ± 0.04
F252	96	0.671	285.70 ± 0.93	65.79 ± 12.17	22.44 ± 8.62	0.81 ± 0.04
F618	104	0.645	291.36 ± 0.76	44.87 ± 8.37	5.1 ± 8.64	0.79 ± 0.05
Mo17	53	0.627	292.84 ± 1.22	58.87 ± 15.74	33.17 ± 13.30	0.76 ± 0.06
UH250	94	0.634	287.76 ± 0.92	65.53 ± 11.89	12.40 ± 8.32	0.83 ± 0.03
UH304	81	0.765	288.50 ± 0.82	37.35 ± 8.5	20.89 ± 8.20	0.73 ± 0.06
W117	84	0.625	273.78 ± 1.25	108.76 ± 20.47	24.16 ± 12.35	0.86 ± 0.03
D152	72	0.749	281.09 ± 0.97	56.73 ± 11.41	5.97 ± 8.04	0.85 ± 0.03
EC49A	29	0.656	288.71 ± 1.50	54.65 ± 17.58	21.96 ± 10.64	0.85 ± 0.05
EP44	17	0.615	292.29 ± 2.04	57.65 ± 24.39	0	0.85 ± 0.05
EZ5	26	0.613	296.48 ± 1.48	42.23 ± 16.17	28.16 ± 14.57	0.77 ± 0.08
F03802	129	0.753	292.93 ± 0.54	27.48 ± 4.78	12.75 ± 5.60	0.75 ± 0.04
F2	54	0.723	285.38 ± 0.97	38.55 ± 9.83	0	0.79 ± 0.04
F283	133	0.716	288.40 ± 0.96	108.89 ± 14.91	5.46 ± 6.59	0.91 ± 0.01
F64	64	0.621	299.27 ± 1.08	63.57 ± 13.40	14.97 ± 7.49	0.87 ± 0.03
UH006	94	0.791	288.09 ± 0.90	63.96 ± 11.16	16.70 ± 6.86	0.86 ± 0.03
UH009	98	0.815	287.88 ± 0.65	31.20 ± 6.07	7.87 ± 6.18	0.77 ± 0.04
DK105	95	0.738	291.70 ± 1.17	118.87 ± 18.86	0	0.93 ± 0.01

Table S2 Total number of lines (n) and simple matching coefficient (SM) between parental lines of 10 dent (F353 x founder) and 11 flint (UH007 x founder) families. Mean ($\overline{x}$), genetic variance component (σ_g^2), genotype by environment variance component (σ_{ge}^2), and heritability (h^2; ± standard error) of dent and flint families estimated for days to tasseling (DtTAS).

Founder	n	SM	$\overline{x}$	σ_g^2	σ_{ge}^2	h^2
B73	64	0.608	83.61 ± 0.16	0.78 ± 0.31	2.23 ± 0.39	0.50 ± 0.11
D06	99	0.642	81.39 ± 0.13	1.07 ± 0.23	0.96 ± 0.2	0.71 ± 0.05
D09	100	0.668	80.52 ± 0.15	1.54 ± 0.31	1.62 ± 0.24	0.73 ± 0.05
EC169	66	0.617	81.66 ± 0.12	0.68 ± 0.18	0.23 ± 0.21	0.71 ± 0.07
F252	96	0.671	80.12 ± 0.13	0.90 ± 0.24	2.00 ± 0.27	0.58 ± 0.08
F618	104	0.645	83.81 ± 0.14	1.12 ± 0.27	1.65 ± 0.32	0.62 ± 0.07
Mo17	53	0.627	84.63 ± 0.25	2.44 ± 0.67	1.45 ± 0.60	0.74 ± 0.07
UH250	94	0.634	82.07 ± 0.13	1.12 ± 0.24	0.85 ± 0.25	0.71 ± 0.06
UH304	81	0.765	81.70 ± 0.12	0.72 ± 0.18	0.65 ± 0.21	0.67 ± 0.07
W117	84	0.625	80.69 ± 0.14	1.04 ± 0.25	0.82 ± 0.26	0.70 ± 0.06
D152	72	0.749	79.63 ± 0.13	0.81 ± 0.21	1.22 ± 0.23	0.68 ± 0.06
EC49A	29	0.656	82.39 ± 0.24	1.17 ± 0.47	1.89 ± 0.47	0.70 ± 0.09
EP44	17	0.615	84.85 ± 0.51	3.74 ± 1.55	1.23 ± 0.79	0.87 ± 0.06
EZ5	26	0.613	84.26 ± 0.41	3.80 ± 1.24	2.02 ± 0.50	0.88 ± 0.04
F03802	129	0.753	81.08 ± 0.12	1.52 ± 0.24	1.16 ± 0.18	0.81 ± 0.03
F2	54	0.723	79.45 ± 0.20	1.62 ± 0.41	1.37 ± 0.28	0.80 ± 0.05
F283	133	0.716	81.15 ± 0.18	3.96 ± 0.55	1.14 ± 0.22	0.90 ± 0.01
F64	64	0.621	84.72 ± 0.27	4.14 ± 0.85	1.30 ± 0.42	0.88 ± 0.03
UH006	94	0.791	80.17 ± 0.15	1.79 ± 0.33	1.09 ± 0.22	0.83 ± 0.03
UH009	98	0.815	80.10 ± 0.12	1.07 ± 0.20	0.84 ± 0.17	0.79 ± 0.04
DK105	95	0.738	81.15 ± 0.23	4.55 ± 0.74	1.04 ± 0.27	0.91 ± 0.02

Table S3 Total number of lines (n) and simple matching coefficient (SM) between parental lines of 10 dent (F353 x founder) and 11 flint (UH007 x founder) families. Mean ($\overline{x}$), genetic variance component (σ_g^2), genotype by environment variance component (σ_{ge}^2), and heritability (h^2; ± standard error) of dent and flint families estimated for days to silking (DtSILK).

Founder	n	SM	$\overline{x}$	σ_g^2	σ_{ge}^2	h^2
B73	64	0.608	85.59 ± 0.20	1.57 ± 0.43	1.66 ± 0.39	0.70 ± 0.07
D06	99	0.642	82.85 ± 0.18	2.72 ± 0.47	0.95 ± 0.24	0.85 ± 0.03
D09	100	0.668	81.93 ± 0.21	3.74 ± 0.61	0	0.89 ± 0.02
EC169	66	0.617	83.02 ± 0.14	0.95 ± 0.24	0.44 ± 0.23	0.75 ± 0.06
F252	96	0.671	81.41 ± 0.18	2.38 ± 0.44	0.87 ± 0.32	0.80 ± 0.04
F618	104	0.645	85.57 ± 0.19	2.91 ± 0.52	0.97 ± 0.35	0.82 ± 0.03
Mo17	53	0.627	87.3 ± 0.33	4.93 ± 1.11	1.09 ± 0.43	0.89 ± 0.03
UH250	94	0.634	83.54 ± 0.18	2.71 ± 0.48	1.05 ± 0.24	0.85 ± 0.03
UH304	81	0.765	82.70 ± 0.16	1.59 ± 0.33	0.83 ± 0.24	0.79 ± 0.04
W117	84	0.625	82.30 ± 0.23	3.59 ± 0.68	0.92 ± 0.40	0.85 ± 0.03
D152	72	0.749	82.88 ± 0.15	1.23 ± 0.26	0.67 ± 0.20	0.81 ± 0.04
EC49A	29	0.656	85.89 ± 0.30	2.21 ± 0.69	0.60 ± 0.38	0.87 ± 0.04
EP44	17	0.615	88.41 ± 0.52	4.14 ± 1.66	1.93 ± 0.57	0.89 ± 0.04
EZ5	26	0.613	88.05 ± 0.36	2.92 ± 0.97	1.69 ± 0.43	0.86 ± 0.04
F03802	129	0.753	84.31 ± 0.14	2.12 ± 0.30	0.46 ± 0.15	0.89 ± 0.02
F2	54	0.723	82.25 ± 0.18	1.39 ± 0.34	1.38 ± 0.21	0.81 ± 0.04
F283	133	0.716	84.67 ± 0.23	6.46 ± 0.84	0.93 ± 0.17	0.95 ± 0.01
F64	64	0.621	88.41 ± 0.27	3.91 ± 0.81	2.00 ± 0.36	0.87 ± 0.03
UH006	94	0.791	83.16 ± 0.17	2.46 ± 0.41	0.83 ± 0.17	0.89 ± 0.02
UH009	98	0.815	82.50 ± 0.12	1.07 ± 0.20	0.96 ± 0.15	0.79 ± 0.04
DK105	95	0.738	84.19 ± 0.26	5.86 ± 0.91	0.96 ± 0.19	0.95 ± 0.01

Table S4 Predictive abilities (± standard error from 1000 Bootstrap samples) when flint lines are in the test set and dent lines are in the estimation set, and vice versa. Predictive ability is evaluated within each family separately.

	DMY	DMC	PH	DtTAS	DtSILK
B73	-0.218 ± 0.101	-0.311 ± 0.097	-0.319 ± 0.096	0.006 ± 0.142	0.228 ± 0.148
D06	0.118 ± 0.099	0.212 ± 0.091	-0.102 ± 0.106	-0.218 ± 0.100	0.030 ± 0.109
D09	0.072 ± 0.126	0.072 ± 0.097	-0.145 ± 0.089	-0.173 ± 0.094	-0.285 ± 0.091
EC169	-0.235 ± 0.113	-0.008 ± 0.112	0.044 ± 0.132	-0.159 ± 0.143	-0.151 ± 0.170
F252	-0.107 ± 0.100	0.252 ± 0.099	0.138 ± 0.091	0.086 ± 0.100	-0.028 ± 0.091
F618	-0.069 ± 0.100	0.095 ± 0.093	0.245 ± 0.112	0.230 ± 0.087	0.156 ± 0.088
Mo17	0.131 ± 0.119	-0.223 ± 0.113	-0.202 ± 0.114	-0.01 ± 0.169	-0.044 ± 0.141
UH250	0.046 ± 0.104	0.109 ± 0.118	-0.343 ± 0.099	-0.194 ± 0.088	-0.290 ± 0.084
UH304	0.183 ± 0.109	0.232 ± 0.114	0.308 ± 0.097	0.276 ± 0.106	0.391 ± 0.090
W117	0.135 ± 0.104	-0.215 ± 0.092	-0.224 ± 0.104	-0.048 ± 0.133	-0.149 ± 0.123
D152	-0.409 ± 0.105	0.078 ± 0.109	-0.275 ± 0.11	-0.099 ± 0.098	-0.057 ± 0.132
EC49A	0.123 ± 0.179	-0.198 ± 0.162	0.210 ± 0.168	0.149 ± 0.189	0.156 ± 0.153
EP44	0.173 ± 0.260	0.242 ± 0.175	0.275 ± 0.212	0.273 ± 0.234	0.262 ± 0.225
EZ5	-0.143 ± 0.229	0.002 ± 0.197	-0.040 ± 0.168	0.207 ± 0.145	0.468 ± 0.087
F03802	-0.036 ± 0.084	-0.187 ± 0.077	0.059 ± 0.081	-0.049 ± 0.072	0.199 ± 0.088
F2	-0.379 ± 0.095	0.363 ± 0.099	-0.167 ± 0.104	-0.316 ± 0.128	-0.160 ± 0.114
F283	0.053 ± 0.077	0.178 ± 0.084	0.385 ± 0.072	0.050 ± 0.073	0.066 ± 0.081
F64	0.011 ± 0.114	0.009 ± 0.116	0.039 ± 0.114	0.153 ± 0.111	0.309 ± 0.113
UH006	-0.217 ± 0.094	-0.174 ± 0.112	0.329 ± 0.094	-0.099 ± 0.106	-0.173 ± 0.104
UH009	-0.080 ± 0.108	-0.028 ± 0.097	0.036 ± 0.096	-0.083 ± 0.103	-0.111 ± 0.092
DK105	-0.138 ± 0.099	-0.024 ± 0.102	0.141 ± 0.104	-0.028 ± 0.084	0.098 ± 0.098