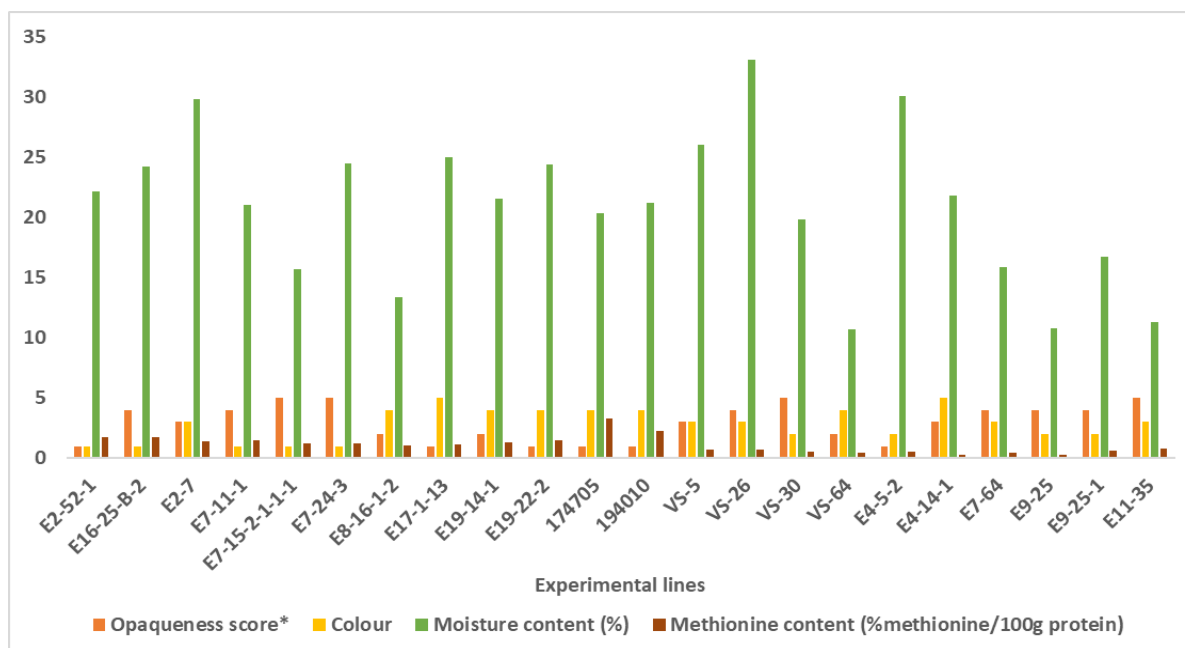
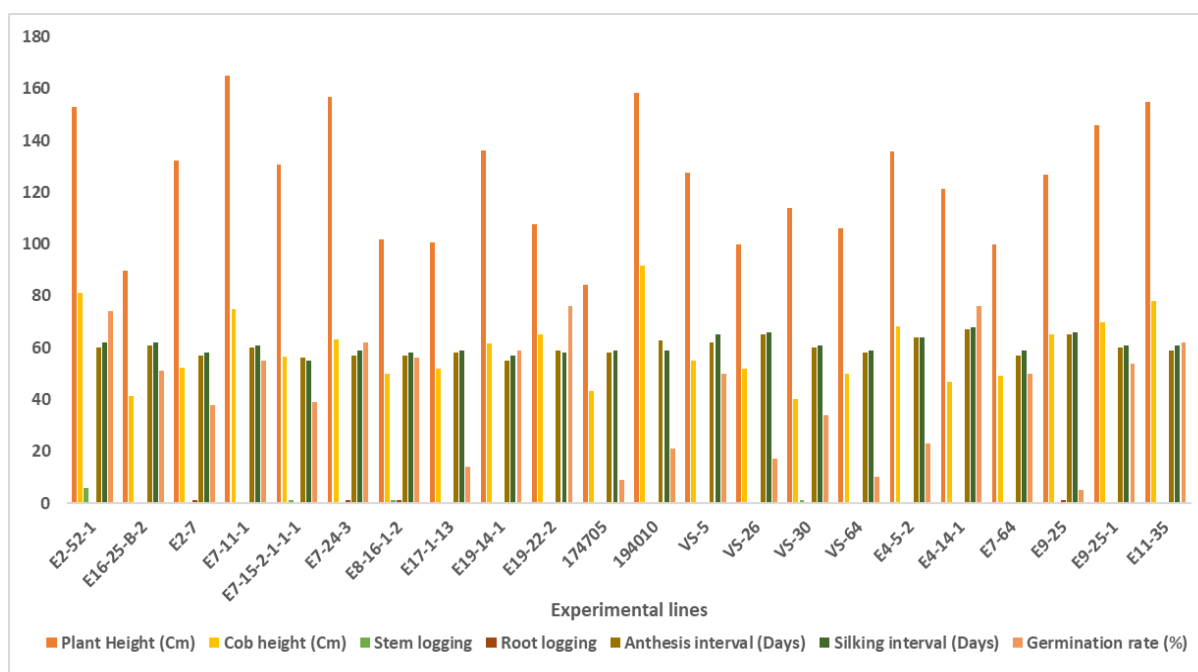


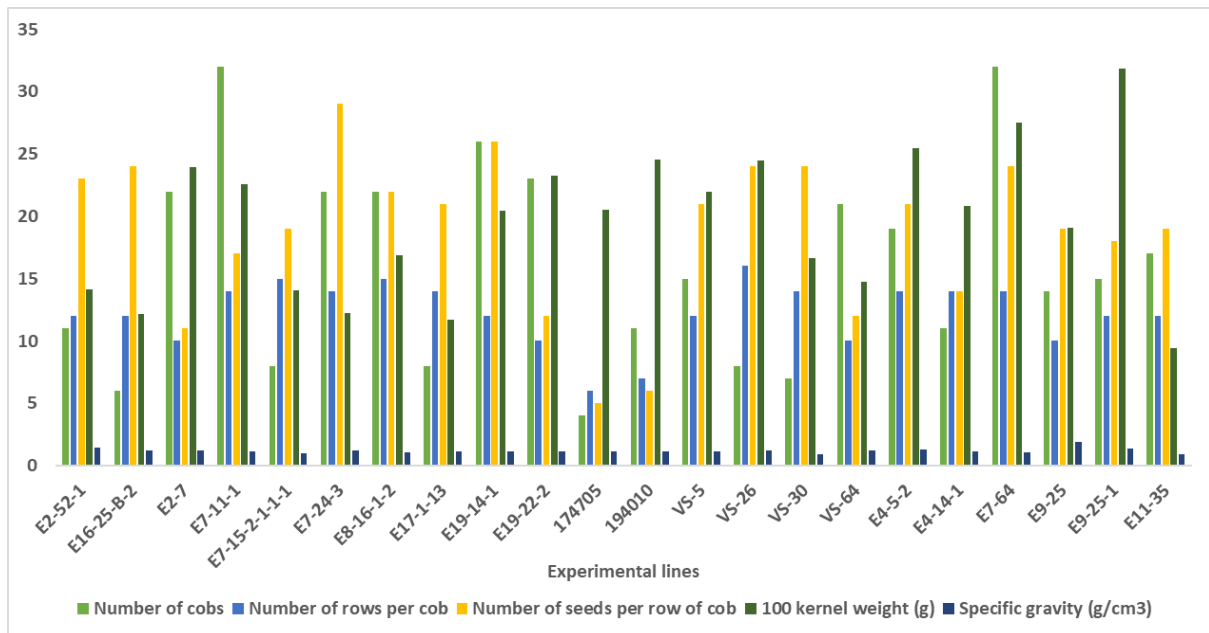


Supplementary Fig. 1 Opaqueness score, kernel colour, moisture and methionine content of the experimental lines.

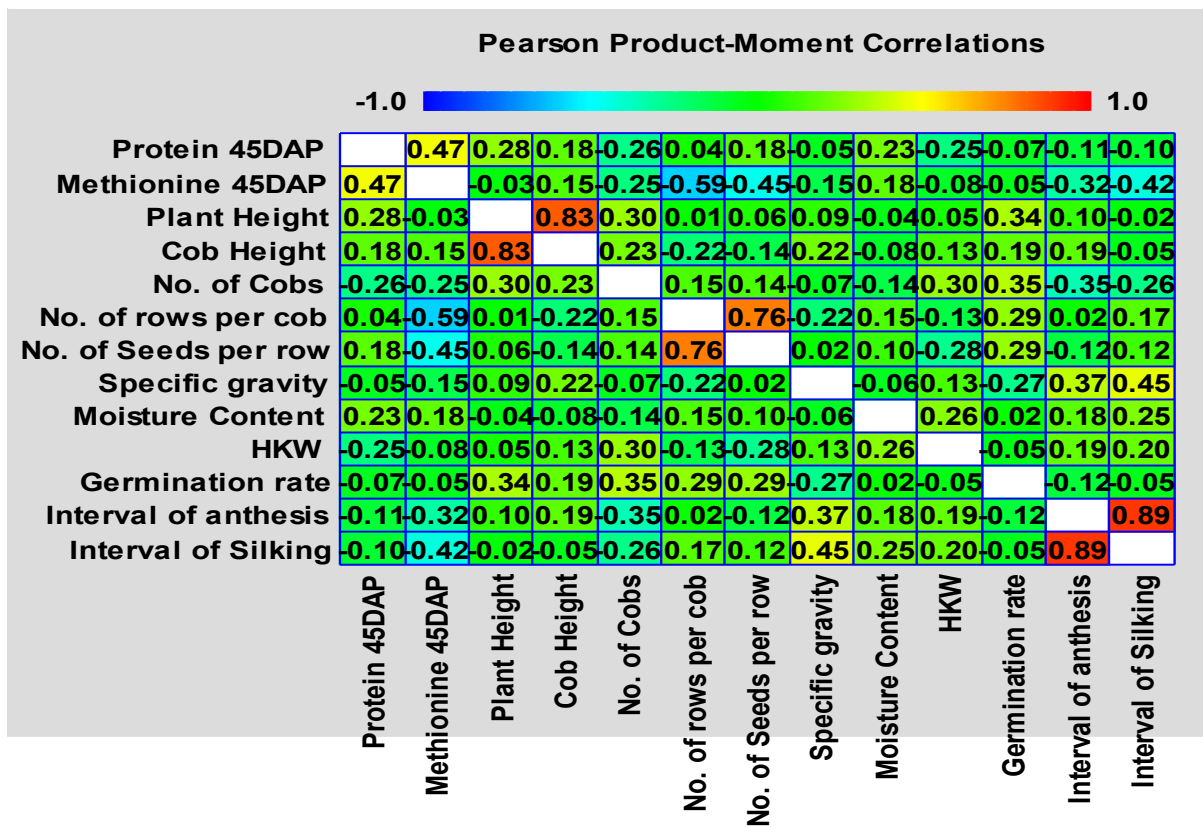
^a*Opaqueness score 1-5, for varied degree of opaqueness from 0-100% i.e. 1-0%, 2-25%, 3-50%, 4-75%, 5-100%. Seed colour: 1= Light-yellow, 2= Yellow, 3= Light-orange, 4= Orange, 5= Dark-orange



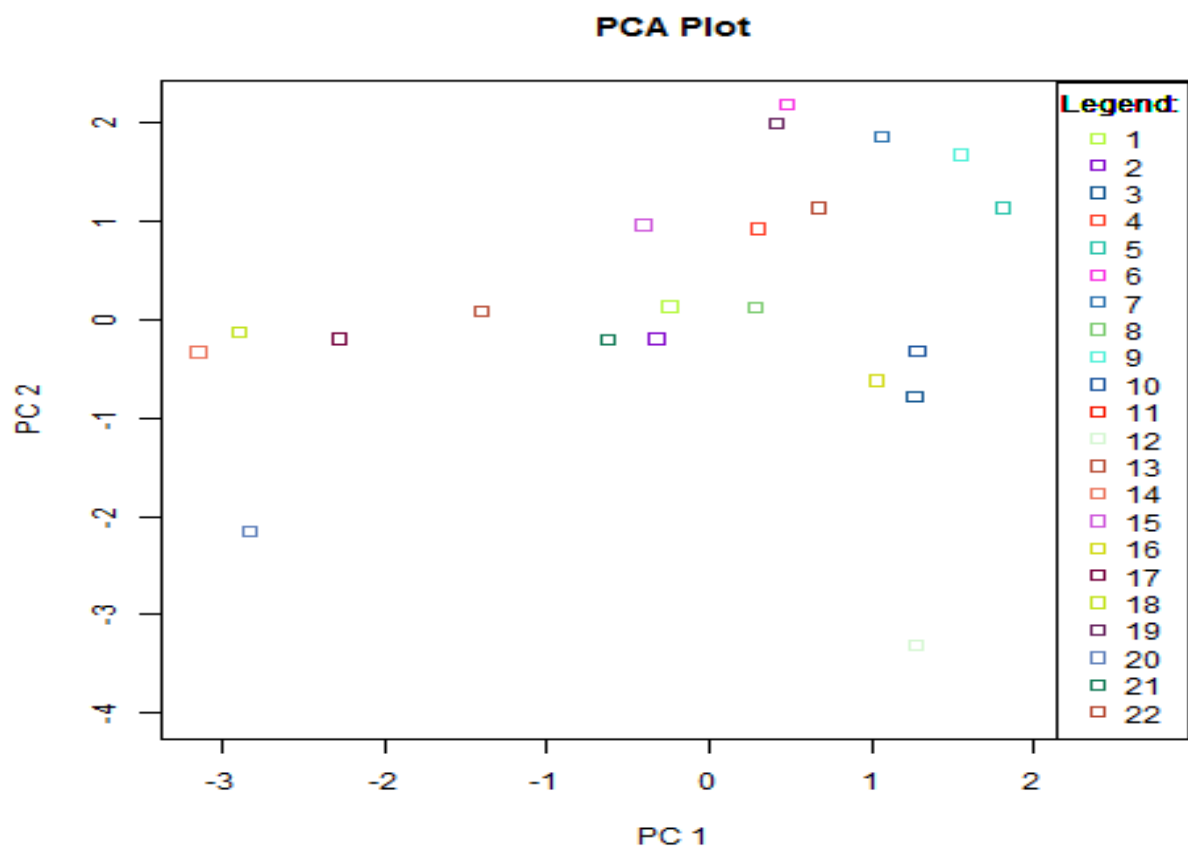
Supplementary Fig. 2 Pre-harvesting field parameters of the experimental maize lines.



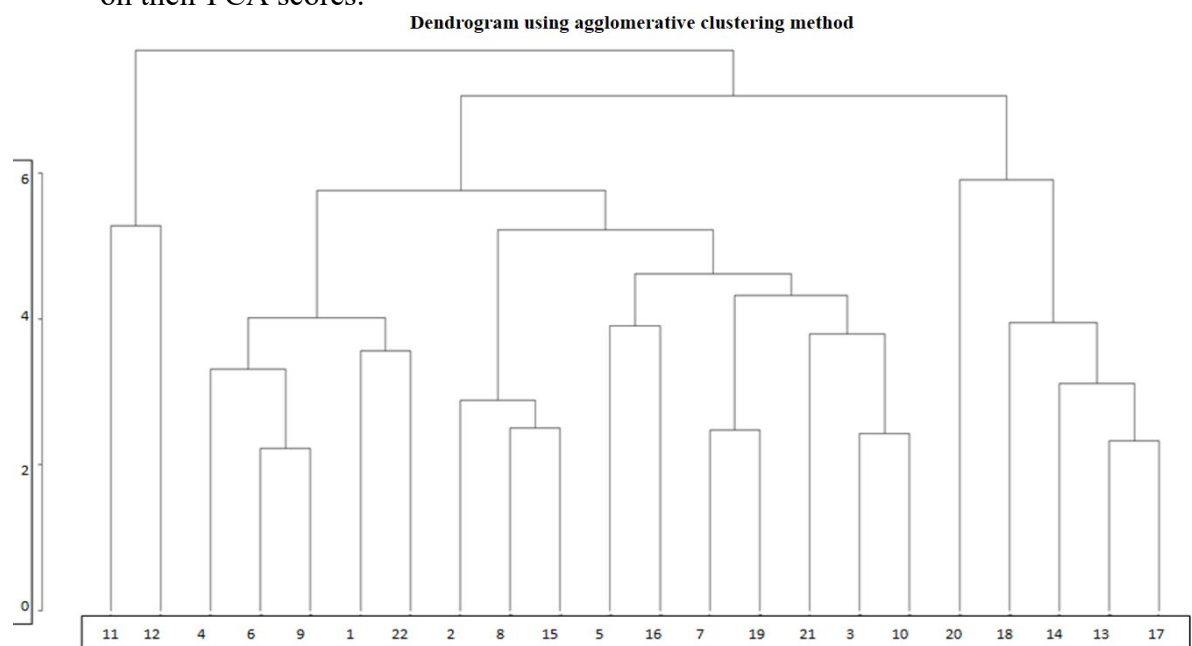
Supplementary Fig. 3 Yield components of cobs of the experimental lines.



Supplementary Fig. 4 Correlation of field and yield related cob parameters with methionine content.



Supplementary Fig. 5 Two-dimensional graph showing relative position of the genotypes based on their PCA scores.



Supplementary Fig. 6 Dendrogram showing clustering of genotypes based on Euclidean distance.

Supplementary Table 1 Seed parameters and methionine content of maize inbred lines

S. No.	Seed colour	100 KW	Specific gravity	Methionine (%)	S. No.	Seed colour	100 KW	Specific gravity	Methionine (%)
1.	1	21.03	1.31	0.73	43.	2	23.85	1.19	1.91
2.	5	25.78	1.29	1.70	44.	2	21.01	1.17	2.30
3.	2	24.14	1.10	1.45	45.	6	15.82	1.13	1.37
4.	5	17.95	1.28	0.98	46.	3	28.86	1.31	1.56
5.	3	20.49	1.28	0.76	47.	2	22.56	1.25	1.74
6.	5	18.16	1.30	1.10	48.	2	28.16	1.17	1.19
7.	6	24.31	1.22	1.72	49.	2	20.11	1.26	1.05
8.	5	15.46	1.10	2.79	50.	2	15.89	1.13	1.34
9.	3	20.06	1.25	1.64	51.	2	21.39	1.34	1.33
10.	5	23.72	1.32	1.19	52.	2	26.27	1.31	1.20
11.	2	16.16	1.15	0.93	53.	2	28.81	1.20	1.75
12.	4	15.71	1.12	0.92	54.	2	22.06	1.10	1.69
13.	2	15.75	1.13	1.12	55.	2	18.21	1.30	1.17
14.	2	17.91	1.28	0.97	56.	2	21.13	1.17	1.31
15.	2	24.30	1.35	0.61	57.	2	19.41	1.39	1.31
16.	5	12.29	1.23	0.92	58.	2	15.51	1.11	1.51
17.	1	22.38	1.24	0.57	59.	2	23.57	1.31	1.13
18.	2	24.53	1.23	1.20	60.	2	28.21	1.28	1.33
19.	2	22.51	1.25	1.38	61.	5	27.44	1.37	1.29
20.	3	23.87	1.33	1.52	62.	2	23.49	1.30	1.48
21.	2	22.02	1.22	1.58	63.	2	18.66	1.17	1.66
22.	3	22.28	1.39	1.48	64.	5	22.96	1.28	1.46
23.	6	15.75	1.31	1.78	65.	5	19.48	1.22	1.38
24.	2	25.39	1.27	1.35	66.	2	22.31	1.24	1.26
25.	2	20.00	1.25	1.59	67.	2	22.54	1.13	1.50
26.	2	23.75	1.19	1.75	68.	2	17.08	1.42	1.04
27.	2	15.62	1.30	1.56	69.	2	19.17	1.20	1.43
28.	5	18.14	1.51	1.69	70.	2	22.66	1.26	1.04
29.	2	20.11	1.26	1.72	71.	3	21.38	1.19	1.31
30.	1	17.80	1.27	1.62	72.	2	14.98	1.07	1.55
31.	2	19.95	1.25	1.62	73.	5	14.69	1.22	1.43
32.	2	15.20	1.09	1.48	74.	2	14.47	1.21	1.34
33.	2	22.54	1.25	1.33	75.	3	22.28	1.24	1.27
34.	3	20.33	1.27	1.19	76.	2	22.37	1.24	1.42
35.	3	30.98	1.29	1.05	77.	2	25.61	1.28	1.11
36.	2	17.91	1.28	1.08	78.	2	24.79	1.24	0.98
37.	2	21.88	1.22	1.54	79.	2	18.55	1.16	0.84
38.	1	23.01	1.28	1.02	80.	5	19.51	1.22	1.20
39.	2	19.10	1.19	1.35	81.	2	21.36	1.07	1.23
40.	2	24.24	1.10	1.26	82.	5	18.47	1.32	1.43
41.	2	19.95	1.11	2.28	83.	6	18.82	1.18	1.32
42.	3	25.47	1.16	1.37	84.	2	16.38	1.37	1.12

S. No.	Seed colour	100 KW	Specific gravity	Methionine (%)	S. No.	Seed colour	100 KW	Specific gravity	Methionine (%)
85.	2	15.82	1.32	1.45	126.	5	16.53	1.18	1.47
86.	2	16.38	1.09	1.44	127.	1	27.68	1.26	1.83
87.	2	11.92	1.19	0.95	128.	6	16.48	1.18	1.16
88.	5	20.47	1.28	1.13	129.	5	16.72	1.39	0.49
89.	2	21.82	1.09	1.55	130.	6	16.72	1.19	1.08
90.	5	24.28	1.21	1.16	131.	5	21.33	1.07	1.41
91.	5	21.98	1.22	1.36	132.	6	16.40	1.03	0.86
92.	7	20.52	0.93	1.31	133.	6	14.82	1.23	1.33
93.	2	24.07	1.34	1.15	134.	6	21.31	1.18	1.12
94.	2	19.75	1.10	1.54	135.	6	15.43	1.10	1.39
95.	5	18.77	1.17	0.92	136.	5	12.32	1.23	0.98
96.	2	20.53	1.28	1.05	137.	2	14.89	1.06	0.42
97.	4	20.56	1.29	1.38	138.	2	18.56	1.16	1.20
98.	1	17.99	1.12	1.36	139.	6	18.38	1.15	1.62
99.	2	24.79	1.18	1.44	140.	6	21.15	1.32	2.32
700.	2	19.91	1.24	1.53	141.	5	25.36	1.15	2.20
101.	4	18.10	1.29	1.34	142.	5	14.78	1.23	1.57
102.	5	21.57	1.20	1.57	143.	2	19.94	1.42	1.52
103.	6	22.24	1.11	1.31	144.	1	18.95	1.18	1.15
104.	5	20.37	1.20	1.15	145.	1	21.89	1.37	1.11
105.	5	15.44	1.10	2.16	146.	5	23.74	1.19	0.97
106.	5	16.53	1.18	1.15	147.	2	23.55	1.18	0.87
107.	5	25.61	1.16	0.93	148.	2	19.51	1.39	0.51
108.	5	23.32	1.30	2.04	149.	2	26.51	1.33	1.33
109.	5	19.52	1.22	1.21	150.	2	18.15	1.13	0.88
110.	5	17.72	1.27	1.25					
111.	6	19.49	1.22	1.14					
112.	4	27.07	1.23	1.52					
113.	6	26.64	2.42	1.30					
114.	6	15.53	1.29	1.47					
115.	5	20.47	1.28	0.91					
116.	1	21.16	1.32	1.36					
117.	6	11.14	1.01	1.04					
118.	2	16.59	1.18	1.34					
119.	4	18.78	1.34	0.60					
120.	2	13.33	1.33	1.57					
121.	4	11.53	1.15	1.62					
122.	2	14.28	1.19	1.31					
123.	5	18.75	1.34	1.96					
124.	2	21.49	1.19	1.32					
125.	6	18.96	1.18	1.11					

*Seed colour is given number from 1-6; 1, Light yellow; 2, Yellow; 3, Dark yellow; 4, Light orange; 5, Orange; 6, Dark orange; 100 KW, 100 kernel weight.

Supplementary Table 2 Opacity score, kernel colour, moisture and methionine content of the experimental lines

S. No.		Sample Name	Opacity score*	Colour	Moisture content (%)	Methionine content (%methionine/100 g protein)
1	HML	E2-52-1	1	LY	22.14 ^F	1.762 ^C
2		E16-25-B-2	4	LY	24.22 ^{DE}	1.716 ^C
3		E2-7	3	LO	29.82 ^B	1.377 ^E
4		E7-11-1	4	LY	20.98 ^{HI}	1.510 ^D
5		E7-15-2-1-1-1	5	LY	15.66 ^K	1.249 ^G
6		E7-24-3	4-5	LY	24.45 ^{DE}	1.257 ^{FG}
7		E8-16-1-2	2	O	13.40 ^L	1.042 ^H
8		E17-1-13	1	DO	25.00 ^D	1.108 ^H
9		E19-14-1	2	O	21.54 ^G	1.346 ^{EF}
10		E19-22-2	1	O	24.35 ^E	1.460 ^D
11		174705	1	O	20.33 ^{HI}	3.293 ^A
12		194010	1	O	21.23 ^{GH}	2.275 ^B
13	LML	VS-5	3	LO	26.01 ^C	0.726 ^{IJ}
14		VS-26	4	LO	33.06 ^A	0.696 ^{IJ}
15		VS-30	5	Y	19.81 ^I	0.552 ^K
16		VS-64	2	O	10.70 ^M	0.432 ^L
17		E4-5-2	1	Y	30.03 ^B	0.510 ^{KL}
18		E4-14-1	3	DO	21.80 ^{FG}	0.312 ^M
19		E7-64	4	LO	15.90 ^{JK}	0.439 ^L
20		E9-25	4	Y	10.75 ^M	0.305 ^M
21		E9-25-1	4	Y	16.71 ^J	0.667 ^J
22		E11-35	5	LO	11.32 ^M	0.770 ^I
Count					22	22
Average					20.8732	1.12745
Standard deviation					6.24389	0.719134
Coeff. Of variation					29.9135 %	63.7838%
Minimum					10.7	0.305
Maximum					33.06	3.293
Range					22.36	2.988
Std. Skewness					- 0.0368847	2.63566
Std. Kurtosis					- 0.488143	2.51948

^{a*}Opacity score 1–5 is given for varied degree of opacity from 0–100% i.e. 1–0%, 2–25%, 3–50%, 4–75%, 5–100%. 1= (LY) light yellow; 2= (Y) Yellow; 3= (LO) light orange; 4= (O) orange; 5= (DO) dark orange; HML, High methionine line; LML, Low methionine line

^{b*}Mean values followed with different superscripts are significantly different ($P<0.05$), using Tukey's test.

Supplementary Table 3 Pre-harvesting field parameters of the experimental maize lines

S. No.	Samp le Name	Plant Height (cm)	Cob height (cm)	Stem loggin g	Root loggin g	Anthesi s interval	Silking interval	Germinati on rate (%)
1	E2- 52-1	153.0 ^A	81.0 ^{ABC}	6	0	60	62	74
2	E16- 25-B- 2	89.7 ^E	41.3 ^C	0	0	61	62	51
3	E2-7	132.3 ^{ABC}	52.3 ^{ABC}	0	1	57	58	38
4	E7- 11-1	165.0 ^{ABC}	75.0 ^{AB}	0	0	60	61	55
5	E7- 15-2- 1-1-1	130.7 ^{ABC} D	56.7 ^{ABC}	1	0	56	55	39
6	E7- 24-3	157.0 ^{ABC} D	63.3 ^{ABC}	0	1	57	59	62
7	E8- 16-1- 2	101.7 ^{ABC} DE	50.0 ^{ABC}	1	1	57	58	56
8	E17- 1-13	100.7 ^{ABC} DE	51.7 ^{ABC}	0	0	58	59	14
9	E19- 14-1	136.0 ^{ABC} DE	61.7 ^{ABC}	0	0	55	57	59
10	E19- 22-2	107.7 ^{ABC} DE	65.0 ^{ABC}	0	0	59	58	76
11	17470 5	84.3 ^{ABCD} E	43.3 ^{ABC}	0	0	58	59	9
12	19401 0	158.3 ^{AB}	91.7 ^A	0	0	63	59	21

13	VS-5	127.7 ^{ABC} DE	55.0 ^{ABC}	0	0	62	65	50
14	VS-26	100.0 ^{ABC} DE	51.7 ^{ABC}	0	0	65	66	17
15	VS-30	114.0 ^{CDE}	40.3 ^{BC}	1	0	60	61	34
16	VS-64	106.0 ^{DE}	50.0 ^{ABC}	0	0	58	59	10
17	E4-5-2	135.7 ^{ABC} DE	68.3 ^{ABC}	0	0	64	64	23
18	E4-14-1	121.3 ^{ABC} DE	47.0 ^{ABC}	0	0	67	68	76
19	E7-64	99.7 ^{BCDE}	49.0 ^{ABC}	0	0	57	59	50
20	E9-25	126.7 ^{ABC} D	65.0 ^{ABC}	0	1	65	66	5
21	E9-25-1	146.0 ^{ABC} DE	70.0 ^A	0	0	60	61	54
22	E11-35	155.0 ^{ABC} DE	78.0 ^{ABC}	0	0	59	61	62
Count		22	22	22	22	22	22	22
Average		124.932	59.4227			60.0455	60.7273	42.5
Standar d deviatio n		24.187	13.7319			3.25836	3.29764	22.803
Coeff. of variatio n		19.3602 %	23.1088 %			5.42648 %	5.43025 %	53.6541%
Minimu m		84.3	40.3	0	0	55.0	55.0	5.0
Maximu m		165.0	91.7	6	1	67.0	68.0	76.0

Range		80.7	51.4			12.0	13.0	71.0
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^{b*}Mean values followed with different superscripts are significantly different ($P<0.05$), using Tukey's test.

Supplementary Table 4 Yield components of cobs of the experimental lines

S. No.	Sample Name	Number of cobs	Number of rows per cob	Number of seeds per row of cob	100 kernel weight (g)	Specific gravity (g/cm ³)
1	E2-52-1	11 ^{ABC}	12 ^{BCD}	23 ^{BCD}	14.13 ^K	1.42 ^B
2	E16-25-B-2	6 ^{ABC}	12 ^{BCD}	24 ^{BC}	12.15 ^L	1.22 ^C
3	E2-7	22 ^{ABC}	10 ^D	11 ^I	23.95 ^E	1.198 ^{EFGHI}
4	E7-11-1	32 ^A	14 ^{ABC}	17 ^H	22.55 ^F	1.128 ^{FGHIJK}
5	E7-15-2-1-1-1	8 ^{ABC}	15 ^A	19 ^{EFGH}	14.03 ^K	1.002 ^{KLM}
6	E7-24-3	22 ^{AB}	14 ^{AB}	29 ^A	12.20 ^L	1.206 ^{CDEFG}
7	E8-16-1-2	22 ^{ABC}	15 ^A	22 ^{CDE}	16.84 ^J	1.053 ^{JKL}
8	E17-1-13	8 ^{BC}	14 ^{ABC}	21 ^{DEFG}	11.70 ^L	1.170 ^{GHIJK}
9	E19-14-1	26 ^A	12 ^{BCD}	26 ^{BCD}	20.41 ^H	1.134 ^{GHIJK}
10	E19-22-2	23 ^A	10 ^D	12 ^I	23.26 ^E	1.163 ^{EFGHI}
11	174705	4 ^C	6 ^E	5 ^J	20.54 ^{GH}	1.122 ^{EFGHIJ}
12	194010	11 ^{BC}	7 ^E	6 ^J	24.56 ^{DE}	1.132 ^{GHIJK}
13	VS-5	15 ^{ABC}	12 ^{BCD}	21 ^{DEF}	21.95 ^{FG}	1.098 ^{HIJK}
14	VS-26	8 ^{ABC}	16 ^A	24 ^B	24.50 ^{CD}	1.225 ^{CDEF}
15	VS-30	7 ^C	14 ^{ABC}	24 ^B	16.61 ^J	0.923 ^M
16	VS-64	21 ^{ABC}	10 ^D	12 ^I	14.71 ^K	1.202 ^{DEFGH}
17	E4-5-2	19 ^{ABC}	14 ^{ABC}	21 ^{DEFG}	25.44 ^C	1.272 ^{CDE}
18	E4-14-1	11 ^{ABC}	14 ^{ABC}	14 ^I	20.84 ^H	1.158 ^{EFGHI}
19	E7-64	32 ^A	14 ^{AB}	24 ^{BC}	27.53 ^B	1.059 ^{JK}
20	E9-25	14 ^{ABC}	10 ^D	19 ^{FGH}	19.09 ^I	1.910 ^A
21	E9-25-1	15 ^{ABC}	12 ^{CD}	18 ^H	31.86 ^A	1.328 ^{CD}
22	E11-35	17 ^{ABC}	12 ^{CD}	19 ^{GH}	9.42 ^M	0.942 ^{LM}
Count		22	22	22	22	22
Average		16.0909	12.2273	18.6818	19.4668	1.18477
Standard deviation		8.17027	2.56221	6.32746	5.86808	0.198651
Coeff. Of variation		50.7757%	20.9549%	33.8696%	30.144%	16.767%
Minimum		4.0	6.0	5.0	9.42	0.923
Maximum		32.0	16.0	29.0	31.86	1.91
Range		28.0	10.0	24.0	22.44	0.987
Std. Skewness		0.841502	-1.74868	-1.39041	0.185898	4.53137
Std. Kurtosis		-0.638335	0.524574	-0.0450888	-0.622666	7.97628

^{b*}Mean values followed with different superscripts are significantly different ($p<0.05$), using Tukey's test.

Supplementary Table 5 Correlation of field and yield related cob parameters with methionine content and each other

	Methionine 45DAP	Plant Height	Cob Height	No. of Cobs	No. of rows per cob	No. of Seeds per row	Specific gravity	Moisture Content	HKW	germination rate	Interval of anthesis	Interval of Silking
Methionine 45DAP												
Plant Height	-0.0289											
	0.8983											
Cob Height	0.1505	0.8250										
	0.5039	0.0000										
No. of Cobs	-0.2487	0.3040	0.2267									
	0.2643	0.1690	0.3104									
No. of rows per cob	-0.5914	0.0128	-0.2218	0.1468								
	0.0037	0.9550	0.3211	0.5144								
No. of Seeds per row	-0.4544	0.0572	-0.1427	0.1443	0.7566							
	0.0336	0.8003	0.5265	0.5218	0.0000							
Specific gravity	-0.1454	0.0925	0.2243	-0.0683	-0.2212	0.0155						
	0.5186	0.6822	0.3156	0.7625	0.3224	0.9455						
Moisture Content	0.1804	-0.0410	-0.0803	-0.1392	0.1537	0.1024	-0.0647					
	0.4218	0.8563	0.7224	0.5366	0.4948	0.6501	0.7748					
HKW	-0.0831	0.0462	0.1295	0.2955	-0.1300	-0.2758	0.1335	0.2648				
	0.7131	0.8382	0.5657	0.1818	0.5642	0.2140	0.5536	0.2336				

Germination rate	-0.0543	0.3358	0.1887	0.3530		0.2903	-0.2684	0.0217	-0.0468			
	0.8103	0.1265	0.4003	0.1071		0.1901	0.2272	0.9235	0.8360			
Interval of anthesis	-0.3163	0.1002	0.1858	-0.3490	0.0215	-0.1194	0.3681	0.1779	0.1938	-0.1163		
	0.1516	0.6572	0.4078	0.1114	0.9243	0.5967	0.0919	0.4283	0.3876	0.6062		
Interval of Silking	-0.4222	-0.0164	-0.0512	-0.2624	0.1711	0.1212	0.4524	0.2498	0.1997	-0.0526	0.8920	
	0.0503	0.9422	0.8211	0.2381	0.4464	0.5912	0.0345	0.2622	0.3729	0.8163	0.0000	

Table shows Pearson product moment correlations between each pair of variables. These correlation coefficients range between -1 and +1 and measure the strength of the linear relationship between the variables. The second number in each location of the table is a P-value which tests the statistical significance of the estimated correlations. Highlighted value indicates the significant difference.

Supplementary Table 6 ANOVA table for field parameters at 45 days after pollination

Source	Df	Mean square	P-value	Coefficient of variance (%)
Methionine content				
Between Experimental lines	21	1.53	0.000	2.29
Moisture content				
Between Experimental lines	21	117.69	0.00	1.43
Plant height				
Between Experimental lines	21	973.18	0.00	11.68
Cob height				
Between Experimental lines	21	204.36	0.0007	13.90
Days to anthesis				
Between Experimental lines	21	31.40	0.00	0
Days to silking				
Between Experimental lines	21	32.55	0.00	0
Number of cobs				
Between Experimental lines	21	91.38	0.00	25.47
Number of rows in a cob				
Between Experimental lines	21	18.32	0.00	5.73
Number of seeds per row of cob				
Between Experimental lines	21	117.77	0.00	5.10
100 kernel weight				
Between Experimental lines	21	99.22	0.00	1.82
Specific gravity				
Between Experimental lines	21	0.11	0.00	2.91