

VARIETY TESTING MANUAL



Seed Certification Agency

Ministry of Agriculture

Joydebpur, Gazipur.

www.sca.gov.bd

PREFACE

Seed is the basic input in agriculture. To feed 160 million people of the country and to achieve sustainable food and nutrition security, we must develop high quality varieties to increase yield vertically. Seed Science and Technology is no more confined within the developed countries. According to UPOV, DUS test activities are being practised in our country through Seed Certification Agency as a routine work for release of new varieties of notified crops since 2000. Proposed varieties are tested to determine if they are unique, to make a botanical descriptor and to ensure their agronomic merit. The varieties which successfully passed the DUS test for uniqueness and VCU test for merit are put in the list of new varieties. In addition, varieties that pass through DUS test become eligible for a grant of Plant Breeders' Right, a form of intellectual property right which allows the breeder to recoup his investment by charging royalties for the growing of his variety.

I am glad to know that Seed Regulation and Quality Control Wing of SCA is publishing a Variety Testing Manual for seven notified crops (rice, wheat, jute, potato, sugarcane, kenaf & mesta). I hope this will be a path finder to the variety testing officers and breeders as well as seed technologists. This may be used as a reference book for those who will conduct DUS, VCU, Pre-post control and Grow-out tests. Valuable suggestions from every corner will be cordially accepted for its improvement in next edition.

I would like to give my thanks to Mr. Md. Meher Ali, AD (FAPM); Mr. Md. Nasir Uddin, DD (QC); Mr. Md. Zakir Hossain, DD (SR); Ms. Rouson Ara Begum, ADD (SR & QC) and Ms. Lialatul Rokshana Lima, SCO for their valuable contribution. Special thanks to Ms. Amina Begum, SP for her tireless efforts for compilation and proof reading of the manual.

We must continue our coordinated endeavour to provide the farmers with superior varieties of crops.

S. M. Sirajul Islam
Director

ACRONYMS

MoA	= Ministry of Agriculture
SCA	= Seed Certification Agency
DAE	= Department of Agricultural Extension
BJRI	= Bangladesh Jute Research Institute
NSB	= National Seed Board
NTC	= National Technical Committee
UPOV	= The International Union for the Protection of New Variety of Plants
ISTA	= International Seed Testing Association
AD (FAPM)	= Additional Director (Field Administration, Planning & Monitoring)
AD (SR & QC)	= Additional Director (Seed Regulation & Quality Control)
DD (SR)	= Deputy Director (Seed Regulation)
DD (QC)	= Deputy Director (Quality Control)
ADD (SR & QC)	= Additional Deputy Director (Seed Regulation & Quality Control)
SP	= Seed Pathologist
SCO	= Sample Collection Officer
DUS	= Distinctness, Uniformity & Stability
VCU	= Value for Cultivation & Uses
PBR	= Plant Breeders' Right
PLRV	= Potato Leaf Roll Virus
PMV	= Potato Mosaic Virus
BS	= Breeder Seed
FS	= Foundation Seed
CS	= Certified Seed
MM	= Market Monitoring

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VARIETY RELEASE AND REGISTRATION SYSTEM IN BANGLADESH

Distinctness, Uniformity and Stability tests: Under the variety release mechanism, there is a provision of DUS tests for notified crops such as rice, wheat, jute, potato, sugarcane, kenaf and mesta by the SCA according to UPOV guide lines. At present, NSB has approved the DUS test procedure for rice, wheat, jute, potato, Sugarcane, kenaf and mesta. At the same time of multilocation test, with characterization list of proposed varieties, breeders should supply to SCA 1 kg seeds of rice and wheat, 250gm seeds of jute and 120 tubers for potato. with two thousand taka per line as DUS Test fee. SCA performs DUS test at its control farm/necessary suitable location in next two consecutive seasons.

Value for Cultivation and Uses Tests through field evaluation: Breeders select outstanding entries (if any) as proposed variety from multilocation trial and then give proposal to the NSB in a prescribed form for final evaluation VCU Tests of the varieties. The proposed variety trial (PVT) is conducted in collaboration with the breeders and DAE at farmer's fields of different regions of the country. One or two standard variety is used as check. Each trial is evaluated by the field evaluation team of NSB chaired by the Additional Director of DAE of respective Region.

National Technical Committee and NSB Recommendation: VCU Tests (Field evaluation trial) results of proposed variety are compiled by the Variety Testing officers of SCA. Compiled results of VCU and DUS tests results are discussed in NTC of NSB. Satisfactory results of proposed variety(if any) are then recommend by NTC to NSB for final approval. By NSB approval, proposed line(s) are released as commercial variety after gazette notification.

In case of non-notified crops, VCU & DUS tests are not necessary. After developing a variety, respective research institute apply with five hundred Tk. registration fee to the Seed Wing, Ministry of Agriculture for registration. After registration the proposed variety is approved to cultivate as a commercial variety.

PURPOSE AND IMPORTANCE OF PRE-POST CONTROL AND GROW-OUT TEST

A pre-post control and grow-out test is one of the cheapest and simplest way to prove and to show whether the genetic purity of seed lots are up to the mark. Since 1997-1998 pre-post control and grow-out test started to conduct in SCA control farm.

Genetic purity can be defined as the uniformity of the seed lot complying with the original plant type that has been described or commonly known in case the description is absent. Observing the genetic purity of a seed lot involves comparing the plants grown from a seed lot with the description of the original plant-type. Deviations from the original plant type, off-type can be divided into genetic variants and admixtures. Admixtures are due to unclean working practices resulting in the mixtures of small quantities from two or more seed lots of different varieties. In self pollinating crops like wheat and rice admixtures are not as harmful as for crops having some extent of natural cross pollinating crops pollution. In self pollinating crops the admixtures may be removed, there by partly restoring the genetic quality of the seed lot. In crops showing a certain level of cross pollination the decline in genetic quality may not be reversed with the same ease and speed. In that case a distinction should be made for admixtures identifiable before on the one hand and admixture identifiable during and after flowering on the other. Admixtures can be removed with the same ease and speed in cross pollinated crops if the admixtures can be identified before flowering, but it is much more difficult if the admixtures can be identified only after flowering.

Genetic variants are caused by small deviations in genetic make-up from the original plant type. Genetic variants are either segregates or mutations but for certification purposes the subdivision yields no practical benefit. Genetic variants may be rouged from the field if they are visible, but even in case of self pollinated crops, the genetic make-up of the seed lot is changed and quite some of this change may not be visible at all. In subsequent generations segregates of the altered genetic make-up may be visible and therefore may be rouged out. The genetic make-up can, however, not be restored in one or two seasons, even in case of self pollinated crops.

PROCEDURE OF PRE-POST CONTROL & GROW-OUT TEST FOR NOTIFIED CROPS

INTRODUCTION:

The following procedures have been suggested to carry out pre-post control and grow out tests of four notified crops viz, Rice, Wheat, Jute, and Potato. These procedures are to be followed by the Seed Regulation & Quality Control Wing of the SCA.

Pre-control : Pre-control is the term applied to variety varification of early generation on seed i.e. breeder seed and foundation seed. When an early generation seed lot is being multiplied to produce a further generation of seed, the information provided by a control plot is invaluable in that it gives the National Designated Authority data on identity and quality that are available before -or about the same time- as the next seed crop is ready for field inspection. In this instance the test, which is referred to as a pre-control test, is grown simultaneously with the seed crop of the following generation.

Pre-control is a very important component of a seed multiplication and certification programme because of its ability to identify varietal identity and varietal purity insufficiencies at an early stage, before they become a major widespread problem. The pre-control is very reliable and for many species the only tool for the assessment of varietal identity. In addition, the pre-control generates useful information concerning varietal purity, seed-borne diseases etc. that can support the field inspection of the corresponding multiplications.

Post-Control : Post control test is done after certification of seed lots, looking backward and giving advice to the Seed Inspectors & seed producers as an internal quality control measure. Post control test of Breeder and Foundation seeds as serve pre-control for the Foundation and certified class of seeds respectively.

Grow out Test : The grow-out test is performed to assess the genetic purity of a specific seed lot after growing plants.

Seed Inspector : The District Seed Certification Officer of SCA serve as Seed Inspector as described in The Seed Rules, 1998 & The Seed Ordinance, 1977.

Off-type : A plant is considered to be an off-type when it differs clearly from the typical plants of the concerned variety in at least one described character.

Other variety : A plant differs clearly with respect to distinctive character (s) of the concerned variety and distinguishable as other variety of the same species.

B-Sample : The Seed Inspector will draw a composite sample of the seed lot according to the rules of the ISTA after offering a seed lot but before small packing. On the basis of utility, the Seed Inspector will divide the sample by a sample divider into 3 (three) sub-samples, namely, A-sample, B-sample and C-sample, The B-sample will be used for pre-post control and grow-out test through SR & QC Wing in the SCA control farm at Gazipur.

TEST PERIOD

The trial period is normally done only one growing season.

TEST CENTRE

The test work on each sample is carried out normally at the SCA control farm. It may be vary due to crying need.

SAMPLES TO BE INCLUDED FOR PRE-POST CONTROL & GROW-OUT TEST

(i) All Breeder seed lots.

(ii) All Foundation seed lots.

(iii) Randomly selected 10-20% Certified seed lots. Farmer's level and Market monitoring samples (if accommodation is possible)

PLOT SIZE AND PLANT NUMBERS

The size of the test plot and plant numbers to be considered on the basis of time of NSB approved field standard of seeds. At present the tolerance level off type and other varieties for Breeder seed of rice, wheat and jute is zero and for foundation class of seeds only four off types out of 4000 plants. In cases of certified, farmer's level and market monitoring sample only two off types out of 400 individual plants. Crop-wise required number of plants and plot size are given in Table1.

Table 1: Required number of plants and plot size for Rice, Wheat, Jute and Potato.

Crop	Breeder and Foundation seed lots		Certified, Farmers level/ Market monitoring samples	
	No. of plants	Plot size (m ²)	No of Plants	Plot size (m ²)
Rice	4000	162.304	400	16.533
Wheat	4000	61.44	400	6.6
Jute	4000	102.4	400	11
Potato	100	22.14	100	22.14

TIME OF SOWING/TRANSPLANTING

The time of sowing/transplanting is listed in Table 2. In order to make a planning the time when the number of samples and to be known by the Deputy Director (Quality Control).

Table 2: Timing of sowing/transplanting for Rice, Wheat, Jute and Potato.

Crop	DD (QC) should ascertain the no. of samples of each variety of BS, FS, CS/Farmer's Level/MM	Expected date of sowing/ Seedling raising	Expected date of transplanting
Rice-Aus	February	2 nd week of March	2 nd week of April
Rice-T.Aman	May	1 st week of July	Last week of July
Rice-Boro	October	4 th week of November	4 th week of December
Wheat	September	1 st week of November	-
Jute	February	March-April*	-
Potato	October	November	-

* Sowing date of jute depends on species and varietal nature.

POINTS TO BE CONSIDERED IN PLANNING

1. Land to be reserved for DUS testing.
2. The crop should be sown / transplanted in time.
3. Normal spacing specified for the crop should be use.
4. Every seed lot samples should be sown separately/single seedling to be transplanted per hill.
5. A snake-like sequence should be followed in preparing the field layout.
6. Sample of one variety should be planted/sown next to each other.
7. Within each variety, Breeder seed lot should be placed nearby to Foundation & Certified seed lots so that comparison can be done easily.
8. Different varieties of the same crop with similar characteristics to be planted next to each other.
9. Optimal cultural practices to be done to facilitate the full expression of all the characteristics.
10. Occurrence of volunteer plants and build-up of disease and pest has to be prevented / discouraged.

ASSESSMENT

An assessment for a Pre-/Post- control test should comprise of important descriptive characters which are easily identifiable and genetically stable. On the other hand, if any special character is noticed then it should be recorded.

In each plot, for pre-control, all off types and other varieties should be recorded, while for post control it is enough to stop looking after more than 8 off-types and other varieties are found. Official descriptors and Breeder's seed lots are to be used for variety identity. The responsible officers will make the assessment in time under close supervision of senior officers. Sub Assistant Variety Testing Officer will help the Senior Officers.

CHARACTERS TO BE OBSERVED

A list of characters to be observed for pre-post-control test of rice, wheat, jute and potato are shown in Table's No. 3 to 6

ASSESSMENT FORM

A Proforma of assessment form for pre-/post-control test of rice, wheat, jute and potato are given Appendix I.

FIELD DAY

At least one field day should be arranged for every pre-post control test in time. Related personnel like Breeders, Seed Inspectors and seed Producers are to be invited to attend the field day. An "abstract" of pre-/post control test of the respective crop should be supplied to the concerned participants.

REPORTING

After completion of a pre-post control test, variety testing officer will submit a report on varietal identity and uniformity to the DD (QC) indicating acceptance or rejection of each seed lot. DD (QC) will communicate with the Director (SCA), through Additional Director (SR & QC) for necessary action.

Table 3. Characters to be observed for pre-post control test of Rice

Sl. No.	Characteristics	Stage (Zadoks Scale)
1.	Leaf: colour	40
2.	Leaf : distribution of anthocyanin colouration	40
3.	Penultimate leaf : pubescence of blade	40
4.	Penultimate Leaf : anthocyanin colouration	40
5.	Flag leaf : curvature of blade	50
6.	Time of 50% heading	55
7.	Lemma : anthocyanin colouration	65
8.	Stem : length	70
9.	Stem : anthocyanin colouration of nodes	70
10.	Panicle : length	72
11.	Panicle : exertion	72
12.	Panicle : curvature of main axis	90
13.	Spikelet : hairs on lemma	60-80
14.	Spikelet : length of hairs on lemma	60-80
15.	Panicle : colour of tip of lemma	80-90
16.	Panicle : length of longest awn	90
17.	Panicle : distribution of awns	90
18.	Time of maturity	90
19.	Grain : length	92
20.	Grain : width	92

Table 4. Characters to be observed for pre-post-control test of Wheat

Sl No	Characteristics	Stage (Zadoks Scale)
1.	Plant growth habit	25-29
2.	Leaf spiral (Flag leaf)	40-47
3.	Flag leaf auricle pigment	47-51
4.	Flag leaf attitude	47-51
5.	50% spike emergence	55
6.	Upper culm node hairs (Where essential)	55-75
7.	Glaucosity : spike	60-69
8.	Glaucosity : culm (neck)	60-69
9.	Glaucosity : flag leaf sheath	60-69
10.	Spike density	80-91
11.	Spike shape	80-91
12.	Lower glume : beak length	80-91
13.	Lower glume : beak shape	80-91
14.	Lower glume : beak spicules	80-91
15.	Lower glume : shoulder shape	80-91
16.	Lower glume : shoulder width	80-91
17.	Lower glume : keel inflection	80-91
18.	Spike length	80-91
19.	Awn length	80-91
20.	Spike colour	91
21.	Chaff colour	91
22.	Grain colour (Where essential)	91
23.	Grain shape -do-	91
24.	Ventral crease pit -do-	91
25.	Embryo shape -do-	91

Table 5. Characters to be observed for pre-post control test of Jute.

Sl. No.	Characteristics	Stage
1.	Stem colour (1 st observation)	60 Days after sowing
2.	Leaf lamina colour	-do-
3.	Leaf vein colour	-do-
4.	Basal serration colour	-do-
5.	Leaf petiole colour	-do-
6.	Stipule	-do-
7.	Stipule colour	-do-
8.	Plant technical height	At pre-bud stage
9.	Branching habit	-do-
10.	Leaf angle	-do-
11.	Leaf length	-do-
12.	Leaf width	-do-
13.	Leaf shape	-do-
14.	Petiole length	-do-
15.	Pigmentation of flower buds	At appearance of flower buds
16.	Flowering date	At first flowering
17.	Stem colour (2 nd observation)	At early fruiting stage before pod browning
18.	Pigmentation of fruit	-do-
19.	Seed dispersal mechanism	Before or during harvesting
20.	Seed coat colour	At harvesting stage

Table 6. Characters to be observed for pre-post control test of Potato.

Sl. No.	Characteristics	Stage
1.	Plant : height	Bud Stage
2.	Plant : type	-do-
3.	Plant : growth habit	-do-
4.	Stem : thickness of main stem	-do-
5.	Stem : extension of anthocyanin colouration	-do-
6.	Leaf : size	-do-
7.	Leaf : silhouette	-do-
8.	Leaf : intensity of green colour	-do-
9.	Leaf : extension of anthocyanin colouration of mid rib	-do-
10.	Leaflet : Size	-do-
11.	Leaflet : Width	-do-
12.	Leaflet : frequency of coalescence	-do-
13.	Leaflet : waviness of margin	-do-
14.	Leaflet : anthocyanin pigmentation of blade of young leaflets at apical rosette	-do-
15.	Leaflet : glossiness of the upper side	-do-
16.	Leaflet : frequency of secondary leaflets.	-do-
17.	Inflorescence : size	Flowering stage
18.	Inflorescence : anthocyanin colouration of peduncle	-do-
19.	Plant : frequency of flowers	-do-
20.	Flower : anthocyanin colouration of bud	-do-
21.	Flower : corolla size	-do-
22.	Flower corolla : colour of inner side	-do-
23.	Flower corolla : anthocyanin colouration of outer side in white flower.	-do-
24.	Plant : time of maturity	Ripening stage
25.	Tuber : shape	After harvest
26.	Tuber : depth of eyes	-do-
27.	Tuber : smoothness of skin	-do-
28.	Tuber : colour of skin	-do-
29.	Tuber : colour of flesh	-do-

Table 7: Zadoks code of growth stages

0	Germination	5	Ear / Panicle Emergence
00	Dry seed	50	-
01	Start of water absorption (imbibitions)	51	First spikelet or ear just visible
02	-	52	-
03	Water absorption complete seed swollen	53	¼ of ear emerged
04	-	54	-
05	Root (radicle) emerged from seed	55	½ of ear emerged
06	-	56	-
07	Shoot (coleoptiles) emerged from seed	57	¾ of ear emerged
08	-	58	-
09	Leaf just at coleoptiles tip	59	Emergence of ear complete
1	Seedling growth	6	Flowering
10	First leaf through coleoptile	60	-
11	First leaf infolded	61	Beginning of anthesis
12	2 leaves unfolded	62	-
13	3 leaves unfolded	63	-
14	4 leaves unfolded	64	-
15	5 leaves unfolded	65	Flowering halfway
16	6 leaves unfolded	66	-
17	7 leaves unfolded	67	-
18	8 leaves unfolded	68	-
19	9 or more leaves unfolded	69	Flowering complete
2	Tillering	7	Milk Development
20	Main shoot only	70	-
21	Main shoot and 1 tiller	71	Grain (caryopsis) water ripe
22	Main shoot and 2 tillers	72	-
23	Main shoot and 3 tillers	73	Early milk
24	Main shoot and 4 tillers	74	-
25	Main shoot and 5 tillers	75	Medium milk
26	Main shoot and 6 tillers	76	-
27	Main shoot and 7 tillers	77	Late milk
28	Main shoot and 8 tillers	78	-
29	Main shoot and 9 or more tillers	79	-
3	Stem Elongation	8	Dough Development
30	Pseudostem (leaf sheath) exertion	80	-
31	1 st node detectable	81	-
32	2 nd node detectable	82	-
33	3 rd node detectable	83	Early dough
34	4 th node detectable	84	-
35	5 th node detectable	85	Soft dough
36	6 th node detectable	86	-
37	Flag leaf just visible	87	Hard dough
38	-	88	-
39	Flag leaf ligule/collar just visible	89	-
4	Booting	9	Ripening
40	-	90	-
41	Flag leaf sheath extending	91	Grain hard
42	-	92	-
43	Boots just visible swollen	93	Grain loosening in day time
44	-	94	Over ripe straw dead and collapsing
45	Boots swollen	95	Seed dormant
46	-	96	Viable seed giving 50% germination
47	Flag leaf sheath opening	97	Seed not dormant
48	-	98	Secondary dormancy induced
49	First awns visible (where appropriate)	99	Secondary dormancy lost

PURPOSE AND IMPORTANCE OF DUS TEST

According to Article 7 of the 1961/1972 and 1978 Acts and Article 12 of the 1991 Act of the UPOV Convention, protection can only be granted in respect of a new plant variety after examination of the variety has shown that it complies with the requirements for protection laid down in those Acts and, in particular, that the variety is distinct (D) from any other variety whose existence is a matter of common knowledge at the time of the filing of the application (here in after referred to as a "variety of common knowledge") and that it is sufficiently uniform (U) and stable (S), or DUS in short. The examination, or DUS Test, is based mainly on growing tests, carried out by the authority competent for granting Plant Breeders' Right or by separate institutions, such as public research institutes, acting on behalf of that authority or, in some cases, on the basis of growing tests carried out by the breeder. The examination generates a description of the variety, using its relevant characteristics (e.g. plant height, leaf shape, time of flowering), by which it can be defined as a variety in terms of Article 1 (vi) of the 1991 Act of the Convention.

PURPOSE AND IMPORTANCE OF VCU TEST

VCU tests is crucial for strategically important food and industrial crops, in this case the notified varieties.

If VCU tests is properly done it can and will avoid the unnecessary release of varieties which in the market place prove useless as these varieties do not offer any added value to the end-user compared to varieties already in use. For instance a new to be released rice variety can be distinct, uniform and stable but if it offers no other added value, it just becomes an added name on the released variety list. SCA has been appointed by the National Seed Board to coordinate and organise the VCU tests, which implies a heavy (added) responsibility and work load. The Seed Regulation & Quality Control Wing of SCA is presently establishing the VCU testing criteria for notified crops. This involves a major coordination effort with the various plant breeders and research stations related to the notified crops. Criteria in VCU test are very much crop specific e.g. baking quality for wheat, cooking quality and palatability for rice, and tensile strength of jute fiber, etc. In this present situation the partial or incomplete VCU testing system is running on. In the shake of farmers benefit, in future this system should to be developed up to the international standard.

PROCEDURE OF DUS TESTS FOR INBREED & HYBRID RICE

Introduction :

DUS test is essential for recognizing, distinguishing and describing a variety. The central theme is identification of a variety through the use of some parameters of characterization. DUS test is being followed in many countries of the world. In Bangladesh, this test has recently been made as part of the variety release mechanism. The ultimate benefit of DUS test will centre around Plant Breeders' Right and specially plant variety protection in view of the globalization of agribusiness. UPOV provides that procedure for conducting DUS test should be different for each species. The following procedures have been approved by NSB for the assessment of DUS test in varieties of rice both released and to be released. These procedures are to be followed by all concerned dealing with variety development and release.

I. DEFINITIONS

DUS : Distinctness, Uniformity & Stability.

Distinctness : The variety shall be deemed to be distinct if it is clearly distinguishable from any other variety whose existence is a matter of common knowledge at the time of the filling of application (for release of the variety).

Uniformity : A variety shall be deemed to be uniform if subject to variation that may be expected from the particular features of its propagation it is sufficiently uniform in its relevant characteristics.

Stability : The variety shall be deemed to be stable if its relevant characteristics remain unchanged after repeated propagation, or in the case of a particular cycle of propagation at the end of each such cycle.

Plot : A test field of 2,000 normal plants in which seeds/seedlings will be sown/transplanted in line at normal seed/seedling rate and spacing in two sets at 15 days interval.

Comparative rows: One plot each of two or more varieties grown adjacent to each other at normal seed rate and spacing.

- Reference sample : A sample of seed submitted/collected from the breeder of a variety used for conducting tests as well as for retaining a portion of the seed to represent the variety as reference stock. The seed is for official use only.
- Off-type : Plants or seeds deviating clearly from the characteristics of a variety as described by the breeder in any observable respect.
- Progeny row : A row of plants resulting from the sowing of seeds from one plant in the following season.
- NSB : National Seed Board.
- Variety : A Plant grouping within a single botanical taxon of the lowest known rank, which grouping can be:
- a) defined by the expression of the characteristic resulting from a given genotype;
 - b) distinguished from any other plant grouping by the expression of at least one of the said characteristics; and
 - c) considered as a unit with regard to its suitability for being propagated unchanged.

II. GENERAL DESCRIPTION

A. Test Period

Normally two consecutive years for which a proposed variety will be recommended. Tests may be continued for a third year if required.

B. Test Centre

The test work on each submission or collection (reference sample) will be carried out at the Seed Certification Agency (SCA). Field tests will be carried out in the SCA farm and laboratory tests in the Central Seed Testing Laboratory in Gazipur. If this site is not suited for field testing of certain varieties of rice then the tests will be conducted by SCA in a suitable research station in appropriate part of the country.

C. Material required

Test material to be submitted or collected only in the first year of testing.

1. Quantity: 1000 grams of rice seed.

2. Submission of Material :

The quantity of material mentioned should be submitted to the SCA with a label inside and outside the container of seed and an accompanying letter should mention at least:

- a) Name of the sender with official designation
- b) Reference number of the sample
- c) Name of the organization responsible for maintaining that particular variety
- d) Name of the variety/line of the seeds
- e) Growing season
- f) Quantity of seed
- g) Date and place of sampling
- h) Month and year of harvest
- i) Nature and quantity of preservative, if any, added to the sample
- j) Germination % as on (date)

3. The sample should be in the possession of SCA on or before the following dates :

- a) Aus : on or before the first week of February
- b) Aman : on or before the second week of May
- c) Boro : on or before the first week of October

4. In case of pre-released variety the sample should be submitted to SCA one season before submission of application for release.

5. A descriptive list (as per agreed upon) filled up by breeder & a pair wise distinctive list of characters of most similar variety/varieties should be submitted.

D. Division of Material

The submitted or collected sample may be divided into 10:10:80 ratio of the quantity. The larger quantity will be preserved as the reference sample.

E. Test Layout

1. Year 1

A plot containing 1000 normal plants should be grown at normal seed rate and spacing. There will be another set with either fifteen days interval or in a different location.

2. Year 2

A plot containing 1000 normal plants should be grown at normal seed rate and spacing from the same seed lot used in the first year. There will be another set with either fifteen days interval or in a different location. Plant-to-row of variant plants will be grown to compare these plants with the plants grown from the reference samples.

3. Year 3

Same as year 2 (if necessary).

F. Comparative row test (if necessary)

A test with a few rows of very similar varieties of a crop are to be conducted each year side by side with the candidate variety.

III. TEST METHODS

For conduction of the test, the latest UPOV published guidelines and instructions are to be followed. Characters will be routinely recorded and verified throughout the growing period by the SCA personnel as is explained in the test guidelines and consequently a complete description of varieties will be prepared.

A. Year 1

Laboratory and field observation tests will be carried out to provide data on uniformity and for classification purposes.

1. Distinctness

Descriptive records will be verified from submitted or collected material and from harvested material. The differences will be recorded and a provisional description will be prepared.

2. Uniformity

Plants from submitted or collected materials will be required to comply with uniformity standards indicated in TG/1/3 of UPOV publication standard.

Off-Type plants will be detected and the characters in which they differ from the normal plants will be recorded. In general, the assessment of differences between variant plants and majority plants will be based on the level of differences required to differentiate between varieties.

When confirmation of the characters of suspected off-types is required, off-type plants and majority plants will be harvested, threshed and grown in the following appropriate season.

3. Stability

No specific test will be carried out but stability may be inferred from the plots by noting variation and segregation within the grown form of the collected or submitted sample.

B. Year 2

Laboratory and field observations will be carried out as in year 1.

1. Distinctness

Data obtained from first year observations will be compared with the data of second year's plots of the same variety. In addition, descriptive records will be prepared to supplement the first year's provisional report.

2. Uniformity

The observations made in the 2nd year will be used to confirm the provisional report prepared in the first year.

IV. VISIT TO TEST CENTRE

The breeders are encouraged to visit the test centre to view their material and discuss with SCA.

V. REPORTING PROCEDURE

A. At the following stages a written summary of the data will be submitted by the SCA to the breeders.

1. If laboratory tests show a marked lack of purity and uniformity
2. If during field observation a marked lack of uniformity is evident
3. If the distinctness of a variety is difficult to establish.

B. Reports

1. Progress Report

The SCA will report to the breeders after each growing season about the result of 1st year trial.

C. Standards

1. Distinctness

To be judged as distinct, a variety must be seen to be clearly distinguishable, consistent and repeatable, from any comparable variety in at least one character.

2. Uniformity

In the assessment of uniformity, Variations observed in plots grown from collected/submitted sample must normally be of demonstrable and repeatable order. Variation which is thought or prone to be due to environmental effects, is disregarded. In general, varieties must not exceed the tolerated maximum variant plant number mentioned in the TG/1/3 of UPOV guidelines.

3. Stability

Plots exceeding the fixed tolerated variant plants are considered to indicate a lack stability, which means, excessive lack of uniformity may imply lack of stability.

Table 8: List of characters for DUS Test of Inbreed and Hybrid Rice

Sl. No.	Characteristics	Observation time/stage (Zadok's scale)	States of the character	Code
1.	Leaf sheath: anthocyanin colour	15-17	Absent Present	1 9
2.	Leaf colour	25-40	Pale green Green Dark green Purple tip Purple margins Purple blotch Purple	1 2 3 4 5 6 7
3.	Penultimate leaf: pubescence	40	Absent or very weak Weak or only on the margins Medium hairs on the lower portion of the leaf. Strong hairs on the leaf blade Very strong	1 3 5 7 9
*4.	Penultimate leaf : anthocyanin colouration of auricles & collar	40	Absent Present	1 9
*5.	Penultimate leaf : ligule	40-45	Absent Present	1 9
6.	Penultimate leaf : shape of the ligule	40-45	Truncate Acute Split or two-cleft	1 2 3
*7.	Flag leaf : attitude of the blade	60-65	Erect (<30) Intermediate or semi-erect (30-45) Horizontal (46-90) Reflexed or descending (>90)	1 3 5 7
*8.	Time of heading (50% of plants with heads)	55	Very early (<70days) Early (70-85 days) Medium (86-105 days) Late (106-120 days) Very late (>120 days)	1 3 5 7 9
*9 (a).	Male sterility	55-59	Absent CMS TGMS PGMS P(T)GMS	1 3 5 7 9

9 (b).	Microscopic Observation of Pollen with I ₂ -KI solution	55-59	Completely sterile with TA Pollen	1
			Completely sterile with 80% TA Pollen	2
			Completely sterile with 50% TA Pollen	3
			Sterile (91-99%)	4
			Partial sterile (31-70%)	5
			Partial fertile (31-70%)	6
			Fertile (21-30%)	7
			Fully fertile (0-20%)	8
10.	Lemma & Palea : anthocyanin colouration	75-85	Absent or very weak	1
			Weak	3
			Medium	5
			Strong	7
			Very strong	9
11.	Lemma : anthocyanin colouration of area below apex	75-85	Absent or very weak	1
			Weak	3
			Medium	5
			Strong	7
			Very strong	9
*12.	Lemma : anthocyanin colouration of apex	75-85	Absent or very weak	1
			Weak	3
			Medium	5
			Strong	7
			Very strong	9
13 (a).	Colour of stigma	65	White	1
			Light green	2
			Yellow	3
			Light purple	4
			Purple	5
13 (b).	Stigma exertion	68-69	No or a few (<5%)	1
			Low (5-20%)	3
			Medium (21-40%)	5
			High (41-60%)	7
			Very high (>61%)	9
14.	Stem: culm diameter (from 5 mother tillers in the lowest internode)	65	Small (<5.0mm)	1
			Medium (5.1 - 6.0mm)	3
			Large (6.1-70mm)	5
			Very Large (>7.0mm)	7
*15.	Stem length (culm length): measure from the base of the plants to the neck of the panicles	70	Very short (<40 cm)	1
			Short (41-60 cm)	3
			Medium (61-80 cm)	5
			Long (81 - 110 cm)	7
			Very long (>110 cm)	9
*16.	Stem: anthocyanin colouration of nodes	70	Absent	1
			Present	9

17.	Stem: intensity of anthocyanin colouration of nodes	70	Weak Medium Strong Very strong	3 5 7 9
18.	Stem: anthocyanin colouration of internodes	70	Absent or very weak Weak Medium Strong Very strong	1 3 5 7 9
*19.	Panicle length: measured from the neck to the tip of the panicle of main tillers without awns	72-90	Short (<20cm) Medium (21-25cm) Long (26-30cm) Very long (>30cm)	3 5 7 9
*20.	Panicle: curvature of main axis (i.e. recurved main axis)	90	Absent or very weak Weak Medium Strong	1 3 5 7
21.	Panicle: number of effective tillers per plant	75-90	Few (<6) Medium (6-10) Many (>10)	3 5 7
*22.	Spikelet: pubescence of lemma & palea	60-80	Absent or very weak Weak Medium Strong Very strong	1 3 5 7 9
23.	Spikelet: colour of the tip of lemma	65-90	White Yellowish Brownish Red Purple Black	1 2 3 4 5 6
24.	Spikelet: awns in the spikelet	90	Absent Present	1 9
25.	Spikelet: length of the longest awn.	90	Very short (<2mm) Short (2-5mm) Medium (5-10 mm) Long (11-20mm) Very long (>20mm)	1 3 5 7 9
*26 (a).	Panicle: distribution of awns	90	Tip only Upper half only Whole length	1 3 5
26(b).	Panicle: colour of awns	90	Yellow white Brown Reddish Purple Black	1 3 5 7 9

*27.	Panicle: attitude of branches	90	Erect Semi-erect Spreading	1 3 5
28.	Panicle: exertion	90	Enclosed Partly exerted Just exerted Moderately exerted Well exerted	1 3 5 7 9
29.	Time of maturity	92	Very early (<100days) Early (101-115 days) Medium (116-135 days) Late (136-150 days) Very late (>150 days)	1 3 5 7 9
30.	Grain: weight of 1000 fully developed grains (adjusted at 12% of moisture)	92	Very early (<15g) Low (16-19 g) Medium (20-23g) High (24-27g) Very high (>27g)	1 3 5 7 9
31.	Grain: length (without dehulling)	92	Very short (<6.0mm) Short (6.1-7.0mm) Medium (7.1-8.0mm) Long (8.1-9.0mm) Very long (>9.0mm)	1 3 5 7 9
32.	Sterile lemma length: measure at post harvest stage	92	Short (<1.5mm) Medium (1.5-2.5mm) Long (2.6-3.0mm) Very long (>3.0mm)	1 3 5 7
33.	Decorticated grain length (After dehulling, before milling)	92	Short (<5.5mm) Medium (5.6-6.5mm) Long (6.6-7.5mm) Very long (>7.5mm)	1 3 5 7
34.	Leaf senescence: penultimate leaves are observed at the time of harvest.	92	Late and slow (2 or more leaves retain green colour at maturity) Intermediate Early and fast (leaves are dead at maturity)	1 5 9
*35.	Decorticated grain: shape {length-width (widest point) ratio of dehulled grain}	92	Round (L:W <1.5) Bold (L:W = 1.5-2.0) Medium (L:W = 2.1 -2.5) Medium Slender (L:W = 2.6 -3.0) Slender (L:W >3.0)	1 3 5 7 9

36.	Decorticated grain (bran) : colour	92	White Light brown Variegated brown Dark brown Red Variegated purple Purple	1 2 3 4 5 6 7
37.	Polished grain : size of white core or chalkiness (% of kernel area)	92	Absent or very small Small (>10%) Medium (11-20%) Large (>20%)	1 3 5 7
38.	Endosperm : content of amylose (non waxy type varieties)	92	Low (<20%) Intermediate (21-25%) High (>25%)	1 3 5
39.	Decorticated grain: aroma	92	Absent Lightly present Strongly present	1 5 9
40.	Other distinct special character (if any)	Description:		

* The asterisk characteristics, which should always be included in description of the variety, except when the state of expression of a preceding characteristic renders this impossible (UPOV/MDN/95/4-T/1/3).

As a general rule (Quantitative characteristics), states are formed in such a way that for the weak and strong expression a reasonable word pair is chosen, for example:

Weak/strong

Short/large

These word pairs are given the notes 3 and 7 and word "medium" is given the notes 5.

The remaining states of the scale indicated by the notes 1 to 9 are formed according to the following example.

State	Note
Very weak	1
Very weak to weak	2
Weak	3
Weak to medium	4
Medium	5
Medium to strong	6
Strong	7
Strong to very strong	8
Very strong	9

(UPOV/MDN/95/4-T/1/3)

PROCEDURE OF DUS TESTS FOR WHEAT

Introduction:

DUS test is essential for recognizing, distinguishing and describing a variety. The central theme is identification of a variety through the use of some parameters of characterization. DUS test is being followed in many countries of the world. In Bangladesh, this test has recently been made part of the variety release mechanism. The ultimate benefit of DUS test will centre around Plant Breeders' Rights and specially Plant Variety Protection in view of the globalization of agribusiness. UPOV provides that procedure for conducting DUS test should be different for each species. The following procedures have been approved by NSB by the of assessment of DUS in varieties of wheat both released and to be released. These procedures are to be followed by all concerned dealing with variety development and release.

I. DEFINITIONS

DUS : Distinctness, Uniformity & Stability.

Distinctness : The variety shall be deemed to be distinct if it is clearly distinguishable from any other variety whose existence is a matter of common knowledge at the time of the application (for release of the variety).

Uniformity : A variety shall be deemed to be uniform if subject to variation that may be expected from the particular features of its propagation, it is sufficiently uniform in its relevant characteristics.

Stability : The variety shall be deemed to be stabled if its relevant characteristics remain unchanged after repeated propagation, or in the case of a particular cycle of propagation at the end of each such cycle.

Plot : A test field of 500 plants in which seed will be sown in line at normal seed rate and spacing.

Comparative rows : One plot each of two or more varieties grown adjacent to each other normal seed rate and spacing.

- Reference sample : A sample of seed submitted/collected from the breeder of a variety used for conducting tests as well as for retaining a portion of the seed to represent the variety as reference stock. The seed is for official use only.
- Off-type : Plants or seeds deviating clearly from the characteristics of a variety as described by the breeder in any observable respect.
- Progeny row : A row of plants resulting from the sowing of seeds from one plant in the following season.
- NSB : National Seed Board
- Variety : A plant grouping within a single botanical taxon of the lowest known rank, which grouping can be:
- a) defined by the expression of the characteristic resulting from a given genotype;
 - b) distinguished from any other plant grouping by the expression of at least one of the said characteristics; and
 - c) Considered as a unit with regard to its suitability for being propagated unchanged.

II. GENERAL DESCRIPTION

A. Test Period

Normally two consecutive years for which a proposed variety will be recommended. Tests may be continued for a third year if required.

B. Test Centre

The test work on each submission or collection (reference sample) will be carried out at the SCA. Field tests will be carried out in the SCA farm and laboratory tests in the Central Seed Testing Laboratory in Gazipur. If this site is not suited for field testing of certain varieties of wheat then the tests will be conducted by SCA in a suitable research station appropriate part of the country.

C. Material required

Test material to be submitted or collected only in the first year of testing.

1. Quantity: Wheat Seed: 2 kg for released varieties
1 kg for to be released varieties.

2. Submission of Material:

The quantity of material mentioned should be submitted to the SCA with a label inside and outside the container of seed and an accompanying letter stating exactly the same information. The information on the labels and in the letter should mention at least:

- a) Name of the sender with official designation
- b) Reference number of the sample
- c) Name of the organization responsible for maintaining that particular variety
- d) Name of the variety/line of the seed
- e) Growing season
- f) Quantity of seed
- g) Date and place of sampling
- h) Month and year of harvest
- i) Nature and quantity of preservative, if any, added to the sample
- j) Germination % as on (date)

3. The sample should be in the possession of SCA on or before the following dates:

On or before the 1st week of October

4. In case of pre-released variety the sample should be submitted to SCA one season before submission of application for release.

5. A descriptive list (as per agreed upon) filled up by breeder & a pair wise distinctive list of characters of most similar variety/varieties should be submitted.

D. Division of Material

The submitted or collected sample may be divided into 10:10:80 ratio of the quantity. The larger quantity will be preserved as the reference sample.

E. Test Layout

1. Year 1

A plot containing 500 normal plants should be grown at normal seed rate and spacing. There will be another set with either fifteen days interval in planting or grown in a different location.

2. Year 2

A plot containing 500 normal plants should be grown at normal seed rate and spacing from the same seed lot used in the first year. There will be another set with either fifteen days interval or in a different location. Plant-to-row of variant Plants will be grown to compare these plants with the plants grown from the reference samples.

3. Year 3

Same as year 2 (if necessary).

F. Comparative row test (if necessary)

A test with a few rows of very similar varieties of a crop are to be conducted each year side by side with the candidate variety.

III. TEST METHODS

For conduction of the test the latest UPOV published guidelines and instructions are to be followed. Characters will be routinely recorded and verified throughout the growing period by the SCA personnel as explained in the test guidelines and consequently a complete description of varieties will be prepared.

A. Year 1

Laboratory and field observation tests will be carried out to provide data on uniformity and for classification purposes.

1. Distinctness

Descriptive records will be verified from submitted or collected material and from harvested material. The differences will be recorded and a provisional description will be prepared.

2. Uniformity

Plants from submitted or collected materials will be required to comply with uniformity standards indicated in TG/1/3 of UPOV publication standard.

Off-type plants will be detected and the characters in which they differ from the normal plants will be recorded. In general, the assessment of differences between variant plant and majority plants will be based on the level of differences required to differentiate between varieties.

When confirmation of the characters of suspected off-type is required, off-type plants and majority plants will be harvested, threshed and grown in the following appropriate season.

3. Stability

No specific test will be carried out but stability may be inferred from the plots by noting variation and segregation within the plots grown from the collected or submitted sample.

B. Year 2

Laboratory and field observations will be carried out as in year 1.

1. Distinctness

Data obtained from first year observations will be compared with the data of second years plots of the same variety. In addition, descriptive records will be prepared to supplement the first year's provisional report.

2. Uniformity

The observations made in the 2nd year will be used to confirm the provisional report prepared in the first year.

IV. VISIT TO TEST CENTRE

The breeders are encouraged to visit the test centre by arrangement to view their material and discuss with SCA.

V. REPORTING PROCEDURE

A. At the following stages a written summary of the data will be submitted by the SCA to the breeders.

1. If laboratory tests show a marked lack of uniformity and purity
2. If during field observation a marked lack of uniformity is evident
3. If the distinctness of a variety is difficult to establish.

B. Reports

1. Progress Report

The SCA will report to the breeders after each growing season about the result of 1st year trial.

2. Final Report

This report will be prepared following the second test season. It will include collected results, a description of the variety and, if appropriate, a conclusion on how to distinguish this variety from other varieties.

C. Standards

1. Distinctness

To be judged as distinct, a variety must be seen to be clearly distinguishable, consistent and repeatable from any comparable variety in at least one character.

2. Uniformity

In the assessment of uniformity, variations observed in plots grown from collected/submitted sample must normally be of demonstrable and repeatable order. Variation which is thought or prone to be due to environmental effects, is disregarded. In general, varieties must not exceed the tolerated maximum variant plant number mentioned in the TG/1/3 of UPOV guidelines.

3. Stability

Plots exceeding the fixed tolerated variant plants are considered to indicate a lack of stability, which means, excessive lack of uniformity may imply lack of stability.

D. Characters

The characters in variety description and character states described will be based on that outline in the UPOV guidelines for the conduct of DUS tests.

Minimum list of character to describe wheat plants:

Characters	Observation time (om the basis of Zadok's scale)
1. Coleoptile pigment (To be done in the laboratory) Code 1 for absent Code 9 for present	09-11
2. Plant growth habit Code 1 for erect Code 3 for semi-erect Code 5 for intermediate Code 7 for semi-prostrate Code 9 for prostrate	25-29
3. Leaf spiral : (Flag leaf) Code 1 for absent Code 3 for weak Code 5 for moderate Code 7 for for strong Code 9 for very strong.	40-47
4. Flag leaf auricle pigment Code 1 for absent Code 9 for present	47-51
5. Flag leaf attitude Code 1 for all flag leaves are erect Code 3 for 1/4 of the plants with recurved flag leaves Code 5 for 1/2 of the plants with recurved flag leaves Code 7 for 3/4 of the plants with recurved flag leaves Code 9 for all plants with flag leaves are erect	47-51
6. 50% spike emergence (days to be quantified) Code 3 for early (<63 days) Code 5 for medium (63-70 days) Code 7 for late (>70 days)	55

7.	Upper culm node hairs	55-75
	Code 1 for absent or few	
	Code 5 for medium	
	Code 9 for very numerous	
8.	Glaucosity: spike	60-69
	Code 1 for absent	
	Code 3 for weak	
	Code 5 for medium	
	Code 9 for very strong	
9.	Glaucosity: culm (neck)	60-69
	Code 1 for absent	
	Code 3 for weak	
	Code 5 for medium	
	Code 9 for very strong	
10.	Glaucosity: flag leaf sheath	60-69
	Code 1 for absent	
	Code 3 for weak	
	Code 5 for medium	
	Code 9 for very strong	
11.	Anther colour	62-68
	Code 1 for yellowish	
	Code 9 for purple	
12.	Straw wall thickness	80-92
	Code 1 for thin	
	Code 5 for thick	
13.	Spike density	80-92
	Code 3 for lax	
	Code 5 for medium	
	Code 7 for dense	
14.	Spike shape	80-92
	Code 1 for club	
	Code 5 for parallel	
	Code 9 for taper	

- | | | |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 15. | Lower glume: beak length (3 rd spikelet upward from middle of the spike)
Code 3 for short (1-5mm)
Code 5 for medium (5.1-12mm)
Code 7 for long (12.1mm and above) | 80-92 |
| 16. | Lower glume: beak spicules
Code 1 for absent
Code 9 for present | 80-92 |
| 17. | Lower glume: shoulder shape
Code 1 for slope
Code 5 for square
Code 9 for elevated | 80-92 |
| 18. | Lower glume: shoulder width
Code 3 for narrow
Code 5 for medium
Code 7 for wide | 80-92 |
| 19. | Lower glume: keel inflection
Code 1 for absent
Code 9 for present | 80-92 |
| 20. | Lower glume: internal hair group
(Visible through 10x or 20x lens)
Code 1 for group 1 (few hairs confined to fold)
Code 5 for group 2 (hairs extending across part of shoulder)
Code 7 for group 3 (many hairs across shoulder) | 80-92 |
| 21. | Spike length
Code 3 for short (<10cm)
Code 5 for medium (10.1-12cm)
Code 7 for long (>12.1cm) | 80-92 |
| 22. | Awn length (At the tip of ear)
Code 1 for absent
Code 3 for short (3-5cm)
Code 5 for medium (5.1-7cm)
Code 7 for long (>7.1cm) | 80-92 |

23.	Spike colour	90-92
	Code 1 for yellowish	
	Code 2 for reddish brown	
24.	Grain colour	92
	Code 1 for white or amber	
	Code 2 for reddish	
25.	Grain shape	92
	Code 1 for rounded	
	Code 5 for ovoid	
	Code 9 for elongated	
26.	Ventral crease pit	92
	Code 1 for absent	
	Code 9 for present	
27.	Embryo shape	92
	Code 1 for round	
	Code 9 for oval	
28.	Grain colouration with phenol (To be done in the laboratory)	92
	Code 1 for none or very light	
	Code 3 for light	
	Code 5 for medium	
	Code 7 for dark	
	Code 9 for very dark	
29.	Other distinct special characters (if any)	

PROCEDURE OF DUS TESTS FOR JUTE

Introduction:

DUS)test is essential for recognizing, distinguishing and describing a variety. The central theme is identification of a variety through the use of some parameters of characterization. DUS test is being followed in many countries of the world. In Bangladesh, this test has recently been made part of the variety release mechanism. The ultimate benefit of DUS test will centre around Plant Breeders' Rights and specially plant variety protection in view of the globalization of agribusiness. UPOV provides that procedure for conducting DUS test should be different for each species. The following procedures have been approved by NSB by the assessment of DUS in varieties of jute both released and to be released. These procedures are to be followed by all concerned dealing with variety development and release.

I. DEFINITIONS

DUS : Distinctness, Uniformity & Stability.

Distinctness : The variety shall be deemed to be distinct if it is clearly distinguishable from any other variety whose existence is a matter of common knowledge at the time of application (for release of the variety)

Uniformity : A variety shall be deemed to be uniform if subject to variation that may be expected from the particular features of its propagation. It is sufficiently uniform in its relevant characteristics.

Stability : The variety shall be deemed to be stable if its relevant characteristics remain unchanged after repeated propagation, or in the case of a particular cycle of propagation at the end of each such cycle.

Plot : A test field of 500 plants in which, seed will be sown in line at normal seed rate and spacing.

Comparative rows : One plot each of two or more varieties grown adjacent to each other normal seed rate and Spacing.

- Reference sample : A sample of seed submitted/collected from the breeder of a variety used for conducting tests as well as for retaining a portion of the seed to represent the variety as reference stock. The seed is for official use only.
- Off-type : Plants or seeds deviating clearly from the characteristics of a variety as described by the breeder in any observable respect.
- Progeny row : A row of plants resulting from the sowing of seed from one plant in the following season.
- NSB : National Seed Board.
- Variety : A plant grouping within a single botanical taxon of the lowest known rank, which grouping can be:
- a) defined by the expression of the characteristics resulting from a given genotype;
 - b) distinguished from any other plant grouping by the expression of at least one of the said characteristics; and
 - c) Considered as a unit with regard to its suitability for being propagated unchanged.

II. GENERAL DESCRIPTION

A. Test period

Normally two consecutive years for which a proposed variety will be recommended. Tests may be continued for a third year if required.

B. Test Centre

The test work on each submission or collection (reference sample) will be carried out at the SCA. Field tests work carried out in the SCA farm and laboratory tests in the Central Seed Testing Laboratory in Gaziur. If this site is not suited for field testing of certain varieties of jute then the tests will be conducted by SCA in a suitable research station appropriate part of the country.

C. Material required

Test material to be submitted or collected only in the first year of testing.

1. Quantity: Jute Seed: 1 kg for released varieties.

250-300gms. for to be released varieties.

2. Submission of Material :

The quantity of material mentioned should be submitted to the SCA with a label inside and outside the container of seed and an accompanying letter stating exactly the same information. The information on the labels and in the letter should mentioned at least:

- a) Name of the sender with official designation
- b) Reference number of the sample
- c) Name of the organization responsible for maintaining that particular variety
- d) Name of the variety/line of the seed
- e) Growing season
- f) Quantity of seed
- g) Date and place of Sampling
- h) Month and year of harvest
- i) Nature and quantity of Preservative, if any, added to the sample
- j) Germination % as on (date)

3. The sample should be in the possession of SCA on or before the following dates.

- a) Jute: *C. capsularis* on or before the 15th January.
- b) Jute: *C. olitorius* on or before the 15th February.

4. In case of pre-released variety the sample should be submitted to SCA one season before submission of application for release.
5. A descriptive list (as per agreed upon) filled up by breeder & a pair-wise distinctive list of characters of most similar varieties should be submitted.

D. Division of Material

The submitted or collected sample may be divided into 10:10:80 ratio of the quantity. The larger quantity will be preserved as the reference sample.

E. Test Layout

1. Year 1

A plot containing 500 normal plants should be grown at normal seed rate and spacing. There will be another set with either fifteen days interval in planting or grown in a different location.

2. Year 2

A plot containing 500 normal plants should be grown at normal seed rate and spacing from the same seed lot used in the first year. There will be another set with either fifteen days interval or in a different location. Plant to-row of variant plants will be grown to compare these plants with the plants grown from the reference samples.

3. Year 3

Same as year 2 (if necessary).

F. Comparative row test (if necessary)

A test with a few rows of very similar varieties of a crop are to be conducted each year side by side with the candidate variety.

III. TEST METHODS

For conduction of the test, the latest UPOV published guidelines and instructions are to be followed. Characters will be routinely recorded and verified throughout the growing period by the SCA personnel as explained in the test guidelines and consequently a complete description of varieties will be prepared.

A. Year 1

Laboratory and field observation tests will be carried out of provide data on uniformity and for classification purposes.

1. Distinctness

Descriptive records will be verified from submitted or collected material and from harvested material. The differences will be recorded and a provisional description will be prepared.

2. Uniformity

Plants from submitted or collected materials will be required to comply with uniformity standards indicated in TG/1/3 of UPOV Publication standard.

Off-type plants will be detected and the characters in which they different from the normal plants will be recorded. In general, the assessment of differences between variant plants and majority plants will be based on the level of differences required to differentiate between varieties.

When confirmation of the characters of suspected off-types is required, off type plants and majority plants will be harvested, threshed and grown in the following appropriate season.

3. Stability

No specific test will be carried out but stability may be inferred from the plots by noting variation and segregation within the plots grown from the collected or submitted sample.

B. Year 2

Laboratory and field observations will be carried out as in year1.

1. Distinctness

Data obtained from first year observations will be compared with the data of second year plots of the same variety. In addition, descriptive records will be prepared to supplement the first year's provisional report.

2. Uniformity

The observations made in the 2nd year will be used to confirm the provisional report prepared in the first year.

IV. VISIT TO TEST CENTRE

The breeders are encouraged to visit the test centre by arrangement to view their material and discuss with SCA.

V. REPORTING PROCEDURE

A. At the following stages a written summary of the data will be submitted by the SCA to the breeders.

1. If laboratory tests show a marked lack of uniformity and purity
2. If during field observation a marked lack of uniformity is evident
3. If the distinctness of a variety is difficult to establish.

B. Reports

1. Progress Report

The SCA will report to the breeders after each growing season about the result of 1st year trial.

2. Final Report

This report will be prepared following the second test season. It will include collected results, a description of the variety and, if appropriate, a conclusion on how to distinguish this variety from other varieties.

C. Standards

1. Distinctness

To be judged as distinct, a variety must be seen to be clearly distinguishable, consistent and repeatable from any comparable variety in at least one character.

2. Uniformity

In the assessment of uniformity, variations observed in plots grown from collected/ submitted sample must normally be of demonstrable and repeatable order. Variation which is thought or prone to be due to environmental effects, is disregarded. In general varieties must not exceed the tolerated maximum variant plant number mentioned in the TG/1/3 of UPOV guidelines.

3. Stability

Plots exceeding the fixed tolerated variant plants are considered to indicate a lack of stability, which means, excessive lack of uniformity may imply lack of stability.

D. Characters


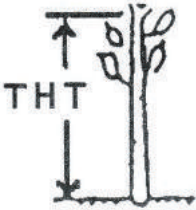
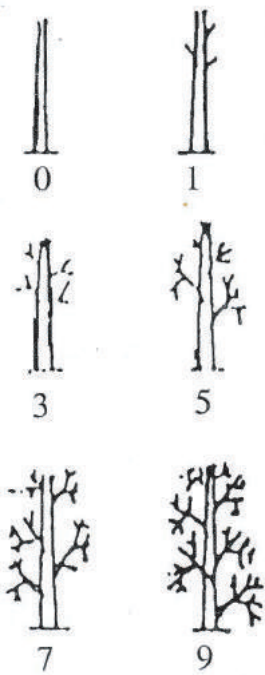
The following minimum list of characters in variety description and character stated described will be considered for the conduct of jute DUS tests:

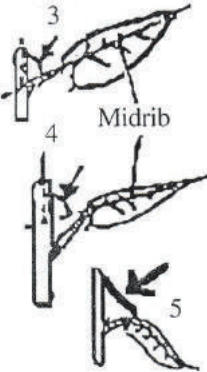
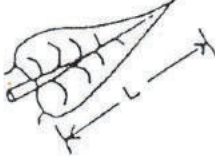

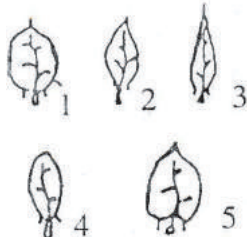
Table 9: List of characters in variety description for DUS test of Jute




Sl No	Characters	Measurements of characters		Stages data collection
		Code	Guide	
1	Stem colour	G R	Green - no sign of any red pigmentation Red - includes the presence of a trace of red pigmentation	50-60 days age
2	Petiole colour	G R	Green Red	50-60 days age
3	Stipule shape	1 2 3	Scaly Filiform Foliaceous	50-60 days age
4	Stipule colour	G R TR	Green Red Tip red	50-60 days age
5	Leaf length-breadth ratio	Ratios of length & breadth	Average length and breadth ratio of 10 leaves starting from the 6 th leaf from top of the main stem.	50-60 days age
6	Leaf shape	1 2 3 4 5 6	Shape of 10 leaves as of sl No. 5 Ovate Ovate-Lanceolate Lanceolate Elliptical Cordate Other (specify)	50-60 days age
7	Leaf texture	S R	Smooth or glossy. Rough or non glossy	50-60 days age
8	Leaf margin	W N	Wavy Non wavy	50-60 days age
9	Pigmentation of flower buds (calyx))	G R	Green Red	At appearance of flower buds on all 10 plants
10	Days to first flowering	-	The date of opening of the first flower	At flowering stage
11	Days to flowering of 50% plants	-	Date of 50% flowering	At 50% flowering stage
12	Pigmentaion of fruits	G R	Green Red	At early flowering stage
13	Seed dispersal mechanism	1 2	Dehiscent Indehiscent	Before or during harvesting for seed
14	Seed coat colour	1 2	Predominant colour by interpretation Brown Blue	After harvesting threshing and cleaning of seed
15	1000 seed weight	-	Actual weight at 10 % moisture content	Do
16	Any new character			


Table 10: Details of selected characters generally followed for describing jute, kenaf and mesta varieties are as follows :

DESCRIPTOR (ON PRINT OUT)	DESCRIPTION (FULL NAME)	CODE	GUIDE	GROWTH STAGE
1. COLLNO	COLLECTION NUMBER	e.g DS/./C BL/./C	Unique number assigned at the time of collection = Das & Sobhan (IJO mission I) = Basak & Li (IJO mission II) C= <i>Corchorus</i>	
2. SPP	SPECIES	CAP OLI	Name of species <i>C. capsularis</i> <i>C. olitorius</i>	
3. VARNM	VARIETY NAME		Name of released varieties i.e. refers, in this case, to variety used as standard check.	
4. SS	SEED SOURCE	KEN	Abbreviation of name of country from which the seed consignment was received. Kenya.	
5. ORI	COUNTRY OF ORIGIN	KEN BGD	Country from where the seed is known to have originated. A blank indicates that no information was given.	
6. SOWDAT	SOWING DATE	DDMMYY	Day, Month and Year of sowing e.g., 110588 = 11 May, 1988.	
7. STCO1	STEM COLOUR		Visual interpretation of colour at full vegetative expression.	60 days after sowing
	(first observation)	G R	Green-no sign of any red pigmentation Red-includes the presence of a trace of red pigmentation	
8. LFCO	LEAF LAMINA COLOUR	G	Green-no sign of any red pigmentation	60 days after sowing
		R	Red-includes the presence of red pigmentation on leaf margin	
9. VNCO	LEAF VEIN COLOUR	G	Green	60 days after sowing
		R	Red	
10. SNCO	BASAL SERRATION COLOUR	G	Green	60 days after sowing
		R	Red	
11. PTCO	LEAF PETIOLE COLOUR	G	Green	60 days after sowing
		R	Red	

DESCRIPTOR (ON PRINT OUT)	DESCRIPTION (FULL NAME)	CODE	GUIDE	GROWTH STAGE
12. STP	STIPULE 	+ O	Presence or absence of leaf stipule Stipulate (present) Exstipulate (absent)	60 days after sowing
13. STPCO	STIPULE COLOUR	G R TR	Green Red Tip red	60 days after sowing
14. THT	PLANT TECHNICAL HEIGHT 	**	The height (in cm) of the main stem measured from soil level to the point of forking	At pre-bud stage (i.e. at time of forking of stem, or before development of first flower bud in non branching types)
15. BRN	BRANCHING HABIT 	0 1 3 5 7 9	Non-branching -no growth of axillary bud Very weak Weak Intermediate Strong Very strong	At pre-bud stage based on relative development of axillary buds on main stem into branches with increasing levels of secondary and tertiary growth

DESCRIPTOR (ON PRINT OUT)	DESCRIPTION (FULL NAME)	CODE	GUIDE	GROWTH STAGE
16. LFAN	LEAF ANGLE 	1 2 3 4 5 6 7 8 9	The angle between the stem and the line connecting the base and the centre of midrib of the leaf. 0-20° erect 21-40° 41-60° intermediate 61-80° 81-100 horizontal 101-120° 121-140° descending 141-160° 161-180° drooping	At pre-stage measure the 10 leaves starting from the 6 th leaf from top of main stem (i.e. ignore first 5 leaves)
17. LFLN	LEAF LENGTH 	**	Average maximum length of 10 leaves (in cm) starting from the 6 th leaf from top of main stem (i.e. ignore first 5 leaves)	At pre-stage
18. LFWI	LEAF WIDTH 	**	Average maximum width (breadth) of 10 leaves (in cm) starting from the 6 th leaf from top main stem (i.e. ignore first 5 leaves)	At pre-stage
19. LFAR	LEAF AREA	**	Average area (in sq.cm) of 10 leaves starting from the 6 th leaf from top of main stem. Calculate from length and maximum breadth or use leaf area.	At pre-stage
20. LFSH	LEAF SHAPE 	1 2 3 4 5 6	Shape of same 10 leaves as in Descriptor 1 Ovate 2 Ovate - lanceolate 3 Lanceolate 4 Elliptical 5 Cordate 6 Other (specify)	At pre -bud stage

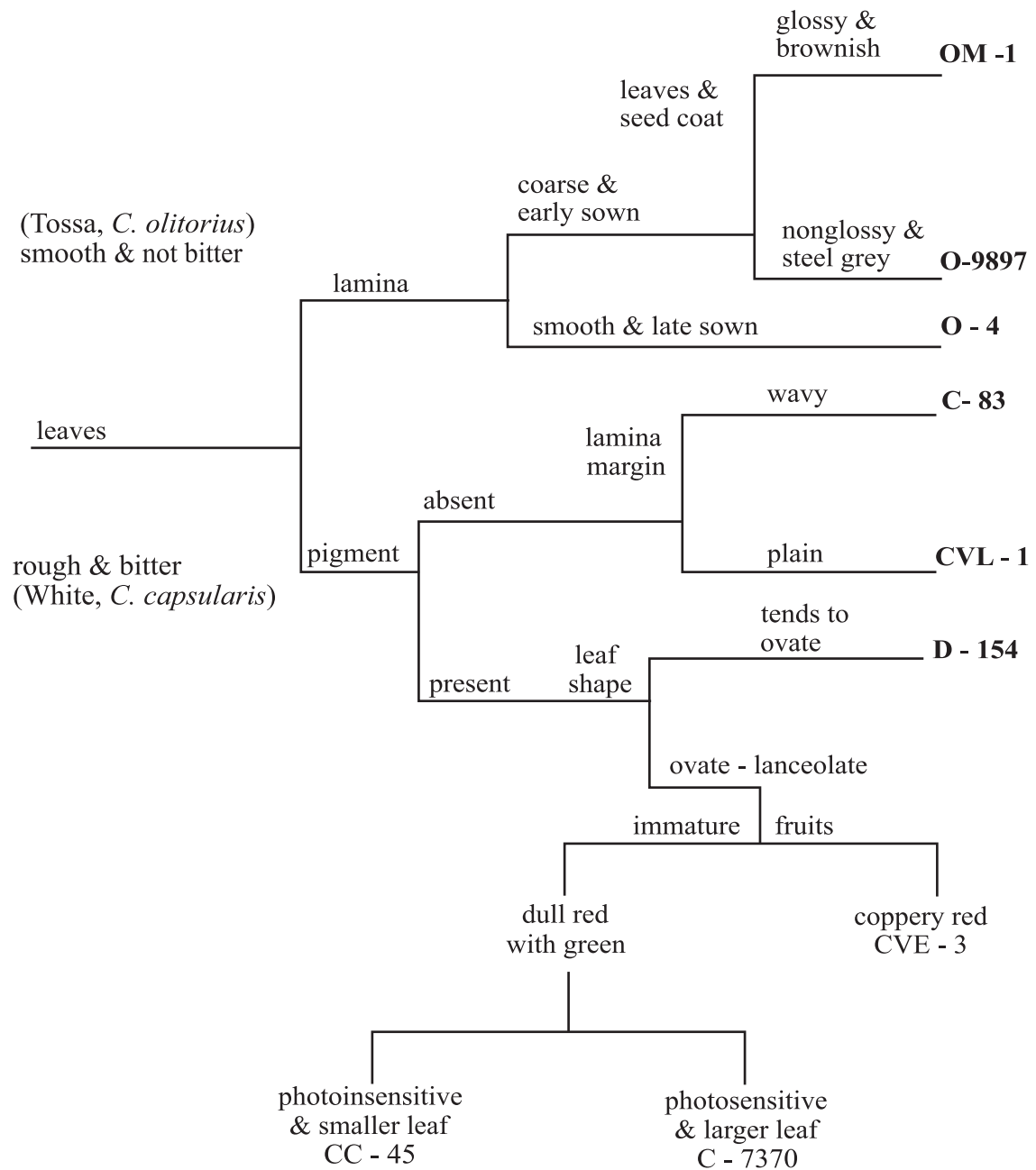
DESCRIPTOR (ON PRINT OUT)	DESCRIPTION (FULL NAME)	CODE	GUIDE	GROWTH STAGE
21. PTLN	PETIOLE LENGTH	**	Measurement in cm. using same 10 leaves as in Descriptor no. 17	At pre-bud stage
22. BUCO	PIGMENTATION OF FLOWER BUDS (CALYX)	G R	Green Red	At appearance of flower buds on all 10 plants
23. FLGDAT	FLOWERING DATE	DDMMYY	The date of opening of the first flower	At first flowering
24. MAT1	DAYS TO FIRST FLOWERING	**	The number of days from sowing to the opening of the first flower	At fist flowering
25. STCO2	STEM COLOUR (second observation)	G R	Green Red	At early fruiting stage before pod browning
26. FTCO	PIGMENTATION OF FRUIT	G R	Green Red	At early fruiting stage before pod browning
27. HARVDAT	DATE OF HARVESTING	DDMMYY		At harvesting stage (i.e. when 50% of pod have turned brown in colour)
28. MAT2	DAYS FROM SOWING TO HARVEST	**	Number of days from sowing to harvesting	At harvesting stage
29. NOD	NUMBER OF NODES AT MATURITY	**	Total number of nodes on main stem from soil surface to technical height	At harvesting stage
30. STD1	STEM DIAMETER- BASAL 	**	Measured (in mm) as close to soil surface as possible using slide calipers	At harvesting stage
31. STD2	STEM DIAMETER- MIDDLE 	**	Measured (in mm) at mid point between base and top	At harvesting stage
32. STD3	STEM DIAMETER-TOP 	**	Measured (in mm) at point of stem forking i.e. at technical height	At harvesting stage

DESCRIPTOR (ON PRINT OUT)	DESCRIPTION (FULL NAME)	CODE	GUIDE	GROWTH STAGE
33. CORDIAM	BASAL CORE DIAMETER 	**	Measured (in mm.) at same position as STD1 but after removal of outer bark to expose core (stick)	At harvesting stage
34. FBWT	DRY FIBRE WEIGHT	**	Average (in gm) of all 10 plants	After defoliation retting fibre extraction and drying of fibre
35. CRWT	DRY CORE WEIGHT	**	Average (in gm) of all 10 plants	After defoliation retting fiber extraction and drying of core (stick)
36. DIS	SEED DISPERSAL MECHANISM	1 2	Dehiscent Indehiscent	Before or during harvesting for seed
37. SCCO	SEED COAT COLOUR	1 2	Predominant colour by visual interpretation Brown-most frequent in <i>C. capsularis</i> Blue-most frequent in <i>C. oplitorius</i>	After harvesting, threshing and cleaning of seed
38. 1000 SDWT	1000 SEED WEIGHT	**	Weight of 1000 seeds (in gm)	After harvesting, threshing, cleaning and drying to 10% moisture content

Notes:

** Enter actual measurement (in metric units) or counts.

KEY TO CURRENT VARIETIES OF JUTE IN BANGLADESH



**Breeder Seed Unit
Breeding Division
Bangladesh Jute Research Institute**

PROCEDURE OF DUS TESTS FOR KENAF AND MESTA

Introduction:

DUS test is essential for recognizing, distinguishing and describing a variety. The central theme is identification of a variety through the use of some parameters of characterization. DUS test is being followed in many countries of the world. In Bangladesh, this test has recently been made part of the variety release mechanism. The ultimate benefit of DUS test will centre around Plant Breeders Rights and specially the plant variety protection in view of the globalization of agribusiness. UPOV provides that procedure for conducting DUS test should be different for each species. The following procedures have been approved by NSB by the assessment of DUS tests in varieties of kenaf and mesta released and to be released. These procedures are to be followed by all concerned dealing with variety development and release.

I. DEFINIITIONS

- DUS : Distinctness, Uniformity and Stability.
- Distinctness : The variety shall be deemed to be distinct if it is clearly distinguishing from any other variety whose existence is a matter of common knowledge at the time of application (for release of the variety).
- Uniformity : A variety shall be deemed to be uniform if subject to variation that may be expected from the particular features of its propagation, it is sufficiently uniform in its relevant characteristics.
- Stability : The variety shall be deemed to be stable if its relevant characteristics remain unchanged after repeated propagation or in the case of a particular cycle of propagation at the end of each such cycle.
- Plot : A test field of 500 plants in which seed will be sown in line at normal seed rate and spacing.
- Comparative rows: One plot each of two or more varieties grown adjacent to each other at normal seed rate and spacing.
- Reference sample : A sample of seed submitted/collected from the breeder of a variety used for conducting tests as well as for retaining a portion of the seed to represent the variety as reference stock. The seed is for official use only.

Off-type	: Plants or seeds deviating clearly from the characteristics of a variety as described by the breeder in any observable respect.
Progeny row	: A row of plant resulting from the sowing of seed from one plant in the following season.
NSB	: National Seed Board.
Variety	: A plant grouping within a single botanical taxon of the lowest known rank, which grouping can be: <ul style="list-style-type: none"> a) defined by the expression of the characteristic resulting from a given genotype; b) distinguished from any other plant grouping by the expression of at least one of the said characteristics; and c) considered as a unit with regard to its suitability for being propagated unchanged.

II. GENERAL DESCRIPTION

A. Test Period

Normally two consecutive years for which a proposed variety will be recommended. Tests may be continued for a third year if required.

B. Test Centre

The test work on each submission or collection (reference sample) will be carried out at the SCA. Field tests will be carried out in the SCA farm and laboratory tests in the Central Seed Testing Laboratory in Gazipur. If this site is not suited for field testing of certain varieties of Kenaf/Mesta then tests will be conducted by SCA in suitable research station appropriate part of the country.

C. Material required

Test materials to be submitted or collected only in the first year of testing.

1. Quantity: Kenaf/Mesta seed: 2 kg for released varieties.

500-600gms. for to be released varieties.

2. Submission of materials:

The quantity of material mentioned should be submitted to the SCA with a label inside and outside the container of seed and an accompanying letter stating exactly the same information. The information on the labels and in the letter should mention at least:

- a) Name of the sender with official designation
 - b) Reference number of the sample
 - c) Name of the organization responsible for maintaining that particular variety
 - d) Name of the variety/line of the seed
 - e) Growing season
 - f) Quantity of seed
 - g) Date and place of sampling
 - h) Month and year of harvest
 - i) Nature and quantity of preservative, if any, added to the sample
 - j) Germination % as on (date)
3. The sample should be in the possession of SCA on or before the following dates:
 - a) Kenaf: *Hibiscus cannabinus* L. on or before the 15th January
 - b) Mesta: *Hibiscus sabdariffa* L. on or before the 15th February
 4. In case of pre-released variety the sample should be submitted to SCA one season before submission of application for release.
 5. A descriptive list (as per agreed upon) filled up by breeder and a pair-wise distinctive list of characters of most similar variety/varieties should be submitted.

D. Division of Material

The submitted or collected sample may be divided into 10:10:80 ratio of the quantity. The larger quantity will be preserved as the reference sample.

E. Test Layout

1. Year 1.

A plot containing 500 normal plants should be grown at normal seed rate and spacing. There will be another set with either fifteen days interval in planting or grown in a different location.

2. Year 2

A plot containing 500 normal plants should be grown at normal seed rate and spacing from the same seed lot used in the first year. There will be another set with either fifteen days interval or in a different location. Plant-to-row of variant plants will be grown to compare these plants with the plants grown from the reference sample.

3. Year 3

Same as year 2 (if necessary).

F. Comparative row test (if necessary)

A Test with a few rows of very similar varieties of a crop are to be conducted each year side by side with the candidate variety.

III. TEST METHODS

For conduction of the test, the latest UPOV published guidelines and instructions are to be followed. Characters will be routinely recorded and verified throughout the growing period by the SCA personnel as explained in the test guidelines and consequently a complete description of varieties will be prepared.

A. Year 1

Laboratory and field observation tests will be carried out to provide data on uniformity and for classification purposes.

1. Distinctness

Descriptive records will be verified from submitted or collected materials and from harvested materials. The differences will be recorded and provisional description will be prepared.

2. Uniformity

Plants from submitted or collected materials will be required to comply with uniformity standards indicated in TG/1/3 or UPOV publication standard.

Off-type plants will be detected and the characters in which they differ from the normal plants will be recorded. In general, the assessment of differences between variant plants and majority plants will be based on the level of differences required to differentiate between varieties. When confirmation of the characters of suspected off-types is required, off-type plants and majority plants will be harvested, threshed and grown in the following appropriate season.

3. Stability

No specific test will be carried out but stability may be inferred from the plots by noting variation and segregation within the plots grown from the collected or submitted sample.

B. Year 2

Laboratory and field observations will be carried out as in year 1.

1. Distinctness

Data obtained from first year observations will be compared with the data of second year plots of the same variety. In addition, descriptive records will be prepared to supplement the first year's provisional report.

2. Uniformity

The observations made in the 2nd year will be used to confirm the provisional report prepared in the first year.

IV. VISIT TO TEST CENTRE

The breeders are encouraged to visit the test centre by arrangement to view their materials and discuss with SCA.

IV. REPORTING PROCEDURE

A. At the following stages a written summary of the data will be submitted by the SCA to the breeders.

1. If laboratory test show a marked lack of uniformity and purity.
2. If during field observation a marked lack of uniformity is evident.
3. If the distinctness of a variety is difficult to establish.

B. Reports

1. Stop work Report

In case where collected or submitted sample has been found to be unsatisfactory in terms of non-compliance with materials requirements, laboratory standard. Or early field observations, a summary report of the results will be prepared with a recommendation of discontinuation of work and communicated to the breeder and Seed Wing (MoA).

2. Progress report

The SCA will report to the breeders after each growing season about the results of 1st year trial.

3. Final Report

This report will be prepared following the second test season. It will include collected results, a description of the variety and if appropriate, a conclusion on how to distinguish this variety from other varieties.

C. Standards

1. Distinctness

To be judged as distinct, a variety must be seen to be clearly distinguishable, consistent and repeatable from any comparable variety in at least one character.

2. Uniformity

In the assessment of uniformity, variations observed in plots grown from collected/submitted sample must normally be of demonstrable and repeatable order. Variation which is thought or prone to be due to environmental effects is disregarded.

In general, Varieties must not exceed the tolerated maximum variant plant number mentioned in the TG/1/3 of UPOV guidelines.

3. Stability

Plots exceeding the fixed tolerated variant plants are considered to indicate a lack of stability, which means, excessive lack of uniformity may imply lack of stability.

D. Characters

The following minimum list of characters in variety description and character stated described will be considered for the conduct of Kenaf and Mesta DUS tests.

Table 11: List of characters in variety description for DUS test of Kenaf & Mesta

Sl. No.	Characters	Measurements of characters		Stages data collection
		Code	Guide	
1	Stem colour	G R P RG PG GrP PbGa RaGb	Green-no sign of any red/ purple Pigmentation Red- includes the presence of a red pigmentation Purple-includes the presence of a purple pigmentation Reddish green Purplish green Green with reddish patches Purple below greenish above Reddish above greenish below	50-60 days age
2	stem pubescence	1 2 3	Smooth Hairy Prickly	Pre-bud
3	Leaf shape	1 2 3 4	Unlobed Partially lobed Deeply lobed Mixed	First bud stage (i.e at appearance of first visible bud on main stem). Measure first 10 leaves from this point downwards
4	Leaf length- breadth ratio	Rations of length and breadth	Average length and breadth ratio of 10 leaves starting from the 6th leaf from top of the main stem	50-60 days age.

5	Leaf colour (lamina)	1 2 3 4 5 6	Pale green Green Deep green Reddish green Purplish green Red	50-60 days age
6	Leaf texture	1 2 3	Smooth or glossy Ventral glabrous (hairless), dorsal hairy Ventral glabrous, dorsal prickly	50-60 days age
7	Leaf pubescence	0 1	Presence of prickles and hairs on upper and lower surface of leaf Absent Present	First bud stage
8	Petiole colour	1 2 3 4 5	Green Red Reddish Purple/Purplish Upper reddish/purplish, lower greenish	50-60 days age
9	Petiole length		Average length of 10 leaves starting from the 6th leaf from top of the main stem	50-60 days age
10	Stipule colour	G R TR	Green Red Tip red	50-60 days age
11	Stipule shape	1 2 3	Scaly Filiform Foliaceous	50-60 days age
12	Flower colour	1 2 3 4 5	Cream/yellow with purple centre Completely cream/yellow Cream with purplish venation and centre Pink with purple centre Purple	At mid flowering stage

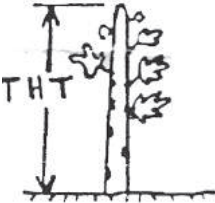
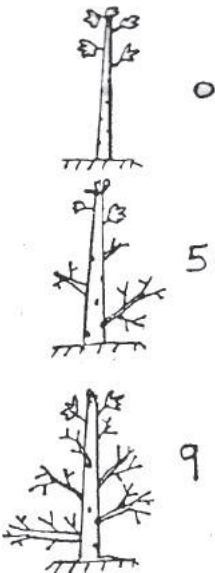
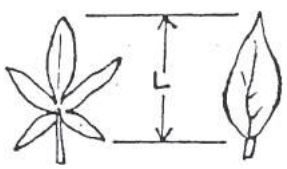
13	Anther colour	1 2	Yellow Purplish	At mid flowering stage
14	Pigmentation of flower bud (calyx)	1 2 3	Green Green with reddish spots Light red	At bud stage
15	Days to first flowering		The date of opening of the first flower	At flowering stage
16	Days to flowering of 50% plants		Date of 50% flowering (1st flowering in 50% plants in the plot)	At 50% flowering stage
17	Pigmentation of fruits (calyx and epicalyxes)	1 2 3	Green Green with reddish spots Red	At early fruiting stage before capsule browning
18	Fruit shape	1 2 3	Globular (Round) Ovoid (Egg shaped) Pointed (Elongated)	At harvesting stage
19	Fruit pubescence	1 2 3	Smooth Hairy Bristled	At harvesting stage
20	Seed dispersal mechanism	1 2	Dehiscent Indehiscent	Before or during harvesting for seed
21	Days to maturity		The date of 60-70% fruits browning	At harvesting stage
22	Seed shape	1 2 3	Reniform Sub-reniform Angular	After harvesting, threshing cleaning of seed
23	Seed coat colour	1 2 3	Ash grey Blackish Brownish	-Do-
24	1000 seed weight		Actual weight at 10% moisture content	-Do-
25	Any new character			

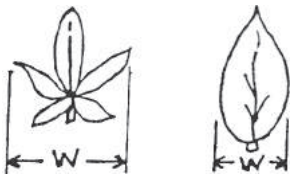
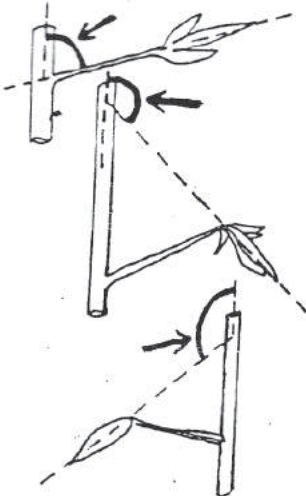
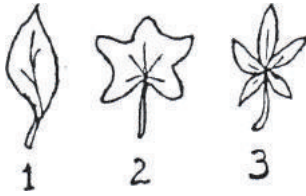
INTERNATIONAL JUTE ORGANISATION GERPLASM PROJECT




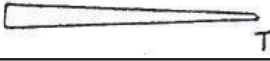

Table 12: Key to descriptors and descriptor States For Characterisation of Kenaf & Mesta

DESCRIPTOR (ON PRINT OUT)	DESCRIPTOR (FULL NAME)	CODE*	GUIDE	GROWTH STAGE
1. INST	INSTITUTE	BJRI FCRI IBFC CRIJAF JDTC RITFC	Name of institute responsible for characterisation Bangladesh Jute Research Institute Field Crops Research Institute, Thailand Institute of Best Fibre Crops, China Central Research Institute for Jute & Allied Fibres Jute Development and Trading Corporation, Nepal Research Institute for Tobacco & Fiber Crops, Indonesia	
2. CGRNO	Registration number assigned to each accession in IJO Centralised Germplasm Repository, Dhaka		A unique number which is never changed or re-assigned. This number should be used when requesting information on IJO germplasm.	
3. DESIG.	DESIGNATION		Number assigned to each accession in national gene bank of country or by donor of seed ie. Plant Introduction number (PI) of the USDA, Commonwealth Plant Introduction number (CPI) of Australia, etc.	


DESCRIPTOR (ON PRINT OUT)	DESCRIPTOR (FULL NAME)	CODE*	GUIDE	GROWTH STAGE
4. COLLNO	COLLECTION NUMBER	DS/.../H BL/.../H	Unique number assigned at the time of collection = Das & Sobhan (IJO mission I) = Basak & Li (IJO mission II) <i>H= Hibiscus</i>	
5. SPP	SPECIES	CAN	Name of species <i>cannabinus</i>	
6. VARNM	VARIETY NAME		Name of released vari- ety i.e. refers, in this case, to variety used as standard check	
7. SS	SEED SOURCE	KEN	Abbreviation of name of country from which the seed consignment was received Kenya (see: Standard List of IBPGR Country Abbreviations.)	
8. ORI	COUNTRY OF ORIGIN	KEN BGD	Country from where the seed is known to have originated. A blank indicates that no information was given	
9. SOWDAT	SOWING DATE	DDMMYY	Day, Month and Year of sowing e.g. 150588 =15 May, 1988	
10. FLGDAT	FLOWERING DATE	DDMMYY	The date of opening of the first flower	At first flowering
11. MAT1	DAYS TO FIRST FLOWERING	**	The number of days from sowing to the opening of the first flower.	At first flowering

DESCRIPTOR (ON PRINT OUT)	DESCRIPTOR (FULL NAME)	CODE*	GUIDE	GROWTH STAGE
12. HARVDAT	DATE OF HARVEST	DDMMYY		At harvesting stage (i.e. when 50% of capsules have turned brown in colour) ***
13. MAT2	DAYS FROM SOWING TO HARVEST	**	Number of days from sowing to harvesting	ditto
14. THT	PLANT TECHNICAL HEIGHT 	**	Total plant height from base to top including all flowering nodes.	At harvesting stage
15. BRN	BRANCHING HABIT AT PRE-BUD STAGE 	0 1 3 5 7 9	Non-branching...no growth of axillary bud Very weak Weak Intermediate Strong Very strong	At pre-bud stage Based on relative development of axillary buds on main stem into branches with increasing levels of secondary and tertiary growth.
16. FLN	LEAF LENGTH 	**	Average maximum length of 10 leaves (in cm.) starting from the 6th leaf from top of main stem (i.e. ignore first 5 leaves)	At pre-bud stage

DESCRIPTOR (ON PRINTOUT)	DESCRIPTOR (FULL NAME)	CODE*	GUIDE	GROWTH STAGE
17. LFWI	LEAF WIDTH 	**	Average maximum width (breadth) of 10 leaves (in cm) from the 6th leaf from the top of main stem (i.e. ignore first 5 leaves)	at per-bud stage
18. LFAN	LEAF ANGLE 	1 2 3 4 5 6 7 8 9	The angle between the stem and the line connecting the base and the centre of midrib of the leaf. Using same 10 leaves as in Descriptor no. 16. 0-20° ... erect 21-40° 41-60° ... intermediate 61-80° 81-100° ... horizontal 101-120° ... 121-140° ... descending 141-160° 161-180° ... drooping	at per-bud stage
19. LFSH	LEAF SHAPE 	1 2 3 4	= Unlobed = Partially lobed = Deeply lobed = Mixed	First bud stage (i.e. at appearance of first visible bud on main stem). Measure first 10 leaves from this point downwards
20. LFPB	LEAF PUBESCENCE	0 1	Presence of prickles and hairs on upper and lower surface of leaf = Absent = Present	First bud stage

DESCRIPTOR (ON PRINT OUT)	DESCRIPTOR (FULL NAME)	CODE*	GUIDE	GROWTH STAGE
21. STP	STIPULE 	1 2	Presence or absence of leaf stipule Stipulate (present) Exstipulate (absent)	At 60 days after sowing
22. PTLN	PETIOLE LENGTH	**	Measurement in mm. using same 10 leaves as in Descriptor no. 16	At pre-bud stage
23. STPB	STEM PUBESCENCE	1 2 3	Presence and type of pubescence on stem surface = Smooth = Hairy = Prickly	Pre-bud
24. STD1	STEM DIAMETER-BASAL 	**	Measured (in mm.) as close to soil surface as possible using slide calipers	At harvesting stage
25. STD2	STEM DIAMETER-MIDDLE 	**	Measured (in mm.) at mid point between base and top	at harvesting stage
26. STD3	STEM DIAMETER-TOP 	**	At technical height on main stem (in mm.)	At harvesting stage
27. CORDIAM	BASAL CORE DIAMETER 	**	Measured in mm at same position as STD1 but after removal of outer bark	At harvesting stage
28. NOD	NUMBER OF NODES AT MATURITY	**	Total number of nodes on main stem from soil surface to top including flowering nodes.	At harvesting stage

DESCRIPTOR (ON PRINT OUT)	DESCRIPTOR (FULL NAME)	CODE*	GUIDE	GROWTH STAGE
29. STCO1	PIGMENTATION OF STEM AT 60 DAYS AFTER SOWING		Green Or Red	Two months (60 days) after sowing
30. STCO2	PIGMENTATION OF STEM AT MATURITY		As for descriptor no. 29	At early fruiting stage before capsule browning
31. LECO	PIGMENTATION OF LEAF LAMINA AT 60 DAYS AFTER SOWING		- do -	60 days after sowing
32. VNCO	PIGMENTATION OF LEAF VEINS AT 60 DAYS AFTER SOWING		- do -	60 days after sowing
33. PTCO	PIGMENTATION OF PETIOLE AT 60 DAYS AFTER SOWING		- do -	60 days after sowing
34. STPCO	PIGMENTATION OF STIPULES AT 60 DAYS AFTER SOWING		- do -	60 days after sowing
35. BUCO	PIGMENTATION OF FLOWER BUDS (CALYX)		- do -	At appearance of buds on all 10 plants

DESCRIPTOR (ON PRINT OUT)	DESCRIPTOR (FULL NAME)	CODE*	GUIDE	GROWTH STAGE
36. FLCO	FLOWER COLOUR (COROLLA)		As for descriptor no. 29	At mid-flowering stage
37. FTCO	PIGMENTATION OF FRUIT (CALYX AND EPICALXY)		-do-	At early fruiting stage before capsule browning
38. FTPB	FRUIT PUBESCENCE	1 2 3	Presence and type of pubescence on surface of capsule = Smooth = Hairy = Bristled	At harvesting stage
39. DIS	SEED DISPERSAL MECHANISM	1 2	Dehiscent Indehiscent	Before or during harvesting for seed
40. SCCO	SEED COAT COLOUR		Brown or grey As for descriptor no. 29	After harvesting, threshing and clean- ing of seed
41. SSHP	SEED SHAPE 	1 2 3	= Reniform = Sub-reniform = Angular	After harvesting, threshing and clean- ing of seed
42. 1000	1000 SEED WEIGHT	**	Weight of 1000 seeds (in gm).	After harvesting, threshing, cleaning and drying to 10% moisture content

DESCRIPTOR (ON PRINT OUT)	DESCRIPTOR (FULL NAME)	CODE*	GUIDE	GROWTH STAGE
43. FBWT	DRY FIBRE WEIGHT	**	Average (in gm.) of all 10 plants.	After defoliation, retting, fibre extra- ction and drying of fibre
44. CRWT	DRY CORE WEIGHT	**	Average (in gm.) of all 10 plants	After defoliation, retting, fibre extra- ction and drying of (stick)

Notes :

* All scores will be averages (x) of 10 plants, unless otherwise indicated.

** Enter actual measurements (in metric units) or counts.

PROCEDURE OF DUS TESTS FOR POTATO

Introduction:

DUS test is essential for recognizing distinguishing and describing a variety. The central theme is identification of a variety through the use of some parameters of characterization, DUS test is being followed in many countries of the world. In Bangladesh, this test has recently been made part of the variety release mechanism. The ultimate benefit of DUS test will centre around Plant Breeders Rights and specially plant variety protection in view of the globalization of agribusiness. UPOV provides that procedure for conducting DUS Test should be different for each species. The following procedures have been approved by NSB to perform DUS tests of potato varieties both released and to be released. These procedures are to be followed by all concerned dealing with variety development and release.

I. DEFINITIONS:

- DUS : Distinctness, Uniformity & Stability.
- Distinctness : The Variety shall be deemed to be distinct if it is clearly distinguishable from other whose existence is a matter of common knowledge at the time of the filing of the application (for release of the variety).
- Uniformity : A variety shall be deemed to be uniform if subject to variation that may be expected from the particular features of its propagation, it is sufficiently uniform in its relevant characteristics.
- Stability : The variety shall be deemed to be stable if its relevant characteristics remain unchanged after repeated propagation, or in the case of particular cycle of propagation at the end of each such cycle.
- Plot : A test field of 120 plants in two replications should be grown at normal seed rate and spacing.

II. GENERAL DESCRIPTION

A. Test period

Normally two consecutive years for which proposed variety will be recommended. Tests may be continued for a third year if required.

B. Test Centre

The test work on each submission or collection (reference sample) will be carried out at the SCA. Field tests will be carried out in the SCA farm and laboratory, tests in the Central Seed Testing Laboratory in Gaizpur. If this site is not suited for field testing of certain varieties of potato then the tests will be conducted by SCA in a suitable research station appropriate part of the country.

C. Material required

1. Quantity: 200 tubers/15 grams of True Potato Seed (TPS) in each year of Testing.

2. Submission of Material:

The quantity of material mentioned should be submitted to the SCA with a label inside and outside with the container of seed/supplying bag and an accompanying letter stating exactly the same information. The information of the labels and in the letter should be mentioned at least:

- a) Name of the sender with official designation
- b) Reference number of the sample
- c) Name of the organization responsible for maintaining that particular variety
- d) Name of the variety/line of the seed
- e) Growing season with year
- f) Quantity of tubers/seeds
- g) Date and place of sampling
- h) Date and year of planting/sowing and harvesting
- i) Nature and quantity of seed treatment chemicals, if any, added to the sample
- j) Germination % as on date (in case of TPS)
- k) Others, if any.

3. The sample should be in the possession of SCA on or before the following dates:

- (a) On or before 2nd week of October

4. In case of pre-released variety the sample should be submitted to SCA one season before submission of application for release.

5. A descriptive list (as per agreed upon) filled up by the breeder & a pair-wise distinctive list of characters of most similar variety/varieties should be submitted.

D. Division of Material

The submitted or collected sample may be divided into as per requirement for field and laboratory test.

E. Test Layout

1. Year 1

A plot containing 60 normal plants should be grown at normal seed rate and spacing. There will be another set with either ten days interval in planting or grown in a different location.

2. Year 2

Same as 1st year.

3. Year 3

Same as 1st year (if necessary).

F. Comparative row test (if necessary)

A test with a few rows of very similar varieties of a crop are to be conducted each year side by side with the candidate variety. The breeders/applicant will specify the variety.

III. TEST METHODS

For the conduct of test test the latest UPOV published guidelines and instructions are to be followed. Characters will be routinely recorded and verified throughout the growing period by the SCA personnel as is explained in the test guidelines and consequently a complete description of varieties will be prepared.

A. Year 1

Laboratory and field observation tests will be carried out to provide data on distinctness, uniformity and other important characteristics.

1. Distinctness

Descriptive records will be verified from submitted or collected material and from harvested material. The differences will be recorded and a provisional description will be prepared.

2. Uniformity

Plants from submitted or collected materials will be required to comply with uniformity standards indicated in TG/1/3 and TG/23/5 of UPOV publication standard.

Off-type plants will be detected and the character in which they differ from the normal plants will be recorded. In general the assessment of differences between variant plants and majority plants will be based on the level of differences required to differentiate between varieties.

When confirmation of the characters of suspected off-types is required, off-type plants and majority plants will be harvested, and grown in the following appropriate season.

3. Stability

Stability may be inferred from the plots by noting variation and segregation within the plots and over generation grown from the collected or submitted sample.

B. Year 2

Laboratory and field observations will be carried out as in year 1.

1. Distinctness

Data obtained from first year observations will be compared with the data of second year's plots of the same variety under similar agronomic condition. In addition, descriptive records will be prepared to supplement the first year's provisional report.

2. Uniformity

The observations made in the 2nd year will be used to confirm the provisional report prepared in the first year.

IV. VISIT TO TEST CENTRE

The breeders/applicant are encouraged to visit the test centre to view their material and discuss with SCA. DUS Tests personnel of SCA can also visit the breeders trial plots if necessary.

V. REPORTING PROCEDURE

A. At the following stages a written summary of the data will be informed by the SCA to the breeders/applicant.

1. If the tests show a marked lack of purity and uniformity.
2. If the distinctness of a variety is difficult to establish.

B. Report

1. Progress Report

The SCA will report to the breeder/applicant after each growing season about the results of 1st year trial.

2. Final Report

This report will be prepared following the second test season. It will include collected result, a description of the variety and, if appropriate, a conclusion on how to distinguish variety from other varieties.

C. Standards

1. Distinctness

To be judged as distinct, a variety must be seen to be clearly distinguishable, consistent and repeatable, from any comparable variety in at least one character.

2. Uniformity

In the assessment of uniformity variations observed in plots grown from collected submitted sample must normally be of demonstrable and repeatable order. Variation which is thought or prone to be due to environmental effects is disregarded. In general, varieties must not exceed the tolerated maximum variant plant number mentioned in the TG/1/3 & TG/23/5 of UPOV guidelines.

3. Stability

Plot exceeding the fixed tolerated variant plants are considered to indicate a lack of stability, which means, excessive lack of uniformity may imply lack of stability.

D. Characters

The characters in variety description and character states described will be based on those outlined in the UPOV (TG/23/5) guidelines for the conduct of DUS Tests.

Minimum list of characters to describe potato plants (*Solanum tuberosum* L.)

Character	Observation stage
* 1. Light sprout: size Code 3 for small Code 5 for medium Code 7 for large	Stage 1 (Light sprout)
** 2. Light sprout: shape Code 1 for spherical Code 2 for ovoid Code 3 for conical Code 4 for broad cylindrical Code 5 for narrow cylindrical	Stage 1 (Light sprout)
** 3. Light sprout: anthocyanin colouraion of base Code 1 for red-violet Code 2 for blue-violet	Stage 1 (Light sprout)
**4. Light sprout: intensity of anthocyanin colouration of base Code 1 for very weak Code 3 for weak Code 5 for medium Code 7 for strong Code 9 for very strong	Stage 1 (Light sprout)
** 5. Light sprout: pubescence of base Code 1 for very weak Code 3 for weak Code 5 for medium Code 7 for Strong Code 9 for very strong.	Stage 1 (Light sprout)
06. Light sprout: size of tip Code 1 for very small Code 3 for small Code 5 for medium Code 7 for large Code 9 for very large	Stage 1 (Light sprout)
07. Light sprout: habit of tip Code 3 for closed Code 5 for medium Code 7 for open	Stage 1 (Light sprout)

- | | | |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| *8. | Light sprout: intensity of anthocyanin colouration of tip
Code 1 for very weak
Code 3 for weak
Code 5 for medium
Code 7 for strong
Code 9 for very strong | Stage 1 (Light sprout) |
| *9. | Light sprout: pubescence of tip
Code 1 for absent or very weak
Code 3 for weak
Code 5 for medium
Code 7 for strong.
Code 9 for very strong. | Stage 1 (Light sprout) |
| 010. | Light sprout: number of root tips
Code 3 for few
Code 5 for medium
Code 7 for many | Stage 1 (Light sprout) |
| 011. | Light sprout: protrusion of lenticels
Code 3 for few
Code 5 for medium
Code 7 for strong | Stage 1 (Light sprout) |
| 012. | Light sprout: length of lateral shoots
Code 3 for short
Code 5 for medium
Code 7 for long | Stage 1 (Light sprout) |
| *13. | Plant: height
Code 1 for very short
Code 3 for short
Code 5 for medium
Code 7 for tall
Code 9 for very tall | Stage 2 |
| *14. | Plant: type
Code 1 for stem-type
Code 2 for intermediate-type
Code 3 for leaf-type | Stage 2 |
| *15. | Plant: growth habit
Code 3 for erect
Code 5 for semi-erect
Code 7 for spreading | Stage 2 |
| *16. | Stem: thickness of main stem
Code 3 for thin
Code 5 for medium
Code 7 for thick | Stage 2 |
| **17. | Stem: extension of anthocyanin colouration
Code 1 for absent or very weak
Code 3 for weak
Code 5 for medium
Code 7 for strong
Code 9 for very strong | Stage 2 |

*18.	Leaf: size Code 1 for very small Code 3 for small Code 5 for medium Code 7 for large Code 9 for very large	Stage 2
*19.	Leaf: silhouette Code 3 for closed Code 5 for medium Code 7 for open	Stage 2
*20.	Leaf: intensity of green colour Code 3 for light Code 5 for medium Code 7 for dark	Stage 2
*21.	Leaf: extension of anthocyanin colouration of midrib Code 3 for weak Code 5 for medium Code 7 for strong Code 9 for very strong	Stage 2
**22.	Leaflet: size Code 1 for very small Code 3 for small Code 5 for medium Code 7 for large Code 9 for very large	Stage 2
*23.	Leaflet: width Code 3 for narrow Code 5 for medium Code 7 for broad	Stage 2
*24.	Leaflet: frequency of (+) coalescence Code 3 for low Code 5 from medium Code 7 for high	Stage 2
**25.	Leaflet: waviness of margin Code 1 for none or very weak Code 3 for weak Code 5 for medium Code 7 for strong Code 9 for very strong	Stage 2
26.	Leaflet: depth of veins Code 3 for shallow Code 5 for medium Code 7 for deep	Stage 2
*27.	Leaflet : anthocyanin pigmentation of blade of young leaflets at apical rosette Code 1 for absent Code 9 for present	Stage 2

*28.	Leaflet: glossiness of the upper-side Code 3 for dull Code 5 for medium Code 7 for glossy	Stage 2
*29.	Leaf (midrib): frequency of secondary leaflets Code 1 for nil or very low Code 3 for low Code 5 for medium Code 7 for high Code 9 for very high	Stage 2
*30.	Terminal leaflet: frequency of secondary leaflets Code 1 for nil or very low Code 3 for low Code 5 for medium Code 7 for high Code 9 for very high	Stage 2
*31.	Lateral leaflet: frequency of secondary leaflets Code 1 for nil or very low Code 3 for low Code 5 for medium Code 7 for high Code 9 for very high	Stage- 2
*32.	Lateral leaflet: size of secondary leaflet Code 3 for small Code 5 for medium Code 7 for large	Stage 3
033.	Inflorescence: size of inflorescence Code 3 for small Code 5 for medium Code 7 for large	Stage 3
034.	Inflorescence: anthocyanin colouration of peduncle Code 1 for absent or very weak Code 3 for weak Code 5 for medium Code 7 for strong Code 9 for very strong	Stage 3
035.	Plant: frequency of flowers Code 1 for nil or very low Code 3 for low Code 5 for medium Code 7 for high Code 9 for very high	Stage 3
036.	Flower: anthocyanin colouration of bud Code 1 for absent or very weak Code 3 for weak Code 5 for medium Code 7 for strong Code 9 for very strong	Stage 3

037.	Flower corolla: size Code 1 for very small Code 3 for small Code 5 for medium Code 7 for large Code 9 for vary large	Stage 3
038.	Flower corolla: colour of inner side Code 1 for white Code 2 for red-violet Code 3 for blue-violet	Stage 3
039.	Flower corolla : intensity of anthocyanin colouration of inner side in coloured flower Code 1 for absent or very weak Code 3 for weak Code 5 for medium Code 7 for strong Code 9 for very strong	Stage 3
040.	Flower corolla : anthocyanin colouration of outer side in white flower. Code 1 for absent Code 9 for present	Stage 3
041.	Flower corolla: size of white tips in coloured flower Code 3 for small Code 5 for medium Code 7 for large	Stage 3
042.	Plant: frequency of fruits Code 1 for absent or very few Code 3 for few Code 5 for medium Code 7 for many Code 9 for very many	Stage 4
*43.	Plant: time of maturity Code 1 for very early Code 3 for early Code 5 for medium Code 7 for late Code 9 for very late	Stage 4
**44.	Tuber: shape Code 1 for round Code 2 for short-oval Code 3 for oval Code 4 for long oval Code 5 for long Code 6 for very long	Stage 5
*45.	Tuber: depth of eyes Code 1 for very shallow Code 3 for shallow Code 5 for medium Code 7 for deep Code 9 for very deep	Stage 5

*46. Tuber: smoothness of skin Stage 5
Code 3 for smooth
Code 5 for medium
Code 7 for rough

**47. Tuber: colour of skin Stage 5
Code 1 for yellow
Code 2 for red
Code 3 for blue
Code 4 for red parti-coloured
Code 5 for blue parti-coloured

*48. Tuber: colour of base of eye Stage 5
Code 1 for yellow
Code 2 for red
Code 5 for blue

**49. Tuber: colour of flesh Stage 5
Code 1 for white
Code 2 for cream
Code 3 for light yellow
Code 4 for yellow
Code 5 for dark yellow

050. Yellow: skinned varieties only: Stage 5
Tuber : anthocyanin colouration of skin in reaction
to light
Code 1 for absent of very weak
Code 3 for weak
Code 5 for medium
Code 7 for strong
Code 9 for very strong

(*&**) These 32 characters are important in Bangladesh condition including 10
(**) characters mentioned in UPOV Guide line (TG/23/5).

O Not so important or feasible for Bangladesh. However if necessary: These
characters may be considered & recorded.

PROCEDURE OF DUS TESTS FOR SUGARCANE

Introduction:

DUS test is essential for recognizing, distinguishing and describing a variety. The purpose of the procedure is to harmonize examination of distinctness (D), uniformity (U) and stability (S) and, in particular, to identify appropriate characteristics for the examination of DUS and production of harmonized variety descriptions. The main theme is identification of a variety through use of some characterization parameters. DUS test is being followed in many countries of the world. In Bangladesh, this test has been taken as a part of the variety release mechanism. The ultimate benefit of DUS test will centre on Plant Breeders' Rights, especially plant variety protection in view of globalization. UPOV provides that the procedure for conducting DUS test should be different for each species. The procedure of DUS testing of new varieties includes testing in the trial field and laboratory that must be conducted according to general procedural guidelines and in accordance with requirements of the UPOV. The following procedure has been developed for the evaluation by the technical committee and final approval of the NSB. This procedure should be applicable for the assessment of DUS in sugarcane varieties already released and to be released.

I. DEFINITIONS

DUS	: Distinctness, Uniformity & Stability.
Distinctness	: The variety shall be deemed to be distinct if it is clearly distinguishing from any other variety whose existence is a matter of common knowledge at the time of application.
Uniformity	: The variety shall be deemed to be sufficiently uniform if, subject to variation that may be expected from the particular features of its propagation, it is sufficiently uniform in its relevant characteristics.
Stability	: The variety shall be deemed to be stable if its relevant characteristics remain unchanged after repeated propagation or in the case of a particular cycle of propagation, at the end of each cycle.
Plot	: A test field of 80 plants in two replications should be grown at normal seed rate and spacing.

II. GENERAL DESCRIPTION

A. Test Period

The duration of tests shall normally be at least two independent growing seasons. Tests may be continued for a third year if required.

B. Test Centre

The field shall be conducted at the SCA and laboratory tests in the Variety Testing Laboratory in Gazipur. In case of test conducted at more than one place, suitable place at own station of SCA or research institute shall be selected.

C. Material required

Test material to be submitted or collected only in the first year of testing.

1. Quantity:

Test quantity of plant material to be supplied by the applicant should be 170 segments of stalk used for vegetative propagation of sugarcane with 3 buds each.

2. Submission of Material:

The quantity of material mentioned should be submitted to the SCA with properly labeled and accompanying letter stating exactly. The information on the labels and in the letter should mention at least:

- a) Name of the sender with official designation
- b) Reference number of the sample
- c) Name of the organization responsible for maintaining that particular variety
- d) Name of the variety/line of the seed
- e) Planting time
- f) Quantity of seed

3. The sample should be in the possession of SCA on or before the 2nd week of October.

4. A descriptive list (as per agreed upon) filled up by breeder and a pair wise distinctive list of characters of most similar variety/varieties should be submitted.

D. Division Of Material

The submitted or collected samples may be divided as per requirements for field and laboratory test.

E. Test layout

1. Year 1

The following design should be followed:

Number of rows	4
Row length	6 m
Row to row distance	90 cm
Plant to plant distance	60 cm
Number of replications	2
Number of plants	80

There will be another set planting with 10-15 days interval.

2. Year 2

Same as 1st year

3. Year 3

Same as 1st year (if necessary)

F. Comparative row test (if necessary)

Tests with a few rows of very similar varieties of the crop are to be conducted each year side by side with the candidate variety.

III. TEST METHODS

The tests are to be conducted following the latest UPOV published guidelines and instructions. Characters will be routinely recorded and verified throughout the growing period by the SCA personnel as is explained in the test guideline and consequently a complete description of varieties will be prepared.

Sometimes it is difficult to identify a variety based on morphological appearance only, particularly for new varieties. In this case, a more reliable and unambiguous means of identification is necessary. Thus, molecular markers in facilitating DUS testing have gained acceptance. DNA markers are also becoming increasingly important in the protection of new varieties through Plant Breeders' Right. However, if necessary application of molecular techniques for DUS test of sugarcane may be applied maintaining the standards indicated in BMT-TWA/sugarcane/2/2 of UPOV guideline. DNA marker testing facilities to be developed as per the guideline of UPOV.

A. Year 1

Laboratory and field tests will be carried out to provide data on Distinctness, Uniformity and other important characteristics.

1. Distinctness

Descriptive records will be verified from submitted or collected material and from harvested material. The differences will be recorded and a provisional description will be prepared.

2. Uniformity

Plants from submitted or collected materials will be required to comply with uniformity standards indicated in TG/1/3 and TG/186/1 of UPOV publication standard.

Off-type plants will be detected and the characters in which they differ from the normal plants will be recorded. In general, the assessment of differences between variant plants and majority plants will be based on the level of differences required to differentiate between varieties.

When confirmation of the characters of suspected off-types is required, off-type plants and majority plants will be grown in the following season.

3. Stability

No specific test will be carried out but stability may be inferred from the plots by noting variation and segregation within the plots grown from the collected or submitted sample.

B. Year 2

Laboratory and field observation will be carried out as in year 1.

1. Distinctness

Data obtained from first year observations will be compared with the data of 2nd year plots of the same variety under similar agronomic condition. In addition, descriptive records will be prepared to supplement the 1st year's provisional report.

2. Uniformity

The observations made in the 2nd year will be used to confirm the provisional report prepared in the first year.

3. Stability

In field condition it should be observed.

IV. VISIT TO TEST CENTER

The breeders/applicants are encouraged to visit the test center to view their material and discuss with SCA personnel. DUS-test personnel of SCA can also visit the breeder's trial plots, if necessary.

V. REPORTING PROCEDURE

A. At the following stages a written summary of the data will be informed by the SCA to the breeders/applicants.

- a) If the tests show any marked lack of purity and uniformity
- b) If the distinctness of a variety is difficult to establish.

B. Reports

1 Progress report

After each growing season SCA will prepare results report of 1st year trial. If the distinctness of a variety is difficult to establish, SCA personnel may discuss with the breeder.

2. Final report

This report will be prepared following the second test season. It will include collected results, a description of the variety and if appropriate, a conclusion on how to distinguish this variety from other varieties.

C. Standards

1. Distinctness

To be judged as distinct, a variety must be seen to be clearly distinguishable, consistent and repeatable from any comparable variety in at least one character.

2. Uniformity

In the assessment of uniformity, variations observed in plots grown from submitted/collected sample must normally be of demonstrable and repeatable order. Variation which is thought or prone to be due to environmental effects is disregarded. In general, varieties must not exceed the tolerated maximum variant plant number mentioned in the TG/1/3 and TG/186/1 of UPOV guidelines.

3. Stability

Plots exceeding the fixed tolerated variant plants are considered to indicate a lack of stability, which means, excessive lack of uniformity may imply lack of stability.

D. Characteristics

Characteristics for DUS test of sugarcane in Bangladesh are selected comparing the characteristics of UPOV and India, and given in the Table of characteristics.

1. 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.

(+) It is to be noted that for certain characteristics the plant parts on which observation to be taken are given in the explanation or figure(s) for clarity and not for the colour variation.

Isd : Ishurdi

BSRI : Bangladesh Sugarcrop Research Institute

RHS : Royal Horticulture Society Colour Chart

End of grand growth stage: 210-240 days

Maturity stage: 270-300 days

Harvest stage: 300-360 days.

Table 13: Charcters for DUS yest of Sugarcane

Sl. No.	Characteristics	Statges	Note	Example varieties	Stage of observation (days)
1. (*) (+)	Plant: Growth habit	Erect Semi-erect	1 2	Isd 40 Isd 25	210-240
2. (*) (+)	Plant: Adherence of leaf sheath	weak (self de-trashing) Medium (semi clasping) Strong (tight clasping)	3 5 7	Isd 30 Isd 35 Isd 28	270-300
3. (+)	Plant: Number of millable canes (NMC) per stool	Low (<3.0) Medium (3.0-5.0) High (5.1-7.0) Very high (>7.0)	3 5 7 9	Isd 25 Isd 37	300-360
4.	Plant: Leaf carriage	Open Compact	1 2	Isd 35 Isd 37	210-240
5.	Plant: Intensity of green colour of leaf canopy	Light Medium Dark	3 5 7	Isd 2-54 Isd 16 Isd 25	210-240
6. (+)	Plant: Cane height (from the base to the TVD leaf)	Short (<1.75 m) Medium (1.75-3.0m) Tall (>3.0 m m)	3 5 7	Isd 24 BSRI Akh 42	300-360
7. (*) (+)	Internode: Diameter	Thin (<2.2 cm) Medium (2.2-3.0 cm) Thick (>3.0 cm)	3 5 7	Isd 35 BSRI Akh 41	270-300
8. (*) (+)	Internode: Shape	Cylindriacal Tumescent Bobbin shaped Conoidal Obconoidal Curved	1 2 3 4 5 6	Isd 37 BSRI Akh 42 ISd 39 ISd 38	270-300
9.	Internode: Cross-section	Round Oval	1 2	Isd 39	300-360
10. (*) (+)	Internode: Colour (Exposed to sun)	Green yellow group (RHS 1) Yellow green group (RHS 144-154) Yellow group (RHS 3-13, 22) Greyed group (RHS 160-182, 184, 199) Brown group (RHS 200) Purple group (RHS 59-65, 77)	1 2 3 4 5 6		270-300
11. (*) (+)	Internode: Colour (Not Exposed to sun)	Green (RHS 138-143) Green yellow (RHS 1) Green White (RHS 157) Yellow (RHS 2-11) Yellow Green (RHS 145-154) Yellow white (RHS 158) Orange white (RHS 159) Greyed green (RHS 193) Greyed yellow (RHS 160)	1 2 3 4 5 6 7 8 9		270-300
12.	Internode: Split/growth crack	Absent Present	1 9	Isd 39 Isd 25	270-300

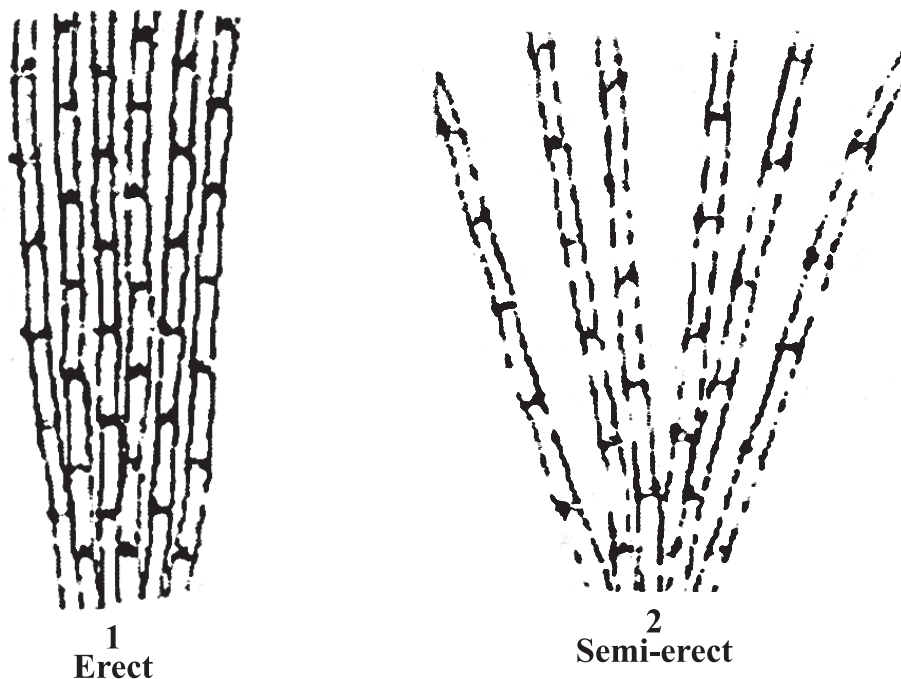
Sl. No.	Characteristics	States	Note	Example varieties	Stage of observation (days)
13.	Internode: Alignment	Straight Zigzag	1 9	Isd 37	270-300
14. (*) (+)	Internode: Appearance (rind surface)	Smooth Corky patches only Ivory marks only Corky patches and ivory marks present	1 2 3 4	Isd 16 BSRI Akh 41	270-300
15.	Internode: Pithiness	Absnt Present	1 9	Isd 39 Isd 35	300-360
16. (*)	Internode: Waxiness	Absnt Light Medium Heavy	1 3 5 7	BSRI Akh 42 Isd 27 Isd 30 Isd 40	270-300
17.	Node: Width of root band	Narrow (< 6mm) Medium (6-8 mm) Broad (>8mm)	3 5 7	Isd 24 Isd 40 Isd 39	270-300
18. (+)	Node: Bud shape	Triangular-pointed Oval Obovate, Pentagonal, Rhomboid, Round Ovate Rectangular Beaked	1 2 3 4 5 6 7 8 9	Isd 20 Isd 24 Isd 33 Isd 38 Isd 16	270-300
19.	Node: Bud prominence	Flat Bulging	1 9	Isd 19 Isd 40	270-300
20. (*)	Node: Depth of bud groove	Absent Shallow Medium Deep	1 3 4 5	Isd 40 Isd 34 Isd 16	270-300
21.	Node: Size of bud (Measured from base of bud to the tip)	Small (6 mm or less), Medium (7-9 mm), Large (10 mm or more)	3 5 7	Isd 19 Isd 24 BSRI Akh 41	270-300
22.	Node: Bud tip position in relation to growth ring	Clearly below growth ring Touching the ring Clearly above growth ring	3 5 7	Isd 19 Isd 33 Isd 26	270-300
23.	Node: Pubescence on the bud	Absent Present	1 9		270-300
24. (*)	Node: Bud cushion (Space between bud base and leaf scar)	Absent Present	1 9	Isd 38 Isd 19	270-300
25. (+)	Node: Growth ring appearance	Weak (Not swollen) Strong (Swollen)	1 9	Isd 39 Isd 33	270-300
26.	Node: Root primordial arrangement	One row Two rows Three rows Four rows Irregular	1 2 3 4 5	Isd 34 Isd 17 Isd 39	270-300

Sl. No.	Characteristics	States	Note	Example varieties	Stage of observation (days)
27. (*)	Leaf sheath: Number of hairs (Groups 57)	Absent Few Many	1 3 5	Isd 34 Isd 16 Isd 24	210-240
28.	Leaf sheath: Distribution of hairs	Absent Only dorsal Lateral and dorsal	1 3 5	Isd 39 Isd 33 Isd 24	210-240
29. (+)	Leaf sheath: Shape of ligule	Strap-shaped Deltoid Crescent-shaped Bow-shaped	1 2 3 4	Isd 27 Isd 39 Isd 2-54	210-240
30. (+)	Leaf sheath: Shape of inner auricle	Sloping transitional Straight transitional Ascending transitional Deltoid Dentoid Unciform Calcareform Lanceolate Falcate	1 2 3 4 5 6 7 8 9	Isd 25 Isd 19 Isd 33 Isd 17 Isd 34 Isd 30	210-240
31. (+)	Leaf sheath: Shape of outer auricle	Sloping transitional Straight transitional Ascending transitional Deltoid Dentoid Unciform Calcareform Lanceolate Falcate	1 2 3 4 5 6 7 8 9	Isd 25 Isd 33 Isd 20 Isd 34 Isd 30	210-240
32. (*)	Leaf sheath: Colour of dewlap	Greenish-yellow Yellow Yellowish-green Brown Purple	1 2 3 4 5	Isd 39	210-240
33. (*)	Leaf blade: Curvature	Erect to tip Curved near tip Bent near tip Curved near middle	1 2 3 4	Isd 18 Isd 25 Isd 17 Isd 28	210-240
34. (*)	Leaf blade: width at the longitudinal midpoint	Narrow (<3.0 cm) Medium (3.0-5.0 cm) Broad (> 5.0 cm)	3 5 7	Isd 28 Isd 34 Isd 25	210-240
35.	Leaf blade: Serration of margin	Absent Present	1 9	Isd 30 Isd 18	210-240
36.	Cane top: Waxiness	Absent Weak Medium Strong	1 3 4 5	Isd 40 Isd 38 Isd 34	210-240
37.	Special feature : (if any)				

VI. EXPLANATION ON THE TABLE OF CHARACTERISTICS

Characteristic 1. Plant: Growth habit

Observations made visually on a group of plants (stools) between ground level and 60 cm height inside the plot.



Characteristic 2. Plant: Adherence of leaf sheath

Observations shall be recorded by pulling dry leaves and shall be grouped as weak/free, if leaf sheath is removed completely and very easily, medium/intermediate, if small part of the leaf sheath remains attached with stem and strong/clinging, if leaf sheath is strongly and completely attached with stem.

Characteristic 3. Plant: Number of millable canes (NMC) per stool

Fully developed cane with a minimum height of one meter shall be considered as millable cane.

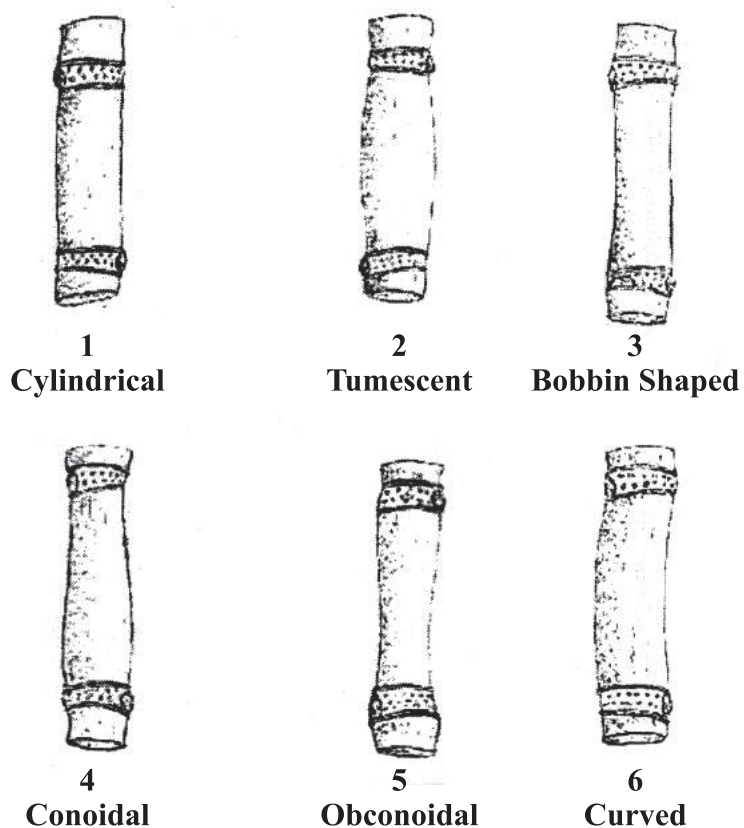
Characteristic 6. Plant: Cane height

Measurement shall be recorded from the base to the top visible dewlap (TVD).

Characteristic 7. Internode: Diameter

Diameter shall be recorded in centimeter with vernier calipers. The measurement shall be taken at the middle of cane and at the middle of the internode on the axis passing through the bud.

Characteristic 8. Internode: Shape



Characteristic 10. Internode: Colour exposed to sun

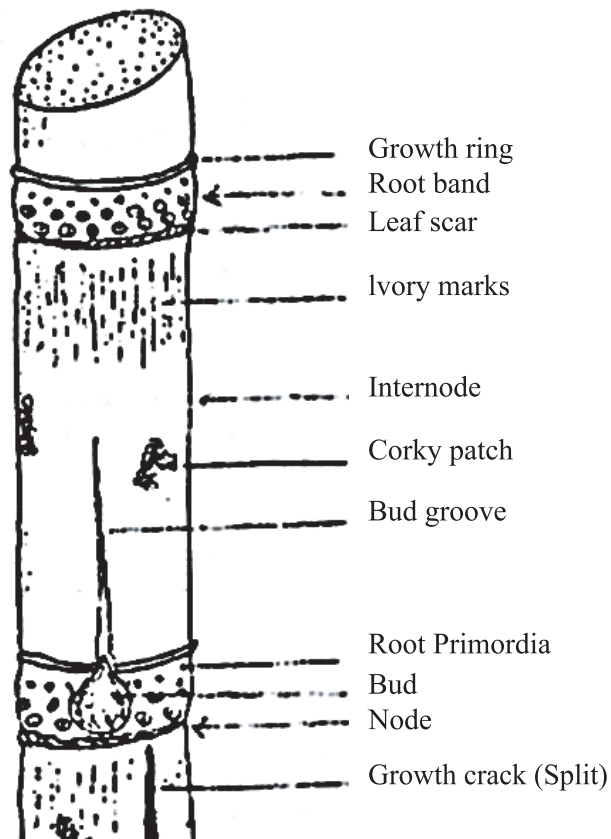
Colour of the stem shall be recorded at fifth internode from the base, two months after de-trashing and removing the wax with moist cotton.

Characteristic 11. Internode: Colour not exposed to sun

Unexposed colour shall be recorded by removing two lower most green leaves of the stem (after removing the wax with moist cotton) in the middle of the plot.

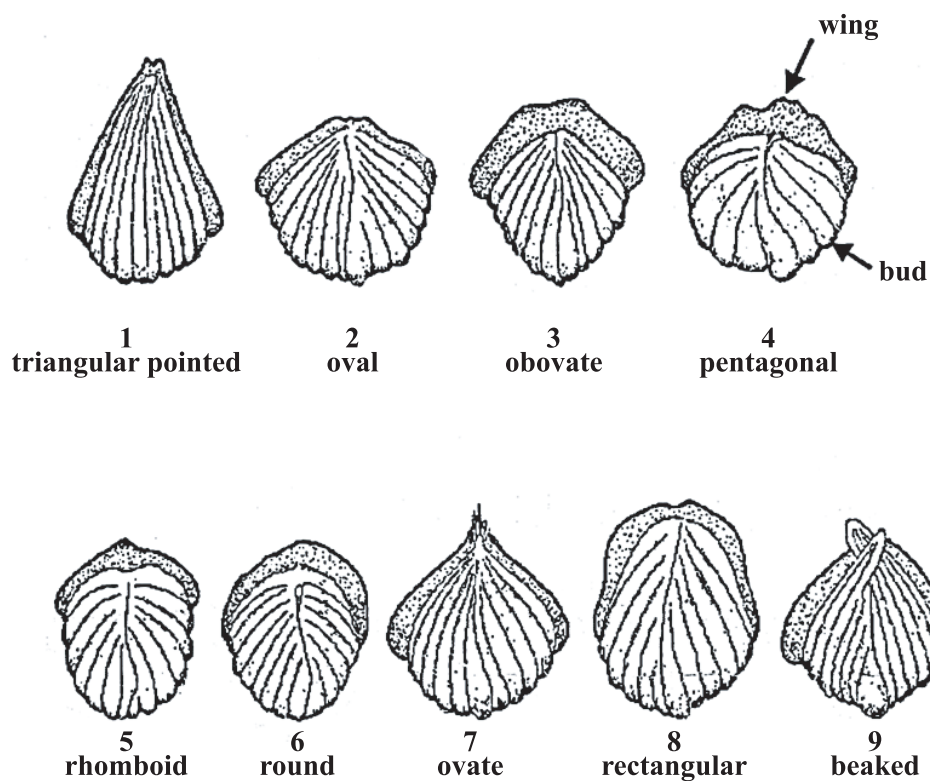
Characteristic 14. Internode: appearance (rind surface)

Corky patches (also known as weather marks) are irregular shaped grey or brown patches on the epidermis. Ivory marks are shallow crevices on the rind below nodes appearing as short or long thin lines. Also known as corky cracks, imparts rough texture to the rind.



Characteristic 18. Node: Bud shape

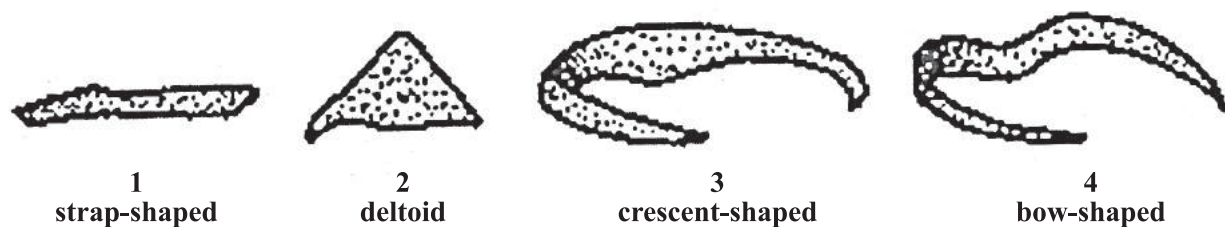
This character shall be observed on the bud at top most joint whose leaf had fully dried.



Characteristic 25. Node: Growth ring appearance

This is a region just above the root zone and shall be observed at a location opposite to the bud in the middle of cane.

Characteristic 29. Leaf sheath: Shape of ligule



Characteristic 30, 31. Leaf sheath: Shape of inner auricle and outer auricle



1
Sloping
transitional



2
Straight
transitional



3
Ascending
transitional



4
Deltoid



5
Dentoid



6
Unciform



7
Clacareform



8
Lanceolate



9
Falcate

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কর্তৃপক্ষ কর্তৃক প্রকাশিত

বৃহস্পতিবার, জুন ২, ২০১৬

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বীজ উইং, কৃষি মন্ত্রণালয়
প্রজ্ঞাপন
তারিখ, ১৭ মে ২০১৬

নং ১২.০০.০০০০.০৯৭.২৯.০২৯.০৪-৩৫৯- গত ২৩-০২-২০১৬ খ্রিঃ তারিখে অনুষ্ঠিত জাতীয় বীজ বোর্ডের ৮৮তম সভায় হাইব্রিড ধানের জাত মূল্যায়ন ও নিবন্ধীকরণ সংশোধনী পদ্ধতি অনুমোদিত হয়েছে। এ পরিপ্রেক্ষিতে এতদসংক্রান্ত পূর্ববর্তী প্রজ্ঞাপন/সার্কুলার বাতিলপূর্বক হাইব্রিড ধানের জাত মূল্যায়ন ও নিবন্ধীকরণের লক্ষ্যে নিম্নবর্ণিত সংশোধিত পদ্ধতি সংশ্লিষ্ট সকলের অবগতি ও অনুসরণের জন্য জারি করা হলো।

হাইব্রিড ধানের জাত মূল্যায়ন ও নিবন্ধীকরণের সংশোধিত পদ্ধতি

বীজ আইন বা জাতীয় বীজ বোর্ডের অন্য কোন সিদ্ধান্তের সাথে সরাসরি পরিপন্থি না হলে হাইব্রিড ধানের জাত মূল্যায়ন ও নিবন্ধীকরণের ক্ষেত্রে নিম্নোক্ত পদ্ধতি অনুসরণ করতে হবেঃ

- ১। দেশের প্রচলিত আইনের আওতায় অন্যদেশ থেকে আমদানির মাধ্যমে অথবা দেশের অভ্যন্তরে গবেষণার মাধ্যমে উদ্ভাবিত হাইব্রিড ধানের জাতসমূহ সার্বিকভাবে মূল্যায়নের পর বাংলাদেশের বিভিন্ন অঞ্চলে আবাদের জন্য নিবন্ধন করা যাবে।
- ২। হাইব্রিড ধানের বীজ আমদানি ও বাজারজাতকরণে ইচ্ছুক ব্যক্তি ও প্রতিষ্ঠান প্রতি বছর প্রতি মৌসুমে পরীক্ষাকার্য পরিচালনার জন্য সর্বাধিক প্রতি জাতের ২০(বিশ) কেজি বীজ মহাপরিচালক, বীজ উইং, কৃষি মন্ত্রণালয় এর অনুমোদন সাপেক্ষে উদ্ভিদ সংগনিরোধ উইং, ডিএই হতে ইমপোর্ট পারমিট নিতে হবে। বীজ উইং এর অনুমোদনের একটি কপি বীজ প্রত্যয়ন এজেন্সীকে প্রদান করতে হবে।
- ৩। মূল্যায়ন ও পরীক্ষার জন্য প্রস্তাবকারী ব্যক্তি, সরকারি-বেসরকারি প্রতিষ্ঠান অথবা প্রাইভেট কোম্পানি-কে নির্দিষ্ট ছকে (পরিশিষ্ট “ক”) বোরো, আউশ ও আমন মৌসুমের হাইব্রিড জাত নিবন্ধীকরণের প্রস্তাব, জাতপ্রতি কমপক্ষে ০৮ (আট) কেজি বীজ এবং ট্রায়াল খরচ যথাক্রমে ০৭ নভেম্বর, ১৫ ফেব্রুয়ারি ও ১৫ মে এর মধ্যে (প্রযোজ্য ক্ষেত্রে) বীজ প্রত্যয়ন এজেন্সীর নিকট পৌছাতে হবে।
- ৪। নমুনা বীজের সাথে অন্য কোন ফসলের বীজ থাকলে অথবা অন্য কোন শনাক্তকারী চিহ্ন ব্যবহার করলে নমুনা বাতিল হবে। আবেদনকারীর প্রস্তাব বীজ প্রত্যয়ন এজেন্সী যাচাই বাছাই করে প্রস্তাব গ্রহণ বা বাতিলের সিদ্ধান্ত প্রস্তাবকারীকে জানাবে।
- ৫। আমদানিকারক আমদানিকৃত বীজ কিভাবে ব্যবহার করেছে তা আমদানির ২(দুই) মাসের মধ্যে বীজ প্রত্যয়ন এজেন্সীকে লিখিতভাবে অবহিত করবে।
- ৬। প্রত্যেক ব্যক্তি/কোম্পানি/প্রতিষ্ঠান অনধিক ২ (দুই) টি জাত এক মৌসুমে মূল্যায়নের জন্য প্রস্তাব করতে পারবে।

- ৭। প্রতিটি হাইব্রিড জাত মূল্যায়ন ও নিবন্ধীকরণ পদ্ধতিতে অংশগ্রহণের জন্য প্রস্তাবকারীকে জাত-প্রতি ৩,০০০ (তিন হাজার) টাকা এন্টি ফি সরকারি কোষাগারে কোড নং ১-৪৩৩৮-০০০০-২০১৭ এ জমা দিয়ে চালান কপি বীজ প্রত্যয়ন এজেন্সীর নিকট দাখিল করতে হবে। এছাড়া প্রতিবছর প্রতি জাত ও প্রতি স্থানের ট্রায়ালের খরচ বাবদ ৪,৫০০ (চার হাজার পাঁচশত) টাকা হিসেবে পরিচালক, বীজ প্রত্যয়ন এজেন্সী এর দপ্তরে জমা দিতে হবে।
- ৮। বাংলাদেশে হাইব্রিড ধানের জাত মূল্যায়নের লক্ষ্যে গৃহীত ১০টি কৃষি অঞ্চলের মধ্যে বরিশাল অঞ্চলসহ ন্যূনতম ৬টি অঞ্চলের খামারে প্রতিটি RCB ডিজাইনে তিনটি Replication এর মাধ্যমে অনস্টেশন টেস্ট প্লট (On-Station test plot) এবং ন্যূনতম ৬টি নিকটবর্তী কৃষক পরিবারের জমিতে অনফার্ম (On-farm) পরীক্ষার ব্যবস্থা করতে হবে।
- ৯। ফসলের জাত ও পরিবেশ এর Interaction বিবেচনায় রেখে আমদানিকৃত হাইব্রিড ধানের মূল্যায়ন বীজ প্রত্যয়ন এজেন্সীর তত্ত্বাবধানে দুই বছর ট্রায়াল করতে হবে। উক্ত দুই বছর ট্রায়াল করার পূর্বে সংশ্লিষ্ট কোম্পানি/প্রতিষ্ঠানকে কমপক্ষে এক বছর নিজস্ব তত্ত্বাবধানে প্রস্তাবিত হাইব্রিড জাতের মাঠ মূল্যায়ন করতে হবে। এক বছর নিজস্ব তত্ত্বাবধানে মূল্যায়ন মাঠের অবস্থানসহ সুনির্দিষ্ট তথ্য পরিচালক, বীজ প্রত্যয়ন এজেন্সিকে দিতে হবে এবং মূল্যায়নের তথ্য সংশ্লিষ্ট জেলা বীজ প্রত্যয়ন অফিসারকে অবহিত করতে হবে।
- ১০। বীজ আমদানিকারক ও উৎপাদনকারীর নিম্নবর্ণিত যোগ্যতা/সুযোগ-সুবিধা থাকতে হবেঃ
- ক) হাইব্রিড ধানের বীজ উৎপাদনে কৃষিবিদসহ প্রয়োজনীয় কারিগরি জনবল;
 - খ) নিজস্ব প্রসেসিং সুবিধা অথবা প্রসেসিং সুবিধা ভোগ করার উৎস; এবং Dehumidified সুবিধা আছে এমন গুদামে বীজ সংরক্ষণের ব্যবস্থা;
- ১১। প্রস্তাবিত হাইব্রিড জাত মূল্যায়ন কর্মসূচীতে দেশীয়ভাবে উদ্ভাবিত সেই ফসলের একটি হাইব্রিড (যদি থাকে) এবং কমপক্ষে একটি মুক্তপরাগায়িত (Open-pollinated) জাত স্ট্যান্ডার্ড চেক (Standard check) হিসেবে গ্রহণ করে test design করতে হবে। ধানের জন্য বোরো মৌসুমে দীর্ঘ জীবনকাল সম্পন্ন ≥ 185 দিনের হাইব্রিড জাতের সাথে ব্রিধান ২৯ এবং স্বল্প জীবনকাল সম্পন্ন < 185 দিনের হাইব্রিড জাতের সাথে ব্রিধান ২৮ Standard চেক জাত হিসেবে ব্যবহৃত হবে। আমন মৌসুমে দীর্ঘ জীবনকাল সম্পন্ন ≥ 180 দিনের হাইব্রিড জাতের সাথে বিআর ১০/বিআর ১১/ব্রিধান ৩০/ব্রিধান ৪৯ এবং স্বল্প জীবনকাল সম্পন্ন < 180 দিনের হাইব্রিড জাতের সাথে ব্রিধান ৬৬/ব্রিধান ৭১/বিনাধান ৭ Standard চেক জাত হিসেবে ব্যবহৃত হবে এবং আউশ মৌসুমে হাইব্রিড জাতের সাথে ব্রিধান/৪৮ Standard চেক জাত হিসেবে ব্যবহৃত হবে।
- অন-স্টেশন ও অন-ফার্ম ট্রায়ালের ক্ষেত্রে স্ট্যান্ডার্ড চেক জাত হতে কমপক্ষে ২০% বেশী ফলন হলে হাইব্রিড জাতটি নিবন্ধনের জন্য সুপারিশ করা হবে। কমপক্ষে চারটি অঞ্চলে নিবন্ধনের যোগ্য হলে উক্ত জাতগুলো সারা দেশ ব্যাপী নিবন্ধনের জন্য সুপারিশ করা হবে। তবে তিনটি অঞ্চলে নিবন্ধনের যোগ্য হলে অঞ্চল ভিত্তিক নিবন্ধনের জন্য সুপারিশ করা হবে, এক্ষেত্রে পুনঃট্রায়ালের সুযোগ থাকবে না। সর্বাধিক ছয় বছরের জন্য একটি নিবন্ধিত জাতের বীজ আমদানির অনুমতি দেয়া যেতে পারে। এক্ষেত্রে প্রথম বছরের বীজ আমদানিকে ভিত্তি ধরে পরবর্তী ছয় বছরের মধ্যে কোম্পানি/প্রতিষ্ঠানকে নিজস্ব ব্যবস্থাপনায়/Joint venture programme এর মাধ্যমে বীজ উৎপাদন করতে হবে। ৭ম বছর থেকে প্যারেন্ট লাইনস (parent lines) ব্যতীত কোনক্রমেই বাণিজ্যিক উদ্দেশ্যে নিবন্ধিত হাইব্রিড জাতের বীজ আমদানি করা যাবে না।
- ১২। হাইব্রিড জাত মূল্যায়নে অন-স্টেশন ট্রায়ালের জন্য বাংলাদেশ কৃষি উন্নয়ন কর্পোরেশন ও গবেষণা প্রতিষ্ঠানসমূহের নির্দিষ্ট খামার ব্যবহার করা হবে এবং অন-ফার্ম ট্রায়াল কৃষি সম্প্রসারণ অধিদপ্তরের সহযোগিতায় নিকটবর্তী এলাকার প্রগতিশীল কৃষকের মাঠে পরিচালনা করা হবে।

অন-স্টেশন ও অন-ফার্ম এর ট্রায়াল স্থান নিম্নরূপঃ

অঞ্চল	প্রাতিষ্ঠানিক খামার	কৃষক পর্যায়ে
১	২	৩
(১) ঢাকা অঞ্চল	বাংলাদেশ ধান গবেষণা ইনস্টিটিউট (ব্রি), গাজীপুর/ বাংলাদেশ কৃষি গবেষণা ইনস্টিটিউট (বারি), গাজীপুর।	সংশ্লিষ্ট অন-স্টেশনের নিকটবর্তী কৃষকের মাঠ
(২) ময়মনসিংহ অঞ্চল	বাংলাদেশ পরমাণু কৃষি গবেষণা ইনস্টিটিউট ময়মনসিংহ/ আঞ্চলিক কৃষি গবেষণা কেন্দ্র, বারি, জামালপুর।	সংশ্লিষ্ট অন-স্টেশনের নিকটবর্তী কৃষকের মাঠ
(৩) কুমিল্লা অঞ্চল	আঞ্চলিক কেন্দ্র, ব্রি, কুমিল্লা/ কৃষি গবেষণা উপ-কেন্দ্র, বারি, কুমিল্লা।	সংশ্লিষ্ট অন-স্টেশনের নিকটবর্তী কৃষকের মাঠ
(৪) চট্টগ্রাম অঞ্চল	আঞ্চলিক কেন্দ্র, ব্রি, সোনাগাজী/ বাংলাদেশ কৃষি উন্নয়ন কর্পোরেশন, ফেনী/ আঞ্চলিক কৃষি গবেষণা কেন্দ্র, বারি, হাটহাজারী, চট্টগ্রাম।	সংশ্লিষ্ট অন-স্টেশনের নিকটবর্তী কৃষকের মাঠ
(৫) রাঙ্গামাটি অঞ্চল	কৃষি গবেষণা উপ-কেন্দ্র, বারি, রাইখালী, রাঙ্গামাটি।	সংশ্লিষ্ট অন-স্টেশনের নিকটবর্তী কৃষকের মাঠ
(৬) বরিশাল অঞ্চল	আঞ্চলিক কেন্দ্র, ব্রি, বরিশাল/ আঞ্চলিক কেন্দ্র, বারি, রহমতপুর, বরিশাল/ কৃষি প্রশিক্ষণ ইনস্টিটিউট (ATI), বরিশাল/ লাকুটিয়া ফার্ম, বিএডিসি, বরিশাল।	সংশ্লিষ্ট অন-স্টেশনের নিকটবর্তী কৃষকের মাঠ
(৭) যশোর অঞ্চল	বাংলাদেশ কৃষি উন্নয়ন কর্পোরেশন খামার, দত্তনগর/ আঞ্চলিক কৃষি গবেষণা কেন্দ্র, বারি, যশোর।	সংশ্লিষ্ট অন-স্টেশনের নিকটবর্তী কৃষকের মাঠ
(৮) রাজশাহী অঞ্চল	আঞ্চলিক কেন্দ্র, ব্রি, রাজশাহী/ আঞ্চলিক গম গবেষণা কেন্দ্র, বারি, রাজশাহী।	সংশ্লিষ্ট অন-স্টেশনের নিকটবর্তী কৃষকের মাঠ
(৯) রংপুর অঞ্চল	আঞ্চলিক কেন্দ্র, ব্রি, রংপুর/ কৃষি গবেষণা উপ-কেন্দ্র, বারি, রংপুর/ পাট গবেষণা আঞ্চলিক কেন্দ্র, রংপুর।	সংশ্লিষ্ট অন-স্টেশনের নিকটবর্তী কৃষকের মাঠ
(১০) সিলেট অঞ্চল	আঞ্চলিক কৃষি গবেষণা কেন্দ্র, বারি, আকবরপুর, মৌলভীবাজার/ আঞ্চলিক কেন্দ্র, ব্রি, হবিগঞ্জ/ বীজ উৎপাদন খামার, বিএডিসি, খাদিমনগর, সিলেট।	সংশ্লিষ্ট অন-স্টেশনের নিকটবর্তী কৃষকের মাঠ

১৩। প্রতিটি অন-স্টেশন এ ৫×৬ ($=৩০$) বর্গ মিটার এর তিনটি প্লট ব্যবহার করতে হবে। কৃষক পর্যায়ের পরীক্ষায়ও ৫×৬ ($=৩০$) বর্গ মিটার জমি ব্যবহার করতে হবে। ফলে প্রস্তাবিত জাতের অন-স্টেশন এ মূল্যায়ন হবে ন্যূনতম $৬ \times ৩ = ১৮$ টি এবং সর্বাধিক $১০ \times ৩ = ৩০$ টি এবং অন-ফার্ম এ ন্যূনতম $৬ \times ৩ = ১৮$ টি এবং সর্বাধিক $১০ \times ৩ = ৩০$ টি। এ হিসেবে অন-স্টেশন ও অন-ফার্ম পরীক্ষার জন্য মোট প্লট সংখ্যা স্থাপন করতে হবে ন্যূনতম $১৮ + ১৮ = ৩৬$ টি অথবা সর্বাধিক $৩০ + ৩০ = ৬০$ টি। তাছাড়া স্ট্যান্ডার্ড চেক হিসেবে প্রয়োজনীয় অনুরূপ প্লট সংখ্যা পরীক্ষার জন্য স্থাপন করতে হবে। যেহেতু বিভিন্ন অঞ্চলে প্রস্তাবিত জাত মূল্যায়ন করা হবে, সেহেতু জাতের গড় উৎপাদন ক্ষমতা এবং অন্যান্য বৈশিষ্ট্য কৃষক পর্যায়ে চাষের সময়ের খুব কাছাকাছি হবে। সমস্ত জাতগুলোকে কোড নম্বর দিয়ে বীজ প্রত্যয়ন এজেন্সী সংশ্লিষ্ট স্থানে ট্রায়ালের জন্য বিতরণ করবে। সার, সেচ ও অন্যান্য পরিচর্যা চেক জাতের অনুরূপ হতে হবে।

১৪। হাইব্রিড জাতের মাঠ মূল্যায়নের জন্য বর্তমানে গঠিত কারিগরি কমিটির মাঠ মূল্যায়ন দল কর্তৃক মূল্যায়ন কার্যাদি পরিচালিত হবে। আবেদনকারী সংস্থার একজন উর্ধ্বতন কর্মকর্তাকে আমন্ত্রিত সদস্য হিসেবে অন্তর্ভুক্ত করতে হবে।

- ১৫। হাইব্রিড জাতসমূহ মূল্যায়ন ও মাঠ মূল্যায়নের কার্যাদি উল্লিখিত ছকে (পরিশিষ্ট ‘খ’) তথ্য সংগ্রহ করতে হবে।
- ১৬। প্রতিটি জাতের বৈশিষ্ট্যসমূহ মাঠ মূল্যায়নের সময় মূল্যায়িত হবে। প্রতিটি অন-স্টেশন ও অন-ফার্ম এর জন্য মূল্যায়ন ছকে (পরিশিষ্ট ‘খ’) তথ্য সংগ্রহ করে মূল্যায়ন টিমের মতামতসহ সরাসরি বীজ প্রত্যয়ন এজেন্সী এর নিকট পাঠাতে হবে। উক্ত অন-স্টেশন প্লট ডাটা ও অন-ফার্ম ডাটা দ্বারা পরিচালক, বীজ প্রত্যয়ন এজেন্সী এর দায়িত্বে একটি Computerrized mean performance sheet তৈরী করতে হবে। অনুচ্ছেদ-১১ অনুসারে নির্দিষ্ট জাতের হাইব্রিডের ফলাফল প্রতিবেদন শুধুমাত্র একটি নির্দিষ্ট চেক জাতের সাথে তুলনা করতে হবে।
- ১৭। পরীক্ষা শেষ হওয়ার দুই মাসের মধ্যে বিশ্লেষিত তথ্য ও দলের মতামতসহ প্রতিবেদন বীজ প্রত্যয়ন এজেন্সী, জাতীয় বীজ বোর্ডের কারিগরি কমিটিতে উপস্থাপন করবে। উক্ত প্রতিবেদন বোরো, আউশ ও আমন মৌসুমের জন্য যথাক্রমে ২০ আগস্ট, ২০ নভেম্বর এবং ২০ মার্চের মধ্যে কারিগরি কমিটিতে পেশ করবে।
- ১৮। হাইব্রিড জাত সম্পর্কিত কারিগরি কমিটির সিদ্ধান্তের ভিত্তিতে জাতীয় বীজ বোর্ডের অনুমোদন এবং প্রার্থিত জাত নিবন্ধিত হওয়ার পর প্রস্তাবকারী প্রতিষ্ঠান/ব্যক্তি বাণিজ্যিকভাবে ব্যবহারের জন্য বীজ আমদানি/উৎপাদন করতে পারবে। তবে ঐ বীজ উৎপাদনকারী প্রতিষ্ঠান বা কোম্পানি দ্বারা অথবা রপ্তানিকারক দেশের উপযুক্ত প্রতিষ্ঠান দ্বারা প্রত্যায়িত হতে হবে। এক্ষেত্রে আমদানির পরিবর্তে স্থানীয়ভাবে বীজ উৎপাদনকারীদের বিশেষভাবে উৎসাহিত করা হবে। হাইব্রিড ফসলের বীজ স্বল্প সময়ের মধ্যে দেশে উৎপাদনের লক্ষ্যে বীজ শিল্পে নিয়োজিত ব্যক্তি প্রতিষ্ঠান/আমদানিকারকদের উৎসাহিত করা হবে।
- ১৯। প্রতিটি বীজের প্যাকেটে কোম্পানি/প্রতিষ্ঠানের নাম, ঠিকানা, লট নম্বর বা ব্যাচ নম্বর, জাতের নিবন্ধিত অঞ্চল, বীজের পরিমাণ, জাতের নাম, অঙ্কুরোদগমের হার, বিশুদ্ধতা, উৎপাদন মৌসুম, সর্বোচ্চ মূল্য, ব্যবহারের সর্বোচ্চ সময়সূচী, প্যাকিং এর তারিখ ও উৎপাদিত ফসল থেকে বীজ রাখা যাবে না উল্লেখ থাকতে হবে। বিভিন্ন পরিমাণের ব্যাগে বীজ বাজারজাত করতে হবে যাতে করে বিক্রেতা কর্তৃক ব্যাগ খুলে বীজ বিক্রি করতে না হয়। ‘উৎপাদিত ফসল থেকে বীজ রাখা যাবে না’ কথাটি প্যাকেটের গায়ে উল্লেখসহ “হাইলাইট” করতে হবে।
- ২০। হাইব্রিড ধান বীজ আমদানি বা উৎপাদনের ক্ষেত্রে কোন ক্রমেই ব্যবহারের প্রদত্ত সর্বোচ্চ সময়সূচী শেষ হয়ে যাওয়া বীজ কৃষক পর্যায়ে বিক্রি করা যাবে না।
- ২১। মাঠ মূল্যায়নের পাশাপাশি পরীক্ষাগারে হাইব্রিড জাতের পোকামাকড় ও রোগবালাইয়ের প্রতি আক্রান্ত হওয়ার প্রবণতা নিরূপণ করা হবে। প্রয়োজনে রোগ-বালাই ও পোকামাকড়ের আক্রান্ত হওয়ার প্রবণতা নিরূপণের জন্য বীজ প্রত্যয়ন এজেন্সী প্রয়োজনীয় পরিমাণ বীজ বাংলাদেশ ধান গবেষণা ইনস্টিটিউট (ব্রি)-কে সরবরাহ করবে। ব্রি, হাইব্রিড জাতের রোগবালাই ও পোকামাকড়ের আক্রান্ত হওয়ার প্রবণতা নিরূপণ পূর্বক ফলাফল কারিগরি কমিটির সভায় উপস্থাপন করবে।
- ২২। আবেদনকারী আবেদনপত্রের সাথে প্রস্তাবিত হাইব্রিড ধান জাতের Molecular data (SSR Markers/গ্রহণ যোগ্য Markers এর মাধ্যমে) পরিচালক, বীজ প্রত্যয়ন এজেন্সী এর দপ্তরে সরবরাহ করবে। বীজ প্রত্যয়ন এজেন্সী প্রয়োজনে ব্রি এর সহায়তায় উক্ত Molecular data যাচাই করবে।

রাষ্ট্রপতির আদেশক্রমে
মোঃ ফজলে ওয়াহেদ খোন্দাকার
মহাপরিচালক

পরিশিষ্ট-ক

হাইব্রিড ধানের জাত মূল্যায়ন ও নিবন্ধীকরণ প্রস্তাবের ছক

- ক। প্রস্তাবকারী/প্রতিষ্ঠানের নাম.....
- খ। বীজ ডিলার রেজিস্ট্রেশন নং.....তারিখ.....
- গ। প্রস্তাবি হাইব্রিড জাতের নাম/নং.....
- ঘ। প্রস্তাবিত হাইব্রিড জাত সংক্রান্ত তথ্যাদি :
- ১) ফলন (হেক্টর প্রতি).....
 - ২) রোগ বালাই এর প্রতিক্রিয়া.....
 - ৩) গাছে ফুল আসার জন্য photo period requiremen.....
 - ৪) যে তাপমাত্রায় গাছে ফুল আসে.....
 - ৫) প্রস্তাবিত জাতের জীবনকাল (বীজ থেকে বীজ).....
 - ৬) জাত শনাক্তকারী সুনির্দিষ্ট বৈশিষ্ট্য (একাধিক হতে পারে).....
(প্রযোজ্য ক্ষেত্রে দাবীর সপক্ষে প্রমাণপত্র দাখিল করতে হবে)
 - ৭) অ্যামাইলোজ (Amylose) এর পরিমাণ (%).....
- ঙ। সরবরাহকারী/জাত উদ্ভাবনকারী প্রতিষ্ঠানের নাম ও ঠিকানা.....
- চ। সরবরাহকারী/জাত উদ্ভাবনকারী প্রতিষ্ঠানের সাথে আমদানিকারকের সমঝোতা পত্রের প্রতিলিপি.....
- ছ। কোন মৌসুমের জন্য হাইব্রিড জাতের ধান মূল্যায়নের প্রস্তাব করা হচ্ছে.....
- জ। মোট টেস্ট প্লটসমূহের জন্য বীজ সরবরাহ ও নির্ধারিত অংকের অর্থ প্রদানের অঙ্গীকারনামা (আলাদা সীটে দিতে হবে)
- ঝ। সংশ্লিষ্ট কোম্পানি/প্রতিষ্ঠানের নিজস্ব ট্রায়ালে প্রাপ্ত ফলাফল (এক বছরের) :
- ১) ফলন (হেক্টর প্রতি চাউলে).....
 - ২) পোকামাকড় ও রোগ বালাইয়ের অবস্থা (Status).....
 - ৩) গাছে ফুল আসার জন্য photo period requirements.....
 - ৪) যে তাপমাত্রায় গাছে ফুল আসে.....
 - ৫) প্রস্তাবিত জাতের জীবনকাল (বীজ থেকে বীজ).....
 - ৬) জাত শনাক্তকারী সুনির্দিষ্ট বৈশিষ্ট্য (একাধিক হতে পারে).....
(প্রযোজ্য ক্ষেত্রে দাবীর সপক্ষে প্রমাণপত্র দাখিল করতে হবে)
- এং। প্রস্তাবিত জাতের Phytosanitary Certificate এর নম্বর/বিবরণী এবং কৃষি সম্প্রসারণ অধিদপ্তরের উদ্ভিদ সংগনিরোধ ছাড়পত্র-IP ও RO (প্রযোজ্য ক্ষেত্রে অনুলিপি দিতে হবে)।

প্রস্তাবকারী ব্যক্তি/প্রতিষ্ঠানের দায়িত্বপ্রাপ্ত কর্মকর্তার
স্বাক্ষর ও তারিখ

পরিশিষ্ট-খ

হাইব্রিড ধানের জাত মার্চ মূল্যায়ন ছক

Variety Code No	Sowing Date (Seed Bed)	Transplant Date	50% Heading Date	Maturity Date	Days to Maturity (Seed to seed)	Sterility %	Major Diseases 0-9 Scale	Major Insects 0-9 Scale	Phenotypic acceptability 0-9 Scale	Loding 0-9 Scale	Yield kg/ha (at 14% Moisture)				Recommendation for Registration	Remarks
											R ₁	R ₂	R ₃	Average Yield		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

তথ্য সংগ্রহকারীগণের নাম, পদবী ও স্বাক্ষর

মূল্যায়নের দলের সদস্যবৃন্দের
নাম, পদবী ও স্বাক্ষর

ফল ফোটার তারিখ:

কর্তনের তারিখ

দলনের স্বাক্ষর ও তারিখ
পদবী/প্রতিষ্ঠান

I(a): FORM OF PRE-POST CONTROL AND GROW-OUT TEST FOR RICE

Date of Sowing:
Date of Transplanting:

Class of Seed	Plant population	Allowable other variety Off type	No of Variety :
BS	4000(0.0%)	0	No of Breeder Seed lot:
FS	4000(0.1%)	4	No of Foundation Seed lot:
CS/MM/ Farmer's level samples	400(0.5%)	2	No of CS/MM/Farmer's level samples

I(b): FORM OF PRE- POST CONTROL AND GROW-OUT TEST FOR WHEAT

[illegible]

Date of Sowing:

Date of Transplanting:

Class of Seed

Plant population

Allowable other
variety Off type

No of Variety :

BS

4000(0.0%)

0

No of Breeder Seed lot:

FS

4000(0.1%)

4

No of Foundation Seed lot:

CS/MM/

400(0.5%)

2

No of CS/MM/Farmer's level samples

Farmer's level samples

I(c): FORM OF PRE-POST CONTROL AND GROW-OUT TEST FOR JUTE

[illegible]

Date of Sowing:

Class of Seed

BS

FS
CS/MM

Plant Population	Allowable other Variety/Off types
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
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80	80
81	81
82	82
83	83
84	84
85	85
86	86
87	87
88	88
89	89
90	90
91	91
92	92
93	93
94	94
95	95
96	96
97	97
98	98
99	99
100	100

No. of Variety :	Total-
1	1
2	1
3	1
4	1
5	1
6	1
7	1
8	1
9	1
10	1
11	1
12	1
13	1
14	1
15	1
16	1
17	1
18	1
19	1
20	1
21	1
22	1
23	1
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80	1
81	1
82	1
83	1
84	1
85	1
86	1
87	1
88	1
89	1
90	1
91	1
92	1
93	1
94	1
95	1
96	1
97	1
98	1
99	1
100	1

No of Breeder Seed lot:

No of Foundation Seed lot:

No of Certified Seed lot:

Parenthesis indicates Problematic Seed lots

APPENDIX-II
Seed Standard of Paddy

Factor	Standard		
	Breeder	Foundation	Certified
1. Pure Seed (Min. % by wt.)	99.0	97.0	96.0
2. Inert Matter (Max. % by wt.)	1.0	2.0	3.0
3. Other Seed (Max. % by wt.)	Trace	1.0	1
a) Other crop seed (Max. No. in total : whole sample will be tested)	2/kg	5/kg	10/kg
b) Total weed seed (Max. No. in total : whole sample will be tested)	2/kg	8/kg	10/kg
4. Germination (Min. %)	80.0	80.0	80.0
5. Moisture content (Max. %)	12.0	12.0	12.0

Field Standard of Paddy.

Factor	Standard		
	Breeder	Foundation	Certified
1. Isolation distance (in meter)	3.0	3.0	3.0
2. Other crop plants (Max. % by No.)	0.0	0.1	0.2
3. Other Varieties (Max. % by No.)	0.0	0.1	0.5
4. Weed plants (obnoxious Max. % by No.)	0.0	0.01	0.02
a. Wild rice/Red rice (ঝরা ধান/বন্য ধান)			
b. Burnyard grass (শ্যামা)			
5. Plants infected by seed borne diseases : (Max % by of infected plants)	5.0	10.0	20.0
6. General condition of crop: If the field crops severely damaged or lodged and irregularly flowered that makes crop assessment difficult to judge the trueness of variety and varietal purity, will be rejected.			

N.B. : Obnoxious weeds to be specified by competent authority.

Seed Standard of Wheat

Factor	Standard		
	Breeder	Foundation	Certified
1. Pure Seed (Min. % by wt)	99.0	97.0	96.0
2. Inert Matter (Max. % by wt.)	1.0	2.0	3.0
3. Other Seed (Max. % by wt)	Trace	1.0	1
a) Other crop seed (Max. No. in total: whole sample will be tested)	2/kg	5/kg	10/kg
b) Total weed seed (Max. No. in total : whole sample will be tested)	2/kg	8/kg	10/kg
4. Germination (Min. %)	85.0	80.0	80.0
5. Moisture content (Max. %)	12.0	12.0	12.0

Field Standard of Wheat

Factor	Standard		
	Breeder	Foundation	Certified
1. Isolation distance (in meter)	3.0	3.0	3.0
2. Other crop plants (Max. % by No.)	0.0	0.1	0.2
3. Other Varieties (Max. % by No.)	0.0	0.1	0.5
4. Weed plants (obnoxious Max. % by No.)	0.0	0.03	0.05
a) Lehli (হিটকীরি)			
b) Wild oat (বন্য যাই)			
c) Wild lentil (বন মসুর)			
5. Diseases (infection by seed borne pathogen : Max. No. of infected plants) Loose smut (plants/ha)	0.0	12.0	25.0
6. General condition of crop: If the field crop so stunted, damaged or lodged that makes crop assessment difficult to judge the trueness of variety and varietal purity, will be rejected.			

N.B. : Obnoxious weeds to be specified by competent authority.

Seed Standard of Jute

Factor	Standard		
	Breeder	Foundation	Certified
1. Pure Seed (Min. % by wt.)	99.0	98.0	96.0
2. Inert Matter (Max. % by wt.)	1.0	1.0	3.0
3. Other Seed (Max. % by wt)	Trace	1.0	1.0
a) Other crop seed (Max. No. in total : whole sample will be tested)	0/kg	5/kg	10/kg
b) Total weed seed (Max. No. in total : whole sample will be tested)	0/kg	5/kg	10/kg
4. Germination (Min. %)			
a) Fresh seed (Min. %)	80.0	80.0	80.0
b) Carry over seed (Min. %)	70.0	70.0	70.0
5. Moisture content (Max. %)			
a) <i>C. capsularis</i>	10.0	10.0	10.0
b) <i>C. olitorius</i>	8.0	8.0	8.0

Field Standard of Jute

Factor	Standard		
	Breeder	Foundation	Certified
1. Isolation distance (in meter)			
a) Field of other varieties of the same species	50.0	30.0	20.0
b) Field of other species	5.0	3.0	3.0
2. Other Varieties (Max. % by No.)	0.0	0.1	0.2
3. Plants infected by seed borne diseases (Max. % by No.)	0.0	0.1	0.5
4. Crop condition: If crops so weedy damaged or lodged that makes inspection difficult to judge the trueness of variety and varietal purity, will be rejected			

N.B. : Obnoxious weeds to be specified by competent authority.

Seed Standard of Kenaf and Mesta.

Factor	Standard		
	Breeder	Foundation	Certified
1. Pure Seed (Min. % by wt)	98.0	96.0	95.0
2. Inert Matter (Max. % by wt)	2.0	4.0	5.0
3. Other Seed (Max. % by wt)			
a) Other crop seed (Max. No. in total : whole sample will be tested)	2/kg	5/kg	10/kg
b) Total weed seed (Max. No. in total : whole sample will be tested)	2/kg	5/kg	10/kg
4. Germination (Min. %)	80.0	80.0	80.0
5. Moisture content (Max. %)	10.0	10.0	10.0
6. Moisture content in vapour proof container (Max. %)	8.0	8.0	8.0

Field Standard of Kenaf and Mesta.

Factor	Standard		
	Breeder	Foundation	Certified
1. Isolation distance (in meter)	50.00	50.00	30.00
2. Other crop plants (Max. % by No.)	0.00	0.10	0.50
3. Other Varieties (Max. % by No.)	0.00	0.10	0.50
4. Weed plants (obnoxious Max. %by No).	0.00	0.50	0.80
5. Plants infected by seed borne diseases : (Max % of infected plants)			
6. General condition of crop: if the field crop is severely damaged or lodged and irregularly flowered or otherwise damaged that makes assessment difficult will be rejected.			

N.B. : Obnoxious weeds to be specified by competent authority.

Seed Standard of Potato

Factor	Standard		
	Breeder	Foundation	Certified
1. Potatoes with any kind of damage or secondary growth are not acceptable			
2. Mixture of other varieties (Max. %)	0.2	0.2	0.2
3. Grade of seed potato a) 28 mm- 35 mm diameter b) 36 mm- 45 mm diameter c) 46 mm- 55 mm diameter			
4. Tubers not conforming to specific size of seed shall not exceed more than 5% by number.			
5. The above mentioned grades will not be applicable for tuberlets produced from true potato seed (TPS)			

Field Standard of Potato

Factor	Standard		
	Breeder	Foundation	Certified
1. Isolation distance (in meter) a) From non-seed potato crop b) From other solanaceous crop	30.0 15.0	30.0 15.0	30.0 15.0
2. Other Varieties (Max. % by No.)	0.20	0.20	0.20
3 . Other crops (Max. % by No.)	0.00	0.00	0.00
4. Obnoxious weeds (Max. %)	0.00	0.00	0.00
5. Diseases (infection by seed borne pathogen : Max. % infected plants) a) Late blight (<i>Phytophthora infestans</i>) b) Leaf roll PLRV c) Mosaic (PMV) d) Ring rot	0.00 0.00 0.00 0.00	0.00 0.50 0.10 0.00	0.00 2.00 1.00 0.00

N.B. : Obnoxious weeds to be specified by competent authority.

Field Standard of Sugarcane.

Factor	Standard		
	Breeder	Foundation	Certified
1. Isolation distance (No of guard rows) (Max. % by No.)	2	2	2
2. Other Varieties (Max. % by No.)	0.00	0.00	0.00
3 . Other crops (Max. % by No.)	0.00	0.00	0.00
4. Obnoxious weeds (Max. %)	0.00	0.00	0.00
5. Diseases (infection by seed borne pathogen: Max. % of infected plants)			
a) Red rot (<i>Colletotrichum falcatum</i>)	0.00	0.00	0.00
b) Mosaic (SCMV) (Stool basis)	0.00	1.00	3.00
c) Wilt (<i>Cephalosporium sacchari</i>) (Stool basis)	0.00	0.10	0.50
d) Smut (<i>Ustilago scitaminea</i>) (Stool basis)	0.00	0.10	0.30
e) RSD/GSD (Coryneform Bacteria MLO) (Stool basis)	0.00	0.10	0.50
f) White leat (MLO) (Stool basis)	0.00	0.10	0.50
g) Striga (<i>Striga densiflora</i>)	0.00	0.00	0.00

N.B. : Obnoxious weeds to be specified by competent authority.