

1. Introduction

Registration of plant germplasm has assumed a great significance under new IPR regime. The soft protection offered by getting unique/useful germplasm registered at NBPGR is being encouraged as through this mode, the contribution of the breeders is acknowledged, protected as well as made available to the researchers for augmenting their breeding program.

The Process of getting unique /useful germplasm of maize registered at NBPGR began in 2003-04. Initially, pools and populations were registered. Later on, with the focus on the development of single cross hybrid breeding program, inbred lines with unique traits were also identified for registration. Now there has been an increased thrust on the development of genetically diverse, vigorous and productive inbred lines which may be used in breeding high yielding single cross hybrids. Consequently, more number of inbred lines are being identified for registration.

In the previous bulletin “Registered germplasm of maize” (2011), Information on 70 registered inbreds was presented. During 2011-12, 10 additional inbred lines have been registered. Of these 10 lines, eight are of normal maize and one each of pop corn and oil, respectively. Among the 80 lines, majority, i.e. 54, are of normal maize; 12 QPM, eight sweet corn and three each of pop corn and high oil corn, respectively. (Fig. 1) The Unique traits in respect of registered inbred lines along with their IC and INGR numbers are compiled in Table.1 whereas, their DUS characteristics have been presented in Table. 2. The information on registered pools and population is given in Table. 3. The DUS related traits with states and group stage code have been given in Annexure 1.

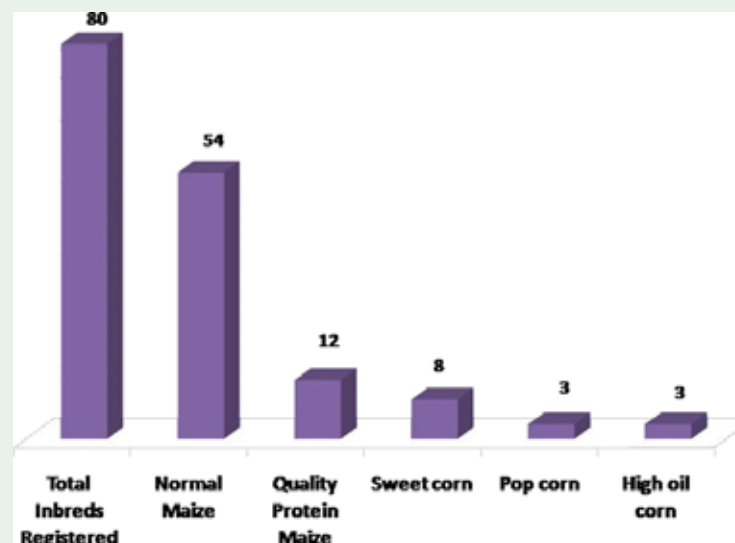


Fig.1-Maize Inbred Lines registered at NBPGR, New Delhi

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2. Accessioning of Registered inbreds

The desirable inbred lines of maize have been allotted INGR i.e. Indian Germplasm Registration Numbers by NBPGR for ready reference and future use. These lines have also been given National Identity or Indian Collection (IC) numbers. The potential lines are registered on the basis of unique/novel traits. Such traits in respect of registered inbred lines of maize is compiled in Table 1.

Table 1: INGR/IC numbers and unique traits of Registered Inbred lines

S No.	Inbred lines	INGR No.	IC No.	Developing Institute	Novel Features
Normal Maize					
1	DMRE-9	11094	0589141	DMR	Source of resistance to pink borer, attractive orange colour kernels
2	DMRE-57	11095	0589142	DMR	Source of resistance to pink borer, attractive orange colour kernels
3	KDTML-19	11082	0589131	Karimnagar	Drought tolerance, stay green and light orange flint kernels
4	KDTML-66	11083	0589132	Karimnagar	Drought tolerance, higher no. of kernel rows per cob and high test weight
5	KDTML-3	11081	0589130	Karimnagar	Drought tolerance, low ASI and orange flint kernels
6	KML-29	11080	0589129	Karimnagar	Drought and waterlogging tolerance, stay green foliage
7	DMR-PFSR-1	11041	0590094	DMR	Source of resistance to PFSR
8	DMR-PFSR-9	11042	0590095	DMR	Source of resistance to PFSR, stiff, strong and stay green stalk
9	DMR-7	10077	0584583	DMR	Flint, productive, source of resistance to pink borer
10	DMR-15	10078	0584584	DMR	Flint, productive, good combiner, cold tolerant, attractive grain colour, temperate origin
11	DMR-16	10079	0584585	DMR	Flint, productive, long cob, cold tolerant, attractive grain colour, temperate origin
12	DMR-17	10080	0584586	DMR	Flint, productive, good combiner, cold tolerant, attractive grain colour, temperate origin
13	HKI 322	10081	0584587	DMR	Medium, white, flint, productive, strong plant, dark green leaves
14	HKI-139-2	10082	0584588	DMR	Medium, white, flint, good combiner, dark green leaves
15	HKI-47	09057	0563953	Karnal	Late, bright orange, flint, good combiner
16	HKI-287L	09058	0563954	Karnal	Late, yellow, flint, long cob, productive
17	HKI-327T	09059	0563955	Karnal	Tall, late, yellow, flint
18	HKI-326	09060	0563957	Karnal	Late, yellow, flint, productive
19	HKI-1040-5	09061	0563960	Karnal	Late, yellow, flint, good combiner, highly productive
20	HKI-1341	09062	0563962	Karnal	Late, white, flint, productive, resistant to rust
21	HKI-1342	09063	0563963	Karnal	Late, white, flint, long cob, resistant to rust, MLB
22	HKI-288-2	08071	0563956	Karnal	Late, Yellow and Flint grain and MLB resistant
23	HKI-1126	08072	0563958	Karnal	Late, Yellow and Flint grain and MLB resistant
24	HKI-1040-4	08073	0563959	Karnal	Medium, Orange and Flint grain and MLB resistant

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S No.	Inbred lines	INGR No.	IC No.	Developing Institute	Novel Features
25	HKI-1015WG-8	08074	0563961	Karnal	Medium, Orange, Flint grain and MLB resistant
26	HKI-1347-4LT	08075	0563964	Karnal	Late, White, Flint grain and MLB resistant
27	V 373	10002	0584057	Almora	High 1000 seed weight (304 g) and good combiner
28	V341	—	0542345	Almora	Medium, yellow flint, tall with droopy leaf
29	V340	—	0542346	Almora	Medium, yellow flint, tall with straight leaf
30	SC7-2-1-26-1	07025	0549903	New Delhi	Resistant to MLB
31	BML 3	04024	0411280	Hyderabad	Long productive ears, resistant to PFSR, MLB and good GCA
32	BML 5	04025	0411281	Hyderabad	Dwarf, tolerant to BLSB, MLB, TLB and good GCA
33	BML 7	04026	0411283	Hyderabad	Tolerant to BLSB, MLB and SDM and good GCA
34	BML 8	04027	0411284	Hyderabad	Tall with conical shaped ears and good GCA
35	BML 11	04029	0411285	Hyderabad	Tassel resembling sorghum panicle
36	BML 14	04030	0411286	Hyderabad	Green tassel, extended pollen shedding period (7 days) and good combiner
37	BML 15	04031	0411287	Hyderabad	Water logging tolerant, resistant to MLB, TLB, BLSB, SDM and good GCA
38	BML 20	04032	0411288	Hyderabad	Tolerant to lodging and GCA
39	BML 22	04033	0411289	Hyderabad	Big tassel and Pollinator
40	HKI 323-8	04066	0405278	Karnal	Medium, MLB resistant, orange grain and good GCA
41	HKI 1025	04067	0405280	Karnal	Early, dark erect green, MLB resistant, orange grain and good GCA
42	HKI 1040-7	04068	0405281	Karnal	Dark green leaves, good pollen shedder and MLB and rust resistant
43	HKI 1105	04069	0405282	Karnal	Broad erect leaves, bold seeded and good GCA
44	HKI 1348-6-2	04070	0405283	Karnal	White grain, good pollen shedder, MLB and rust resistant, and good GCA
45	HKI 1352-58-9	04071	0405284	Karnal	Bold white grain, good pollen shedder, MLB and rust resistant and good GCA
46	HKI 1354	04072	0405285	Karnal	Long cob, white grain, good pollen shedder, MLB and rust resistant and good GCA
47	HKI 295	04073	0408327	Karnal	Medium, good pollen shedder, MLB and rust resistant and good GCA
48	HKI 586	04074	0408328	Karnal	Early dark green erect leaves, MLB resistant and good GCA
49	HKI 1344	04075	0408330	Karnal	Medium, bold white grain MLB Resistant and good GCA
50	BML 6	04119	0411282	Hyderabad	MLB, TLB, and SDM tolerant and good GCA
51	HKI 1332	04120	0408327	Karnal	Medium, dark green erect leaves and good GCA
52	HKI 209	03055	0405277	Karnal	Early, Protogyous, semi-flint, yellow grains with cap
53	HKI 335	03056	0405279	Karnal	Early with stay green
54	BML 2	03056	0411279	Hyderabad	Prolific rabbit ear, tolerant to trait BLSB, SDM, PFSR and water logging and GCA
Quality Protein Maize (QPM)					
55	HKI 5072-2 – BT	10083	0584589	DMR	Medium, yellow, flint, high tryptophan (>0.6%), attractive grain colour, dark green leaves
56	DMRQ-107	10084	0584590	DMR	Medium, yellow, flint, high tryptophan (0.66%), good combiner, thin cob

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S No.	Inbred lines	INGR No.	IC No.	Developing Institute	Novel Features
57	HKI-170(1+2)	09064	0563967	Karnal	Late, yellow, flint, high tryptophan (0.6%)
58	VQL-3	09012	0568701	Almora	Early, orange, flint, high tryptophan (0.83%)
59	VQL-8	09013	0568703	Almora	Medium, orange, flint, high tryptophan (0.94%)
60	VQL-12	09014	0568706	Almora	Early, orange, flint, high tryptophan (0.75%)
61	VQL-16	09015	0569174	Almora	Early, yellow, flint, high tryptophan (0.73%)
62	VQL-30	09016	0569176	Almora	Early, orange, flint, high tryptophan (0.71%)
63	HKI-164D-4	08076	0563965	Karnal	Late, Yellow, semi-dent grain, MLB resistant, high tryptophan (>0.6%)
64	HKI-164-7-6	08077	0563966	Karnal	Late, Orange and semi-dent grain and MLB resistant high tryptophan (>0.6%)
65	VQL-1	08011	0542343	Almora	Medium, semi-flint, yellow grains with cap, high tryptophan (>0.6%)
66	VQL- 2	08012	0542344	Almora	Early, flint, orange grains, high tryptophan (>0.6%)
Sweet corn					
67	Win Sweet Corn	10085	0584591	DMR	Yellow, shrunken, high sugar
68	DMSC-1	10086	0584592	DMR	Yellow, shrunken, high sugar
69	DMSC-6	10087	0584593	DMR	Yellow, shrunken, high sugar
70	DMS-201	10088	0584594	DMR	Yellow, shrunken, high sugar
71	DMS-203	10089	0584595	DMR	Yellow, shrunken, high sugar
72	DMS-206	10090	0584596	DMR	Yellow, shrunken, high sugar
73	DMS-207	10091	0584597	DMR	Yellow, shrunken, high sugar
74	DMS-208	10092	0584598	DMR	Yellow, shrunken, high sugar
Popcorn					
75	DPcl-10	11096	0589143	DMR	100% poppiness, good pollinator
76	HKI PC-4B	10093	0584599	DMR	Medium, high popping, good pollinator
77	HKI PCBT-3	10094	0584600	DMR	Medium, high popping, good pollinator
High Oil Corn					
78	DMRHO-57	11090	0589137	DMR	High oil content (6.34%), attractive yellow flint kernels
79	HKI-6	10095	0584601	DMR	Yellow, flint, high oil content
80	HKI-1(T)	10096	0584602	DMR	Yellow, flint, high oil content

3. DUS Profile

Developing the DUS profile of potential lines is an important aspect for registration. The inbred lines are evaluated for 31 DUS traits (as per DUS Guidelines). In this section DUS profile of registered maize inbred lines is presented.

3.1 Normal Maize

Single Cross Hybrid Technology entails the development and identification of genetically diverse hybrid-oriented germplasm. Accordingly, over the past 5-6 years, genetically diverse, productive, biotic and abiotic stress resistant/tolerant inbred lines with good *per se* performance have been developed. Thirty of these inbred lines with unique traits like high protein, resistance against fungal diseases and insect-pests, high productivity, pollen shedding capacity, drought tolerance, etc. have been registered at NBPGR, New Delhi. The DUS profile in respect of registered normal maize inbred lines has been given in this section.

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Table 2: DUS characteristics of registered Inbreds

S. No.	Characteristics	Expression (Score)		
		DMRE-9	DMRE-57	KDTML-19
1	Leaf: angle between blade and Stem (on leaf just above upper ear)	Wide (7)	Small (3)	Small (3)
2	Leaf attitude of blade (on leaf just above upper ear)	Drooping (9)	Straight (1)	Straight (1)
3	Stem: anthocyanin colouration of brace roots	Present (9)	Absent (1)	Absent (1)
4	Tassel: time of anthesis(on middle third of main axis, 50% of plants)	Late (7)	Very Early (1)	Late (7)
5	Tassel: anthocyanin colouration at base of glumes (in middle third of main axis)	Absent (1)	Absent (1)	Absent (1)
6	Tassel: anthocyanin colouration of glumes excluding base	Present (9)	Absent (1)	Present (9)
7	Tassel: anthocyanin colouration of anthers	Present (9)	Absent (1)	Absent (1)
8	Tassel: density of spikelets (in middle third of main axis)	Sparse (3)	Dense (7)	Sparse (3)
9	Tassel: angle between main axis and lateral branches	Wide (7)	Wide (7)	Wide (7)
10	Tassel: attitude of lateral branches (in lower third of tassel)	Strongly curved (9)	Straight (1)	Curved (5)
11	Ear: time of silk emergence (50% plants)	Late (7)	Very Early (1)	Late (7)
12	Ear: anthocyanin colouration of silks (on day of emergence)	Present (9)	Absent (1)	Absent (1)
13	Leaf: anthocyanin colouration of sheath (below the ear)	Absent (1)	Absent (1)	Absent (1)
14	Tassel: length of main axis above lowest side branch	Long (7)	Medium (5)	Long (7)
15	Inbred lines only plant length (up to flag leaf)	Short (3)	Medium (5)	Medium (5)
16	Plant: ear placement	Medium (5)	Medium (5)	Medium (5)
17	Leaf: width of blade (leaf of upper ear)	Narrow (3)	Narrow (3)	Medium (5)
18	Ear: length (without husk)	Medium (5)	Medium (5)	Long (7)
19	Ear: diameter (in middle)	Small (3)	Medium (5)	Medium (5)
20	Ear: shape	Conico-Cylindrical (2)	Conico-cylindrical (2)	Conico-cylindrical (2)
21	Ear: number of rows of grains	Medium (5)	Many (7)	Medium (5)
22	Ear: type of grain (in middle third of ear)	Flint (1)	Flint (1)	Flint (1)
23	Ear: colour of top of grain	Yellow (3)	Orange Yellow with cap (4)	Orange (5)
24	Ear: colouration of glumes of cob	White (1)	White (1)	White (1)
25	Kernel row arrangement	Straight (1)	Straight (1)	Irregular (3)
26	Kernel: Poppiness	Present (9)	Absent (1)	-
27	Kernel: Sweetness	Absent (1)	Absent (1)	-
28	Kernel: Waxiness	Absent (1)	Absent (1)	-
29	Kernel: Opaqueness	Absent (1)	Absent (1)	-
30	Grain shape	Round (2)	Round (2)	Round (2)
31	1000 Kernel weight	Small (3)	Medium (5)	Small (3)



DMRE-9



DMRE-57



KDTML-19

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S. No.	Characteristics	Expression (Score)		
		KDTML-66	KDTML-3	KML-29
1.	Leaf: angle between blade and Stem (on leaf just above upper ear)	Small (3)	Wide (7)	Small (3)
2.	Leaf attitude of blade (on leaf just above upper ear)	Straight (1)	Drooping (9)	Straight (1)
3.	Stem: anthocyanin colouration of brace roots	Absent (1)	Present (9)	Absent (1)
4.	Tassel: time of anthesis (on middle third of main axis, 50% of plants)	Late (7)	Late (7)	Late (7)
5.	Tassel: anthocyanin colouration at base of glumes (in middle third of main axis)	Absent (1)	Absent (1)	Absent (1)
6.	Tassel: anthocyanin colouration of glumes excluding base	Absent (1)	Absent (1)	Absent (1)
7.	Tassel: anthocyanin colouration of Anthers	Absent (1)	Absent (1)	Absent (1)
8.	Tassel: density of spikelets (in middle third of main axis)	Sparse (3)	Dense (7)	Dense (7)
9.	Tassel: angle between main axis and lateral branches	Wide (7)	Wide (7)	Narrow (1)
10.	Tassel: attitude of lateral branches (in lower third of tassel)	Curved (5)	Curved (5)	Straight (1)
11.	Ear: time of silk emergence (50% plants)	Late (7)	Late (7)	Late (7)
12.	Ear: anthocyanin colouration of silks (on day of emergence)	Absent (1)	Present (9)	Present (9)
13.	Leaf: anthocyanin colouration of sheath (below the ear)	Absent (1)	Absent (1)	Absent (1)
14.	Tassel: length of main axis above lowest side branch	Medium (5)	Long (7)	Medium (5)
15.	Inbred lines only plant length (up to flag leaf)	Medium (5)	Short (3)	Short (3)
16.	Plant: ear placement	Medium (5)	Medium (5)	Medium (5)
17.	Leaf: width of blade (leaf of upper ear)	Narrow (3)	Medium (5)	Narrow (3)
18.	Ear: length (without husk)	Long (7)	Medium (5)	Medium (5)
19.	Ear: diameter (in middle)	Large (7)	Large (7)	Medium (5)
20.	Ear: shape	Conico-cylindrical (2)	Conico-cylindrical (2)	Conical (1)
21.	Ear: number of rows of grains	Medium (5)	Many (7)	Medium (5)
22.	Ear: type of grain (in middle third of ear)	Flint (1)	Flint (1)	Flint (1)
23.	Ear: colour of top of grain	Orange (5)	Orange (5)	Orange (5)
24.	Ear: colouration of glumes of cob	White (1)	White (1)	White (1)
25.	Kernel row arrangement	Straight (3)	Irregular (3)	Straight (1)
26.	Kernel: Poppiness	-	-	-
27.	Kernel: Sweetness	-	-	-
28.	Kernel: Waxiness	-	-	-
29.	Kernel: Opaqueness	-	-	-
30.	Grain shape	Round (2)	Round (2)	Round (2)
31.	1000 Kernel weight	Small (3)	Small (3)	Small (3)



KDTML-66



KDTML-3



KML-29

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S. No.	Characteristics	Expression (Score)	
		PFSR-R1	PFSR-R9
1.	Leaf: angle between blade and Stem (on leaf just above upper ear)	Small (3)	wide (7)
2.	Leaf attitude of blade (on leaf just above upper ear)	Drooping (9)	Straight (1)
3.	Stem: anthocyanin colouration of brace roots	Present (9)	Present (9)
4.	Tassel: time of anthesis(on middle third of main axis, 50% of plants)	Medium (5)	Late (7)
5.	Tassel: anthocyanin colouration at base of glumes (in middle third of main axis)	Absant (1)	Absent (1)
6.	Tassel: anthocyanin colouration of glumes excluding base	Absant (1)	Present (9)
7.	Tassel: anthocyanin colouration of Anthers	Absant (1)	Absent (1)
8.	Tassel: density of spikelets (in middle third of main axis)	Sparse (3)	Sparse (3)
9.	Tassel: angle between main axis and lateral branches	Narrow (3)	Narrow (3)
10.	Tassel: attitude of lateral branches (in lower third of tassel)	Curved (5)	Curved (5)
11.	Ear: time of silk emergence (50% plants)	Medium (5)	Late (7)
12.	Ear: anthocyanin colouration of silks (on day of emergence)	Absant (1)	Absent (1)
13.	Leaf: anthocyanin colouration of sheath (below the ear)	Absant (1)	Absent (1)
14.	Tassel:length of main axis above lowest side branch	Long (7)	Long (7)
15.	Inbred lines only plant length (up to flag leaf)	Short (3)	Long (7)
16.	Plant: ear placement	High (7)	High (7)
17.	Leaf: width of blade (leaf of upper ear)	Narrow (3)	Narrow (3)
18.	Ear: length (without husk)	Short (3)	Medium (5)
19.	Ear: diameter (in middle)	Small (3)	Medium (5)
20.	Ear: shape	Conical (1)	Conical (1)
21.	Ear: number of rows of grains	Medium (5)	Medium (5)
22.	Ear: type of grain (in middle third of ear)	Flint (1)	Semi flint (2)
23.	Ear: colour of top of grain	Yellow (3)	Yellow (3)
24.	Ear: colouration of glumes of cob	White (1)	White (1)
25.	Kernel row arrangement	Straight (1)	Spiral (2)
26.	Kernel: Poppinesss	Absent (1)	Absent (1)
27.	Kernel: Sweetness	Absent (1)	Absent (1)
28.	Kernel: Waxiness	Absent (1)	Absent (1)
29.	Kernel: Opaqueness	Absent (1)	Absent (1)
30.	Grain shape	Round (2)	Round (2)
31.	1000 Kernel weight	Medium (5)	Large (7)



PFSR-R1



PFSR-R9

Registered Germplasm of Maize (2nd Edition)

S. No.	Characteristics	Expression (Score)		
		DMR-7	DMR-15	DMR-16
1	Leaf: angle between blade and stem (on leaf just above upper ear)	Small (3)	Small (3)	Small (3)
2	Leaf attitude of blade (on leaf just above upper ear)	Drooping (9)	Straight (3)	Drooping (9)
3	Stem: anthocyanin colouration of brace roots	Absent (1)	Absent (1)	Absent (1)
4	Tassel: time of anthesis (50% of plants)	Late (7)	Late (7)	Late (7)
5	Tassel: anthocyanin colouration at base of glume (in middle third of main axis)	Present (9)	Absent (1)	Absent (1)
6	Tassel: anthocyanin colouration of glumes excluding base	Present (9)	Absent (1)	Absent (1)
7	Tassel: anthocyanin colouration of anthers	Present (9)	Absent (1)	Absent (1)
8	Tassel: density of spikelets (in middle third of main axis)	Sparse (3)	Sparse (3)	Sparse (3)
9	Tassel: angle between main axis and lateral branches	Narrow (3)	Wide (7)	Wide (7)
10	Tassel: attitude of lateral branches (in lower third of tassel)	Curved (5)	Straight (1)	Straight (1)
11	Ear: time of silk emergence (50% plants)	Late (7)	Late (7)	Late (7)
12	Ear: anthocyanin colouration of silks	Present (9)	Absent (1)	Absent (1)
13	Leaf: anthocyanin colouration of sheath	Present (9)	Absent (1)	Absent (1)
14	Tassel: length of main axis above lowest side branch	Medium (5)	Low (3)	Medium (5)
15	Plant: length (up to flag leaf)	Medium (5)	Short (3)	Short (3)
16	Plant: ear placement	Medium (5)	Low (3)	Low (3)
17	Leaf: width of blade (leaf of upper ear)	Narrow (3)	Medium (5)	Broad (7)
18	Ear: length (without husk)	Medium (5)	Short (3)	Medium (5)
19	Ear: diameter (in middle)	Small (3)	Small (3)	Small (3)
20	Ear: shape	Conical (1)	Cylindrical (3)	Conical (1)
21	Ear: number of rows of grains	Medium (5)	Many (7)	Medium (5)
22	Ear: type of grain (in middle third of ear)	Flint (1)	Flint (1)	Flint (1)
23	Ear: colour of top of grain	Yellow (3)	Yellow (3)	Yellow with cap (4)
24	Ear: colouration of glumes of cob	White (1)	White (1)	White (1)
25	Kernel: row arrangement	Straight (1)	Irregular (3)	Straight (1)
26	Kernel: poppiness	Absent (1)	Absent (1)	Absent (1)
27	Kernel: sweetness	Absent (1)	Absent (1)	Absent (1)
28	Kernel: waxiness	Absent (1)	Absent (1)	Absent (1)
29	Kernel: opaqueness	Absent (1)	Absent (1)	Absent (1)
30	Kernel: shape	Round (2)	Round (2)	Round (2)
31	Kernel: size (1000 kernel weight)	Small (3)	Medium (5)	Small (3)



DMR-7



DMR-15



DMR-16

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S. No.	Characteristics	Expression (Score)		
		DMR-17	HKI-47	HKI-287L
1	Leaf: angle between blade and stem (on leaf just above upper ear)	Small (3)	Small (3)	Small (3)
2	Leaf attitude of blade (on leaf just above upper ear)	Straight (1)	Straight (1)	Straight (1)
3	Stem: anthocyanin colouration of brace roots	Absent (1)	Present (9)	Present (9)
4	Tassel: time of anthesis (50% of plants)	Late (7)	Late (7)	Late (7)
5	Tassel: anthocyanin colouration at base of glume (in middle third of main axis)	Absent (1)	Present (9)	Absent (1)
6	Tassel: anthocyanin colouration of glumes excluding base	Absent (1)	Present (9)	Absent (1)
7	Tassel: anthocyanin colouration of anthers	Absent (1)	Present (9)	Present (9)
8	Tassel: density of spikelets (in middle third of main axis)	Dense (7)	Sparse (3)	Sparse (3)
9	Tassel: angle between main axis and lateral branches	Medium (5)	Narrow (3)	Narrow (3)
10	Tassel: attitude of lateral branches (in lower third of tassel)	Straight (1)	Straight (1)	Straight (1)
11	Ear: time of silk emergence (50% plants)	Late (7)	Late (7)	Late (7)
12	Ear: anthocyanin colouration of silks	Absent (1)	Present (9)	Present (9)
13	Leaf: anthocyanin colouration of sheath	Absent (1)	Present (9)	Absent (1)
14	Tassel: length of main axis above lowest side branch	Medium (5)	Medium (5)	Medium (5)
15	Plant: length (up to flag leaf)	Short (3)	Medium (5)	Long
16	Plant: ear placement	Low (3)	Medium (5)	Medium (5)
17	Leaf: width of blade (leaf of upper ear)	Medium (5)	Medium (5)	Medium (5)
18	Ear: length (without husk)	Short (3)	Medium (5)	Medium (5)
19	Ear: diameter (in middle)	Small (3)	Medium (5)	Small (3)
20	Ear: shape	Conico-cylindrical (2)	Conical-cylindrical (2)	Conical (1)
21	Ear: number of rows of grains	Medium (5)	Medium (5)	Medium (5)
22	Ear: type of grain (in middle third of ear)	Flint (1)	Flint (1)	Flint (1)
23	Ear: colour of top of grain	Yellow (3)	Orange (1)	Orange with cap (5)
24	Ear: colouration of glumes of cob	White (1)	White (1)	White (1)
25	Kernel: row arrangement	Straight (1)	Straight (1)	Straight (1)
26	Kernel: poppiness	Absent (1)	Absent (1)	Absent (1)
27	Kernel: sweetness	Absent (1)	Absent (1)	Absent (1)
28	Kernel: waxiness	Absent (1)	Absent (1)	Absent (1)
29	Kernel: opaqueness	Absent (1)	Absent (1)	Absent (1)
30	Kernel: shape	Round (2)	Round (2)	Round (2)
31	Kernel: size (1000 kernel weight)	Medium (5)	Medium (5)	Medium (5)



DMR-17



HKI-47



HKI-287L

Registered Germplasm of Maize (2nd Edition)

S. No.	Characteristics	Expression (Score)		
		HKI-326	HKI-1040-5	HKI-327T
1	Leaf: angle between blade and stem (on leaf just above upper ear)	Small (3)	Small (3)	Small (3)
2	Leaf attitude of blade (on leaf just above upper ear)	Straight (1)	Straight (1)	Straight (1)
3	Stem: anthocyanin colouration of brace roots	Present	Present (9)	Present (9)
4	Tassel: time of anthesis (50% of plants)	Late (7)	Late (7)	Late (7)
5	Tassel: anthocyanin colouration at base of glume (in middle third of main axis)	Absent (1)	Present (9)	Present (9)
6	Tassel: anthocyanin colouration of glumes excluding base	Absent (1)	Present (9)	Present (9)
7	Tassel: anthocyanin colouration of anthers	Absent (1)	Present (9)	Absent (1)
8	Tassel: density of spikelets (in middle third of main axis)	Sparse (3)	Large (1)	Sparse (3)
9	Tassel: angle between main axis and lateral branches	Narrow (3)	Medium (5)	Narrow (3)
10	Tassel: attitude of lateral branches (in lower third of tassel)	Straight (1)	Erect (1)	Straight (1)
11	Ear: time of silk emergence (50% plants)	Late (7)	Late (7)	Late (7)
12	Ear: anthocyanin colouration of silks	Present (9)	Present (9)	Present (9)
13	Leaf: anthocyanin colouration of sheath	Absent (1)	Present (9)	Absent (1)
14	Tassel: length of main axis above lowest side branch	Medium (5)	Long (1)	Medium (5)
15	Plant: length (up to flag leaf)	Medium (5)	Medium (5)	Long (7)
16	Plant: ear placement	Medium (5)	Medium (5)	Medium (5)
17	Leaf: width of blade (leaf of upper ear)	Medium (5)	Medium (5)	Medium (5)
18	Ear: length (without husk)	Long (7)	Medium (5)	Medium (5)
19	Ear: diameter (in middle)	Medium (5)	Medium (5)	Medium (5)
20	Ear: shape	Cylindrical (3)	Conical (1)	Conical (1)
21	Ear: number of rows of grains	Medium (5)	Medium (5)	Medium (5)
22	Ear: type of grain (in middle third of ear)	Flint (1)	Flint (1)	Flint (1)
23	Ear: colour of top of grain	Orange (5)	Orange (1)	Yellow with cap (4)
24	Ear: colouration of glumes of cob	White (1)	Purple (3)	White (1)
25	Kernel: row arrangement	Straight (1)	Regular (3)	Straight (1)
26	Kernel: poppiness	Absent (1)	Absent (1)	Absent (1)
27	Kernel: sweetness	Absent (1)	Absent (1)	Absent (1)
28	Kernel: waxiness	Absent (1)	Absent (1)	Absent (1)
29	Kernel: opaqueness	Absent (1)	Absent (1)	Absent (1)
30	Kernel: shape	Round (2)	Round (2)	Round (2)
31	Kernel: size (1000 kernel weight)	Medium (5)	Medium (5)	Medium (5)



HKI-326



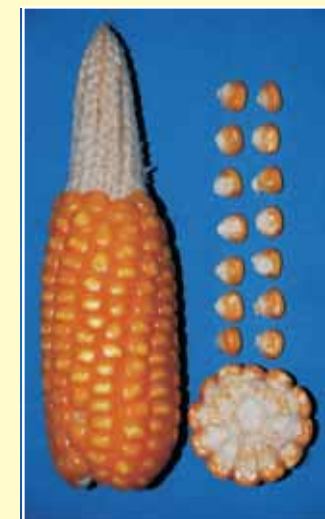
HKI-1040-5



HKI-327T

Registered Germplasm of Maize (2nd Edition)

S. No.	Characteristics	Expression (Score)		
		HKI-288-2	HKI-1126	HKI-1040-7
1	Leaf: angle between blade and stem (on leaf just above upper ear)	Wide (7)	Small (3)	Small (3)
2	Leaf attitude of blade (on leaf just above upper ear)	Drooping (3)	Straight (1)	Drooping (9)
3	Stem: anthocyanin colouration of brace roots	Present (9)	Present (9)	Present (9)
4	Tassel: time of anthesis (50% of plants)	Late (7)	Late (7)	Late (7)
5	Tassel: anthocyanin colouration at base of glume (in middle third of main axis)	Present (9)	Present (9)	Present (9)
6	Tassel: anthocyanin colouration of glumes excluding base	Absent (1)	Present (9)	Absent (1)
7	Tassel: anthocyanin colouration of anthers	Absent (1)	Present (9)	Present (9)
8	Tassel: density of spikelets (in middle third of main axis)	Dense (7)	Sparse (3)	Sparse (3)
9	Tassel: angle between main axis and lateral branches	Narrow (3)	Narrow (3)	Narrow (3)
10	Tassel: attitude of lateral branches (in lower third of tassel)	Straight (1)	Straight (1)	Straight (1)
11	Ear: time of silk emergence (50% plants)	Late (7)	Late (7)	Late (7)
12	Ear: anthocyanin colouration of silks	Present (9)	Present (9)	Absent (1)
13	Leaf: anthocyanin colouration of sheath	Absent (1)	Absent (1)	Absent (1)
14	Tassel: length of main axis above lowest side branch	Medium (5)	Medium (5)	Long (7)
15	Plant: length (up to flag leaf)	Medium (5)	Medium (5)	Long (7)
16	Plant: ear placement	Medium (5)	Medium (5)	Low (3)
17	Leaf: width of blade (leaf of upper ear)	Medium (5)	Broad (7)	Broad (7)
18	Ear: length (without husk)	Medium (5)	Medium (5)	Medium (5)
19	Ear: diameter (in middle)	Medium (5)	Small (3)	Medium (5)
20	Ear: shape	Conical (5)	Conical (1)	Conical (1)
21	Ear: number of rows of grains	Medium (5)	Medium (5)	Many (7)
22	Ear: type of grain (in middle third of ear)	Flint (1)	Flint (1)	Semi-flint (2)
23	Ear: colour of top of grain	Yellow (3)	Yellow with cap (4)	Yellow (3)
24	Ear: colouration of glumes of cob	White (1)	White (1)	Dark purple (3)
25	Kernel: row arrangement	Straight (2)	Straight (1)	Irregular (3)
26	Kernel: poppiness	Absent (1)	Absent (1)	Absent (1)
27	Kernel: sweetness	Absent (1)	Absent (1)	Absent (1)
28	Kernel: waxiness	Absent (1)	Absent (1)	Absent (1)
29	Kernel: opaqueness	Absent (1)	Absent (1)	Absent (1)
30	Kernel: shape	Round (2)	Round (2)	Tooted (4)
31	Kernel: size (1000 kernel weight)	Medium (5)	Medium (5)	Medium (5)



HKI-288-2



HKI-1126

Registered Germplasm of Maize (2nd Edition)

S. No.	Characteristics	Expression (Score)		
		HKI-1105	HKI-1332	HKI-1341
1	Leaf: angle between blade and stem (on leaf just above upper ear)	Small (3)	Small (3)	Small (1)
2	Leaf attitude of blade (on leaf just above upper ear)	Straight (1)	Straight (1)	Straight (1)
3	Stem: anthocyanin colouration of brace roots	Present (9)	Absent (1)	Present (9)
4	Tassel: time of anthesis (50% of plants)	Late (7)	Late (7)	Late (7)
5	Tassel: anthocyanin colouration at base of glume (in middle third of main axis)	Absent (1)	Absent (1)	Absent (1)
6	Tassel: anthocyanin colouration of glumes excluding base	Absent (1)	Absent (1)	Absent (1)
7	Tassel: anthocyanin colouration of anthers	Present (9)	Present (9)	Absent (1)
8	Tassel: density of spikelets (in middle third of main axis)	Sparse (3)	Sparse (3)	Sparse (3)
9	Tassel: angle between main axis and lateral branches	Narrow (3)	Narrow (3)	Narrow (3)
10	Tassel: attitude of lateral branches (in lower third of tassel)	Straight (1)	Straight (1)	Straight (1)
11	Ear: time of silk emergence (50% plants)	Late (7)	Late (7)	Late (7)
12	Ear: anthocyanin colouration of silks	Absent (1)	Absent (1)	Absent (1)
13	Leaf: anthocyanin colouration of sheath	Absent (1)	Absent (1)	Absent (1)
14	Tassel: length of main axis above lowest side branch	Medium (5)	Long (7)	Medium (5)
15	Plant: length (up to flag leaf)	Short (3)	Medium (5)	Medium (5)
16	Plant: ear placement	High (7)	High (7)	Medium (5)
17	Leaf: width of blade (leaf of upper ear)	Broad (7)	Broad (7)	Medium (5)
18	Ear: length (without husk)	Medium (5)	Medium (5)	Medium (5)
19	Ear: diameter (in middle)	Small (3)	Medium (5)	Medium (5)
20	Ear: shape	Conical (1)	Conico-cylindrical (2)	Conical (1)
21	Ear: number of rows of grains	Medium (5)	Many (7)	Medium (5)
22	Ear: type of grain (in middle third of ear)	Flint (1)	Semi-flint (2)	Flint (1)
23	Ear: colour of top of grain	Yellow (3)	Yellow with cap (4)	White (1)
24	Ear: colouration of glumes of cob	White (1)	White (1)	White (1)
25	Kernel: row arrangement	Irregular (3)	Irregular (3)	Straight (1)
26	Kernel: poppiness	Absent (1)	Absent (1)	Absent (1)
27	Kernel: sweetness	Absent (1)	Absent (1)	Absent (1)
28	Kernel: waxiness	Absent (1)	Absent (1)	Absent (1)
29	Kernel: opaqueness	Absent (1)	Present (9)	Absent (1)
30	Kernel: shape	Round (2)	Round (2)	Round (2)
31	Kernel: size (1000 kernel weight)	Medium (5)	Small (3)	Medium (5)



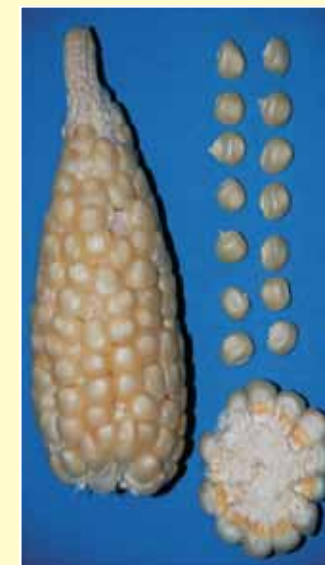
HKI-1105



HKI-1341

Registered Germplasm of Maize (2nd Edition)

S. No.	Characteristics	Expression (Score)		
		HKI-1342	HKI-1354	HKI-1344
1	Leaf: angle between blade and stem (on leaf just above upper ear)	Small (3)	Small (3)	Small (3)
2	Leaf attitude of blade (on leaf just above upper ear)	Straight (1)	Drooping (9)	Drooping (9)
3	Stem: anthocyanin colouration of brace roots	Present (9)	Absent (1)	Present (9)
4	Tassel: time of anthesis (50% of plants)	Late (7)	Late (7)	Late (7)
5	Tassel: anthocyanin colouration at base of glume (in middle third of main axis)	Present (9)	Absent (1)	Absent (1)
6	Tassel: anthocyanin colouration of glumes excluding base	Absent (1)	Absent (1)	Absent (1)
7	Tassel: anthocyanin colouration of anthers	Absent (1)	Present (9)	Present (9)
8	Tassel: density of spikelets (in middle third of main axis)	Sparse (3)	Sparse (3)	Sparse (3)
9	Tassel: angle between main axis and lateral branches	Narrow (3)	Narrow (3)	Narrow (3)
10	Tassel: attitude of lateral branches (in lower third of tassel)	Straight (1)	Curved (5)	Curved (5)
11	Ear: time of silk emergence (50% plants)	Late (7)	Late (7)	Late (7)
12	Ear: anthocyanin colouration of silks	Present (9)	Present (9)	Absent (1)
13	Leaf: anthocyanin colouration of sheath	Absent (1)	Absent (1)	Absent (1)
14	Tassel: length of main axis above lowest side branch	Medium (5)	Long (7)	Long (7)
15	Plant: length (up to flag leaf)	Medium (5)	Medium (5)	Medium (5)
16	Plant: ear placement	Medium (5)	Low (3)	High (7)
17	Leaf: width of blade (leaf of upper ear)	Medium (5)	Broad (7)	Medium (5)
18	Ear: length (without husk)	Medium (5)	Long (7)	Medium (5)
19	Ear: diameter (in middle)	Medium (5)	Small (3)	Small (3)
20	Ear: shape	Conical (1)	Conico- Cylindrical (2)	Conical (1)
21	Ear: number of rows of grains	Medium (5)	Many (7)	Medium (5)
22	Ear: type of grain (in middle third of ear)	Flint (1)	Semi-flint (2)	Semi-flint (2)
23	Ear: colour of top of grain	White (1)	White with cap (2)	White (1)
24	Ear: colouration of glumes of cob	White (1)	White (1)	White (1)
25	Kernel: row arrangement	Straight (1)	Straight (1)	Irregular (3)
26	Kernel: poppiness	Absent (1)	Absent (1)	Absent (1)
27	Kernel: sweetness	Absent (1)	Absent (1)	Absent (1)
28	Kernel: waxiness	Absent (1)	Absent (1)	Absent (1)
29	Kernel: opaqueness	Absent (1)	Absent (1)	Absent (1)
30	Kernel: shape	Round (2)	Indented (3)	Tooted (4)
31	Kernel: size (1000 kernel weight)	Medium (5)	Small (3)	Small (3)



HKI-1342

Registered Germplasm of Maize (2nd Edition)

S. No.	Characteristics	Expression (Score)		
		HKI-1347	HKI-1348	BML-2
1	Leaf: angle between blade and stem (on leaf just above upper ear)	Small (1)	Small (3)	Small (3)
2	Leaf attitude of blade (on leaf just above upper ear)	Straight (1)	Drooping (9)	Straight(1)
3	Stem: anthocyanin colouration of brace roots	Present (9)	Present (9)	Present (9)
4	Tassel: time of anthesis (50% of plants)	Late (7)	Late (7)	Late (7)
5	Tassel: anthocyanin colouration at base of glume (in middle third of main axis)	Absent (1)	Absent (1)	Absent (1)
6	Tassel: anthocyanin colouration of glumes excluding base	Absent (1)	Absent (1)	Absent (1)
7	Tassel: anthocyanin colouration of anthers	Absent (1)	Present (9)	Absent (1)
8	Tassel: density of spikelets (in middle third of main axis)	Sparse (3)	Dense (7)	Dense(7)
9	Tassel: angle between main axis and lateral branches	Narrow (3)	Narrow (3)	Wide(7)
10	Tassel: attitude of lateral branches (in lower third of tassel)	Straight (1)	Straight (1)	Straight (1)
11	Ear: time of silk emergence (50% plants)	Late (7)	Late (7)	Late (7)
12	Ear: anthocyanin colouration of silks	Absent (1)	Absent (1)	Present (9)
13	Leaf: anthocyanin colouration of sheath	Absent (1)	Absent (1)	Absent (1)
14	Tassel: length of main axis above lowest side branch	Medium (5)	Medium (5)	Medium (5)
15	Plant: length (up to flag leaf)	Medium (5)	Short (3)	Long(7)
16	Plant: ear placement	Medium (5)	Low (3)	Medium (5)
17	Leaf: width of blade (leaf of upper ear)	Medium (5)	Medium (5)	Broad (7)
18	Ear: length (without husk)	Medium (5)	Short (3)	Long (7)
19	Ear: diameter (in middle)	Medium (5)	Small (3)	Medium (5)
20	Ear: shape	Conical (1)	Conical (1)	Cylindrical (3)
21	Ear: number of rows of grains	Medium (5)	Medium (5)	Medium (5)
22	Ear: type of grain (in middle third of ear)	Flint (1)	Dent (3)	Semi Dent (2)
23	Ear: colour of top of grain	White (1)	White (1)	Orange with cap (7)
24	Ear: colouration of glumes of cob	White (1)	White (1)	White (1)
25	Kernel: row arrangement	Straight (1)	Spiral (2)	Straight (1)
26	Kernel: poppiness	Absent (1)	Absent (1)	Absent (1)
27	Kernel: sweetness	Absent (1)	Absent (1)	Absent (1)
28	Kernel: waxiness	Absent (1)	Absent (1)	Absent (1)
29	Kernel: opaqueness	Absent (1)	Absent (1)	Absent (1)
30	Kernel: shape	Round (2)	Tooted (4)	Round (2)
31	Kernel: size (1000 kernel weight)	Medium (5)	Small (3)	Large(7)



HKI 1347

Registered Germplasm of Maize (2nd Edition)

S. No.	Characteristics	Expression (Score)		
		HKI 139-2	HKI 1348-6-2	HKI 1352-58-9
1	Leaf: angle between blade and stem (on leaf just above upper ear)	Wide (7)	Small (3)	Small (3)
2	Leaf attitude of blade (on leaf just above upper ear)	Drooping (9)	Drooping (9)	Drooping (9)
3	Stem: anthocyanin colouration of brace roots	Absent (1)	Present (9)	Absent (1)
4	Tassel: time of anthesis (50% of plants)	Late (7)	Late (7)	Late (7)
5	Tassel: anthocyanin colouration at base of glume (in middle third of main axis)	Absent (1)	Absent (1)	Absent (1)
6	Tassel: anthocyanin colouration of glumes excluding base	Present (9)	Absent (1)	Absent (1)
7	Tassel: anthocyanin colouration of anthers	Present (9)	Present (9)	Present (9)
8	Tassel: density of spikelets (in middle third of main axis)	Sparse (3)	Dense (7)	Sparse (3)
9	Tassel: angle between main axis and lateral branches	Wide (7)	Narrow (3)	Narrow (3)
10	Tassel: attitude of lateral branches (in lower third of tassel)	Straight (1)	Straight (1)	Straight (1)
11	Ear: time of silk emergence (50% plants)	Late (7)	Late (7)	Late (7)
12	Ear: anthocyanin colouration of silks	Absent (1)	Absent (1)	Present (9)
13	Leaf: anthocyanin colouration of sheath	Absent (1)	Absent (1)	Absent (1)
14	Tassel: length of main axis above lowest side branch	Medium (5)	Medium (5)	Long (7)
15	Plant: length (up to flag leaf)	Medium (5)	Short (3)	Medium (5)
16	Plant: ear placement	Low (3)	Low (3)	High (7)
17	Leaf: width of blade (leaf of upper ear)	Narrow (3)	Medium (5)	Medium (5)
18	Ear: length (without husk)	Medium (5)	Short (3)	Medium (5)
19	Ear: diameter (in middle)	Small (3)	Small (3)	Medium (5)
20	Ear: shape	Conico-cylindrical (2)	Conical (1)	Conical (1)
21	Ear: number of rows of grains	Medium (5)	Medium (5)	Many (7)
22	Ear: type of grain (in middle third of ear)	Flint (1)	Dent (3)	Flint (1)
23	Ear: colour of top of grain	White (1)	White (1)	White (1)
24	Ear: colouration of glumes of cob	White (1)	White (1)	White (1)
25	Kernel: row arrangement	Straight (1)	Spiral (2)	Irregular (3)
26	Kernel: poppiness	Absent (1)	Absent (1)	Absent (1)
27	Kernel: sweetness	Absent (1)	Absent (1)	Absent (1)
28	Kernel: waxiness	Absent (1)	Absent (1)	Absent (1)
29	Kernel: opaqueness	Absent (1)	Absent (1)	Present (9)
30	Kernel: shape	Round (2)	Tooted (4)	Tooted (4)
31	Kernel: size (1000 kernel weight)	Medium (5)	Small (3)	Medium (5)



HKI 139-2

Registered Germplasm of Maize (2nd Edition)

S. No.	Characteristics	Expression (Score)		
		BML-15	HKI 1040-4	HKI-1015
1	Leaf: angle between blade and stem (on leaf just above upper ear)	Wide(7)	Small (3)	Wide (7)
2	Leaf attitude of blade (on leaf just above upper ear)	Drooping(9)	Straight (1)	Drooping (9)
3	Stem: anthocyanin colouration of brace roots	Present(9)	Present (9)	Absent (1)
4	Tassel: time of anthesis (50% of plants)	Late(7)	Medium (5)	Medium (5)
5	Tassel: anthocyanin colouration at base of glume (in middle third of main axis)	Absent(1)	Present (9)	Present (9)
6	Tassel: anthocyanin colouration of glumes excluding base	Absent(1)	Present (9)	Absent (1)
7	Tassel: anthocyanin colouration of anthers	Absent(1)	Present (9)	Present (9)
8	Tassel: density of spikelets (in middle third of main axis)	Dense (7)	Large (1)	Sparse (3)
9	Tassel: angle between main axis and lateral branches	Narrow(3)	Medium (5)	Wide (7)
10	Tassel: attitude of lateral branches (in lower third of tassel)	Straight (1)	Erect (1)	Straight (1)
11	Ear: time of silk emergence (50% plants)	Late(7)	Medium (5)	Medium (5)
12	Ear: anthocyanin colouration of silks	Present(9)	Present (9)	Absent (1)
13	Leaf: anthocyanin colouration of sheath	Absent (1)	Present (9)	Absent (1)
14	Tassel: length of main axis above lowest side branch	Medium (5)	Long (1)	Long (7)
15	Plant: length (up to flag leaf)	Long(7)	Medium (5)	Medium (5)
16	Plant: ear placement	Medium (5)	Medium (5)	Medium (5)
17	Leaf: width of blade (leaf of upper ear)	Medium(5)	Medium (5)	Medium (5)
18	Ear: length (without husk)	Medium(5)	Medium (5)	Medium (5)
19	Ear: diameter (in middle)	Small(3)	Medium (5)	Medium (5)
20	Ear: shape	Conico – cylindrical (2)	Conical (1)	Conical (1)
21	Ear: number of rows of grains	Few(3)	Medium (5)	Medium (5)
22	Ear: type of grain (in middle third of ear)	Semi flint(2)	Flint (1)	Flint (1)
23	Ear: colour of top of grain	Yellow with cap (4)	Orange (1)	Orange (5)
24	Ear: colouration of glumes of cob	White(1)	Purple (3)	White (1)
25	Kernel: row arrangement	Straight(1)	Regular (3)	Straight (1)
26	Kernel: poppiness	Absent (1)	Absent (1)	Absent (1)
27	Kernel: sweetness	Absent (1)	Absent (1)	Absent (1)
28	Kernel: waxiness	Absent (1)	Absent (1)	Absent (1)
29	Kernel: opaqueness	Absent (1)	Absent (1)	Absent (1)
30	Kernel: shape	Pointed (5)	Round (2)	Round (2)
31	Kernel: size (1000 kernel weight)	Medium(5)	Medium (5)	Medium (5)



HKI 1040-4



HKI-1015

Registered Germplasm of Maize (2nd Edition)

S. No.	Characteristics	Expression (Score)		
		V 341	V 340	HKI 323-8
1	Leaf: angle between blade and stem (on leaf just above upper ear)	Wide (7)	Wide (7)	Small (3)
2	Leaf attitude of blade (on leaf just above upper ear)	Drooping (9)	Straight (1)	Drooping (9)
3	Stem: anthocyanin colouration of brace roots	Absent (1)	Absent (1)	Present (9)
4	Tassel: time of anthesis (50% of plants)	Medium (5)	Medium (5)	Late (7)
5	Tassel: anthocyanin colouration at base of glume (in middle third of main axis)	Absent (1)	Absent (1)	Absent (1)
6	Tassel: anthocyanin colouration of glumes excluding base	Absent (1)	Present (9)	Present (9)
7	Tassel: anthocyanin colouration of anthers	Absent (1)	Present (9)	Present (9)
8	Tassel: density of spikelets (in middle third of main axis)	Dense (7)	Dense (7)	Sparse (3)
9	Tassel: angle between main axis and lateral branches	Wide (7)	Narrow (3)	Narrow (3)
10	Tassel: attitude of lateral branches (in lower third of tassel)	Curved (5)	Straight (1)	Straight (1)
11	Ear: time of silk emergence (50% plants)	Medium (5)	Early (3)	Late (7)
12	Ear: anthocyanin colouration of silks	Absent (1)	Present (9)	Present (9)
13	Leaf: anthocyanin colouration of sheath	Absent (1)	Absent (1)	Absent (1)
14	Tassel: length of main axis above lowest side branch	Long (7)	Medium (5)	Long (7)
15	Plant: length (up to flag leaf)	Long (7)	Long (7)	Short (3)
16	Plant: ear placement	Medium (5)	Medium (5)	High (7)
17	Leaf: width of blade (leaf of upper ear)	Medium (5)	Broad (7)	Narrow (3)
18	Ear: length (without husk)	Medium (5)	Medium (5)	Medium (5)
19	Ear: diameter (in middle)	Medium (5)	Medium (5)	Small (3)
20	Ear: shape	Cylindrical (3)	Cylindrical (3)	Conical (1)
21	Ear: number of rows of grains	Medium (5)	Many (7)	Medium (5)
22	Ear: type of grain (in middle third of ear)	Flint (1)	Flint (1)	Flint (1)
23	Ear: colour of top of grain	Yellow with cap (4)	Yellow (3)	Yellow (3)
24	Ear: colouration of glumes of cob	White (1)	White (1)	White (1)
25	Kernel: row arrangement	Straight (1)	Straight (1)	Irregular (3)
26	Kernel: poppiness	Absent (1)	Absent (1)	Absent (1)
27	Kernel: sweetness	Absent (1)	Absent (1)	Absent (1)
28	Kernel: waxiness	Absent (1)	Absent (1)	Absent (1)
29	Kernel: opaqueness	Absent (1)	Absent (1)	Absent (1)
30	Kernel: shape	Indented (3)	Indented (3)	Round (2)
31	Kernel: size (1000 kernel weight)	Medium (5)	Medium (5)	Small (3)



V 341

Registered Germplasm of Maize (2nd Edition)

S. No.	Characteristics	Expression (Score)		
		HKI-295	BML 6	HKI 322
1	Leaf: angle between blade and Stem (on leaf just above upper ear)	Small (3)	Wide(7)	Wide (7)
2	Leaf attitude of blade (on leaf just above upper ear)	Straight (1)	Drooping(9)	Drooping (9)
3	Stem: anthocyanin colouration of brace roots	Present (9)	Present(9)	Absent (1)
4	Tassel: time of anthesis (50% of plants)	Late (7)	Medium(5)	Late (7)
5	Tassel: anthocyanin colouration at base of glume (in middle third of main axis)	Absent (1)	Present(9)	Absent (1)
6	Tassel: anthocyanin colouration of glumes excluding base	Absent (1)	Present(9)	Absent (1)
7	Tassel: anthocyanin colouration of Anthers	Absent (1)	Present(9)	Absent (1)
8	Tassel: density of spikelets (in middle third of main axis)	Dense (7)	Dense (7)	Sparse (3)
9	Tassel: angle between main axis and lateral branches	Narrow (3)	Narrow(3)	Wide (7)
10	Tassel: attitude of lateral branches (in lower third of tassel)	Straight (1)	Curved(5)	Straight (1)
11	Ear: time of silk emergence (50% plants)	Late (7)	Medium(5)	Late (7)
12	Ear: anthocyanin colouration of silks	Absent (1)	Present(9)	Absent (1)
13	Leaf: anthocyanin colouration of sheath	Absent (1)	Present(9)	Absent (1)
14	Tassel: length of main axis above lowest side branch	Medium (5)	Medium (5)	Medium (5)
15	Plant: length (lup to flag leaf)	Short (3)	Long(7)	Short (3)
16	Plant: ear placement	High (7)	Medium(5)	Low (3)
17	Leaf: width of blade (leaf of upper ear)	Narrow (3)	Medium(5)	Medium (5)
18	Ear: length (without husk)	Medium (5)	Medium(5)	Short (3)
19	Ear: diameter (in middle)	Small (3)	Large(7)	Medium (5)
20	Ear: shape	Conical (1)	Conico – cylindrical (2)	Conico-cylindrical (2)
21	Ear: number of rows of grains	Medium (5)	Many(7)	Medium (5)
22	Ear: type of grain (in middle third of ear)	Flint (1)	Dent (3)	Flint (1)
23	Ear: colour of top of grain	Yellow (3)	Yellow(3)	White (1)
24	Ear: colouration of glumes of cob	Dark purple(3)	White (1)	White (1)
25	Kernel: row arrangement	Spiral (2)	Straight (1)	Irregular (3)
26	Kernel: poppiness	Absent (1)	Absent (1)	Absent (1)
27	Kernel: sweetness	Absent (1)	Absent (1)	Absent (1)
28	Kernel: waxiness	Absent (1)	Absent (1)	Absent (1)
29	Kernel: opaqueness	Absent (1)	Absent (1)	Absent (1)
30	Kernel: shape	Round (2)	Indented (3)	Round (2)
31	Kernel: size (1000 kernel weight)	Small (3)	Large(7)	Small (3)



HKI 322

Registered Germplasm of Maize (2nd Edition)

S. No.	Characteristics	Expression (Score)		
		HKI 209	HKI 586	HKI 335
1	Leaf: angle between blade and stem (on leaf just above upper ear)	Wide (7)	Small (3)	Small (3)
2	Leaf attitude of blade (on leaf just above upper ear)	Straight (1)	Straight (1)	Drooping (9)
3	Stem: anthocyanin colouration of brace roots	Present (9)	Absent (1)	Present (9)
4	Tassel: time of anthesis (50% of plants)	Early (3)	Early (3)	Early (3)
5	Tassel: anthocyanin colouration at base of glume (in middle third of main axis)	Absent (1)	Absent (1)	Present (9)
6	Tassel: anthocyanin colouration of glumes excluding base	Absent (1)	Absent (1)	Absent (1)
7	Tassel: anthocyanin colouration of anthers	Absent (1)	Present (9)	Present (9)
8	Tassel: density of spikelets (in middle third of main axis)	Sparse (3)	Sparse (3)	Dense (7)
9	Tassel: angle between main axis and lateral branches	Narrow (3)	Narrow (3)	Narrow (3)
10	Tassel: attitude of lateral branches (in lower third of tassel)	Straight (1)	Curved (5)	Straight (1)
11	Ear: time of silk emergence (50% plants)	Early (3)	Early (3)	Early (3)
12	Ear: anthocyanin colouration of silks	Absent (1)	Absent (1)	Absent (1)
13	Leaf: anthocyanin colouration of sheath	Absent (1)	Absent (1)	Absent (1)
14	Tassel: length of main axis above lowest side branch	Long (7)	Long (7)	Medium (5)
15	Plant: length (up to flag leaf)	Short (3)	Medium (5)	Medium (5)
16	Plant: ear placement	High (7)	High (7)	Low (3)
17	Leaf: width of blade (leaf of upper ear)	Narrow (3)	Narrow (3)	Narrow (3)
18	Ear: length (without husk)	Short (3)	Medium (5)	Short (3)
19	Ear: diameter (in middle)	Small (3)	Medium (5)	Small (3)
20	Ear: shape	Conical (1)	Conico-cylindrical (2)	Conical (1)
21	Ear: number of rows of grains	Medium (5)	Many (7)	Medium (5)
22	Ear: type of grain (in middle third of ear)	Semi-flint (2)	Flint (1)	Flint (1)
23	Ear: colour of top of grain	Yellow with cap (4)	Yellow (3)	Yellow (3)
24	Ear: colouration of glumes of cob	White (1)	White (1)	White (1)
25	Kernel: row arrangement	Irregular (3)	Irregular (3)	Irregular (3)
26	Kernel: poppiness	Absent (1)	Absent (1)	Absent (1)
27	Kernel: sweetness	Absent (1)	Absent (1)	Absent (1)
28	Kernel: waxiness	Absent (1)	Absent (1)	Absent (1)
29	Kernel: opaqueness	Absent (1)	Absent (1)	Absent (1)
30	Kernel: shape	Round (2)	Round (2)	Tooted (4)
31	Kernel: size (1000 kernel weight)	Small (3)	Small (3)	Small (3)



HKI 209



HKI 335

Registered Germplasm of Maize (2nd Edition)

S. No.	Characteristics	Expression (Score)
		HKI 1025
1	Leaf: angle between blade and stem (on leaf just above upper ear)	Small (3)
2	Leaf attitude of blade (on leaf just above upper ear)	Drooping (9)
3	Stem: anthocyanin colouration of brace roots	Present (9)
4	Tassel: time of anthesis (50% of plants)	Early (3)
5	Tassel: anthocyanin colouration at base of glume (in middle third of main axis)	Absent (1)
6	Tassel: anthocyanin colouration of glumes excluding base	Absent (1)
7	Tassel: anthocyanin colouration of anthers	Absent (1)
8	Tassel: density of spikelets (in middle third of main axis)	Dense (7)
9	Tassel: angle between main axis and lateral branches	Narrow (3)
10	Tassel: attitude of lateral branches (in lower third of tassel)	Straight (1)
11	Ear: time of silk emergence (50% plants)	Medium (5)
12	Ear: anthocyanin colouration of silks	Absent (1)
13	Leaf: anthocyanin colouration of sheath	Absent (1)
14	Tassel: length of main axis above lowest side branch	Long (7)
15	Plant: length (up to flag leaf)	Short (3)
16	Plant: ear placement	Low (3)
17	Leaf: width of blade (leaf of upper ear)	Narrow (3)
18	Ear: length (without husk)	Medium (5)
19	Ear: diameter (in middle)	Small (3)
20	Ear: shape	Conical (1)
21	Ear: number of rows of grains	Medium (5)
22	Ear: type of grain (in middle third of ear)	Flint (1)
23	Ear: colour of top of grain	Yellow (3)
24	Ear: colouration of glumes of cob	White (1)
25	Kernel: row arrangement	Irregular (3)
26	Kernel: poppiness	Absent (1)
27	Kernel: sweetness	Absent (1)
28	Kernel: waxiness	Absent (1)
29	Kernel: opaqueness	Absent (1)
30	Grain shape	Round (2)
31	Kernel: size (1000 kernel weight)	Small (3)



HKI 1025

3.2 Quality Protein Maize

In India, nine QPM hybrids of different maturity groups have been developed, and are suitable for cultivation in different agro-climatic conditions under different cropping systems. Twelve QPM inbred lines have been registered at NBPGR, New Delhi. In this section, the DUS profile in respect of registered QPM inbred lines has been given.

Registered Germplasm of Maize (2nd Edition)

S. No.	Characteristics	Expression (Score)		
		HKI-170 (1+2)	HKI-164 D-4 (O)	HKI-164 -7-6
1	Leaf: angle between blade and stem (on leaf just above upper ear)	Wide (7)	Small (3)	Small (3)
2	Leaf attitude of blade (on leaf just above upper ear)	Drooping (9)	Straight (1)	Straight (1)
3	Stem: anthocyanin colouration of brace roots	Absent (1)	Absent (1)	Absent (1)
4	Tassel: time of anthesis (50% of plants)	Medium (5)	Late (7)	Late (7)
5	Tassel: anthocyanin colouration at base of glume (in middle third of main axis)	Absent (1)	Absent (1)	Absent (1)
6	Tassel: anthocyanin colouration of glumes excluding base	Absent (1)	Absent (1)	Absent (1)
7	Tassel: anthocyanin colouration of anthers	Present (9)	Absent (1)	Present (9)
8	Tassel: density of spikelets (in middle third of main axis)	Sparse (3)	Medium (2)	Sparse (3)
9	Tassel: angle between main axis and lateral branches	Wide (7)	Medium (3)	Medium (5)
10	Tassel: attitude of lateral branches (in lower third of tassel)	Straight (1)	Medium (3)	Medium (5)
11	Ear: time of silk emergence (50% plants)	Medium (5)	Late (7)	Late (7)
12	Ear: anthocyanin colouration of silks	Absent (1)	Absent (1)	Absent (1)
13	Leaf: anthocyanin colouration of sheath	Absent (1)	Absent (1)	Absent (1)
14	Tassel: length of main axis above lowest side branch	Medium (5)	Long (7)	Long (7)
15	Plant: length (up to flag leaf)	Medium (-)	Long (7)	Long (7)
16	Plant: ear placement	Medium (5)	Medium (5)	Small (3)
17	Leaf: width of blade (leaf of upper ear)	Narrow (3)	Wide/broad (9)	Medium (5)
18	Ear: length (without husk)	Medium (5)	Medium (5)	Medium (5)
19	Ear: diameter (in middle)	Medium (5)	Medium (5)	Medium (5)
20	Ear: shape	Conical (1)	Conical (1)	Conical (1)
21	Ear: number of rows of grains	Medium (5)	Medium (5)	Medium (5)
22	Ear: type of grain (in middle third of ear)	Flint (1)	Semi dent (2)	Semi dent (2)
23	Ear: colour of top of grain	Yellow (3)	Yellow (3)	Orange (5)
24	Ear: colouration of glumes of cob	White (1)	White (1)	White (1)
25	Kernel: row arrangement	Straight (1)	Regular (1)	Straight (1)
26	Kernel: poppiness	Absent (1)	Absent (1)	Absent (1)
27	Kernel: sweetness	Absent (1)	Absent (1)	Absent (1)
28	Kernel: waxiness	Absent (1)	Absent (1)	Absent (1)
29	Kernel: opaqueness	Present (9)	Present (9)	Present (9)
30	Grain shape	Round (2)	Medium (5)	Round (2)
31	Kernel: size (1000 kernel weight)	Medium (5)	Round (2)	Medium (5)



HKI-170 (1+2)



HKI-164 D-4(O)



HKI-164-7-6

Registered Germplasm of Maize (2nd Edition)

S. No.	Characteristics	Expression (Score)		
		HKI 5072-2-BT	DMRQ-107	VQL 1
1	Leaf: angle between blade and stem (on leaf just above upper ear)	Small (3)	Small (3)	Small (3)
2	Leaf attitude of blade (on leaf just above upper ear)	Drooping (9)	Straight (1)	Drooping (9)
3	Stem: anthocyanin colouration of brace roots	Present (9)	Absent (1)	Absent (1)
4	Tassel: time of anthesis (50% of plants)	Late (7)	Late (7)	Medium (5)
5	Tassel: anthocyanin colouration at base of glume (in middle third of main axis)	Absent (1)	Absent (1)	Absent (1)
6	Tassel: anthocyanin colouration of glumes excluding base	Absent (1)	Absent (1)	Present(9)
7	Tassel: anthocyanin colouration of anthers	Absent (1)	Absent (1)	Present(9)
8	Tassel: density of spikelets (in middle third of main axis)	Dense (7)	Dense (7)	Dense (7)
9	Tassel: angle between main axis and lateral branches	Narrow (3)	Narrow (3)	Wide(7)
10	Tassel: attitude of lateral branches (in lower third of tassel)	Straight (1)	Straight (1)	Curved(5)
11	Ear: time of silk emergence (50% plants)	Late (7)	Late (7)	Early (3)
12	Ear: anthocyanin colouration of silks	Absent (1)	Absent (1)	Absent (1)
13	Leaf: anthocyanin colouration of sheath	Absent (1)	Absent (1)	Present (9)
14	Tassel: length of main axis above lowest side branch	Medium (5)	Medium (5)	Medium (5)
15	Plant: length (up to flag leaf)	Short (3)	Medium (5)	Long (7)
16	Plant: ear placement	Medium (5)	Medium (5)	Medium (5)
17	Leaf: width of blade (leaf of upper ear)	Narrow (3)	Medium (5)	Medium (5)
18	Ear: length (without husk)	Medium (5)	Medium (5)	Medium (5)
19	Ear: diameter (in middle)	Small (3)	Small (3)	Medium (5)
20	Ear: shape	Conical (1)	Conical (1)	Cylindrical(3)
21	Ear: number of rows of grains	Many (7)	Medium (5)	Many(7)
22	Ear: type of grain (in middle third of ear)	Flint (1)	Dent (3)	Semi-flint(2)
23	Ear: colour of top of grain	Yellow with cap (4)	Yellow with cap (4)	Yellow with cap (3)
24	Ear: colouration of glumes of cob	Dark purple (3)	White(1)	White(1)
25	Kernel: row arrangement	Straight (1)	Spiral (3)	Straight(1)
26	Kernel: poppiness	Absent (1)	Absent (1)	Absent (1)
27	Kernel: sweetness	Absent (1)	Absent (1)	Absent (1)
28	Kernel: waxiness	Absent (1)	Absent (1)	Absent (1)
29	Kernel: opaqueness	Present (9)	Present (9)	Present (9)
30	Kernel: shape	Round (2)	Round (2)	Indented(3)
31	Kernel: size (1000 kernel weight)	Small (3)	Medium (5)	Medium (5)



DMRQ-107



VQL 1

Registered Germplasm of Maize (2nd Edition)

S. No.	Characteristics	Expression (Score)		
		VQL 8	VQL 2	VQL 3
1	Leaf: angle between blade and stem (on leaf just above upper ear)	Wide (7)	Small (3)	Wide (7)
2	Leaf attitude of blade (on leaf just above upper ear)	Straight (1)	Drooping (9)	Drooping(9)
3	Stem: anthocyanin colouration of brace roots	Present (9)	Absent (1)	Present (9)
4	Tassel: time of anthesis (50% of plants)	Medium (5)	Early (3)	Early (3)
5	Tassel: anthocyanin colouration at base of glume (in middle third of main axis)	Present(9)	Present(9)	Present(9)
6	Tassel: anthocyanin colouration of glumes excluding base	Present(9)	Present(9)	Present(9)
7	Tassel: anthocyanin colouration of anthers	Present(9)	Present(9)	Present(9)
8	Tassel: density of spikelets (in middle third of main axis)	Dense (7)	Dense (7)	Sparse (3)
9	Tassel: angle between main axis and lateral branches	Narrow(3)	Narrow(3)	Narrow(3)
10	Tassel: attitude of lateral branches (in lower third of tassel)	Straight (1)	Straight (1)	Straight (1)
11	Ear: time of silk emergence (50% plants)	Early (3)	Early (3)	Early (3)
12	Ear: anthocyanin colouration of silks	Present (9)	Present (9)	Present (9)
13	Leaf: anthocyanin colouration of sheath	Absent(1)	Present (9)	Absent(1)
14	Tassel: length of main axis above lowest side branch	Medium (5)	Short (3)	Medium (5)
15	Plant: length (up to flag leaf)	Medium (5)	Medium (5)	Long (7)
16	Plant: ear placement	Medium (5)	Medium (5)	Medium (5)
17	Leaf: width of blade (leaf of upper ear)	Medium (5)	Medium (5)	Medium (5)
18	Ear: length (without husk)	Medium (5)	Medium (5)	Medium (5)
19	Ear: diameter (in middle)	Medium (5)	Medium (5)	Medium (5)
20	Ear: shape	Cylindrical(3)	Cylindrical(3)	Cylindrical(3)
21	Ear: number of rows of grains	Many(7)	Many(7)	Many(7)
22	Ear: type of grain (in middle third of ear)	Flint (1)	Flint (1)	Flint (1)
23	Ear: colour of top of grain	Orange (5)	Orange (5)	Orange (5)
24	Ear: colouration of glumes of cob	White(1)	White(1)	White(1)
25	Kernel: row arrangement	Straight(1)	Straight(1)	Straight(1)
26	Kernel: poppiness	Absent (1)	Absent (1)	Absent (1)
27	Kernel: sweetness	Absent (1)	Absent (1)	Absent (1)
28	Kernel: waxiness	Absent (1)	Absent (1)	Absent (1)
29	Kernel: opaqueness	Present (9)	Present (9)	Present (9)
30	Kernel: shape	Indented (3)	Round(2)	Indented (3)
31	Kernel: size (1000 kernel weight)	Medium (5)	Medium (5)	Small (3)



VQL 2



VQL 3

Registered Germplasm of Maize (2nd Edition)

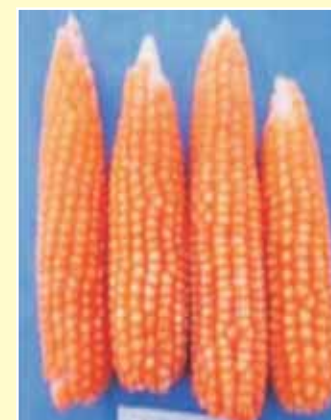
S. No.	Characteristics	Expression (Score)		
		VQL 12	VQL 16	VQL 30
1	Leaf: angle between blade and stem (on leaf just above upper ear)	Small (3)	Wide (7)	Wide (7)
2	Leaf attitude of blade (on leaf just above upper ear)	Straight (1)	Straight (1)	Drooping (9)
3	Stem: anthocyanin colouration of brace roots	Present (9)	Absent (1)	Absent (1)
4	Tassel: time of anthesis (50% of plants)	Medium (5)	Medium (5)	Medium (5)
5	Tassel: anthocyanin colouration at base of glume (in middle third of main axis)	Present(9)	Present (9)	Present(9)
6	Tassel: anthocyanin colouration of glumes excluding base	Present(9)	Present (9)	Present(9)
7	Tassel: anthocyanin colouration of anthers	Present(9)	Absent (1)	Present(9)
8	Tassel: density of spikelets (in middle third of main axis)	Sparse (3)	Dense (7)	Dense (7)
9	Tassel: angle between main axis and lateral branches	Wide (7)	Narrow(3)	Narrow (3)
10	Tassel: attitude of lateral branches (in lower third of tassel)	Curved (5)	Straight (1)	Straight (1)
11	Ear: time of silk emergence (50% plants)	Early (3)	Early (3)	Early (3)
12	Ear: anthocyanin colouration of silks	Present (9)	Present (9)	Present (9)
13	Leaf: anthocyanin colouration of sheath	Present (9)	Absent (1)	Absent (1)
14	Tassel: length of main axis above lowest side branch	Medium (5)	Medium (5)	Medium (5)
15	Plant: length (up to flag leaf)	Long (7)	Long (7)	Medium (5)
16	Plant: ear placement	Medium (5)	Medium (5)	Medium (5)
17	Leaf: width of blade (leaf of upper ear)	Medium (5)	Medium (5)	Medium (5)
18	Ear: length (without husk)	Medium (5)	Medium (5)	Medium (5)
19	Ear: diameter (in middle)	Small (3)	Medium (5)	Medium (5)
20	Ear: shape	Conico-cylindrical (2)	Cylindrical (3)	Cylindrical (3)
21	Ear: number of rows of grains	Many(7)	Many(7)	Many (7)
22	Ear: type of grain (in middle third of ear)	Flint (1)	Flint (1)	Flint (1)
23	Ear: colour of top of grain	Orange (5)	Yellow (3)	Orange (5)
24	Ear: colouration of glumes of cob	White(1)	White(1)	White(1)
25	Kernel: row arrangement	Straight(1)	Straight(1)	Straight (1)
26	Kernel: poppiness	Absent (1)	Absent (1)	Absent (1)
27	Kernel: sweetness	Absent (1)	Absent (1)	Absent (1)
28	Kernel: waxiness	Absent (1)	Absent (1)	Absent (1)
29	Kernel: opaqueness	Present (9)	Present (9)	Present (9)
30	Kernel: shape	Indented (3)	Indented (3)	Round (2)
31	Kernel: size (1000 kernel weight)	Medium (5)	Medium (5)	Medium (5)



VQL 12



VQL 16



VQL 30

3.3 Sweet corn

Over the past few years, increased emphasis has been laid on the identification of genetically diverse inbred lines of sweet corn. Eight elite inbred lines with high sugar content have been registered at NBPGR, New Delhi. In this section, the DUS profile in respect of such lines is given.

Registered Germplasm of Maize (2nd Edition)

S. No.	Characteristics	Expression (Score)		
		DMS-201	DMS-203	DMS-206
1	Leaf: angle between blade and stem (on leaf just above upper ear)	Small (3)	Small (3)	Wide (7)
2	Leaf attitude of blade (on leaf just above upper ear)	Straight (1)	Straight (1)	Straight (1)
3	Stem: anthocyanin colouration of brace roots	Present (9)	Absent (1)	Absent (1)
4	Tassel: time of anthesis (50% of plants)	Late (7)	Late (7)	Late (7)
5	Tassel: anthocyanin colouration at base of glume (in middle third of main axis)	Absent (1)	Absent (1)	Absent (1)
6	Tassel: anthocyanin colouration of glumes excluding base	Absent (1)	Absent (1)	Absent (1)
7	Tassel: anthocyanin colouration of anthers	Present (9)	Absent (1)	Absent (1)
8	Tassel: density of spikelets (in middle third of main axis)	Sparse (3)	Sparse (3)	Dense (7)
9	Tassel: angle between main axis and lateral branches	Wide (7)	Wide (7)	Narrow (3)
10	Tassel: attitude of lateral branches (in lower third of tassel)	Straight (1)	Straight (1)	Straight (1)
11	Ear: time of silk emergence (50% plants)	Late (7)	Late (7)	Late (7)
12	Ear: anthocyanin colouration of silks	Absent (1)	Absent (1)	Absent (1)
13	Leaf: anthocyanin colouration of sheath	Absent (1)	Absent (1)	Absent (1)
14	Tassel: length of main axis above lowest side branch	Low (3)	Medium (5)	Medium (5)
15	Plant: length (up to flag leaf)	Short (3)	Short (3)	Short (3)
16	Plant: ear placement	Low (3)	Medium (5)	Low (3)
17	Leaf: width of blade (leaf of upper ear)	Narrow (3)	Narrow (3)	Medium (5)
18	Ear: length (without husk)	Medium (5)	Medium (5)	Medium (5)
19	Ear: diameter (in middle)	Small (3)	Medium (5)	Small (3)
20	Ear: shape	Cylindrical (3)	Cylindrical(3)	Conical (1)
21	Ear: number of rows of grains	Many (7)	Many (7)	Medium (5)
22	Ear: type of grain (in middle third of ear)	Dent (3)	Dent (3)	Dent (3)
23	Ear: colour of top of grain	Yellow (3)	Yellow (3)	Yellow (3)
24	Ear: colouration of glumes of cob	White (1)	Light purple (2)	White (1)
25	Kernel: row arrangement	Straight (1)	Straight (1)	Straight (1)
26	Kernel: poppiness	Absent (1)	Absent (1)	Absent (1)
27	Kernel: sweetness	Present (9)	Present (9)	Present (9)
28	Kernel: waxiness	Absent (1)	Absent (1)	Absent (1)
29	Kernel: opaqueness	Absent (1)	Absent (1)	Absent (1)
30	Kernel: shape	Shrunken (1)	Shrunken(1)	Shrunken (1)
31	Kernel: size (1000 kernel weight)	Small(3)	Small (3)	Very small (1)



DMS-201



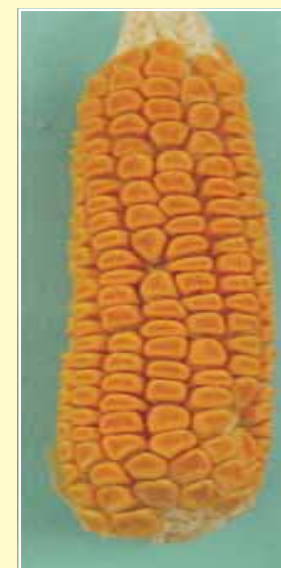
DMS-206

Registered Germplasm of Maize (2nd Edition)

S. No.	Characteristics	Expression (Score)		
		Win Sweet Corn	DMSC-1	DMSC-6
1	Leaf: angle between blade and stem (on leaf just above upper ear)	Small (3)	Small (3)	Small (3)
2	Leaf attitude of blade (on leaf just above upper ear)	Straight (1)	Straight (1)	Drooping (9)
3	Stem: anthocyanin colouration of brace roots	Absent (1)	Absent (1)	Absent (1)
4	Tassel: time of anthesis (50% of plants)	Late (7)	Late (7)	Late (7)
5	Tassel: anthocyanin colouration at base of glume (in middle third of main axis)	Absent (1)	Absent (1)	Absent (1)
6	Tassel: anthocyanin colouration of glumes excluding base	Absent (1)	Absent (1)	Absent (1)
7	Tassel: anthocyanin colouration of anthers	Absent (1)	Absent (1)	Absent (1)
8	Tassel: density of spikelets (in middle third of main axis)	Sparse (3)	Sparse (3)	Sparse (3)
9	Tassel: angle between main axis and lateral branches	Wide (7)	Wide (7)	Wide (7)
10	Tassel: attitude of lateral branches (in lower third of tassel)	Curved (5)	Straight (1)	Curved (5)
11	Ear: time of silk emergence (50% plants)	Late (7)	Late (7)	Late (7)
12	Ear: anthocyanin colouration of silks	Absent (1)	Absent (1)	Absent (1)
13	Leaf: anthocyanin colouration of sheath	Absent (1)	Absent (1)	Absent (1)
14	Tassel: length of main axis above lowest side branch	Medium (5)	Medium (5)	Medium (5)
15	Plant: length (up to flag leaf)	Short (3)	Short (3)	Medium (5)
16	Plant: ear placement	Low (3)	High (7)	Low (3)
17	Leaf: width of blade (leaf of upper ear)	Narrow (3)	Narrow (3)	Narrow (3)
18	Ear: length (without husk)	Medium (5)	Medium (5)	Medium (5)
19	Ear: diameter (in middle)	Small (3)	Small (3)	Small (5)
20	Ear: shape	Conical (1)	Conical (1)	Conical (1)
21	Ear: number of rows of grains	Medium (5)	Medium (5)	Many (7)
22	Ear: type of grain (in middle third of ear)	Dent (3)	Dent (3)	Dent (3)
23	Ear: colour of top of grain	Yellow (3)	Yellow (3)	Yellow (3)
24	Ear: colouration of glumes of cob	White (1)	White (1)	White (1)
25	Kernel: row arrangement	Irregular (3)	Straight (1)	Irregular (3)
26	Kernel: poppiness	Absent (1)	Absent (1)	Absent (1)
27	Kernel: sweetness	Present (9)	Present (9)	Present (9)
28	Kernel: waxiness	Absent (1)	Absent (1)	Absent (1)
29	Kernel: opaqueness	Absent (1)	Absent (1)	Absent (1)
30	Grain shape	Shrunken (1)	Shrunken (1)	Shrunken (1)
31	Kernel: size (1000 kernel weight)	Very small (1)	Very small (1)	Small (3)



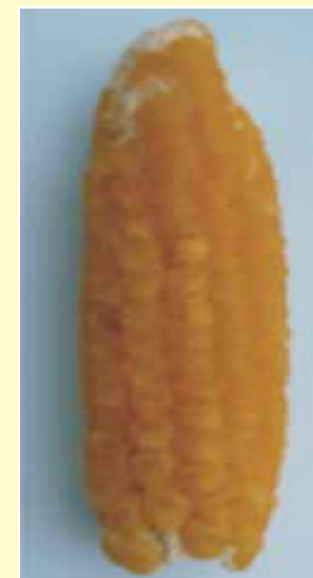
Win Sweet Corn



DMSC-1

Registered Germplasm of Maize (2nd Edition)

S. No.	Characteristics	Expression (Score)	
		DMS-207	DMS-208
1	Leaf: angle between blade and stem (on leaf just above upper ear)	Small (3)	Wide (7)
2	Leaf attitude of blade (on leaf just above upper ear)	Straight (1)	Drooping (9)
3	Stem: anthocyanin colouration of brace roots	Present (9)	Present (9)
4	Tassel: time of anthesis (50% of plants)	Late (7)	Late (7)
5	Tassel: anthocyanin colouration at base of glume (in middle third of main axis)	Absent (1)	Absent (1)
6	Tassel: anthocyanin colouration of glumes excluding base	Absent (1)	Absent (1)
7	Tassel: anthocyanin colouration of anthers	Present (9)	Absent (1)
8	Tassel: density of spikelets (in middle third of main axis)	Dense (7)	Sparse (3)
9	Tassel: angle between main axis and lateral branches	Narrow (3)	Wide (7)
10	Tassel: attitude of lateral branches (in lower third of tassel)	Curved (5)	Straight (1)
11	Ear: time of silk emergence (50% plants)	Late (7)	Late (7)
12	Ear: anthocyanin colouration of silks	Absent (1)	Absent (1)
13	Leaf: anthocyanin colouration of sheath	Present (9)	Absent (1)
14	Tassel: length of main axis above lowest side branch	Medium (5)	Medium (5)
15	Plant: length (up to flag leaf)	Short (3)	Short (3)
16	Plant: ear placement	Low (3)	Low (3)
17	Leaf: width of blade (leaf of upper ear)	Narrow (3)	Narrow (3)
18	Ear: length (without husk)	Medium (5)	Medium (5)
19	Ear: diameter (in middle)	Small (3)	Small (3)
20	Ear: shape	Conical (1)	Conical (1)
21	Ear: number of rows of grains	Many (7)	Medium (5)
22	Ear: type of grain (in middle third of ear)	Dent (3)	Dent (3)
23	Ear: colour of top of grain	Yellow (3)	Light yellow (3)
24	Ear: colouration of glumes of cob	White (1)	White (1)
25	Kernel: row arrangement	Straight (1)	Straight (1)
26	Kernel: poppiness	Absent (1)	Absent (1)
27	Kernel: sweetness	Present (9)	Present (9)
28	Kernel: waxiness	Absent (1)	Absent (1)
29	Kernel: opaqueness	Absent (1)	Absent (1)
30	Kernel: shape	Shrunken (1)	Shrunken (1)
31	Kernel: size (1000 kernel weight)	Small (3)	Small (3)



DMS-207



DMS-208

3.4 Popcorn

Till date in India no popcorn hybrid is available. Hence, the thrust is on the development of high yielding Single Cross Hybrids meeting international standards in quality parameters. Efforts are being made to develop hybrid-oriented germplasm from genetically diverse sources. These efforts have led to the identification of three popcorn lines with high poppiness and high popping volume that have been registered. The DUS profile in respect of these lines has been given in this section.

Registered Germplasm of Maize (2nd Edition)

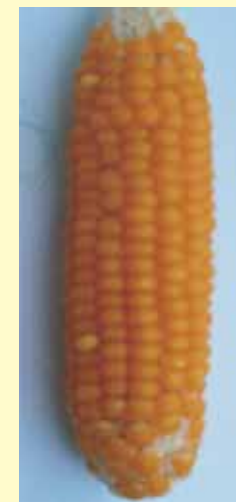
S. No.	Characteristics	Expression (Score)
		DPcl 10
1.	Leaf: angle between blade and Stem (on leaf just above upper ear)	Wide (7)
2.	Leaf attitude of blade (on leaf just above upper ear)	Drooping (9)
3.	Stem: anthocyanin colouration of brace roots	Present (9)
4.	Tassel: time of anthesis(on middle third of main axis, 50% of plants)	Late (7)
5.	Tassel: anthocyanin colouration at base of glumes (in middle third of main axis)	Absent (1)
6.	Tassel: anthocyanin colouration of glumes excluding base	Present (9)
7.	Tassel: anthocyanin colouration of Anthers	Present (9)
8.	Tassel: density of spikelets (in middle third of main axis)	Sparse (3)
9.	Tassel: angle between main axis and lateral branches	Wide (7)
10.	Tassel: attitude of lateral branches (in lower third of tassel)	Strongly Curved (9)
11.	Ear: time of silk emergence (50% plants)	Late (7)
12.	Ear: anthocyanin colouration of silks (on day of emergence)	Present (9)
13.	Leaf: anthocyanin colouration of sheath (below the ear)	Absent (1)
14.	Tassel:length of main axis above lowest side branch	Long (7)
15.	Inbred lines only plant length (up to flag leaf)	Short (3)
16.	Plant: ear placement	Medium (5)
17.	Leaf: width of blade (leaf of upper ear)	Narrow (3)
18.	Ear: length (without husk)	Medium (5)
19.	Ear: diameter (in middle)	Small (3)
20.	Ear: shape	Conico-Cylindrical (2)
21.	Ear: number of rows of grains	Medium (5)
22.	Ear: type of grain (in middle third of ear)	Flint (1)
23.	Ear: colour of top of grain	Yellow (3)
24.	Ear: colouration of glumes of cob	White (1)
25.	Kernel row arrangement	Straight (1)
26.	Kernel: Poppinesss	Present (9)
27.	Kernel: Sweetness	Absent (1)
28.	Kernel: Waxiness	Absent (1)
29.	Kernel: Opaqueness	Absent (1)
30.	Grain shape	Round (2)
31.	1000 Kernel weight	Small (3)



DPcl 10

Registered Germplasm of Maize (2nd Edition)

S. No.	Characteristics	Expression (Score)	
		HKI PC-4B	HKI PCBT-3
1	Leaf: angle between blade and stem (on leaf just above upper ear)	Wide (7)	Small (3)
2	Leaf attitude of blade (on leaf just above upper ear)	Drooping (9)	Straight (1)
3	Stem: anthocyanin colouration of brace roots	Absent (1)	Present (9)
4	Tassel: time of anthesis (50% of plants)	Medium (5)	Early (3)
5	Tassel: anthocyanin colouration at base of glume (in middle third of main axis)	Absent (1)	Absent (1)
6	Tassel: anthocyanin colouration of glumes excluding base	Absent (1)	Absent (1)
7	Tassel: anthocyanin colouration of anthers	Absent (1)	Present (9)
8	Tassel: density of spikelets (in middle third of main axis)	Sparse (3)	Sparse (3)
9	Tassel: angle between main axis and lateral branches	Wide (7)	Wide (7)
10	Tassel: attitude of lateral branches (in lower third of tassel)	Curved (5)	Curved (5)
11	Ear: time of silk emergence (50% plants)	Late (7)	Early (3)
12	Ear: anthocyanin colouration of silks	Absent (1)	Absent (1)
13	Leaf: anthocyanin colouration of sheath	Absent (1)	Absent (1)
14	Tassel: length of main axis above lowest side branch	Medium (5)	Long (7)
15	Plant: length (up to flag leaf)	Short (3)	Short (3)
16	Plant: ear placement	Medium (5)	Medium (5)
17	Leaf: width of blade (leaf of upper ear)	Narrow (3)	Narrow (3)
18	Ear: length (without husk)	Medium (5)	Medium (5)
19	Ear: diameter (in middle)	Small (3)	Small (3)
20	Ear: shape	Conical (1)	Conical (1)
21	Ear: number of rows of grains	Medium (5)	Medium (5)
22	Ear: type of grain (in middle third of ear)	Flint (1)	Flint (1)
23	Ear: colour of top of grain	Yellow (3)	Yellow (3)
24	Ear: colouration of glumes of cob	White (1)	White (1)
25	Kernel: row arrangement	Straight (1)	Irregular (3)
26	Kernel: poppiness	Present (9)	Present (9)
27	Kernel: sweetness	Absent (1)	Absent (1)
28	Kernel: waxiness	Absent (1)	Absent (1)
29	Kernel: opaqueness	Absent (1)	Absent (1)
30	Kernel: shape	Round (2)	Round (2)
31	Kernel: size (1000 kernel weight)	Small (3)	Very small (1)



HKI PC-4B



HKI PCBT-3

3.5 High-oil corn

Efforts are being made to develop high oil germplasm from genetically diverse sources. Three inbred lines with high oil content have been registered at NBPGR, New Delhi. The DUS profile in respect of these lines has been given in this section.

Registered Germplasm of Maize (2nd Edition)

S. No.	Characteristics	Expression (Score)
DMRHO-57		
1.	Leaf: angle between blade and Stem (on leaf just above upper ear)	Small (3)
2.	Leaf attitude of blade (on leaf just above upper ear)	Erect (1)
3.	Stem: anthocyanin colouration of brace roots	Present (9)
4.	Tassel: time of anthesis(on middle third of main axis, 50% of plants)	Late (7)
5.	Tassel: anthocyanin colouration at base of glumes (in middle third of main axis)	Absent (1) Present (9)
6.	Tassel: anthocyanin colouration of glumes excluding base	Present (9)
7.	Tassel: anthocyanin colouration of Anthers	Present (9)
8.	Tassel: density of spikelets (in middle third of main axis)	Sparse (3)
9.	Tassel: angle between main axis and lateral branches	Wide (7)
10.	Tassel: attitude of lateral branches (in lower third of tassel)	Straight (1)
11.	Ear: time of silk emergence (50% plants)	Late (7)
12.	Ear: anthocyanin colouration of silks (on day of emergence)	Present (9)
13.	Leaf: anthocyanin colouration of sheath (below the ear)	Absent (1)
14.	Tassel:length of main axis above lowest side branch	Medium (5)
15.	Inbred lines only plant length (up to flag leaf)	Medium (3)
16.	Plant: ear placement	Medium (5)
17.	Leaf: width of blade (leaf of upper ear)	Narrow (3)
18.	Ear: length (without husk)	Medium (5)
9.	Ear: diameter (in middle)	Small (3)
20.	Ear: shape	Conicol - Cylindrical (3)
21.	Ear: number of rows of grains	Medium (5)
22.	Ear: type of grain (in middle third of ear)	Flint (1)
23.	Ear: colour of top of grain	Yellow (3)
24.	Ear: colouration of glumes of cob	White (1)
25.	Kernel row arrangement	Irregular (3)
26.	Kernel: Poppinesss	Absent (1)
27.	Kernel: Sweetness	Absent (1)
28.	Kernel: Waxiness	Absent (1)
29.	Kernel: Opaqueness	Absent (1)
30.	Grain shape	Toothed (4)
31.	1000 Kernel weight	Small (3)



DMRHO-57

Registered Germplasm of Maize (2nd Edition)

S. No.	Characteristics	Expression (Score)	
		HKI -1(T)	HKI -6
1	Leaf: angle between blade and stem (on leaf just above upper ear)	Small (3)	Small (3)
2	Leaf attitude of blade (on leaf just above upper ear)	Straight (1)	Straight (1)
3	Stem: anthocyanin colouration of brace roots	Absent (1)	Absent (1)
4	Tassel: time of anthesis (50% of plants)	Medium (5)	Late (7)
5	Tassel: anthocyanin colouration at base of glume (in middle third of main axis)	Absent (1)	Absent (1)
6	Tassel: anthocyanin colouration of glumes excluding base	Absent (1)	Absent (1)
7	Tassel: anthocyanin colouration of anthers	Absent (1)	Absent (1)
8	Tassel: density of spikelets (in middle third of main axis)	Sparse (3)	Sparse (3)
9	Tassel: angle between main axis and lateral branches	Wide (7)	Wide (7)
10	Tassel: attitude of lateral branches (in lower third of tassel)	Curved (5)	Straight (1)
11	Ear: time of silk emergence (50% plants)	Medium (5)	Late (7)
12	Ear: anthocyanin colouration of silks	Absent (1)	Absent (1)
13	Leaf: anthocyanin colouration of sheath	Absent (1)	Absent (1)
14	Tassel: length of main axis above lowest side branch	Medium (5)	Medium (5)
15	Plant: length (up to flag leaf)	Short (3)	Short (3)
16	Plant: ear placement	Medium (5)	Medium (5)
17	Leaf: width of blade (leaf of upper ear)	Narrow (3)	Narrow (3)
18	Ear: length (without husk)	Short (3)	Medium (5)
19	Ear: diameter (in middle)	Small (3)	Small (3)
20	Ear: shape	Conico-cylindrical (2)	Conical (1)
21	Ear: number of rows of grains	Medium (5)	Medium (5)
22	Ear: type of grain (in middle third of ear)	Flint (1)	Flint (1)
23	Ear: colour of top of grain	Yellow (3)	Yellow (3)
24	Ear: colouration of glumes of cob	White (1)	White(1)
25	Kernel: row arrangement	Straight (1)	Irregular (3)
26	Kernel: poppiness	Absent (1)	Absent (1)
27	Kernel: sweetness	Absent (1)	Absent (1)
28	Kernel: waxiness	Absent (1)	Absent (1)
29	Kernel: opaqueness	Absent (1)	Absent (1)
30	Kernel: shape	Round (2)	Round (2)
31	Kernel: size (1000 kernel weight)	Medium (5)	Small (3)



HKI -1(T)



HKI -6

4. Pools/Population

Given below is the list of registered pools and populations of maize along with their unique/novel traits.

Table 3: Registered pools/Population

S No.	Pools/ Populations	INGR No	IC No.	Developing Institute	Novel Features
1	BPPTI 28	3054	396382	Hyderabad	Tolerant to PFSR (2.2 point scale)
2	BPPTI 32	4085	396385	Hyderabad	Semi erect leaf with orange yellow grain and resistant to PFSR
3	BPPTI 34	4086	396387	Hyderabad	Resistan to PFSR and bold grain
4	BPPT 135	6043	396388	Hyderabad	Source of PFSR resistance
5	BPPT 137	6044	396390	Hyderabad	Source of PFSR resistance
6	BPPT 138	6045	396391	Hyderabad	Source of PFSR resistance
7	BPPT 144	6046	396393	Hyderabad	Source of PFSR resistance
8	MS Pool C4	3052	296598	Ludhiana	Heterotic gene pool

ABBREVIATIONS

BML	Hyderabad Maize Line	MLB	Maydis Leaf Blight
DMRQ	DMR Quality Protein Maize Line	NC	North Carolina
DMS	DMR Sweet Corn Line	Pop	Population
DMSC	DMR Sweet Corn Line	QPM	Quality Protein Maize
DUS	Distinctiveness, Uniformity and Stability	RDM	Rajasthan Downy Mildew
GCA	General Combining Ability	PFSR	Post Flowering Stalk Rot
HKI	Haryana Karnal Inbred	SDM	Sorghum Downy Mildew
LMP	Ludhiana MS Pool	TLB	Turcicum Leaf Blight
LTP	Ludhiana Tuxpeno Pool		

Registered Germplasm of Maize (2nd Edition)

Annexure 1: Characteristics as per DUS Guidelines

S. No.	Characteristics	States	Notes	Stage of observation	Type of assessment
Leaf Traits					
1	Leaf: Angle between blade and stem (on leaf just above upper ear)	Small (<45°)	3	61	VG
		Wide (>45°)	7		
2	Leaf: Anthocyanin colouration of sheath (below the ear)	Absent	1	71	VS
		Present	9		
3	Leaf: Attitude of blade (on leaf just above upper ear)	Straight	1	61	VG
		Drooping	9		
4	Leaf: Width of blade (leaf of upper ear)	Narrow (<8 cm)	3	75	MS
		Medium (8-9 cm)	5		
		Broad (> 9cm)	7		
Plant/Stem Traits					
5	Plant : Length (up to flag leaf) Inbred lines only:	Short (<120 cm)	3	75	MS
		Medium (120-150 cm)	5		
		Long (>150cm)	7		
6	Plant: Ear placement	Low	3	75	MS
		Medium	5		
		High	7		
7	Stem: Anthocyanin colouration of brace roots	Absent	1	65-75	VS
		Present	9		
Tassel Traits					
8	Tassel: Time of anthesis (on middle third of main axis, 50 % of plants)	Very early (<45 days)	1	65	VG
		Early (45-50 days)	3		
		Medium (50-55 days)	5		
		Late (>55 days)	7		
9	Tassel: Anthocyanin colouration at base of glume (in middle third of main axis)	Absent	1	65	VS
		Present	9		

Registered Germplasm of Maize (2nd Edition)

10	Tassel: Anthocyanin colouration of glumes excluding base (in middle third of main axis)	Absent	1	65	VS
		Present	9		
11	Tassel: Anthocyanin colouration of anthers (in middle third of main axis on fresh anthers)	Absent	1	65	VG
		Present	9		
12	Tassel: Density of spikelets (in middle third of main axis)	Sparse	3	65	VG
		Dense	7		
13	Tassel: Angle between main axis and lateral branches (in lower third of tassel)	Narrow (<45°)	3	65	VG
		Wide (>45°)	7		
14	Tassel: Attitude of lateral branches (in lower third of tassel)	Straight	1	65	VG
		Curved	5		
		Strongly curved	9		
15	Tassel: Length of main axis above lowest side branch	Short (<20 cm)	3	71	MS
		Medium (20-30 cm)	5		
		Long (> 30 cm)	7		
Ear Traits					
16	Ear: Time of silk emergence (50% plants)	Very early (<48 days)	1	65	VG
		Early (48-53 days)	3		
		Medium (53-58 days)	5		
		Late (>58 days)	7		
17	Ear: Anthocyanin colouration of silks (on day of emergence)	Absent	1	65	VG
		Present	9		
18	Ear: Length without husk	Short (<10 cm)	3	92	MS
		Medium (10-15 cm)	5		
		Long (>15 cm)	7		
19	Ear: Diameter without husk (in middle)	Small (<4 cm)	3	92	MS
		Medium (4-5 cm)	5		
		Large (> 5 cm)	7		
20	Ear: Shape	Conical	1	92	VG
		Conico-cylindrical	2		
		Cylindrical	3		
21	Ear: Number of rows of grains	Few (£8)	3	92	MS
		Medium (10-12)	5		
		Many (³14)	7		

Registered Germplasm of Maize (2nd Edition)

22	Ear: Type of grain (in middle third of ear)	Flint	1	92	VG
		Semi flint/ semi dent	2		
		Dent	3		
23	Ear: Colour of top of grain	White	1	92	VG
		White with cap	2		
		Yellow	3		
		Yellow with cap	4		
		Orange	5		
		Red	6		
		Other (specify)	7		
24	Ear: Anthocyanin colouration of glumes of cob	White	1	93	VG
		Light purple	2		
		Dark purple	3		
25	Kernel: Row arrangement (middle of ear)	Straight	1	93	VG
		Spiral	2		
		Irregular	3		
Kernel Traits					
26	Kernel: Poppiness	Absent	1	93	VG
		Present	9		
27	Kernel: Sweetness	Absent	1	93	VG
		Present	9		
28	Kernel: Waxiness	Absent	1	93	VG
		Present	9		
29	Kernel: Opaqueness	Absent	1	93	VG
		Present	9		
30	Kernel: Shape	Shrunken	1	93	VG
		Round	2		
		Indented	3		
		Toothed	4		
		Pointed	5		
31	Kernel: Size (1000 kernel weight)	Very small (<100g)	1	93	MG
		Small (100-200 g)	3		
		Medium (200-300 g)	5		
		Large (>300 g)	7		

Registered Germplasm of Maize (2nd Edition)

MG: Measurement by a single observation of a group of plants or parts of plants

MS: Measurement of a number of individual plants or parts of plants

VG: Visual assessment by a single observation of a group of plants or parts of plants

VS: Visual assessment by observation of individual plant or parts of plants

Decimal Code for the Growth Stage (Stage of observation)

Stage Code	General Description
61	Beginning of anthesis
65	Anthesis halfway
71	Caryopsis watery ripe
75	Medium milk
85	Soft dough
92	Caryopsis hard (can no longer be dented by thumbnail)
93	Caryopsis loosening daytime

Source: National Guidelines for the Conduct of Tests for Distinctiveness, Uniformity and Stability on Maize (*Zea mays* L.) (2006).

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Cover page designed by:
Jyoti Kaul, Bilal Ahmad and Usha Nara



Directorate of Maize Research

(Indian Council of Agricultural Research)

Pusa Campus, New Delhi 110012 (India)

Website : www.maizeindia.org

Email: pdmaize@gmail.com

Phone: 011-25841805, 25842372, 25849725

Fax: 011-25848195