सत्यमेव जयते

भारत सरकार
GOVERNMENT OF INDIA

भारतीय पौधा किस्म जरनल

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पौधा किस्म और कृषक अधिकार संरक्षण प्राधिकरण
एनएएससी काम्प्लैक्स, डीपीएस मार्ग, निकट टोडापुर गांव, नई दिल्ली–110012

PROTECTION OF PLANT VARIETIES & FARMERS' RIGHTS AUTHORITY
NASC COMPLEX, DPS MARG, Opp. Todapur Village, New Delhi-110012

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'भारतीय पाधा किस्म जरनल' पौधा किस्म और कृषक अधिकार संरक्षण प्राधिकरण (पौ.कि.कृ.अ.सं.प्रा.) का आधिकारिक जरनल है। पीपीवी और एफआर अधिनियम, 2001 तथा पीपीवी और एफआर नियमावली, 2003 के नियम 2 (जी) के अंतर्गत अध्यक्ष, पीपीवी और एफआरए, एनएएससी काम्प्लैक्स (द्वितीय तल), डीपीएस मार्ग, निकट टोडापुर गांव, नई दिल्ली–110012 की ओर से प्राधिकरण के रजिस्ट्रार द्वारा प्रकाशित किया जा रहा है।

Plant Variety Journal of India is the Official Journal of the Protection of Plant Varieties and Farmers' Rights Authority (PPV & FRA) published by the Registrar on behalf of the Chairperson, PPV & FRA, NASC Complex (IInd Floor), DPS Marg, Opp. Todapur Village, New Delhi-110012 under the PPV & FR Act, 2001 and Rule 2 (g) of the PPV & FR Rules, 2003.

PUBLIC NOTICE

Sub: Notice is given under Rule 29 (8 and 9) of the PPV & FR Rules, 2003.

As a requirement under Rule 29 (8 and 9) of the PPV & FR Rules, 2003, it is hereby informed that the specific DUS test guidelines for Durum (*Triticum durum* Desf.), Dicoccum wheat (*Triticum dicoccum* L.) and *Triticum* species and Isabgol (*Plantago ovata* Forsk.) crop species is hereby published in 'Plant Variety Journal of India', Vol. 04, No. 10, October 01, 2010. Interested parties may read these guidelines and act accordingly.

Durum (*Triticum durum* Desf.), Dicoccum wheat (*Triticum dicoccum* L.) and ***Triticum*** species

I. Subject

These test guidelines shall apply to all varieties, hybrids and parental lines of Durum (*Triticum durum* Desf.), Dicoccum wheat (*Triticum dicoccum* L.) and *Triticum* species.

II. Seed material required

1. The Protection of Plant Varieties and Farmers' Rights Authority (PPV & FRA) shall decide where and in what quantity and quality the seed material are required for testing the variety denomination applied for registration under the Protection of Plant Varieties and Farmers' Rights (PPV & FR) Act, 2001. Applicants submitting such seed material from a country other than India shall make sure that all customs and quarantine requirements stipulated under relevant national legislations and regulations are complied with. The minimum quantity of the seed to be provided by the applicant shall be 3000 gram in the case of the candidate variety or hybrid and 1500 gram for each of the parental line of the hybrid. Each of these seed lots shall be packed and sealed in ten equal weighing packets and submitted in one lot. Wherever, individual spikes are to be supplied, such spikes shall be individually packed and submitted along with the said seed lot.
2. At least 100 ears, each representing the normal ear size and drawn from the main tiller of the candidate variety shall be submitted.
3. The seeds and ears submitted shall have at least 95 % germination, 98% physical purity, highest genetic purity, uniformity, sanitary and phyto-sanitary standards. In addition, the moisture content of the seed shall not exceed 8 - 9% to meet the safe storage requirement. The applicant shall also submit along with the seed a certified data on germination test made not more than one month prior to the date of submission.
4. The seed material shall not have been subjected to any chemical and bio-physical treatment.

III. Conduct of tests

1. The minimum duration of the DUS tests shall normally be at least two independent similar growing seasons.
2. The test shall normally be conducted at least at two test locations. If any essential characteristics of the candidate variety are not expressed for visual observation at these locations, the variety shall be considered for further examination at another appropriate test site or under special test protocol on expressed request of the applicant.
3. The field tests shall be carried out under conditions favouring normal growth and expression of all test characteristics. The size of the plots shall be such that plants or parts of plants could be removed for measurement and observation without prejudicing the other observations on the standing plants until the end of the growing period. Each test shall include about 1000 plants, in the plot size and planting space specified below across three replications. Separate plots for observation and for measuring can only be used if they have been subjected to similar environmental conditions. All the replications shall be sharing similar environmental conditions of the test location.
4. Test plot design:

Number of rows	:	6
Row length	:	6 m
Row to row distance	:	30 cm
Plant to plant distance	:	10 cm
Expected plants / replication	:	360
Number of replications	:	3

5. Observations shall not be recorded on plants in border rows.
6. Additional test protocols for special purposes shall be established by the PPV & FR Authority.

IV. Methods and observations

1. The characteristics described in the Table of characteristics shall be used for the testing of varieties, inbred lines and hybrids for their DUS.

2. For the assessment of Distinctiveness and Stability observations shall be made on 30 plants or parts of 30 plants, which shall be equally divided among 3 replications (10 plants per replication).
3. For the assessment of Uniformity of characteristics on the plot as a whole (visual assessment by observations of a number of individual panicle-rows, plants or parts of plants) the number of aberrant or odd plants or parts of plant shall not exceed 2 in 1000.
4. For the assessment of Uniformity of characteristics on single ear-rows, plants or parts of plant shall be visually observed on all individual ear-rows, plants or parts of plants. An ear-rows having at least one aberrant or odd plant or parts of plant is dealt as an aberrant row. A variety shall be deemed uniform when the number of such aberrant ear-rows shall not exceed 3 in 100.
5. For the assessment of color characteristics, the latest Royal Horticultural Society (RHS) colour chart shall be used.

V. Grouping of varieties

1. The candidate varieties for DUS testing shall be divided into groups to facilitate the assessment of Distinctiveness. Characteristics, which are known from experience not to vary or to vary only slightly, within a variety and which in their various states are fairly evenly distributed across all varieties in the collection, are suitable for grouping purposes.
2. The following characteristics are proposed to be used for grouping durum and Dicoccum varieties:
    a) Coleoptile colouration (Characteristic 1)
    b) Flag leaf : Anthocynin coloration of auricle (Characteristic 4)
    c) Time of ear emergence (Characteristic 7)
    d) Plant length (Characteristic 15)
    e) Awn colour (Characteristic 21)
    f) Outer glume : Pubescence (Characteristic 23)
    g) Ear : Colour (Characteristic 24)
    h) Season type (Characteristic 39)
    i) Grain colouration with phenol (Characteristic 32)

VI. Characteristics and symbols

1. To assess Distinctiveness, Uniformity and Stability, the characteristics and their states as given in the Table of characteristics (Section VII) shall be used.
2. Note (1 to 9) is used to describe the state of each character for the purpose of digital data processing.
3. **Legend :**

(*) Characteristics that shall be observed during every growing season on all varieties and shall always be included in the description of the variety, except when the state of expression of any of these characters is rendered impossible by a preceding phenological characteristic or by the environmental conditions of the testing region. Under such exceptional situation, adequate explanation shall be provided.

(+) See Explanation on the Table of characteristics in Section VIII. It is to be noted that for certain characteristics the plant parts on which observations to be taken are given in the explanation or figure(s) for clarity and not the colour variation.

4. The optimum stage for the observation of each characteristic during the plant growth and development is indicated by a decimal code number in the sixth column of table of characteristics. The relevant growth stages corresponding to these decimal code numbers are described below:

Decimal code for the growth stage

Growth Stage Code	**Corresponding Growth Stage**
Germination	
09	Leaf just at coleoptile tip
10	First leaf through coleoptile
11	First leaf unfolded
Tillering	
25	Main shoot and 5 tillers
26	Main shoot and 6 tillers
27	Main shoot and 7 tillers

28	Main shoot and 8 tillers
29	Main shoot and 9 tillers
Booting	
40	Early boot stage
41	Flag leaf sheath extending
43	Boots just visibly swollen
47	Flag leaf sheath opening
49	First awns visible [in awned forms only]
Inflorescence	
50-51	First spikelet of inflorescence just visible
52	1/4 of inflorescence emerged
Anthesis	
60-61	Beginning of anthesis
64-65	Anthesis half-way
68-69	Anthesis complete
Milk development	
73	Early milk
75	Medium milk
77	Late milk
Dough development	
83	Early dough
85	Soft dough
87	Hard dough
Ripening	
91	Caryopsis hard (difficult to divide by thumb-nail)
92	Caryopsis hard (can no longer be dented by thumb-nail)
93	Caryopsis loosening in daytime
94	Over-ripe, straw dead and collapsing

5. Type of assessment of characteristics indicated in column seven of Table of characteristics is as follows:

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 on a group of plants or parts of plants

VS: Visual assessment by observations of individual plants or parts of plants

VII. Table of characteristics

S. No.	Characteristics	States	Note	Example Varieties			Stage of observation	Type of assessment
				Durum	Dicoccum	Triticum spp.		
1	2	3	4	5	6	7	8	8
1. (*) (+)	Coleoptile : Anthocyanin colouration	Absent Present	1 9	HI 7483 HD 4672	DDK 1025 DDK 1009	TL 2942, DT 46 TL 2908	09-11	VS
2. (*) (+)	Plant : Growth habit	Erect Semi-erect Intermediate Semi-prostrate Prostrate	1 3 5 7 9	HI 7483, HI 8498 HD 4502 WH 912 -- --	-- DDK 1029 DDK 1009 -- --	TL 2942 DT 46 -- -- --	25-29	VG
3.	Foliage : Colour	Pale green Green Dark green	3 5 7	HI 7483, GW 2 HI 8381, DWR 185 HD 4502, NIDW 295	NP 200 DDK 1025 --	TL 2942 DT 46 TL 2908	40-45	VG
4. (*)	Flag leaf : Anthocyanin colouration of auricles	Absent Present	1 9	GW 1139, HI 8381 NIDW 15, HD 4530	DDK 1025 DDK 1001	TL 2908 --	49-51	VS
5. (*)	Flag leaf : Hairs on auricle	Absent Present	1 9	DWR 185 HI 7483	DDK 1009 NP 200	TL 2908 --	49-51	VS
6. (+)	Plant : Flag leaf attitude	Erect Semi-erect Drooping	1 3 5	HI 8498 HI 8381 RAJ 911	-- DDK 1009 --	-- -- TL 2908	47-51	VG
7. (*)	Ear: Time of emergence (first spikelet visible on 50% of ears)	Very early Early Medium Late Very late	1 3 5 7 9	-- DWR 185 HI 8381 PDW 274 HD4672	-- -- -- DDK 1025 --	-- -- -- -- --	50-52	VG

8.	Waxiness of the plant	Absent Present	1 9	HI 7483 AKDW 2997-16	-- --	-- --		
9. (*)	Flag leaf: Waxiness of sheath	Very weak/absent Weak Medium Strong	1 3 5 7	HI 7483 A 28 MACS 1967 HI 8381	-- NP 200 DDK 1009 DDK 1029	-- -- -- --	60-65	VG
10. (*)	Flag leaf: Waxiness of blade	Very weak/absent Weak Medium Strong	1 3 5 7	HI 7483 MACS 2694 AKDW 2997-6 RAJ 6560	DDK 1029 DDK 1009 -- --	-- -- -- TL 2908	60-65	VG
11. (*)	Ear: Waxiness	Very weak/absent Weak Medium Strong	1 3 5 7	HI 7483 MACS 1967 HD 4672 GW 1139	DDK 1009 -- -- --	-- -- -- --	60-69	VG
12. (*)	Peduncle: waxiness	Very weak/absent Weak Medium Strong	1 3 5 7	HI 7483 MACS 1967 HD 4672 PDW 274	DDK 1001 DDK 1025 -- --	-- -- -- --	60-69	VG
13.	Flag leaf: Length	Short Medium Long	3 5 7	PDW 274 HI 8381 MACS 1967	DDK 1001 DDK 1009 --	-- -- --	70-80	MS
14.	Flag leaf: Width	Very Narrow Narrow Medium Broad	1 3 5 7	- A 28 HD 4672 MACS 1967	-- -- -- DDK 1029	-- -- -- --	70-80	MS
15. (*)	Plant: Height	Very short Short Medium Long very long	1 3 5 7 9	HD 4530 GW 1139 HI 8381 HI 7483 A 28	-- DDK 1001 DDK 1029 -- NP 200	-- -- -- -- --	75-92	MS
16. (*) (+)	Ear: Shape in profile	Tapering Parallel sided Club shaped Fusiform	1 2 3 4	BIJAGA RED HI 7483 -- AKDW 2997-6	-- DDK 1009 -- --	TL2908 -- -- --	92	VS
17. (*) (+)	Ear: Density	Very Lax Lax Medium Dense Very dense	1 3 5 7 9	-- GW 2 GW 1 HI 7483, AKDW 2997-16	-- -- DDK 2001 DDK 1009 --	-- -- TL 2942 -- --	80-92	VS
18. (*)	Ear: Length (excluding awns and scurs)	Very short Short Medium Long Very long	1 3 5 7 9	-- A 28 DWR 185 MACS 3125 --	-- -- DDK 1009 DDK 1025 --	-- -- DT 46 -- --	80-92	MS
19. (*) (+)	Awns: Presence	Absent Present	1 9	-- DWR 1006	-- DDK 1009	-- DT 46	80-92	VG
20. (*)	Awns: Length	Very Short Short Medium Long Very long	1 3 5 7 9	-- -- A 28 PDW 274 PDW 215, DWR 1006	-- NP 200 -- DDK 1029 DDK 1025	-- DT 46 TL 2942 -- --	80-92	VG or MS

21. (*)	Awn: Colour	Dull White Light brown Dark brown Black	1 2 3 4	WH 896 HI 7483 -- PDW 274, HD 4503	DDK 1001 -- -- --	DT 46 TL 2908 -- --	80-92	VS
22. (+)	Awn: Attitude	Oppressed Medium Spreading	1 2 3	HD 4672 MACS 1967 DWR 185	NP 200 DDK 1009 --	-- -- --	80-92	VS
23. (*)	Outer glume: Pubescence	Absent Present	1 9	WH 912, HI 8498 DWR 185	DDK 1025 --	-- --	90-92	VS
24. (*)	Ear: Colour	Dull White Light brown Dark brown Black	1 2 3 4	HI 8498 HI 7483, NIDW 15 -- --	DDK 1009 -- -- --	-- -- -- --	90-92	VG
25.	Lower glume shape	Ovoid Elongated	1 2	HI 8498 HI 8381, MACS 3125	-- DDK 1009	-- --	80-92	VS
26. (*) (+)	Lower glume: Shoulder width (spikelets in mid-third of ear)	Very narrow Narrow Medium Broad Very broad	1 3 5 7 9	HI 8381 GW 1139 HI 7483 NIDW 15 --	DDK 1029 DDK 1025 -- -- --	-- -- -- -- --	80-92	VS
27. (*) (+)	Lower glume: Shoulder shape (as for 27)	Sloping Round Straight Elevated Indented	1 3 5 7 9	HI 8381 HD 4672, NIDW 15 -- HD 4502, HD 4530 --	DDK 1029 NP 200 -- -- --	-- -- -- -- --	80-92	VS
28. (*)	Lower glume: Beak length (as for 27)	Very short Short Medium Long Very long	1 3 5 7 9	HI 7483, RAJ 1555 HD 4672,WH 912 WH 896 MACS 2971 --	DDK 1009 -- -- -- --	-- -- -- -- --	80-92	VS
29. (+)	Lower glume: Beak shape (as for 27)	Straight Moderately curved Strongly curved Geniculate	1 2 3 4	HD 4672 GW 1139, A 28 --	DDK 1009 -- -- --	-- -- -- --	80-92	VS
30.	Peduncle: Length	Short Medium Long	1 5 9	-- HI 8498 HI 7483,	DDK1001 DDK 1025 --	-- -- --	80-92	MS
31 (*) (+)	Peduncle: Attitude (at the time of maturity)	Straight Bent Crooked	3 5 9	DWR 1006WH 912, HI 8381, HD 4672 GW 1139	NP 200 DDK 1001 --	-- -- --	80-92	VG
32. (*) (+)	Grain: Colouration with phenol	None Light Medium Dark Very dark	1 3 5 7 9	WH 896 A 28 JNK-4W-184 DWR 137 A-9-10-1	DDK 1025 DDK 1029 NP 200 -- --	-- -- -- -- --	92	VG
33. (*)	Grain: Colour	White Amber Red	1 2 3	-- HI 8498 BIJAGA RED	-- -- DDK 1009	-- -- --	92	VG
34. (+)	Grain : Shape	Round Ovate	1 2	-- JU-12	-- --	-- --	92	VG

		Oblong	3	HD 8498, DWR 1006	--	--		
		Elliptical	4	HI 7483, HD 4672	DDK 1029	--		
		Very long	5	--	DDK 1009	--		
35. (+)	Grain: Crease	Angular	1	HI 7483	DDK 1001	--	92	VG
		Round	9	HI 8498	--	--		
36. (*) (+)	Grain: Germ width	Narrow	3	WH 912	--	--	92	VG
		Medium	5	HI 8498	--	--		
		Wide	7	DWR 137	--	--		
37. (*) (+)	Brush hair : Length	Absent/Short	3	HD 4672	--	--	92	VG
		Medium	5	HD 4502	--	--		
		Long	7	MACS 1967	NP 200	--		
38. (*)	Grain weight (weight of 1000 grains)	Low	3	AKDW 2997-16	--	--	92	MG
		Medium	5	BIJAGA RED	NP 200	--		
		Bold	7	HI 7483	DDK 1009	--		
		Very bold	9	HI 8498, MACS 1967	--	--		
39. (*)	Season: Type	Winter type	1	--	--	--	92	VG
		Alternative type	2	--	--	--		
		Spring type	3	HI 7483	--	--		
40.	Grain : Hardness	Very Soft	1	--	--	--	92	VG
		Soft	3	--	--	--		
		Semi-hard	5	--	--	--		
		Hard	7	HI 8381	DDK 1001	--		
		Very hard (flint)	9	HD 4672	DDK 1009	--		
41.	Threshability	Easy	1	GW 1139	--	--	92	
		Medium	5	DWR 185	--	--		
		Hard	7	---	DDK 1029	--		
42.	Rachis brittleness	Present	1	DWR 1006, HI 8381	DDK 1001	--	92	VG
		Absent	9	DWR 137, HI 7483	--	--		
43. (*)	Anther extrusion	Complete	1	A 28, HI 8381	--	--	64-69	VG
		Incomplete	9	GW 1139	--	--		
44. (*)	Anther colour	Green	1	HD 4672	--	--	64-69	VG
		Pink	9	--	DDK 1001	--		
45. (*)	Male fertility	Fully Sterile	3	--	--	--		MS
		Partially sterile	5	HD 4672	--	--		
		Fully Fertile	7	A 9-30-1	--	--		

VIII. Explanations on the Table of characteristics.

Characteristic 1: Coleoptile: Anthocyanin colouration

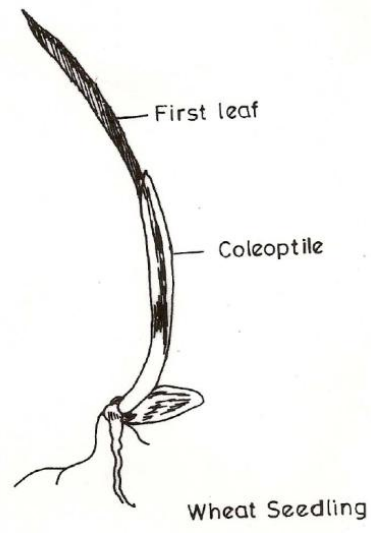
Method for determination of colour of anthocyanin

Number of grains per test: 20 grains for Distinctiveness, 100 grains for homogeneity

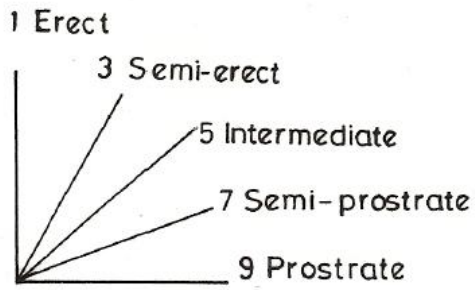
Preparation of grains: Set up non-dormant grains on moistened filter paper covered with a petri dish lid during germination

Place:	Laboratory
Light:	After the coleoptiles have reached a length of about 1 cm in darkness, they are placed in artificial light (daylight equivalent), at 15,000 lux continuously for 3-4 day
Temperature:	15 to 20^0 C
Time of recording:	Coleoptiles fully developed (about 1 week) at stage 09-11
Scale of recording:	See characteristics 1

Note: At least, two of the example varieties shall be included as a control when testing for Distinctiveness.



Characteristic 2: Plant: Growth habit



The growth habit shall be assessed visuallyfrom the altitude of the leaves and tillers. The angle formed by the outer leaves and the tillers with an imaginary vertical axis shall be used.

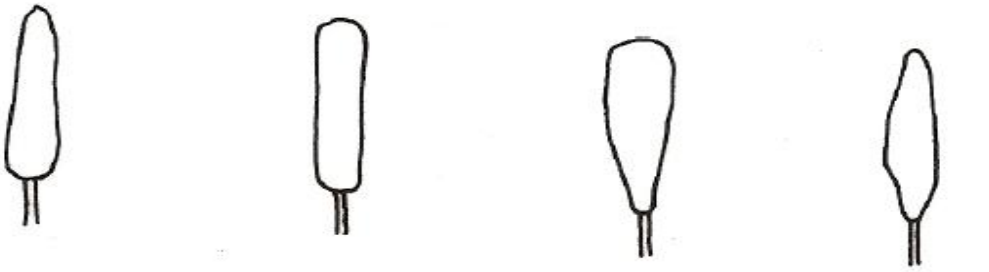
Characteristic 6: Plant: Flag leaf attitude

1
Erect

3
Semi-erect

5
Drooping

Characteristic 16: Ear: Shape in profile



1
Tapering

2
Parallel sided

3
Club shaped

4
Fusiform

Characteristic 17: Ear: Density

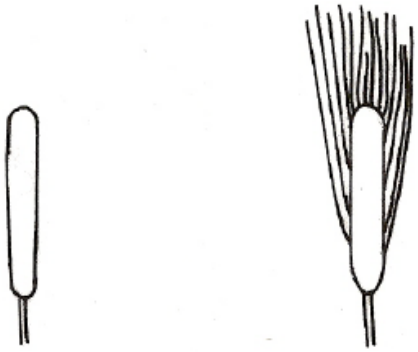
3
Lax

5
Medium

7
Dense

9
Very dense

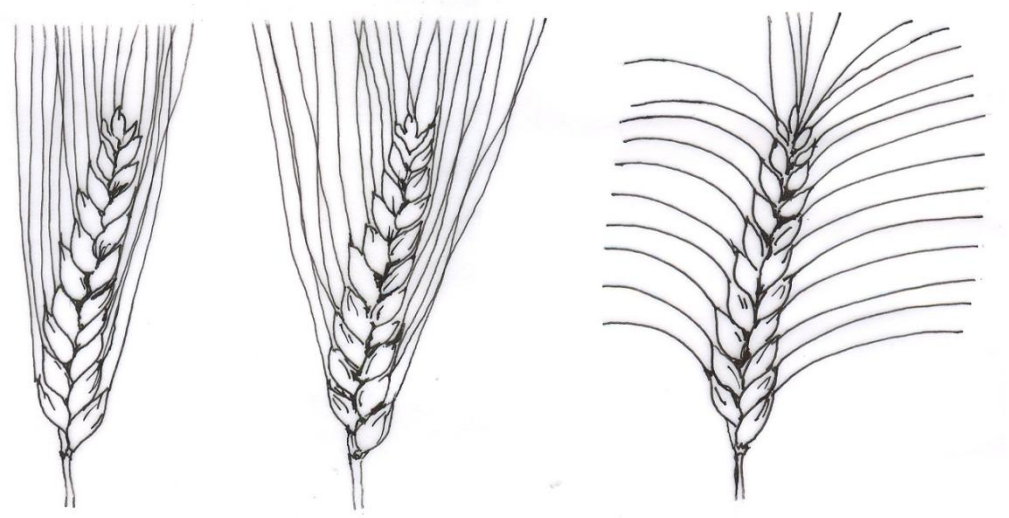
Characteristic 19: Awns or scurs: Presence



1
Awns absent

2
Awns present

Characteristic 22: Awn: Attitude



1
Oppressed

2
Medium

3
Spreading

Characteristic 26: Lower glume: Shoulder width (spikelet in the mid third of ear)

1
Very narrow

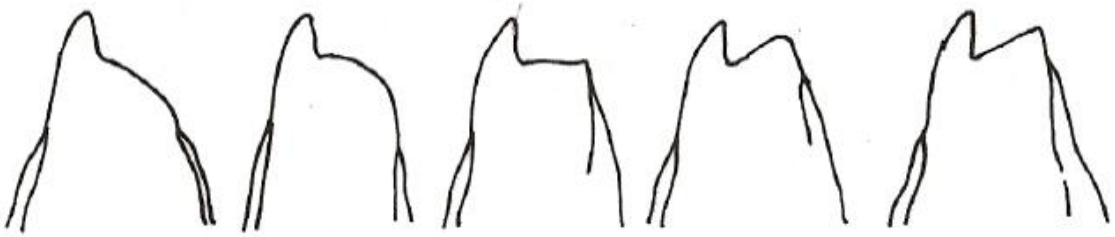
3
Narrow

5
Medium

7
Broad

9
Very broad

Characteristic 27: Lower glume: Shoulder shape (spikelet in the mid third of ear)



1
Sloping

3
Round

5
Straight

7
Elevated

9
Indented

Characteristic 29: Lower glume: Beak shape (spikelet in the mid third of ear)

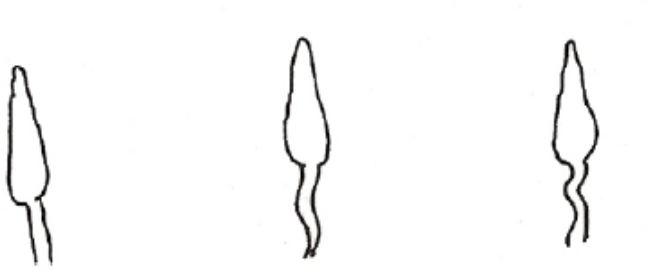
1
Straight

2
Moderately

3
Strongly

4
Geniculate

Characteristic 31: Lower glume: Spike attitude (at the time of flowering)



3	5	7
Straight	**Bent**	**Crooked**

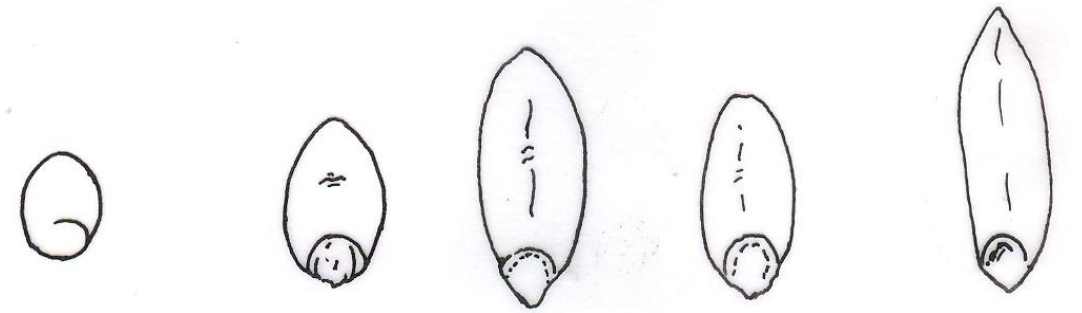
Characteristic 32. Grain: Colouration with phenol

Method for colour determination of with phenol reaction

Number of grains per test:	20 grains for Distinctiveness, 100 grains for homogeneity. The grains shall not have been treated chemically
Preparation of grains:	Soak in tap water for 16 to 20 hours, drain and remove surface water, place the grains with crease downwards, cover dish with lid
Concentration of solution:	1 per cent Phenol-solution (freshly made up)
Amount of solution:	The grains shall be about 3/4 covered
Place:	Laboratory
Light:	Daylight - out of direct sunshine
Temperature:	18 to 20^0C
Time of recording:	4 hours (after adding solution)
Scale of recording:	See characteristics 31 in the Table of characteristics

Note: At least, two of the example varieties shall be included as a control.

Characteristic 34: Grain: Shape



1
Round

2
Ovate

3
Oblong

4
Elliptical

5
Very long

Characteristic 35: Grain: Crease

1
Angular

9
Round

Characteristic 36: Grain: Germ width

3
Narrow

5
Medium

7
Wide

Characteristic 37: Brush hair: Length

3	5	7
Absent/Short	**Medium**	**Long**

IX. DUS Test Centers

Nodal DUS test Centre	**Other DUS test Centers**
Directorate of Wheat Research, Karnal	IARI, Regional Station, Indore
	University of Agricultural Sciences, Dharwad

Isabgol (*Plantago ovata* Forsk.)

I. Subject

These test guidelines shall apply to all varieties, pure lines/inbreds, parental lines and F_1 hybrids of Isabgol (*Plantago ovata* Forsk.).

II. Seed material required

1. The Protection of Plant Varieties and Farmers' Rights Authority (PPVFRA) shall decide in what quantity and quality of the seed material is required for testing the variety denomination applied for registration under the Protection of Plant Varieties and Farmers' Rights (PPVFR) Act, 2001. Applicants submitting such seed material from a country other than India shall make sure that all customs and quarantine requirements stipulated under relevant national legislations and regulations are complied with.
2. The minimum quantity of the seeds to be provided by the applicant shall be 250 g. Each of these seed lots shall be packed and sealed in ten equal weighing packets and submitted in one lot. Wherever, individual spikes are to be supplied, such spikes shall be individually packed and submitted along with the said seed lot. At least 100 spikes, representing apparently healthy looking are drawn from main branch of plants of the candidate variety shall be submitted.
3. The seeds and spikes submitted shall have at least 95% germination, 98% physical purity, highest genetic purity, uniformity, sanitary and phyto-sanitary standards. The moisture content of the seed shall not exceed 8 - 9% to meet the safe storage requirement. In addition, the applicant shall also submit along with the seed, a certified data on germination test made not more than one month prior to the date of submission. Especially for storage, which requires a higher standard, the applicant shall state, the actual germination capacity which shall be as high as possible.
4. The seed material submitted shall not have undergone any chemical and bio-physical treatments unless the competent authorities allow or request such treatment. If it has been treated, full details of the treatment shall be given.

III. Conduct of tests

1. The minimum duration of the DUS tests shall normally be at least two independent similar growing seasons.
2. The test shall normally be conducted at two test locations. If any essential characteristic of the candidate variety is not expressed for visual observation at these locations, the variety shall be considered for further examination at another appropriate test site and under special test protocol on expressed request of the applicant.
3. The field tests shall be carried out under conditions ensuring normal growth and expression of characters included in the test. The size of the plots shall be such that plants or parts of plants could be removed for measurement and counting without prejudice to observations on the standing plants until the end of the growing period. Each test shall include about 400 plants in the plot size and planting specified below across three replications. Separate plots for observation and for measurement can only be used if they have been subjected to similar environmental conditions. All the replications shall be sharing similar environmental conditions of the test location.
4. Test plot design

Number of rows	:	8
Row length	:	7.5 m
Row to row distance	:	45 cm
Plant to plant distance	:	15 cm
Expected plants / replication	:	400
Number of replications	:	3

5. Observations shall not be recorded on plants in border rows.
6. Additional test protocols for special purposes shall be established by the PPV&FR Authority.

IV. Methods and observations

1. The characteristics described in the Table of characteristics shall be used for the testing of varieties for DUS.

2. For the assessment of Distinctiveness and Stability, observations shall be made on 30 plants or parts of 30 plants, which shall be equally divided among 3 replications (10 plants per replication).
3. For the assessment of Uniformity of characteristics on the plot as a whole (visual assessment by observations of a number of individual rows, plants or parts of plants), the number of aberrant or odd type plants or parts of plant shall not exceed 2 in 400.
4. For the assessment of Uniformity of characteristics on single spike-rows, plants or parts of plant shall be visually observed on all individual spike-rows, plants or parts of plants. A spike-row having at least one aberrant or odd plant or parts of plant is dealt as an aberrant row. A variety shall be deemed uniform when the number of such aberrant spike-rows shall not exceed 1 in 50.
5. For the assessment of colour characteristics, the latest Royal Horticultural Society (RHS) Colour Chart shall be used.
6. Measurements shall be made in metric units.

V. Grouping of varieties

1. The candidate varieties for the DUS testing shall be divided into groups to facilitate the assessment of distinctiveness. Characteristics which are known from experience not to vary or to vary only slightly within a variety and which in their various states are fairly evenly distributed across all varieties in the collection are suitable for grouping purpose.
2. The following characteristics shall be used for grouping varieties.
    i. Spike: Peduncle Characteristic 9
    ii. Peduncle : Axis Characteristic 10
    iii. Spike: Flower arrangement Characteristic 11

VI. Characteristics and symbols

1. To assess distinctiveness, uniformity and stability, the characteristics and their states as given in the Table of characteristics (section VII) shall be used.
2. Notes (1 to 9) shall be used to describe the state of each character for the purpose of digital data processing and their notes shall be given against the state of each characteristic.
3. Legend :

(*) Characteristics that shall be observed during every growing season on all varieties and shall always be included in the description of the variety, except when the state of expression of any of these characters is rendered impossible by the environmental conditions of the testing region. Under such exceptional situation, adequate explanation shall be provided.

(+) See explanations on the table of characteristics in section VIII. It is to be noted that for certain characteristics the plant parts on which observations to be taken are given in the explanation or figure(s) for clarity.

4. A decimal code number in the fifth column of the Table of characteristics indicates the optimum stage for observation of each characteristic during the growth and development of plant. The relevant growth stages corresponding to their decimal code number are described below:

* Decimal code for the growth stage

Code	Growth Stage
00	Dry seed
05	Seedling emergence
13	Branching initiation
21	Vegetative branches
26	Transition stage
30	Reproductive branches initiation
32	Inflorescence bud initiation
37	Bud emergence
44	Date of anthesis
50	50% flower opening in first spike
81	Seed coat (‘Husk’) development
100	Full husk formation

***** Total growth period of 135 days was converted to decimal scale

Type of assessment of characteristics indicated in column 6 of Table of characteristics is as follows:

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 observations of individual plants or parts of plants

VII. Table of characteristics

Sl. no	Characteristics	States	Notes	Reference varieties	Stage of observation	Type of assessment
1	2	3	4		5	6
1. (*)	Leaf: Colour	Whitish green	3	DMAPR PO8	30	VG
		Yellowish green	5	DMAPR PO5		
		Green	7	DMAPR PO1, DMAPR PO2, DMAPR PO3, DMAPR PO4, DMAPR PO6, DMAPR PO7		
2. (*)	Leaf: Pubescence	Sparse	3	DMAPR PO5	30	VG
		Medium	5	DMAPR PO1, DMAPR PO2, DMAPR PO3, DMAPR PO4, DMAPR PO6, DMAPR PO7		
		Dense	7	DMAPR PO8		
3. (*) (+)	Leaf : Breadth (cm)	Narrow (Below 1.0)	3	DMAPR PO5	32	MS
		Medium (1.00 to 1.40)	5	DMAPR PO1, DMAPR PO2, DMAPR PO3		

		Broad (Above 1.50)	7	DMAPR PO9		
4. (*) (+)	Plant: Growth habit	Erect	1	DMAPR PO1	44	VG
		Drooping (Caespitose)	9	DMAPR PO2		
5. (*)	Anther: Appearance	Normal	1	DMAPR PO1, DMAPR PO2, DMAPR PO3, DMAPR PO4, DMAPR PO6, DMAPR PO7, DMAPR PO8, DMAPR PO9	50	VS
		Shriveled	9	DMAPR PO10		
6.	Plant: Height (cm)	Short(Below 35) Medium(35-50) Tall(Above 50)	3 5 7	-- --	81	MS
7.	Plant: Number of branches	Low (Below 5) Medium (5-15) High (Above 15)	3 5 7	-- -- --	81	MS
8. (*) (+)	Spike: Arrangements	Compact	1	DMAPR PO3	81	VS
		Spreading	9	DMAPR PO4		
9. (*) (+)	Spike : Peduncle	Unbranched	1	DMAPR PO1, DMAPR PO2, DMAPR PO3, DMAPR PO4, DMAPR PO5	81	VS
		Branched	9	DMAPR PO6		
10. (*)	Peduncle: Axis	Partially filled	1	DMAPR PO7	81	VS
		Filled	9	DMAPR PO1, DMAPR PO2,		

(+)				DMAPR PO3, DMAPR PO4, DMAPR PO5, DMAPR PO6		
11. (*) (+)	Spike: Flower arrangement	Protruding	1	DMAPR PO5, DMAPR PO11	81	VS
		Compressed	9	DMAPR PO1, DMAPR PO2, DMAPR PO3, DMAPR PO4		
12. (+)	Spike: Length (cm)	Small (Below 3)	3	--		MS
		Medium (3-7)	5	--	81	
		Long (Above 7)	7	--		
13.	Spike: Number	Low (Below 50)	3	--		MS
		Medium (50-100)	5	--	81	
		High (Above 100)	7	--		
14.	Spike: Number of seed bearing spikes	Low (Below 50)	3	--		
		Medium (50-100)	5	--	81	MS
		High (Above 100)	7	--		
15	1000 seed weight (g)	Low (Below 1.6 g)	3	--	100	MG
		Medium (1.6-1.8 g))	5	--		
		High (Above 1.8 g)	7	--		
16. (+)	Seed: Swelling factor (cc g^{-1})	Low (below 10 cc)	3		100	MG
		High (Above 10 cc)	5			

VIII. Explanation on the Table of Characteristics

Characteristic 3. Leaf: Breadth

Leaf breadth shall be measured from the sixth leaf from the **bottom**, of main branch.

Characteristic 4. Plant: Growth habit

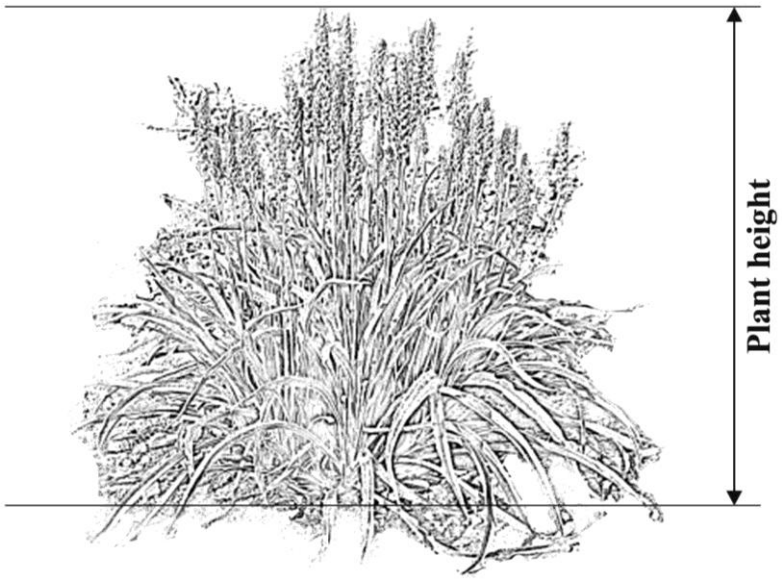
The plant growth habit shall be assessed visually from the arrangement of branches and placement of leaves from the imaginary vertical axis.

Erect

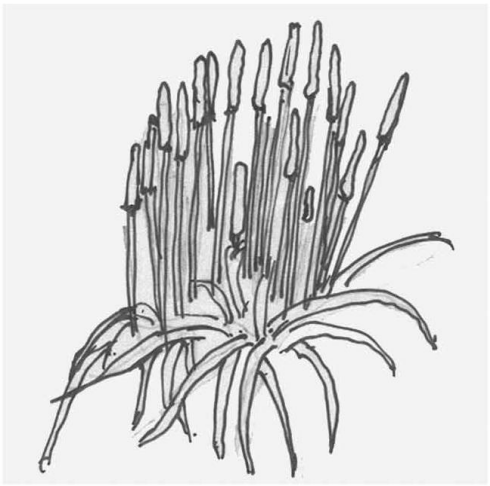
Drooping type (Caespitose)

Characteristic 6. Plant: Height

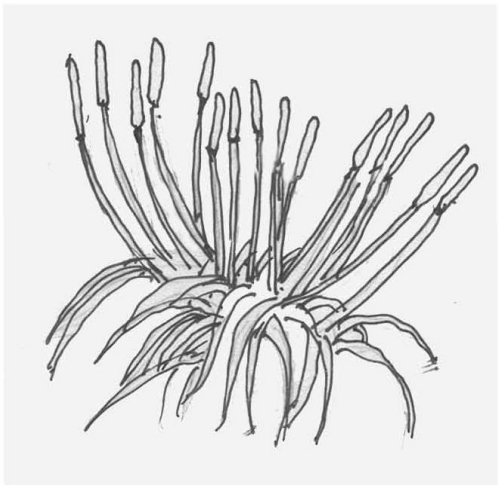
Plant height shall be recorded by taking measurement from base of the plant to top of the spikes as shown below.



Characteristic 8. Spike: Arrangement



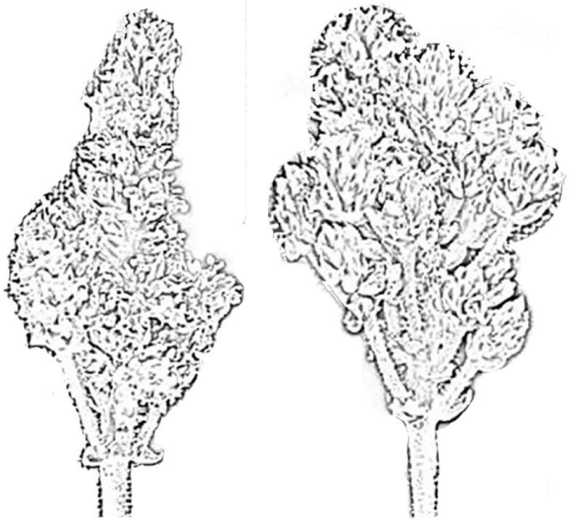
Compact



Spreading

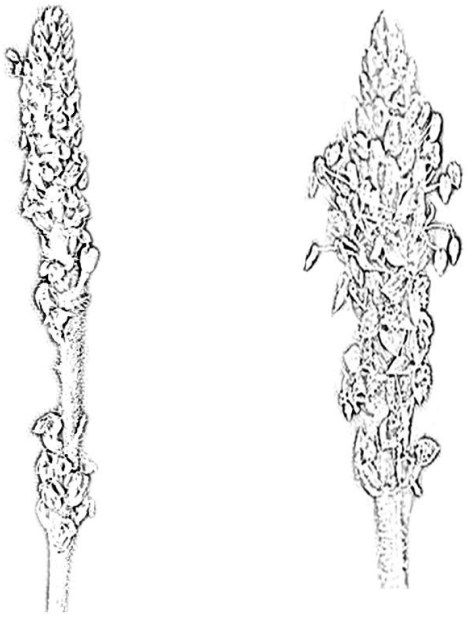
Characteristic 9. Spike: Peduncle

Unbranched



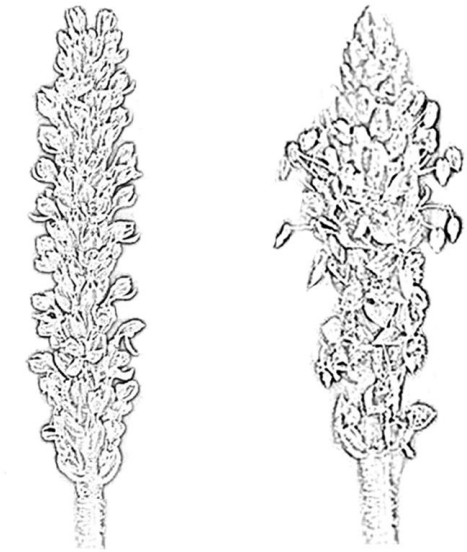
Branched

Characteristic 10. Peduncle: Axis



Partially filled **Filled**

Characteristic 11. Spike: Flower arrangement



Protruding **Compressed**

Characteristic 12. Spike: Length

Spike length shall be measured from the spikes of the main axis.

Characteristic 16. Swelling factor

Collect seeds from the spikes of main axis from 10 randomly selected plants Take minimum three lots of seeds, one gram each from the collected seeds into a 25 ml glass graduated measuring cylinder. The length of the graduated portion of the cylinder shall be ~ 125 mm, the internal diameter ~ 16mm, subdivided into 0.2 ml and marked from 0 to 25 ml in an upward direction. Add 20 ml of water; shake the mixture thoroughly at intervals of every 10 minutes for one hour. Allow to stand for 3 hours at room temperature. Measure the volume in ml occupied by the seed material, including sticky mucilage. Calculate the mean value related to 1.0 g of seed material, which indicate the swelling index (factor).

IX. DUS Test Centres:

Nodal DUS Centre	Other DUS Test Centres
DMAPR, Boriavi, Anand	AICRP on MAP& B , MPUA&T, Udaipur

PUBLIC NOTICE

Sub: Advertisement is given under sub-section (2) and (3) of Section 21 of the Protection of Plant Varieties and Farmers' Rights Act, 2001 and Rules 30 and 31 of PPV & FR Rules, 2003

It is hereby advertised that the application (s) for registration of varieties listed herein have been accepted subject to the condition of fulfillment of provisions under section 19 of the Act read with Rule 29 of PPV&FR Rules, 2003. The passport data of each variety furnished by the applicant are herewith advertised as specified for calling objections from the interested persons in the matter.

The place or places where the specimen of the variety may be inspected can be obtained in writing from the Registrar of the PPV & FR Authority.

Any person may, within three months from the date of advertisement of the application(s) give notice of opposition in writing to the registration of variety (as per Form PV-3 of the First Schedule of PPV&FR Rules, 2003). Oppositions, if any, to the registration must be submitted, in triplicate, to the Registrar, PPV&FRA, NASC Complex, DPS Marg, New Delhi -110 012 accompanied with the fee of Rs.1,500/- (Rupees One Thousand and Five Hundred Only) by way of Demand Draft drawn in favour of "The Registrar, PPV & FR Authority" payable at New Delhi.

FORM O - 1
(See Rule 30)
Government of India, Plant Varieties Registry
ADVERTISEMENT OF ACCEPTED APPLICATION FOR REGISTRATION

01. Application No. | **N16** | **ZM36** | **09** | **342** | filed on **24/08/2009** by **Indian Council of Agricultural Research, Krishi Bhawan, Dr. Rajendra Prasad Road, New Delhi-110001, India** on behalf of -------NA----- for a **new plant variety** of crop **Maize** [*Zea mays* L.] having denomination **Vivek Sankul Makka 35 (VL 113)**, the specification includes its drawing and or photograph(s) of which are given below, has been accepted and given registration number --------NA --------on ---------- NA --------.

The convention application no. -----NA-----, in respect of the said variety has been filed on -----NA------, in ---NA----.

Appropriate office for the opposition of proceeding under Rule 29, of the Protection of Plant Varieties and Farmers' Rights Rules,2003 is **Office of the Registrar, PPV & FR Authority, New Delhi – 110 012.**

Passport data of the variety Vivek Sankul Makka 35 (VL 113):

Applicant	: Indian Council of Agricultural Research
Address of the Applicant	: Krishi Bhawan, Dr. Rajendra Prasad Road, New Delhi-110001, India
Nationality of Applicant	: Indian
Application details	
a. Number	: **N16** | **ZM36** | **09** | **342**
b. Date of receipt	: 24/08/2009
c. Date of acceptance	: 04/08/2010
Crop (Taxonomical Lineage)	: Maize (*Zea mays* L.)
Denomination	: Vivek Sankul Makka 35 (VL 113)
Type of Variety	: New
Classification of Variety	: Typical
Previously proposed	

denomination : Not applicable

Name of Parental Material : Eary Yellow Heterotic Pool-1

Name of Reference Varieties : Surya

Variety Description:

A. Group Characteristics	**Remarks measured values, example varieties, etc.**
Tassel: Time of anthesis (on middle third of main axis, 50% of plants)	Early [HKI 1025]
Ear: Time of silk emergence (50% plants)	Early [HKI 1025]
Ear: Anthocyanin colouration of silks	Present [HKI 323]
Plant: Length	Long [HQPM 1]
Ear: Type of grain	Flint [HKI 1105]
B. Distinct Characteristics: **Vivek Sankul Makka 35 (VL 113)** has distinguishing characters like wide angle between blade and stem, early time of anthesis, presence of anthocyanin colouration at base of glume of tassel, presence of anthocyanin colouration of silk, medium ear placement and broad leaf width.	
C. Reference varieties: **Surya:** It has distinguishing characters like small angle between blade and stem, medium time of anthesis, absence of anthocyanin colouration at base of glume of tassel, absence of anthocyanin colouration of silk, medium-high ear placement and medium leaf width.	
D. Date of commercialization of the variety	Not commercialized.

E. Photographs: (See figure 01a and b)

02. Application No. | **N20** | **ZM44** | **09** | **364** | filed on **07/09/2009** by **Indian Council of Agricultural Research, Krishi Bhawan, Dr. Rajendra Prasad Road, New Delhi-110001, India** on behalf of -------NA----- for a **new plant variety** of crop **Maize** [*Zea mays* L.] having denomination **HM-11 (HKH-1273)**, the specification includes its drawing and or photograph(s)

of which are given below, has been accepted and given registration number ---------NA --------on ------- NA ------.

The convention application no. -----NA-----, in respect of the said variety has been filed on -----NA------, in ---NA----.

Appropriate office for the opposition of proceeding under Rule 29, of the Protection of Plant Varieties and Farmers' Rights Rules,2003 is **Office of the Registrar, PPV & FR Authority, New Delhi – 110 012.**

Passport data of the variety HM-11 (HKH-1273):

Applicant : Indian Council of Agricultural Research

Address of the Applicant : Krishi Bhawan, Dr. Rajendra Prasad Road, New Delhi-110001, India

Nationality of Applicant : Indian

Application details

a. Number : **N20** | **ZM44** | **09** | **364**

b. Date of receipt : 07/09/2009

c. Date of acceptance : 10/09/2010

Crop (Taxonomical Lineage) : Maize (*Zea mays* L.)

Denomination : HM-11 (HKH-1273)

Type of Variety : New

Classification of Variety : Hybrid

Previously proposed denomination : Not applicable

Name of Parental Material : HKI-1128 x HKI-163

Name of Reference Varieties : X 3342

Variety Description:

A. Group Characteristics	**Remarks measured values, example varieties, etc.**
Tassel: Time of anthesis (on middle third of main axis, 50% of plants)	Late [HKI 1126]
Ear: Time of silk emergence (50% plants)	Late [HKI 1126]

Ear: Anthocyanin colouration of silks	Absent [HKI 1025]
Plant: Length	Long [HQPM 1]
Ear: Type of grain	Semi dent [HKI 1344]

B. Distinct Characteristics:

HM-11 (HKH-1273) has distinguishing characters like wide angle between blade and stem, presence of anthocyanin colouration of brace root of stem, late time of anthesis, absence of anthocyanin colouration of anthers, sparse density of spikelets, wide angle between main axis and lateral branches of tassel, straight attitude of lateral branches of tassel, late time of silk emergence, long length of main axis above upper side branch of tassel, long plant length, medium ear placement, medium width of blade, medium ear diameter, medium number of rows of grains in ear and semi-dent type of grains.

C. Reference varieties:

X 3342: It has distinguishing characters like wide angle between blade and stem, absence of anthocyanin colouration of brace root of stem, early time of anthesis, presence of anthocyanin colouration of anthers, sparse density of spikelets, wide angle between main axis and lateral branches of tassel, curved attitude of lateral branches of tassel, early time of silk emergence, medium length of main axis above upper side branch of tassel, very long plant length, high ear placement, broad width of blade, large ear diameter, many number of rows of grains in ear and flint type of grains.

D. Date of commercialization of the variety	Not commercialized.

E. Photographs: (See figure 02)

भारतीय पौधा किस्म जरनल खंड 04, अंक - 10, 01 अक्टूबर 2010 में अधिसूचित प्रत्याशी किस्मा के चित्र

Photograph of candidate varieties notified in Plant Variety Journal of India, Vol. 4, No.- 10, October 01, 2010

चित्र 01:
Figure 01: Maize: Vivek Sankul Makka 35 (VL 113)

चित्र 01:
Figure 01a: General view of the cobs

चित्र 01:
Figure 01b: General view of number of rows of grains in ear

चित्र 02:
Figure 02: Maize: HM-11 (HKH-1273)

चित्र 02:
Figure 02: General view of cob