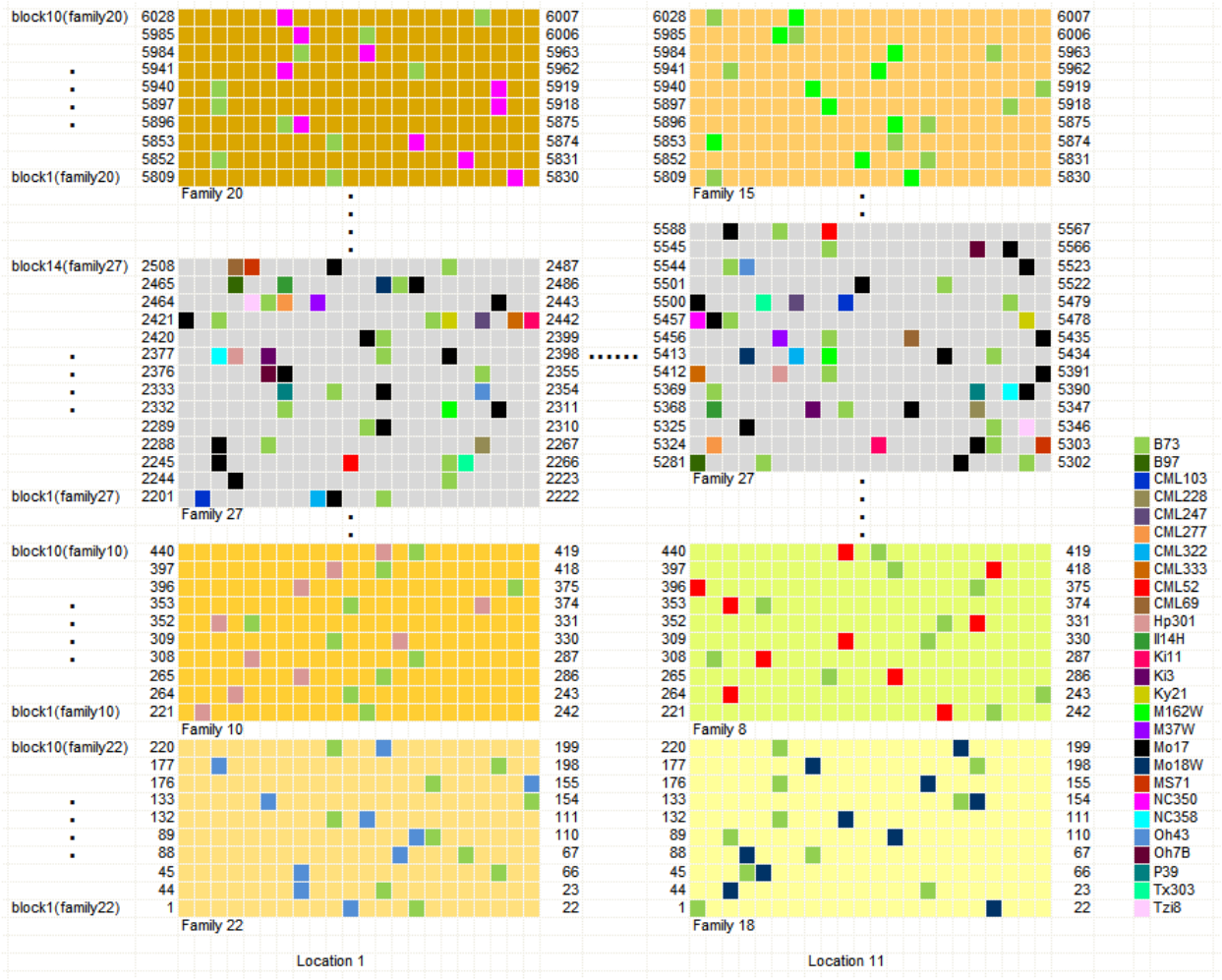
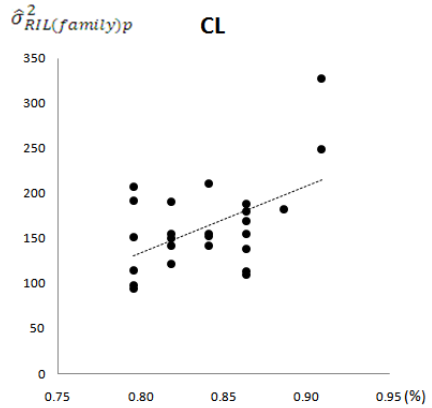
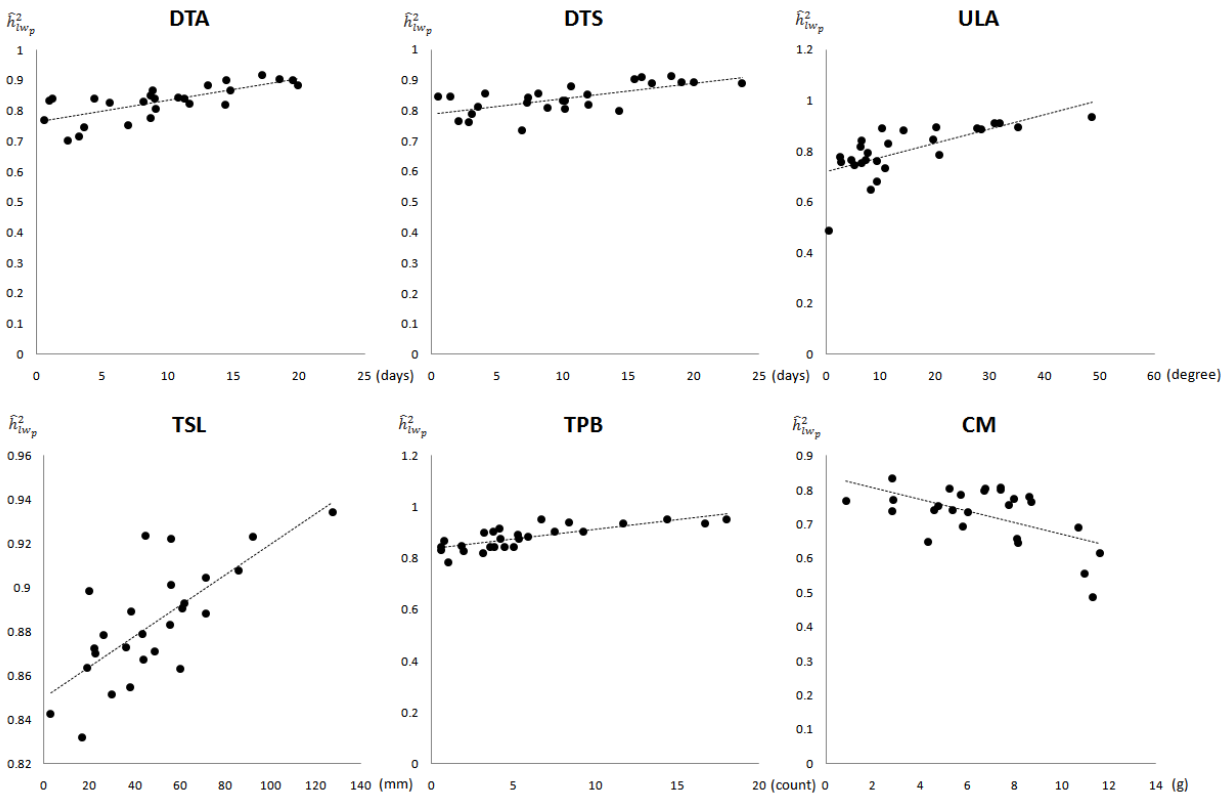
Supplementary Information



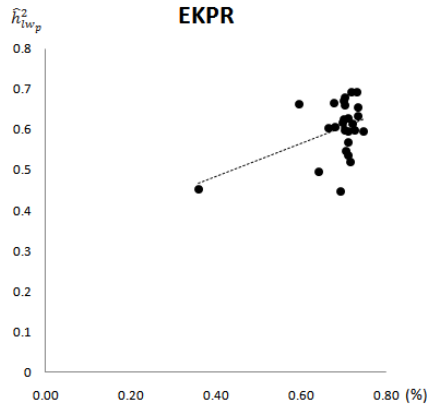
Supplementary Figure 1. An example field layout of NAM. Each family contains its 200 RILs and both parents. Note that the gray boxes in family 27 are all different lines.



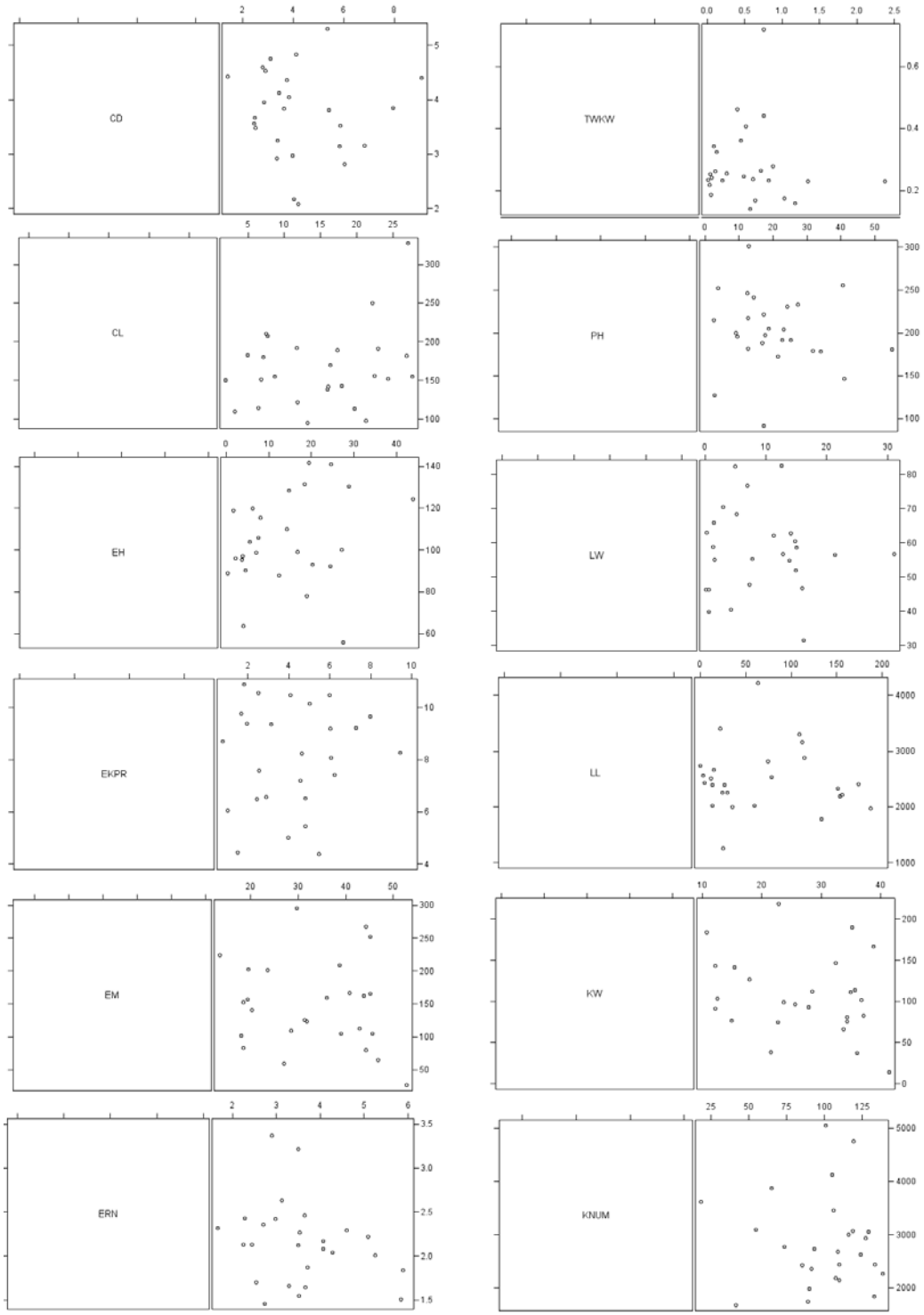
Supplementary Figure 2. Significant regression of GVC on SSR-based GD. X-axis is GDssr and Y-axis is GVC. Only CL exhibited a significant regression of GVC on GDssr.



Supplementary Figure 3. Significant regressions of within-family heritability on PD. X-axis is PD and Y-axis is within-family heritability. Only CM exhibited a negative regression slope



Supplementary Figure 4. Significant regression of within-family heritability on GDsnp. X-axis is GDsnp and Y-axis is within-family heritability. Only EKPR had a significant regression coefficient.



Supplementary Figure 5. Non-significant regressions of within-family GVC on PD. X-axis is PD and Y-axis is within-family GVC for each trait.

Supplementary Table 1. Environments in which each trait was measured on NAM and IBM RIL families and maize diversity panel.

Trait categories	Trait	Environments in which trait was evaluated
Flowering	Days to anthesis (DTA)	NC06, MO06, NY06, IL06, NC07, MO07, NY07, IL07
	Days to silk (DTS)	NC06, MO06, NY06, IL06, NC07, MO07, NY07, IL07
	Anthesis-silking interval (ASI)	NC06, MO06, NY06, IL06, NC07, MO07, NY07, IL07
Height and development	Plant height (PH)	NC06, MO06, NY06, IL06, FL06, PR06, NC07, MO07, NY07, IL07, FL07
	Ear height (EH)	NC06, MO06, NY06, IL06, FL06, PR06, NC07, MO07, NY07, IL07, FL07
Male inflorescence	Tassel length (TSL)	NC06, MO06, NY06, IL06, FL06, PR06, NY07, IL07
	Tassel prime branches (TPB)	NC06, MO06, NY06, IL06, FL06, PR06, NY07, IL07
Female inflorescence	Ear row number (ERN)	NC06, NY06, IL06, FL06, PR06, NC07
	Cob diameter (CD)	NC06, NY06, IL06, FL06, PR06, NC07
	Cob length (CL)	NC06, NY06, IL06, FL06, PR06, NC07
	Number of Kernel per row (EKPR)	NC06, NY06, IL06, FL06, PR06, NC07
Leaf morphology	Upper leaf angle (ULA)	NC06, MO06, NY06, IL06, FL06, PR06, NC07, NY07, IL07
	Leaf length (LL)	NC06, MO06, NY06, IL06, FL06, PR06, NC07, NY07, IL07
	Leaf width (LW)	NC06, MO06, NY06, IL06, FL06, PR06, NC07, NY07, IL07
Seed traits	Ear mass (EM)	NC06, NY06, IL06, FL06, PR06, NC07
	Cob mass (CM)	NC06, NY06, IL06, FL06, PR06, NC07
	Total seed weight (KW)	NC06, NY06, IL06, FL06, PR06, NC07
	20-kernel weight (TWKW)	NC06, NY06, FL06, PR06, NC07
	Total Kernel number (KNUM)	NC06, NY06, FL06, PR06, NC07

Supplementary Table 2. Within-family genetic variance component ($\hat{\sigma}^2_{RIL(\,family)_p}$) estimates for each trait.

Family	Pedigree	ASI	DTA	DTS	PH	EH	LL	LW	ULA	TSL	TPB	CD	CL	ERN	EKPR	EM	CM	KW	TWKW	KNUM
1	B73×B97	0.63	2.71	3.13	181.11	105.90	4221.25	56.60	24.56	772.26	5.37	2.18	114.24	1.55	6.58	83.60	6.06	76.00	0.24	2422.37
2	B73×CML103	0.56	2.83	2.66	246.48	128.46	2744.30	82.57	54.25	947.65	5.14	3.67	210.47	2.63	9.77	224.17	11.90	183.75	0.41	3870.71
3	B73×CML228	0.80	7.81	8.38	217.06	115.42	2212.59	82.40	23.98	878.35	3.26	3.52	182.90	1.87	6.51	125.71	13.68	96.46	0.25	2440.59
4	B73×CML247	1.14	7.76	8.82	204.23	95.99	3297.77	46.35	22.24	801.64	5.94	4.13	98.08	2.43	4.38	105.16	10.40	75.36	0.14	3074.15
5	B73×CML277	0.93	9.68	10.62	214.81	119.85	2504.56	46.33	21.97	836.62	2.37	2.97	152.50	1.84	8.26	252.11	15.91	166.30	0.24	2273.55
6	B73×CML322	0.97	4.46	5.00	232.99	98.70	2436.46	40.45	64.39	748.37	3.94	3.83	94.95	2.32	4.45	59.09	9.32	38.57	0.16	1678.05
7	B73×CML333	0.57	4.45	4.45	127.50	93.03	2258.19	76.73	23.01	608.33	14.22	4.36	142.48	2.04	7.41	162.84	13.09	101.89	0.24	2628.21
8	B73×CML52	0.80	6.19	8.37	301.23	130.54	2873.78	39.82	63.72	1041.69	10.57	2.82	142.06	2.22	6.50	112.72	6.96	80.38	0.17	3457.39
9	B73×CML69	0.73	3.66	3.78	195.21	88.95	2401.34	56.53	38.14	812.75	3.75	4.59	169.67	2.01	9.66	166.78	10.87	113.73	0.34	1833.64
10	B73×Hp301	0.72	4.08	5.27	230.60	103.68	2563.85	62.06	56.57	1357.72	10.89	4.41	191.99	1.66	6.04	26.89	6.03	13.59	0.23	1749.72
11	B73×Il14H	0.57	4.44	5.90	197.62	140.95	3402.04	46.76	75.78	1191.92	4.52	4.84	181.95	3.22	9.19	165.44	9.41	110.75	0.25	3057.18
12	B73×Ki11	0.81	7.51	9.82	191.68	90.20	3161.90	58.61	15.65	1138.03	6.30	4.43	150.19	2.46	7.20	140.53	18.07	99.07	0.19	2149.16
13	B73×Ki3	0.72	4.27	5.51	178.32	87.76	2257.21	54.86	28.18	583.38	3.74	4.53	327.34	2.13	9.21	159.37	14.49	111.60	0.22	2439.21
14	B73×Ky21	0.68	2.46	4.03	91.62	63.68	2000.65	47.82	6.44	694.15	6.32	3.24	151.36	2.17	10.56	156.47	11.59	126.78	0.46	4125.37
15	B73×M162W	0.83	3.98	5.03	191.41	97.03	2661.62	62.85	39.22	740.35	3.29	4.76	190.42	1.70	10.16	201.88	14.35	141.46	0.44	2361.36
16	B73×M37W	0.64	3.85	4.55	221.02	110.04	2025.01	68.43	69.58	1448.70	4.91	2.91	122.01	2.08	5.45	208.74	14.08	146.25	0.32	2687.49
17	B73×Mo17 (IBM)	0.83	4.67	6.10	205.14	99.18	2193.85	62.89	55.92	1308.57	3.75	3.85	249.57	1.51	9.38	202.24	13.28	142.83	0.36	2775.87
18	B73×Mo18W	1.57	6.28	9.09	187.82	95.14	1778.27	65.93	20.26	1642.54	10.21	4.04	155.38	2.13	10.48	267.06	11.56	189.94	0.28	4755.52
19	B73×MS71	0.61	1.96	3.17	146.34	55.74	1261.50	31.54	33.64	701.10	6.89	2.08	109.77	1.64	5.02	122.84	9.84	93.16	0.26	1988.47
20	B73×NC350	0.90	4.03	5.29	255.60	92.38	2529.01	51.81	29.54	1057.80	8.87	3.14	154.86	3.37	8.08	80.25	4.70	66.28	0.23	3004.75
21	B73×NC358	0.50	2.46	3.71	172.08	77.81	2335.40	58.76	25.19	755.46	7.04	5.31	179.90	2.29	7.58	108.81	13.31	74.89	0.23	2738.17
22	B73×Oh43	0.90	2.01	4.21	178.85	100.20	2819.12	55.12	53.37	985.48	3.68	3.95	154.87	2.13	10.88	101.62	9.70	91.47	0.26	3619.16
23	B73×Oh7B	0.87	3.42	4.05	199.65	118.67	2027.26	70.46	22.02	828.01	4.78	3.16	207.79	1.46	8.71	152.70	10.18	103.52	0.23	3096.72
24	B73×P39	0.62	5.59	5.98	180.42	124.33	1968.02	56.68	103.30	880.90	4.21	3.82	113.28	2.42	9.35	64.69	3.91	37.45	0.23	2183.29
25	B73×Tx303	1.45	4.60	7.10	241.31	131.45	2391.88	55.31	13.33	1143.49	14.89	3.56	188.67	2.27	10.46	295.61	13.80	218.59	0.72	5048.78
26	B73×Tzi8	1.50	5.30	7.70	252.23	141.65	2392.85	60.41	20.45	688.39	13.32	3.48	138.67	2.36	8.22	105.00	6.32	82.07	0.17	2935.79
27	Association Panel	1.68	81.76	100.89	475.19	298.48	10795.70	174.01	199.09	1938.29	22.50	6.87	296.46	2.53	11.70	264.73	20.90	179.13	0.66	2334.56

Supplementary Table 3. Heritability estimates, their standard errors, among-family variance components ($\hat{\sigma}^2_{family}$), average within-family genetic variance component excluding association panel ($\overline{\hat{\sigma}}^2_{RIL(family)}$), variance among within-family genetic variance component (Var($\hat{\sigma}^2_{RIL(family)_p}$) and the ratio between among-family and average within-family genetic variance component ($\hat{\sigma}^2_{family} / \overline{\hat{\sigma}}^2_{RIL(family)}$), family by environment interaction ($\hat{\sigma}^2_{env*family}$), RILs within family by environment interaction ($\hat{\sigma}^2_{env*RIL(family)}$) and average residual variance ($\overline{\hat{\sigma}}^2_{residual}$). $\hat{h}^2_p$ is individual plot basis heritability across all families in NAM, $\hat{h}^2_l$ is line mean basis heritability across all families in NAM, $\overline{\hat{h}}^2_{lw}$ is the average within-family line mean basis heritability, and $\hat{h}^2_c$ is heritability across the entire experiment described by Cullis *et al*. (2006). The heritability estimators are based on evaluation of the maize NAM population across up to 11 environments.

Parameter	ASI	DTA	DTS	PH	EH	LL	LW	ULA	TSL	TPB	CD	CL	ERN	EKPR	EM	CM	KW	TWKW	KNUM
$\hat{h}^2_p$	0.33	0.71	0.70	0.56	0.59	0.60	0.59	0.50	0.62	0.66	0.42	0.37	0.43	0.24	0.26	0.42	0.23	0.35	0.29
S.E.($\hat{h}^2_p$)	0.02	0.04	0.04	0.02	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.02
$\hat{h}^2_l$	0.78	0.94	0.94	0.92	0.93	0.93	0.92	0.89	0.92	0.94	0.78	0.74	0.79	0.60	0.63	0.78	0.59	0.69	0.63
S.E.($\hat{h}^2_l$)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.02	0.03	0.01	0.03	0.02	0.02
$\overline{\hat{h}}^2_{lw}$	0.71	0.78	0.85	0.90	0.85	0.88	0.87	0.80	0.88	0.88	0.73	0.70	0.67	0.60	0.54	0.73	0.52	0.63	0.62
S.E.($\overline{\hat{h}}^2_{lw}$)	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.03	0.03	0.03	0.04	0.05	0.03	0.05	0.04	0.04
$\hat{h}^2_c$	0.80	0.97	0.96	0.93	0.93	0.93	0.93	0.90	0.92	0.94	0.79	0.76	0.80	0.61	0.65	0.79	0.62	0.72	0.63
$\hat{\sigma}^2_{family}$	0.26	9.99	11.62	66.08	75.57	1853.01	41.06	20.59	469.46	3.88	1.41	46.03	0.41	1.29	58.36	3.74	35.78	0.11	344.05
$\hat{\sigma}^2_{RIL(family)}$	0.84	4.63	5.84	201.63	104.11	2489.22	57.62	38.64	945.91	6.62	3.75	164.44	2.15	8.06	148.17	10.88	107.01	0.28	2861.33
Var($\hat{\sigma}^2_{RIL(family)_p}$)	0.08	3.80	4.97	1821.00	468.91	342968.43	154.15	545.77	74193.39	13.00	0.64	2492.19	0.22	3.89	4451.63	12.99	2323.75	0.01	750218.94
$\hat{\sigma}^2_{family} / \hat{\sigma}^2_{RIL(family)}$	0.31	2.16	1.99	0.33	0.73	0.74	0.71	0.53	0.50	0.59	0.38	0.28	0.19	0.16	0.39	0.34	0.33	0.40	0.12
$\hat{\sigma}^2_{env*family}$	0.08	0.29	0.77	8.09	5.01	90.10	1.27	1.33	11.42	0.09	0.73	25.70	0.27	3.00	67.03	2.23	58.12	0.09	992.22
$\hat{\sigma}^2_{env*RIL(family)}$	0.39	0.70	1.02	68.50	27.51	568.00	9.61	11.01	0.00	1.05	5.69	294.32	2.69	24.14	461.08	15.53	360.26	0.49	5753.77
$\overline{\hat{\sigma}}^2_{residual}$	1.76	5.00	5.71	130.80	90.01	2202.23	58.67	47.58	854.19	4.27	0.82	36.92	0.39	2.65	64.01	2.79	49.47	0.14	915.86

Supplementary Table 4. Phenotypic difference (PD) between the parents of 26 RIL families comprising the maize NAM and IBM populations.

Family	PDasi (day)	PDdta (day)	PDdts (day)	PDph (cm)	PDeh (cm)	PDll (mm)	PDlw (mm)	PDula (degree)	PDtsl (mm)	PDtpb (count)	PDcd (mm)	PDcl (mm)	PDern (count)	PDekpr (count)	PDem (g)	PDcm (g)	PDkw (g)	PDtwkw (g)	PDknum (count)
B73×B97	1.57	0.55	2.08	-12.72	-7.54	-63.35	12.82	-20.66	22.44	5.87	-4.03	-6.47	-3.51	-2.89	-18.56	-4.32	-14.90	0.61	-85.33
B73×CML103	-1.82	8.69	6.87	-12.34	14.69	0.05	12.52	-14.22	71.27	5.34	-2.49	7.52	-3.12	-1.67	-13.57	-2.84	-10.74	0.51	-65.02
B73×CML228	1.05	18.52	19.07	-12.57	8.01	156.43	4.97	-9.38	55.64	3.11	-5.87	-4.90	-3.70	-4.81	-31.43	-8.64	-25.57	0.25	-109.91
B73×CML247	0.43	19.50	19.99	-23.05	-2.12	109.00	0.58	-5.13	43.56	5.25	-3.44	-21.21	-2.28	-5.45	-39.07	-4.60	-34.33	-0.58	-118.53
B73×CML277	1.36	17.14	18.28	2.57	6.18	11.72	-0.13	-7.27	38.39	-1.01	-3.98	-24.30	-5.89	-9.45	-45.15	-5.25	-38.82	0.06	-138.47
B73×CML322	0.75	9.02	10.00	-27.43	-7.07	-4.59	4.18	-27.65	29.63	-0.57	-3.65	-13.24	-1.66	-1.51	-26.98	-5.80	-21.59	-1.18	-41.43
B73×CML333	1.24	10.74	11.95	2.81	20.27	24.23	6.95	-4.72	-2.91	18.03	-3.75	-17.89	-4.28	-6.22	-43.76	-6.72	-36.81	-0.49	-123.80
B73×CML52	0.93	19.91	23.69	12.76	28.79	114.88	-0.63	-10.32	56.02	11.68	-6.03	-16.08	-5.08	-2.42	-42.97	-8.10	-34.35	-1.03	-106.03
B73×CML69	0.26	14.33	14.33	-9.42	-0.29	174.23	21.32	-6.51	26.15	3.83	-2.80	-16.31	-5.24	-7.98	-40.84	-4.77	-35.76	0.09	-132.72
B73×Hp301	0.60	0.97	1.47	-24.16	-5.51	-2.94	-11.21	-35.15	44.69	8.39	-9.08	-11.74	-3.29	-0.99	-52.80	-11.60	-41.47	-2.38	-89.20
B73×Il14H	0.60	-4.39	-4.11	-17.72	-24.66	-22.16	-15.99	-31.68	61.83	5.01	-4.11	-26.85	-3.50	-6.03	-45.20	-10.71	-35.03	-0.04	-129.21
B73×Ki11	1.66	14.43	16.04	-25.27	-4.46	112.24	14.99	-9.28	85.89	3.23	1.42	-1.90	-3.64	-4.57	-20.34	2.82	-23.75	0.04	-109.68
B73×Ki3	0.59	11.24	11.92	-34.01	-12.36	-29.50	13.86	-6.35	-16.84	4.45	-2.91	-27.06	-3.49	-7.29	-35.98	-7.40	-28.45	-0.02	-133.28
B73×Ky21	1.83	6.97	8.86	-17.28	3.98	-35.48	7.24	0.57	18.86	9.25	-3.39	-6.85	-4.06	-2.51	-19.48	-0.84	-17.90	0.40	-105.16
B73×M162W	-1.65	11.61	10.18	-22.74	-3.83	-14.75	14.10	-19.66	22.01	1.94	-3.10	-22.94	-2.54	-5.03	-23.66	-7.42	-15.44	0.76	-91.63
B73×M37W	1.41	5.55	7.32	-17.22	-14.29	59.95	5.15	-30.85	91.95	4.20	-3.36	-11.84	-4.06	-4.80	-38.68	-6.78	-32.44	-0.13	-108.82
B73×Mo17 (IBM)	1.95	-1.20	0.49	-18.77	-16.82	-153.71	-0.21	-20.21	56.02	-1.81	-7.96	22.18	-5.83	1.93	-19.56	-7.75	-12.14	0.45	-73.75
B73×Mo18W	2.89	13.01	15.49	-16.82	-3.74	132.94	1.40	-10.78	127.35	16.70	-3.84	-22.40	-2.25	-6.00	-44.24	-8.72	-35.16	-0.88	-119.22
B73×MS71	-0.12	-2.32	-2.83	-41.02	-27.53	-25.45	-16.23	-11.46	-38.09	3.74	-4.20	-3.21	-3.65	-3.98	-31.87	-2.80	-27.84	-0.10	-90.02
B73×NC350	-0.66	8.13	7.34	-40.62	-24.44	78.45	-14.88	-7.55	61.09	4.16	-5.85	-27.64	-2.89	-6.07	-44.24	-10.96	-33.73	-0.82	-115.68
B73×NC358	-0.35	3.63	3.10	-21.43	-18.96	-151.62	1.27	2.70	-60.25	7.49	-5.36	-7.13	-4.60	-2.55	-28.48	-5.74	-22.71	0.01	-93.48
B73×Oh43	0.19	-3.23	-3.54	-31.78	-27.06	-74.79	1.55	-28.42	19.81	-0.55	-2.86	8.67	-2.43	1.82	-18.07	-5.39	-12.11	-0.71	-18.47
B73×Oh7B	0.85	9.07	10.14	-9.05	1.66	-13.43	2.90	-2.85	48.68	0.78	-6.83	7.65	-2.74	-0.76	-18.53	-6.04	-12.58	0.20	-54.50
B73×P39	0.97	-8.80	-8.18	-55.14	-43.85	-187.81	-31.09	-48.52	-36.16	3.59	-5.42	-19.69	-2.98	-3.14	-46.75	-11.31	-36.05	-1.35	-107.19
B73×Tx303	1.81	8.69	10.67	14.33	18.42	13.14	7.77	-8.23	71.17	14.38	-2.47	-17.29	-3.53	-4.07	-29.78	-7.98	-22.82	0.75	-100.61
B73×Tzi8	1.73	14.76	16.84	3.84	19.36	26.90	14.76	-6.60	43.82	6.73	-2.51	-15.95	-2.70	-4.64	-45.67	-8.16	-37.09	-0.64	-127.28

Supplementary Table 5. Parental BLUPs for NAM population.

Line	ASI (day)	DTA (day)	DTS (day)	PH (cm)	EH (cm)	LL (mm)	LW (mm)	ULA (degree)	TSL (mm)	TPB (count)	CD (mm)	CL (mm)	ERN (count)	EKPR (count)	EM (g)	CM (g)	KW (g)	TWKW (g)	KNUM (count)
B73	1.05	73.96	75.01	170.88	83.34	767.39	89.00	78.22	301.61	6.71	29.13	134.64	16.57	24.78	91.55	20.75	70.96	4.56	313.69
B97	2.62	74.51	77.08	158.16	75.80	704.04	101.81	57.57	324.05	12.59	25.11	128.17	13.06	21.88	72.99	16.43	56.06	5.17	228.36
CML103	-0.76	82.64	81.87	158.54	98.03	767.43	101.52	64.00	372.88	12.06	26.65	142.16	13.46	23.11	77.98	17.91	60.22	5.07	248.67
CML228	2.10	92.48	94.08	158.31	91.34	923.82	93.97	68.84	357.25	9.83	23.27	129.74	12.87	19.97	60.13	12.11	45.39	4.81	203.78
CML247	1.48	93.46	95.00	147.83	81.21	876.39	89.58	73.10	345.17	11.97	25.69	113.43	14.29	19.32	52.48	16.15	36.63	3.98	195.16
CML277	2.42	91.10	93.29	173.45	89.52	779.10	88.87	70.96	340.00	5.70	25.15	110.34	10.68	15.33	46.40	15.50	32.15	4.62	175.22
CML322	1.81	82.97	85.01	143.45	76.26	762.79	93.18	50.57	331.24	6.15	25.48	121.40	14.91	23.27	64.57	14.95	49.37	3.38	272.26
CML333	2.29	84.70	86.96	173.69	103.60	791.62	95.95	73.50	298.70	24.74	25.38	116.75	12.29	18.56	47.79	14.02	34.16	4.07	189.89
CML52	1.99	93.87	98.70	183.64	112.13	882.27	88.36	67.90	357.63	18.39	23.11	118.56	11.49	22.35	48.59	12.65	36.62	3.53	207.66
CML69	1.31	88.29	89.34	161.46	83.05	941.62	110.32	71.72	327.76	10.54	26.33	118.33	11.33	16.80	50.71	15.98	35.20	4.65	180.97
Hp301	1.65	74.93	76.48	146.72	77.83	764.45	77.79	43.08	346.30	15.11	20.05	122.90	13.28	23.78	38.75	9.14	29.49	2.18	224.49
Il14H	1.65	69.57	70.89	153.16	58.68	745.22	73.00	46.54	363.44	11.73	25.02	107.78	13.07	18.75	46.35	10.04	35.93	4.52	184.48
Ki11	2.71	88.38	91.04	145.60	78.88	879.63	103.99	68.94	387.50	9.94	30.55	132.74	12.94	20.21	71.21	23.57	47.21	4.60	204.01
Ki3	1.64	85.20	86.92	136.87	70.98	737.89	102.86	71.87	284.77	11.16	26.22	107.58	13.08	17.49	55.57	13.34	42.51	4.53	180.41
Ky21	2.88	80.92	83.87	153.60	87.31	731.90	96.24	78.80	320.47	15.97	25.75	127.79	12.51	22.27	72.08	19.90	53.06	4.96	208.53
M162W	-0.59	85.56	85.18	148.14	79.50	752.64	103.09	58.56	323.62	8.66	26.03	111.70	14.03	19.75	67.90	13.32	55.52	5.32	222.07
M37W	2.46	79.51	82.32	153.65	69.05	827.34	94.15	47.37	393.56	10.91	25.77	122.80	12.51	19.98	52.87	13.96	38.52	4.43	204.88
Mo17	3.00	72.76	75.49	152.11	66.52	613.68	88.78	58.01	357.63	4.91	21.17	156.82	10.74	26.71	71.99	13.00	58.82	5.01	239.95
Mo18W	3.95	86.96	90.49	154.06	79.59	900.33	90.39	67.45	428.96	23.42	25.30	112.24	14.32	18.78	47.32	12.03	35.80	3.68	194.47
MS71	0.94	71.63	72.18	129.86	55.80	741.93	72.77	66.77	263.52	10.45	24.93	131.43	12.92	20.80	59.69	17.95	43.12	4.46	223.67
NC350	0.40	82.09	82.35	130.26	58.89	845.84	74.12	70.67	362.70	10.88	23.28	107.00	13.68	18.70	47.31	9.79	37.24	3.74	198.01
NC358	0.70	77.58	78.10	149.45	64.38	615.77	90.26	80.92	241.36	14.21	23.77	127.51	11.98	22.23	63.07	15.01	48.25	4.57	220.22
Oh43	1.24	70.73	71.47	139.10	56.27	692.60	90.55	49.80	321.42	6.16	26.27	143.31	14.14	26.59	73.48	15.36	58.85	3.85	295.22
Oh7B	1.90	83.02	85.15	161.83	85.00	753.95	91.90	75.38	350.29	7.49	22.30	142.29	13.84	24.01	73.02	14.71	58.38	4.76	259.20
P39	2.03	65.15	66.82	115.73	39.48	579.58	57.91	29.70	265.45	10.30	23.71	114.95	13.60	21.64	44.80	9.44	34.91	3.21	206.50
Tx303	2.86	82.64	85.68	185.21	101.76	780.53	96.77	70.00	372.78	21.09	26.66	117.34	13.04	20.70	61.77	12.77	48.14	5.31	213.08
Tzi8	2.78	88.72	91.85	174.71	102.69	794.29	103.76	71.62	345.43	13.44	26.62	118.69	13.87	20.14	45.88	12.59	33.87	3.92	186.41

Supplementary Table 6. r^2, $\hat{\beta}$ and p-value of regressions of within-family heritability ($\overline{\hat{h}}^2_{lw}$) on the absolute value of phenotypic difference (PD), genetic distance estimate from SSR markers (GDssr) and genetic distance estimate from SNP markers (GDsnp).

	$\overline{\hat{h}}^2_{lw}$ on PD			$\overline{\hat{h}}^2_{lw}$ on GDssr			$\overline{\hat{h}}^2_{lw}$ on GDsnp		
trait	r^2	$\hat{\beta}$	p-value	r^2	$\hat{\beta}$	p-value	r^2	$\hat{\beta}$	p-value
ASI	0.1348	0.0309	0.0650	0.0036	-0.0958	0.7713	0.0041	-0.1558	0.4412
DTA	0.5239	0.0071	**<0.0001***	0.0218	0.2367	0.4712	0.0682	0.6330	0.1553
DTS	0.4550	0.0048	**0.0002***	0.0384	0.2478	0.3373	0.0417	0.3908	0.2531
PH	0.0118	-0.0002	0.5970	0.0257	0.1149	0.4345	0.0168	0.1407	0.4560
EH	0.0059	0.0002	0.7094	0.0065	0.0685	0.6944	0.0553	0.3012	0.7330
LL	0.0035	<0.0001	0.7750	0.0611	-0.2011	0.2235	0.0003	0.0215	0.2979
LW	0.0015	-0.0002	0.8508	0.0006	0.0201	0.9078	0.0700	0.3364	0.5751
ULA	0.4830	0.0057	**0.0001***	0.0414	0.5653	0.3186	0.1765	1.7655	0.6896
TSL	0.5326	0.0007	**<0.0001***	0.0007	0.0192	0.8979	0.0131	0.1261	0.9024
TPB	0.6029	0.0077	**<0.0001***	0.0257	-0.2107	0.4336	0.0440	-0.4165	0.8668
CD	0.0650	-0.0065	0.2088	0.0037	0.0783	0.7677	0.1840	0.8345	0.1515
CL	0.0071	0.0006	0.6818	0.1411	0.6198	0.0586	0.0068	0.2053	0.1073
ERN	0.0491	-0.0095	0.2767	0.0005	0.0290	0.9139	0.0199	0.2773	0.4867
EKPR	0.0233	0.0046	0.4570	0.0686	0.5017	0.1961	0.0057	0.2181	**0.0243***
EM	0.0760	-0.0031	0.1727	0.0762	0.9936	0.1722	0.0044	-0.3626	0.3434
CM	0.3168	-0.0169	**0.0028***	0.0035	0.1389	0.7735	0.0179	-0.4745	0.7583
KW	0.1008	-0.0044	0.1140	0.0564	0.8958	0.2428	0.0183	-0.7729	0.2775
TWKW	0.0371	-0.0307	0.3458	0.0097	0.2334	0.6322	0.0170	-0.4676	0.1045
KNUM	0.0001	<0.0001	0.9687	0.0010	-0.0683	0.8762	0.0555	-0.7580	0.6397

*Significant at 5% level