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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

SORGHUM *

UPOV Code: SRGHM_BIC; SRGHM_DRU

Sorghum bicolor (L.) Moench;
Sorghum ×drummondii (Steud.) Millsp. & Chase

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

Alternative Names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Sorghum bicolor (L.) Moench, *Sorghum dochna* (Forssk.) Snowden, *Sorghum saccharatum* (L.) Moench, *Sorghum technicum* Batt. & Trab., *Sorghum vulgare* Pers.	Broomcorn, Durra, Feterita, Forage Sorghum, Grain sorghum, Great Millet, Kaffir-corn, Milo, Shallu, Sorghum, Sweet sorghum	Gros mil, Sorgho	Mohrenhirse	Daza, Sorgo, Sorgo forrajero
Sorghum ×drummondii (Steud.) Millsp. & Chase, *Sorghum bicolor* (L.) Moench x *S. sudanense* (Piper) Stapf, *Sorghum bicolor* var. sudanense, *Sorghum saccharatum* (L.) Moench x *S. sudanense* (Piper) Stapf, *Sorghum sudanense* (Piper) Stapf, *Sorghum vulgare* Pers. x *S. sudanense* (Piper) Stapf	Chicken-corn, Shattercane, Sordan, Sorghum x Sudan Grass, Sorghum-sudangrass, Sudan grass	Sorgho menu, Sorgho x Sorgho du Soudan	Mohrenhirse x Sudangras, Sudangrass	Pasto del Sudán, Pasto Sudán, Sorgo x Pasto del Sudán, Sudangrass

The purpose of these guidelines ("Test Guidelines") is to elaborate the principles contained in the General Introduction (document TG/1/3), and its associated TGP documents, into detailed practical guidance for the harmonized examination of distinctness, uniformity and stability (DUS) and, in particular, to identify appropriate characteristics for the examination of DUS and production of harmonized variety descriptions.

ASSOCIATED DOCUMENTS

These Test Guidelines should be read in conjunction with the General Introduction and its associated TGP documents.

* These names were correct at the time of the introduction of these Test Guidelines but may be revised or updated. [Readers are advised to consult the UPOV Code, which can be found on the UPOV Website (www.upov.int), for the latest information.]

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1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Sorghum bicolor* (L.) Moench and *Sorghum ×drummondii* (Steud.) Millsp. & Chase.

2. Material Required

2.1 The competent authorities decide on the quantity and quality of the plant material required for testing the variety and when and where it is to be delivered. Applicants submitting material from a State other than that in which the testing takes place must ensure that all customs formalities and phytosanitary requirements are complied with.

2.2 The material is to be supplied in the form of seed.

2.3 The minimum quantity of plant material, to be supplied by the applicant, should be:

0.2 kg for parental components
1 kg for hybrids and open-pollinated varieties.

The seed should meet the minimum requirements for germination, species and analytical purity, health and moisture content, specified by the competent authority. In cases where the seed is to be stored, the germination capacity should be as high as possible and should, be stated by the applicant.

2.4 The plant material supplied should be visibly healthy, not lacking in vigor, nor affected by any important pest or disease.

2.5 The plant material should not have undergone any treatment which would affect the expression of the characteristics of the variety, unless the competent authorities allow or request such treatment. If it has been treated, full details of the treatment must be given.

3. Method of Examination

3.1 Number of Growing Cycles

The minimum duration of tests should normally be two independent growing cycles.

3.2 Testing Place

Tests are normally conducted at one place. In the case of tests conducted at more than one place, guidance is provided in TGP/9 “Examining Distinctness”.

3.3 Conditions for Conducting the Examination

3.3.1 The tests should be carried out under conditions ensuring satisfactory growth for the expression of the relevant characteristics of the variety and for the conduct of the examination.

3.3.2 The optimum stage of development for the assessment of each characteristic is indicated by a number in the second column of the Table of Characteristics. The stages of development denoted by each number are described in Chapter 8.3.

3.4 Test Design

3.4.1 Each test should be designed to result in a total of at least 40 plants in the case of inbred lines and single hybrids and 60 plants in the case of other hybrids and open-pollinated varieties. Each test should be divided between at least 2 replicates.

3.4.2 The design of the tests should be such that plants or parts of plants may be removed for measurement or counting without prejudice to the observations which must be made up to the end of the growing cycle.

3.5 Additional Tests

Additional tests, for examining relevant characteristics, may be established.

4. Assessment of Distinctness, Uniformity and Stability

4.1 Distinctness

4.1.1 General Recommendations

It is of particular importance for users of these Test Guidelines to consult the General Introduction prior to making decisions regarding distinctness. However, the following points are provided for elaboration or emphasis in these Test Guidelines.

To assess distinctness of hybrids, the parent lines and the formula may be used according to the following recommendations:

(i) description of parent lines according to the Test Guidelines;

(ii) check of the originality of the parent lines in comparison with the variety collection, based on the characteristics in Chapter 7, in order to identify similar parent lines;

(iii) check of the originality of the hybrid formula in relation to the hybrids in the variety collection, taking into account the most similar lines; and

(iv) assessment of the distinctness at the hybrid level for varieties with a similar formula.

Further guidance is provided in documents TGP/9 “Examining Distinctness” and TGP/8 “Trial Design and Techniques Used in the Examination of Distinctness, Uniformity and Stability”.

4.1.2 Consistent Differences

The differences observed between varieties may be so clear that more than one growing cycle is not necessary. In addition, in some circumstances, the influence of the environment is not such that more than a single growing cycle is required to provide assurance that the differences observed between varieties are sufficiently consistent. One means of ensuring that a difference in a characteristic, observed in a growing trial, is sufficiently consistent is to examine the characteristic in at least two independent growing cycles.

4.1.3 Clear Differences

Determining whether a difference between two varieties is clear depends on many factors, and should consider, in particular, the type of expression of the characteristic being examined, i.e. whether it is expressed in a qualitative, quantitative, or pseudo-qualitative manner. Therefore, it is important that users of these Test Guidelines are familiar with the recommendations contained in the General Introduction prior to making decisions regarding distinctness.

4.1.4 Number of Plants / Parts of Plants to be Examined

4.1.4.1 Inbred lines and single hybrids: Unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 10 plants or parts taken from each of 10 plants and any other observations made on all plants in the test, disregarding any off-type plants.

4.1.4.2 Other types of hybrids: Unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 20 plants or parts taken from each of 20 plants and any other observations made on all plants in the test, disregarding any off-type plants.

4.1.4.3 Open-pollinated varieties: Unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 40 plants or parts taken from each of 40 plants and any other observations made on all plants in the test, disregarding any off-type plants.

4.1.5 Method of Observation

The recommended method of observing the characteristic for the purposes of distinctness is indicated by the following key in the second column of the Table of Characteristics (see document TGP/9 “Examining Distinctness”, Section 4 “Observation of characteristics”):

MG: single measurement of a group of plants or parts of plants
MS: measurement of a number of individual plants or parts of plants
VG: visual assessment by a single observation of a group of plants or parts of plants
VS: visual assessment by observation of individual plants or parts of plants

Type of observation: visual (V) or measurement (M)

“Visual” observation (V) is an observation made on the basis of the expert’s judgment. For the purposes of this document, “visual” observation refers to the sensory observations of the experts and, therefore, also includes smell, taste and touch. Visual observation includes observations where the expert uses reference points (e.g. diagrams, example varieties, side-by-side comparison) or non-linear charts (e.g. color charts). Measurement (M) is an objective observation against a calibrated, linear scale e.g. using a ruler, weighing scales, colorimeter, dates, counts, etc.

Type of record: for a group of plants (G) or for single, individual plants (S)

For the purposes of distinctness, observations may be recorded as a single record for a group of plants or parts of plants (G), or may be recorded as records for a number of single, individual plants or parts of plants (S). In most cases, “G” provides a single record per variety and it is not possible or necessary to apply statistical methods in a plant-by-plant analysis for the assessment of distinctness.

In cases where more than one method of observing the characteristic is indicated in the Table of Characteristics (e.g. VG/MG), guidance on selecting an appropriate method is provided in document TGP/9, Section 4.2.

4.2 Uniformity

4.2.1 It is of particular importance for users of these Test Guidelines to consult the General Introduction prior to making decisions regarding uniformity. However, the following points are provided for elaboration or emphasis in these Test Guidelines:

4.2.2 For the assessment of uniformity of inbred lines and single hybrids, a population standard of 3% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 40 plants, 3 off-types are allowed. In addition, the same population standard and acceptance probability should apply to clear cases of out-crossed plants in inbred lines as well as plants obviously resulting from the selfing of a parent line in single-cross hybrids

4.2.3 For three-way cross hybrids, double cross hybrids and open-pollinated varieties, the variability within the variety should not exceed the variability of comparable varieties already known.

4.2.4 The assessment of uniformity for open-pollinated varieties should be according to the recommendations for cross-pollinated varieties in the General introduction.

4.3 Stability

4.3.1 In practice, it is not usual to perform tests of stability that produce results as certain as those of the testing of distinctness and uniformity. However, experience has demonstrated that, for many types of variety, when a variety has been shown to be uniform, it can also be considered to be stable.

4.3.2 Where appropriate, or in cases of doubt, stability of parental lines or open-pollinated varieties may be tested, either by growing a further generation, or by testing a new seed stock to ensure that it exhibits the same characteristics as those shown by the previous material supplied.

4.3.3 Where appropriate, or in cases of doubt, the stability of a hybrid variety may, in addition to an examination of the hybrid variety itself, also be assessed by examination of the uniformity and stability of its parent lines.

5. Grouping of Varieties and Organization of the Growing Trial

5.1 The selection of varieties of common knowledge to be grown in the trial with the candidate varieties and the way in which these varieties are divided into groups to facilitate the assessment of distinctness are aided by the use of grouping characteristics.

5.2 Grouping characteristics are those in which the documented states of expression, even where produced at different locations, can be used, either individually or in combination with other such characteristics: (a) to select varieties of common knowledge that can be excluded from the growing trial used for examination of distinctness; and (b) to organize the growing trial so that similar varieties are grouped together.

5.3 The following have been agreed as useful grouping characteristics:

(a) Plant: time of panicle emergence (characteristic 7)
(b) Stigma: color (characteristic 10)
(c) Flower: self-fertility (characteristic 13)
(d) Plant: length (characteristic 18)
(e) Panicle: density at maturity (characteristic 25)
(f) Panicle: position of broadest part (characteristic 26)
(g) Grain: color (characteristic 29)
(h) Plant: photoperiod sensitivity (characteristic 36)

5.4 Guidance for the use of grouping characteristics, in the process of examining distinctness, is provided through the General Introduction and document TGP/9 “Examining Distinctness”.

6. Introduction to the Table of Characteristics

6.1 Categories of Characteristics

6.1.1 Standard Test Guidelines Characteristics

Standard Test Guidelines characteristics are those which are approved by UPOV for examination of DUS and from which members of the Union can select those suitable for their particular circumstances.

6.1.2 Asterisked Characteristics

Asterisked characteristics (denoted by *) are those included in the Test Guidelines which are important for the international harmonization of variety descriptions and should always be examined for DUS and included in the variety description by all members of the Union, except when the state of expression of a preceding characteristic or regional environmental conditions render this inappropriate.

6.2 States of Expression and Corresponding Notes

6.2.1 States of expression are given for each characteristic to define the characteristic and to harmonize descriptions. Each state of expression is allocated a corresponding numerical note for ease of recording of data and for the production and exchange of the description.

6.2.2 In the case of qualitative and pseudo-qualitative characteristics (see Chapter 6.3), all relevant states of expression are presented in the characteristic. However, in the case of quantitative characteristics with 5 or more states, an abbreviated scale may be used to minimize the size of the Table of Characteristics. For example, in the case of a quantitative characteristic with 9 states, the presentation of states of expression in the Test Guidelines may be abbreviated as follows:

State	Note
small	3
medium	5
large	7

However, it should be noted that all of the following 9 states of expression exist to describe varieties and should be used as appropriate:

State	Note
very small	1
very small to small	2
small	3
small to medium	4
medium	5
medium to large	6
large	7
large to very large	8
very large	9

6.2.3 Further explanation of the presentation of states of expression and notes is provided in document TGP/7 “Development of Test Guidelines”.

6.3 Types of Expression

An explanation of the types of expression of characteristics (qualitative, quantitative and pseudo-qualitative) is provided in the General Introduction.

6.4 Example Varieties

Where appropriate, example varieties are provided to clarify the states of expression of each characteristic.

6.5 Legend

(*) Asterisked characteristic – see Chapter 6.1.2

QL Qualitative characteristic – see Chapter 6.3
QN Quantitative characteristic – see Chapter 6.3
PQ Pseudo-qualitative characteristic – see Chapter 6.3

MG, MS, VG, VS – see Chapter 4.1.5

(a)-(c) See Explanations on the Table of Characteristics in Chapter 8.1
(+) See Explanations on the Table of Characteristics in Chapter 8.2
12-93 See Explanations on the Table of Characteristics in Chapter 8.3 (Decimal Code for the Growth Stages)

7. Table of Characteristics/Tableau des caractères/Merkmalstabelle/Tabla de caracteres

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1.	**12-14 VG**	**Seedling: anthocyanin coloration of coleoptile**	**Plantule : pigmentation anthocyanique du coléoptile**	**Keimpflanze: Anthocyanfärbung der Keimscheide**	**Plántula: pigmentación antociánica del coleóptilo**		
QN		absent or very weak	nulle ou très faible	fehlend oder sehr gering	ausente o muy débil	Aralba, Argence	1
		weak	faible	gering	débil	Aneto, PR85G85	3
		medium	moyenne	mittel	media	Cellu, Dorado E	5
		strong	forte	stark	intensa	Piper	7
		very strong	très forte	sehr stark	muy intensa		9
2. **(+)**	**15 VG**	**Leaf: anthocyanin coloration of blade**	**Feuille : pigmentation anthocyanique du limbe**	**Blatt: Anthocyanfärbung der Spreite**	**Hoja: pigmentación antociánica del limbo**		
QN		absent or very weak	nulle ou très faible	fehlend oder sehr gering	ausente o muy débil	Albita, Double TX	1
		weak	faible	gering	débil	Alpilles, Solarius	3
		medium	moyenne	mittel	media	PR85G85	5
		strong	forte	stark	intensa		7
		very strong	très forte	sehr stark	muy intensa		9
3. **(+)**	**41-49 MS/ MG/ VG**	**Plant: number of tillers**	**Plante : nombre de talles**	**Pflanze: Anzahl Bestockungstriebe**	**Planta: número de macollos**		
QN		absent or very few	nul ou très petit	fehlend oder sehr wenige	nulo o muy bajo	PR83G66, Velox 701	1
		few	petit	wenige	bajo	Gardavan, PR82G10	2
		medium	moyen	mittel	medio	Nutri Honey	3
		many	grand	viele	alto	NS-Dzïn, Zöldike	4
		very many	très grand	sehr viele	muy alto		5
4.	**45-59 VG**	**Leaf: intensity of green color**	**Feuille : intensité de la couleur verte**	**Blatt: Intensität der Grünfärbung**	**Hoja: intensidad del color verde**		
QN	**(a)**	very light	très faible	sehr hell	muy claro		1
		light	faible	hell	claro	Nectar	2
		medium	moyenne	mittel	medio	Grazer, P8500	3
		dark	forte	dunkel	oscuro	GK ZSófia	4
		very dark	très forte	sehr dunkel	muy oscuro		5
5. **(*)**	**45-59 VG**	**Leaf: color of midrib**	**Feuille : couleur de la nervure médiane**	**Blatt: Farbe der Mittelrippe**	**Hoja: color del nervio central**		
PQ	**(a)**	white	blanc	weiß	blanco	Dorado E, Gardavan	1
		yellowish white	blanc jaunâtre	gelblich weiß	blanco amarillento	Beefbuilder, Vidan 697	2
		light green	vert clair	hellgrün	verde claro		3
		light yellow	jaune clair	hellgelb	amarillo claro	PR82G55, PR87G57	4
		medium yellow	jaune moyen	mittelgelb	amarillo medio	P8500	5
		dark yellow	jaune foncé	dunkelgelb	amarillo oscuro	Digestivo	6
		brownish	brunâtre	bräunlich	amarronado	Teide	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
6. **(+)**	**45-59 VG**	**Leaf: area of discoloration of midrib**	**Feuille : surface de décoloration de la nervure médiane**	**Blatt: farbloser Bereich der Mittelrippe**	**Hoja: zona descolorida del nervio central**		
QN	**(a)**	absent or very small	nulle ou très petite	fehlend oder sehr klein	ausente o muy pequeña	Balto	1
		small	petite	klein	pequeña		3
		medium	moyenne	mittel	mediana	Super Sile 20	5
		large	grande	groß	grande	Primsilo	7
		very large	très grande	sehr groß	muy grande		9
7. **(*)** **(+)**	**51 MG/ MS**	**Plant: time of panicle emergence**	**Plante : époque de l'apparition de la panicule**	**Pflanze: Zeitpunkt des Rispenschiebens**	**Planta: época de aparición de las panículas**		
QN		very early	très précoce	sehr früh	muy temprana	Ludan	1
		early	précoce	früh	temprana	Artaban, Artigas	3
		medium	moyenne	mittel	media	Albita, Dorado DR	5
		late	tardive	spät	tardía	Béreny, PR82G55	7
		very late	très tardive	sehr spät	muy tardía		9
8.	**65-69 VG**	**Glume: anthocyanin coloration**	**Glume : pigmentation anthocyanique**	**Hüllspelze: Anthocyanfärbung**	**Gluma: pigmentación antociánica**		
QN	**(b)**	absent or very weak	nulle ou très faible	fehlend oder sehr gering	ausente o muy débil	Dorado E, Grazer	1
		weak	faible	gering	débil	Nicol	3
		medium	moyenne	mittel	media		5
		strong	forte	stark	intensa		7
		very strong	très forte	sehr stark	muy intensa		9
9.	**65-69 VG**	**Stigma: anthocyanin coloration**	**Stigmate : pigmentation anthocyanique**	**Narbe: Anthocyanfärbung**	**Estigma: pigmentación antociánica**		
QN	**(b)**	absent or very weak	nulle ou très faible	fehlend oder sehr gering	ausente o muy débil	Grazer, P8500	1
		weak	faible	gering	débil		3
		medium	moyenne	mittel	media		5
		strong	forte	stark	intensa		7
		very strong	très forte	sehr stark	muy intensa		9
10. **(*)** **(+)**	**65-69 VG**	**Stigma: color**	**Stigmate : couleur**	**Narbe: Farbe**	**Estigma: color**		
PQ	**(b)**	white	blanc	weiß	blanco	P8500	1
		light yellow	jaune clair	hellgelb	amarillo claro	Albita	2
		medium yellow	jaune moyen	mittelgelb	amarillo medio	Argence, Dorado E	3
		dark yellow	jaune foncé	dunkelgelb	amarillo oscuro	Digestivo, Nutri Honey	4
		grey	gris	grau	gris	Nectar, Vidan 697	5

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
11. **(+)**	**65-69 VG**	**Stigma: length**	**Stigmate : longueur**	**Narbe: Länge**	**Estigma: longitud**		
QN	**(b)**	very short	très court	sehr kurz	muy corto		1
		short	court	kurz	corto	Aralba, Velox 701	2
		medium	moyen	mittel	mediano	Dorado E, Nutri Honey	3
		long	long	lang	largo	Arfrio, PR82G55	4
		very long	très long	sehr lang	muy largo		5
12. **(+)**	**65-69 VG**	**Flower with pedicel: length of flower**	**Fleur avec pédicelle : longueur de la fleur**	**Gestielte Blüte: Länge der Blüte**	**Flor con pedicelo: longitud de la flor**		
QN	**(b)**	very short	très courte	sehr kurz	muy corta		1
		short	courte	kurz	corta	Nicol, PR82G55	3
		medium	moyenne	mittel	mediana	Aneto, Gardavan	5
		long	longue	lang	larga	SF2003	7
		very long	très longue	sehr lang	muy larga		9
13. **(*)** **(+)**	**65-69 VG**	**Flower: self-fertility**	**Fleur : autogamie**	**Blüte: Selbstbefruchtung**	**Flor: autofertilidad**		
QN		absent or very low	nulle ou très faible	fehlend oder sehr gering	ausente o muy baja		1
		medium	moyenne	mittel	media		2
		high	élevée	hoch	alta	Aneto, P8500	3
14.	**69 VG**	**Glume: color <u>at end of flowering</u>**	**Glume : couleur <u>à la fin de la floraison</u>**	**Hüllspelze: Farbe <u>zum Blühende</u>**	**Gluma: color <u>al final de la floración</u>**		
PQ	**(b)**	light green	vert clair	hellgrün	verde claro		1
		medium green	vert moyen	mittelgrün	verde medio		2
		yellow green	vert-jaune	gelbgrün	verde amarillento	Grazer, PR82G55	3
		light yellow	jaune clair	hellgelb	amarillo claro	Nutri Honey	4
		medium yellow	jaune moyen	mittelgelb	amarillo medio	Teide	5
15.	**69 VG**	**Panicle: density at <u>end of flowering</u>**	**Panicule : densité <u>à la fin de la floraison</u>**	**Rispe: Dichte <u>zum Blühende</u>**	**Panícula: densidad <u>al final de la floración</u>**		
QN	**(b)**	very sparse	nulle ou très faible	sehr locker	muy rala		1
		sparse	faible	locker	rala	Digestivo, Gardavan	3
		medium	moyenne	mittel	media	Argence, Nutri Honey	5
		dense	forte	dicht	densa	PR82G55, PR85G85	7
		very dense	Très forte	sehr dicht	muy densa	Velox 701	9
16. **(*)** **(+)**	**69-75 VG**	**Lemma: length of arista**	**Glumelle inférieure : longueur de la barbe**	**Deckspelze: Länge der Granne**	**Lema: longitud de la arista**		
QN	**(b)**	absent or very short	nulle ou très courte	fehlend oder sehr kurz	ausente o muy corta	Dorado E, Grazer	1
		short	courte	kurz	corta	Lussi, Nectar	3
		medium	moyenne	mittel	mediana	Digestivo, SF 2003	5
		long	longue	lang	larga	Vidan 697	7
		very long	très longue	sehr lang	muy larga		9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
17. (*)	**69-75 VG**	**Dry anther: color**	**Anthère sèche : couleur**	**Trockene Anthere: Farbe**	**Antera seca: color**		
PQ	**(b)**	light yellow	jaune clair	hellgelb	amarillo claro		1
		greyish pink	rose grisâtre	gräulich rosa	rosa grisáceo		2
		orange	orange	orange	naranja	Dorado DR, Gardavan	3
		orange red	rouge-orangé	orangerot	rojo anaranjado	Elite, PR82G55	4
		red	rouge	rot	rojo		5
		red brown	brun-rouge	rotbraun	marrón rojizo		6
18. (*) (+)	**75-85 MS**	**Plant: length**	**Plante : longueur**	**Pflanze: Länge**	**Planta: altura**		
QN		dwarf	naine	Zwergform	enana		1
		dwarf to extremely short	naine à extrêmement petite	Zwergform bis äußerst kurz	enana a extremadamente baja		2
		extremely short	extrêmement petite	äußerst kurz	extremadamente baja	Sibelus	3
		extremely short to very short	extrêmement petite à très petite	äußerst kurz bis sehr kurz	extremadamente baja a muy baja	Aruski	4
		very short	très petite	sehr kurz	muy baja	PR88Y20	5
		very short to short	très petite à petite	sehr kurz bis kurz	muy baja a baja	Albita	6
		short	petite	kurz	baja	PR84G62	7
		short to medium	petite à moyenne	kurz bis mittel	baja a mediana	PR82G55	8
		medium	moyenne	mittel	mediana	Jumak	9
		medium to tall	moyenne à haute	mittel bis groß	mediana a alta	Topsilo	10
		tall	haute	groß	alta	Zöldike	11
		tall to very tall	haute à très haute	groß bis sehr groß	alta a muy alta	Zöldozön	12
		very tall	très haute	sehr groß	muy alta	Rona 1	13
		very tall to extremely tall	très haute à extrêmement haute	sehr groß bis äußerst groß	muy alta a extremadamente alta	Agnes	14
		extremely tall	extrêmement haute	äußerst groß	extremadamente alta	Gardavan	15
		extremely tall to giant	extrêmement haute à géante	äußerst groß bis riesig	extremadamente alta a gigante		16
		giant	géante	riesig	gigante		17
19.	**69-85 MS**	**Stem: diameter**	**Tige : diamètre**	**Stengel: Durchmesser**	**Tallo: diámetro**		
QN	**(c)**	small	petit	klein	pequeño	SF2003, Vidan 697	3
		medium	moyen	mittel	mediano	Cellu, Double TX, PR88Y20	5
		large	grand	groß	grande	Elite	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
20.	**75-85 VG/ MS**	**Leaf: length of blade**	**Feuille : longueur du limbe**	**Blatt: Länge der Spreite**	**Hoja: longitud del limbo**		
QN	**(a)**	very short	très court	sehr kurz	muy corto		1
		short	court	kurz	corto	Buggy	3
		medium	moyen	mittel	mediano	Choice, Vidan 697	5
		long	long	lang	largo	SF2003	7
		very long	très long	sehr lang	muy largo		9
21.	**75-85 VG/ MS**	**Leaf: width of blade**	**Feuille : largeur du limbe**	**Blatt: Breite der Spreite**	**Hoja: anchura del limbo**		
QN	**(a)**	very narrow	très étroit	sehr schmal	muy estrecho		1
		narrow	étroit	schmal	estrecho	Maya, Vidan 697	3
		medium	moyen	mittel	medio	Aneto	5
		broad	large	breit	ancho	Beefbuilder, P8500	7
		very broad	très large	sehr breit	muy ancho		9
22. (*) (+)	**75-85 VG/ MS**	**Panicle: length**	**Panicule : longueur**	**Rispe: Länge**	**Panícula: longitud**		
QN		very short	très courte	sehr kurz	muy corta		1
		short	courte	kurz	corta	Iggloo, Nectar	3
		medium	moyenne	mittel	mediana	Aneto, Dorado Dr	5
		long	longue	lang	larga	Jimggo	7
		very long	très longue	sehr lang	muy larga		9
23. (+)	**75-85 VG/ MS**	**Panicle: length of neck**	**Panicule : longueur du col**	**Rispe: Länge des Halses**	**Panícula: longitud del cuello**		
QN		absent or very short	nul ou très court	fehlend oder sehr kurz	ausente o muy corto	PR84G62	1
		short	court	kurz	corto	Nectar, Profus	3
		medium	moyen	mittel	mediano	Nicol, SF2003	5
		long	long	lang	largo	Arlys, Vidan 697	7
		very long	très long	sehr lang	muy largo		9
24.	**75-85 VG/ MS**	**Panicle: length of primary lateral branches**	**Panicule : longueur des branches latérales primaires**	**Rispe: Länge der primären Seitenäste**	**Panícula: longitud de las ramificaciones primarias**		
QN	**(b)**	short	courtes	kurz	cortas	Beefbuilder, Nectar	3
		medium	moyennes	mittel	medianas	Grazer, Nicol	5
		long	longues	lang	largas	Gardavan	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
25. (*)	**92-93 VG**	**Panicle: density at maturity**	**Panicule : densité à maturité**	**Rispe: Dichte zur Reife**	**Panícula: densidad en la madurez**		
QN		very sparse	très faible	sehr locker	muy rala	DK18, Gardavan	1
		sparse	faible	locker	rala	Grazer, SF2003	3
		medium	moyenne	mittel	media	Argence	5
		dense	dense	dicht	densa	Nectar, PR85G85	7
		very dense	très dense	sehr dicht	muy densa	Albita, Velox 701	9
26. (*) (+)	**92-93 VG**	**Panicle: position of broadest part**	**Panicule : position de la partie la plus large**	**Rispe: Position der breitesten Stelle**	**Panícula: posición de la parte más ancha**		
QN		very low	très basse	sehr tief	muy baja		1
		low	basse	tief	baja	PR84G62	2
		medium	moyenne	mittel	media	Nutri Honey	3
		high	haute	hoch	alta	Beefbuilder	4
		very high	très haute	sehr hoch	muy alta	Vidan 697	5
27. (*)	**92-93 VG**	**Glume: color at maturity**	**Glume : couleur à maturité**	**Hüllspelze: Farbe zur Reife**	**Gluma: color en la madurez**		
PQ		white	blanc	weiß	blanco		1
		light yellow	jaune clair	hellgelb	amarillo claro	PR88Y20	2
		medium yellow	jaune moyen	mittelgelb	amarillo medio	Dorado E, Nectar	3
		light brown	brun clair	hellbraun	marrón claro	Grazer	4
		reddish brown	brun rougeâtre	rötlich braun	marrón rojizo	Argence, P8500	5
		dark brown	brun foncé	dunkelbraun	marrón oscuro	PR82G55, Velox 701	6
		black	noir	schwarz	negro	Digestivo, Vidan 697	7
28. (+)	**92-93 VG**	**Glume: length**	**Glume : longueur**	**Hüllspelze: Länge**	**Gluma: longitud**		
QN		very short	très courte	sehr kurz	muy corta		1
		short	courte	kurz	corta	PR83G66, PR87G57	3
		medium	moyenne	mittel	mediana	Aralba, PR85G85	5
		long	longue	lang	larga	Digestivo, Nutri Honey	7
		very long	très longue	sehr lang	muy larga		9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
29. (*) (+)	**92-93 VG**	**Grain: color**	**Graine : couleur**	**Korn: Farbe**	**Grano: color**		
PQ		white	blanc	weiß	blanco	Choice	1
		yellowish white	blanc jaunâtre	gelblich weiß	blanco amarillento	Aralba, PR88Y20	2
		grey white	blanc-gris	grauweiß	blanco grisáceo	Albita	3
		light yellow	jaune clair	hellgelb	amarillo claro	Beefbuilder, Gardavan	4
		orange	orange	orange	naranja	Argence, PR85G85	5
		orange red	rouge-orangé	orangerot	rojo anaranjado	PR82G55, PR83G66	6
		light brown	brun clair	hellbraun	marrón claro	Velox 701	7
		red brown	brun-rouge	rotbraun	marrón rojizo	Nutri Honey, PR82G10	8
		dark brown	brun foncé	dunkelbraun	marrón oscuro	Nicol, Vidan 697	9
		purple	violet	purpurn	púrpura		10
		black	noir	schwarz	negro		11
30.	**92-93 MG**	**Weight of 1000 grains**	**Poids pour 1000 graines**	**Tausendkorngewicht**	**Peso de 1000 granos**		
QN		very low	très faible	sehr gering	muy pequeño	Velox 701	1
		low	faible	gering	pequeño	Nicol, PR87G57	3
		medium	moyen	mittel	medio	Nutri Honey	5
		high	élevé	groß	grande	Aralba, PR88Y20	7
		very high	très élevé	sehr groß	muy grande		9
31. (+)	**92-93 VG**	**Grain: shape in dorsal view**	**Graine : forme en vue dorsale**	**Korn: Form in Rückenansicht**	**Grano: forma en vista dorsal**		
PQ		narrow elliptic	elliptique étroit	schmal elliptisch	elíptico estrecho	Aneto, Vidan 697	1
		broad elliptic	elliptique large	breit elliptisch	elíptico ancho	Nectar, Nutri Honey	2
		ovate	ovale	eiförmig	oval	Bechna	3
		circular	circulaire	rund	circular		4
32. (+)	**92-93 VG**	**Grain: size of mark of germ**	**Graine : taille de l'empreinte du germe**	**Korn: Größe des Keimbereichs**	**Grano: tamaño de la marca del germen**		
QN		very small	très petite	sehr klein	muy pequeña		1
		small	petite	klein	pequeña	Digestivo, Grazer	3
		medium	moyenne	mittel	mediana	PR84G62, PR83G66	5
		large	grande	groß	grande	Dorado E, PR85G85	7
		very large	très grande	sehr groß	muy grande		9
33. (+)	**92-93 MG**	**Grain: content of tannin**	**Graine : teneur en tanins**	**Korn: Tanningehalt**	**Grano: contenido de taninos**		
QN		absent or very low	nulle ou très faible	fehlend oder sehr niedrig	nulo o muy bajo	Albita	1
		medium	moyenne	mittel	medio	PR82G55	2
		very high	très élevée	sehr hoch	muy alto	Gardavan, Nectar	3

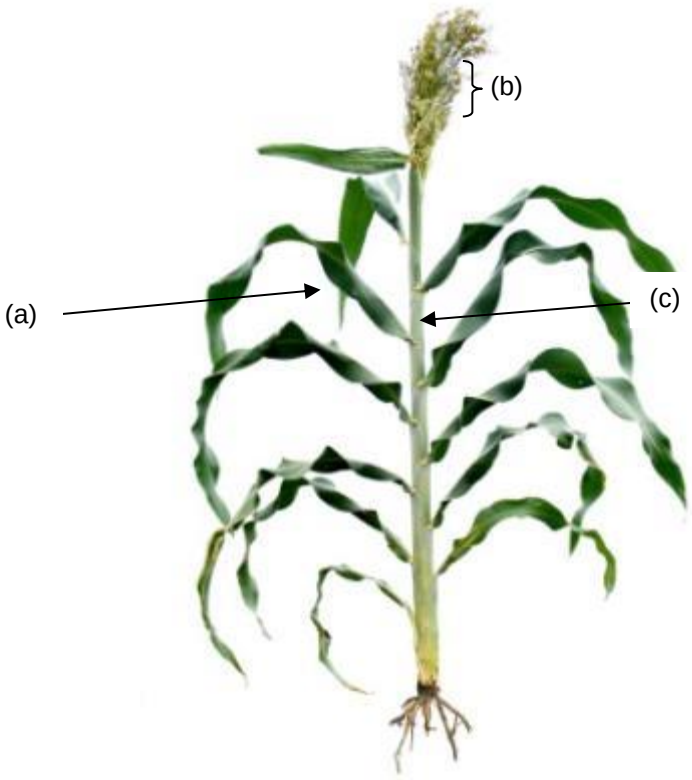
		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
34. (*) (+)	**92-93 VG**	**Grain: type of endosperm**	**Graine : type d'endosperme**	**Korn: Endospermtyp**	**Grano: tipo de endospermo**		
QN		fully vitreous	entièrement vitreux	vollglasig	vítreo en su totalidad		1
		¾ vitreous	au ¾ vitreux	¾ glasig	vítreo en sus ¾ partes	Nicol, SF2003	2
		half vitreous	à moitié vitreux	halbglasig	la mitad vítreo	Albita, Nectar	3
		¾ farinaceous	au ¾ farineux	¾ mehlig	farináceo en sus ¾ partes	Beefbuilder, PR85G85	4
		fully farinaceous	entièrement farineux	vollmehlig	farináceo en su totalidad	PR83G66, PR82G10	5
35. (*)	**92-93 VG**	**Grain: color of vitreous endosperm**	**Graine : couleur de l'endosperme vitreux**	**Korn: Farbe des glasigen Endosperms**	**Grano: color de la porción vítrea del endospermo**		
PQ		white	blanc	weiß	blanco	Sanggat, Sweet Virginia	1
		yellow	jaune	gelb	amarillo	Dorado E, PR88Y20	2
		orange	orange	orange	naranja	P8500, PR83G66	3
		violet	violet	violett	violeta	Nectar, Nicol	4
36. (*) (+)	**MG/ MS**	**Plant: photoperiod sensitivity**	**Plante : sensibilité photopériodique**	**Pflanze: Abhängigkeit von der Tageslänge**	**Planta: sensibilidad al fotoperíodo**		
QL		insensitive	insensible	unabhängig	insensible	Albita	1
		sensitive	sensible	abhängig	sensible	Teide	9

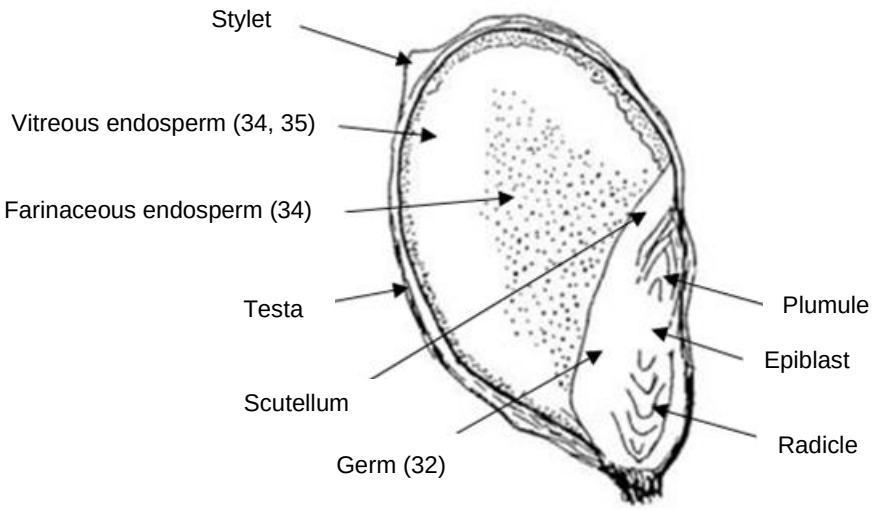
8. Explanations on the Table of Characteristics

8.1 Explanations covering several characteristics

Characteristics containing the following key in the second column of the Table of Characteristics should be examined as indicated below:

(a) Observations should be made on the third leaf from the top of the plant excluding flag leaf.
(b) Observations should be made in the middle third of the main panicle.
(c) Observations should be made just above the third leaf from the top of the plant excluding flag leaf.





8.2 Explanations for individual characteristics

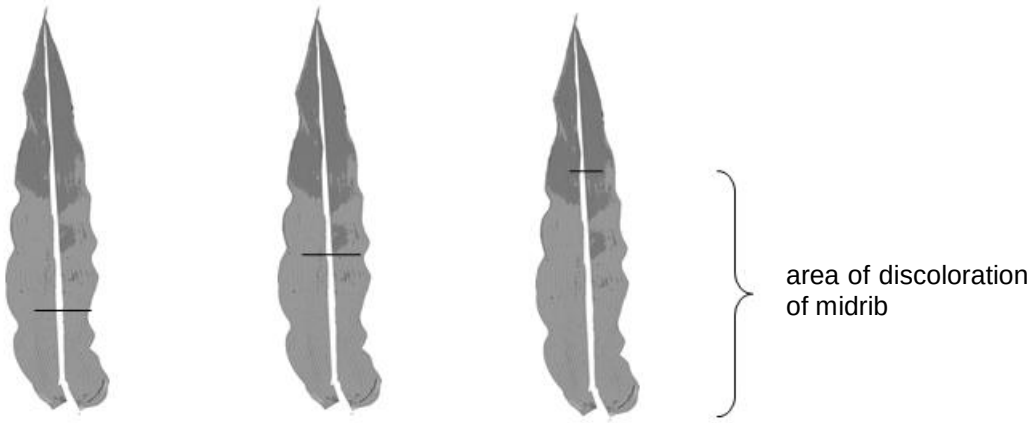
Ad. 2: Leaf: anthocyanin coloration of blade

The observation should be made on the third leaf from the bottom.

Ad. 3: Plant: number of tillers

The minimum height necessary to be counted as tiller should be one third of the height of the plant.

Ad. 6: Leaf: area of discoloration of midrib



3
small

5
medium

7
large

Ad. 7: Plant: time of panicle emergence

The time of panicle emergence is when the tip of the panicle has emerged from flag leaf sheath on 50% of the plants.

Ad. 10: Stigma: color

Impossibility to observe in case of strong anthocyanin coloration.

Ad. 11: Stigma: length

1
very short

2
short

3
medium

4
long

5
very long

Ad. 12: Flower with pedicel: length of flower

1	3	5	7	9
very short	short	medium	long	very long

Ad. 13: Flower: self-fertility

To be observed on 10 plants.

The heads are bagged with selfing bags before flowering. After maturity the bag is removed from each head, the estimated seed set in percentage of total number of florets is recorded.

Panicle: self-fertility
1 absent or very low: 0% - 10%
2 medium: 11% - 70%
3 high: 71% - 100%

Ad. 16: Lemma: length of arista

1	3	5	7	9
absent or very short	short	medium	long	very long

Ad. 18: Plant: length

Plant length should be observed from ground level to the top of the panicle.

Ad. 22: Panicle: length
Ad. 23: Panicle: length of neck

The neck is between flag leaf and first ramification of the panicle. The assessment of panicle length should be made without the neck.

Ad. 26: Panicle: position of broadest part

1	2	3	4	5
very low	low	medium	high	very high

Ad. 28: Glume: length

1	3	5	7	9
very short (about 1/4 of grain covered)	short (about 1/2 of grain covered)	medium (about 3/4 of grain covered)	long (as long as grain)	very long

Ad. 29: Grain: color

The color of the grain should be observed after threshing.

Ad. 31: Grain: shape in dorsal view

1	2	3	4
narrow elliptic	broad elliptic	ovate	circular

Ad. 32: Grain: size of mark of germ

1	3	5	7	9
very small	small	medium	large	very large

Ad. 33: Grain: content of tannin

METHOD DETECTION OF TANNIN IN SORGHUM GRAIN BY THE BLEACH TEST (see reference in Chapter 9)

1. Scope

Applicable to whole grain sorghum

2. Definitions

Certain varieties of sorghum contain proanthocyanidins (commonly referred to as tannins or more strictly-speaking condensed tannins) in the seed coat layer beneath the pericarp (commonly referred to as the testa layer) of the grain. These varieties are variously referred to as: tannin, high-tannin, brown, bird-proof, bird-resistant, or bitter sorghums.

Varieties of sorghum not containing tannins are various referred to as: non-tannin, lowtannin, condensed tannin-free, or sweet sorghums.

In this Test Guidelines the term “tannin sorghum” shall be used for those sorghums containing tannins and the term “non-tannin sorghum” used for those sorghums not containing tannins.

3. Principle

Sorghum grain is immersed in a sodium hypochlorite solution (bleach) containing alkali. The solution dissolves away the outer pericarp layer of sorghum grain, revealing the presence of a black pigmented testa layer in the case of tannin sorghums, or its absence in the case of non-tannin sorghums.

4. Reagent

4.1 Bleaching reagent
Five g sodium hydroxide is dissolved in 100 ml of 3.5% sodium hypochlorite solution (commercial bleach). Reagent can be stored at room temperature in light-proof bottle for up to one month.

4.2 Sorghum standards
An appropriate tannin and non-tannin standard.

5. Apparatus

Glass beakers (50 ml)
Tea strainer
Aluminum foil
Paper towel

6. Procedure

6.1 Test must be performed in duplicate.

6.2 Known tannin sorghum and non-tannin sorghum standards must be included each time the test is performed.

6.3 One hundred whole, sound sorghum grains are placed in a beaker.

6.4 Bleaching reagent is added to **just** cover the sorghum grains and close beaker with aluminum foil. Too much bleaching reagent will cause over bleaching and give false negative results. If in doubt repeat using less reagent.

6.5 Incubate beaker at room temperature (20-30°C) for 20 minutes, swirling contents of beaker every 5 minutes.

6.6 Empty contents of beaker into tea strainer, discarding bleaching reagent. Rinse sorghum grains in tea strainer with tap water.

6.7 Empty contents of tea strainer onto sheet of paper towel. Spread grains out into a single layer and gentle blot them dry with another piece of paper towel.

6.8 Count tannin sorghum grains. Tannin sorghum grains are those grains that are **black over the entire surface of the grain**, unless the germ is somewhat lighter in colour. Non-tannin sorghum grains are those which are either completely white, **or** are brown over **part** of the surface of the grain.

7. Presentation of results

7.1 Calculate tannin sorghum grains as percentage of total sorghum grains. Duplicate determinations should not differ by more than +/- 5 grains, for example first determination 90%, second determination 85%, or 95%. The mean of the duplicate determinations should be calculated.

7.2 Expression of results
Results should be expressed as:
Percentage tannin sorghum, e.g. 90% tannin sorghum

1
absent or very low

2
medium

3
very high

States of expression:
Number of grains to be observed: 100 grains
1 absent or very low: ≤5% tannin
2 medium: >5% - <95% tannin
3 very high: ≥95% tannin

Ad. 34: Grain: type of endosperm

The observation should be made on the longitudinal section.

1	2	3	4	5
fully vitreous	¾ vitreous	half vitreous	¾ farinaceous	fully farinaceous

Ad. 36: Plant: photoperiod sensitivity

Photoperiod insensitive varieties are not dependent on the length of daylight for floral development.

Photoperiod sensitive varieties will not initiate floral development until the photoperiod is less than approximately 12 hours.

8.3 Decimal Code for the Growth Stages of Cereals

This decimal code is in close conformity with the BBCH-code (Witzenberger et al., 1989; Lancashire et al., 1991)

CODE	GENERAL DESCRIPTION
	GERMINATION
00	Dry seed
01	Beginning of seed imbibition
02	
03	Seed imbibition complete
04	
05	Radicle emerged from caryopsis
06	Radicle elongated, root hairs and /or side roots visible
07	Coleoptile emerged from caryopsis
08	
09	Emergence: coleoptile penetrates soil surface (cracking stage)
	LEAF DEVELOPMENT
10	First leaf through coleoptile
11	First leaf unfolded
12	2 leaves unfolded
13	3 leaves unfolded
14	4 leaves unfolded
15	5 leaves unfolded
16	6 leaves unfolded
17	7 leaves unfolded
18	8 leaves unfolded
19	9 or more leaves unfolded
	TILLERING
20	No tillers
21	Beginning of tillering: first tiller detectable
22	2 tillers detectable
23	3 tillers detectable
24	4 tillers detectable
25	5 tillers detectable
26	6 tillers detectable
27	7 tillers detectable
28	8 tillers detectable
29	End of tillering. Maximum no. of tillers detectable.
	STEM ELONGATION
30	Pseudo stem erection
31	1st node detectable
32	2nd node detectable
33	3rd node detectable
34	4th node detectable
35	
36	
37	Flag leaf just visible, still rolled
38	
39	Flag leaf stage: flag leaf fully unrolled, ligule just visible
	BOOTING
40	
41	Early boot stage: flag leaf sheath extending
42	
43	Mid boot stage: flag sheath just visibly swollen
44	
45	Late boot stage: flag leaf sheath swollen
46	
47	Flag leaf sheath opening
48	
49	First awns visible (in awned forms only)

INFLORESCENCE EMERGENCE, HEADING

Beginning of heading: tip of inflorescence emerged from sheath, first spikelet just visible
20% of inflorescence emerged
30% of inflorescence emerged
40% of inflorescence emerged
50% of inflorescence emerged
60% of inflorescence emerged
70% of inflorescence emerged
80% of inflorescence emerged
End of heading: inflorescence fully emerged

FLOWERING, ANTHESIS

Beginning of flowering: first anthers visible

Full flowering: 50% of anthers mature

End of flowering: all spikelets have completed flowering but some dehydrated anthers may remain.

DEVELOPMENT OF FRUIT

Watery ripe: first grains have reached half their final size

Early milk

Medium milk: grain content milky, grains reached final size, still green

Late milk

RIPENING

Early dough

Soft dough: grain content soft but dry. Fingernail impression not held.

Hard dough: grain content solid. Fingernail impression held

Fully ripe: grain hard, difficult to divide with thumbnail

SENESCENCE

Over-ripe: grain very hard cannot be dented by thumbnail
Grains loosening in day-time

Plant dead and collapsing

Harvested product

9. Literature

All India coordinated Sorghum Improvement Project, MPVK, Rahuri-413722 District, Ahmednagar, Maharashtra, India. atul_sorghum@rediffmail.com

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10. Technical Questionnaire

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

	Application date: (not to be filled in by the applicant)

TECHNICAL QUESTIONNAIRE
to be completed in connection with an application for plant breeders' rights

1. Subject of the Technical Questionnaire

1.1.1 Botanical name	*Sorghum bicolor* (L.) Moench
1.1.2 Common name	Broomcorn, Durra, Feterita, Forage Sorghum, Grain sorghum, Great Millet, Kaffir-corn, Milo, Shallu, Sorghum, Sweet sorghum
1.2.1 Botanical name	*Sorghum* ×*drummondii* (Steud.) Millsp. & Chase
1.2.2 Common name	Chicken-corn, Shattercane, Sordan, Sorghum x Sudan Grass, Sorghum-sudangrass, Sudan grass

2. Applicant

Name	
Address	
Telephone No.	
Fax No.	
E-mail address	
Breeder (if different from applicant)	

3. Proposed denomination and breeder's reference

Proposed denomination (if available)	
Breeder's reference	

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

[#]4. Information on the breeding scheme and propagation of the variety

4.1 Breeding scheme

(i)	Inbred line	[ ]
(ii)	Single-cross hybrid	[ ]
(iii)	Three-way cross hybrid	[ ]
(iv)	Double-cross hybrid	[ ]
(v)	Open-pollinated variety	[ ]
(vi)	Other (provide details)	[ ]

Variety resulting from:

4.1.1 Crossing

(a) controlled cross [ ]
(please state parent varieties)

(……..……..…) x (……..……..…)
female parent male parent

(b) partially known cross [ ]
(please state known parent variety(ies))

(……..……..…) x (……..……..…)
female parent male parent

(c) unknown cross [ ]

4.1.2 Mutation [ ]
(please state parent variety)

4.1.3 Discovery and development [ ]
(please state where and when discovered and how developed)

4.1.4 Other [ ]
(please provide details)

[#] Authorities may allow certain of this information to be provided in a confidential section of the Technical Questionnaire.

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

4.2 Method of propagating the variety

4.2.1 In the case of hybrid varieties the production scheme for the hybrid should be provided on a separate sheet. This should provide details of all the parent lines required for propagating the hybrid e.g.

(a) Single Hybrid

(……..……..) x (……..……..)
female parent male parent

(b) Three-Way Hybrid

single hybrid (below) used as female parent x (….....)
male parent line

or (…….....) x single hybrid (below) used as male parent
female parent line

(….....) x (….....…)
female parent line male parent line
single hybrid

(c) Double Hybrid

(….....…) x (….....…)
female parent line male parent line
single hybrid used as female parent

(….....) x (….....)
female parent line male parent line
single hybrid used as male parent

(single hybrid used as female parent) x (single hybrid used as male parent)

and should identify in particular:

(i) any male sterile female parent lines

……

(ii) maintenance system of male sterile female parent lines

……

4.2.2 Open–pollinated variety (please provide details)

4.2.3 Other (please provide details)

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

5. Characteristics of the variety to be indicated (the number in brackets refers to the corresponding characteristic in Test Guidelines; please mark the note which best corresponds).

	Characteristics	Example Varieties	Note
5.1 (5)	**Leaf: color of midrib**		
	white	Dorado E, Gardavan	1 [ ]
	yellowish white	Befbuilder, Vidan 697	2 [ ]
	light green		3 [ ]
	light yellow	PR82G55, PR87G57	4 [ ]
	medium yellow	P8500	5 [ ]
	dark yellow	Digestivo	6 [ ]
	brownish	Teide	7 [ ]
5.2 (7)	**Plant: time of panicle emergence**		
	very early	Ludan	1 [ ]
	very early to early		2 [ ]
	early	Artaban, Artigas	3 [ ]
	early to medium		4 [ ]
	medium	Albita, Dorado DR	5 [ ]
	medium to late		6 [ ]
	late	Béreny, PR82G55	7 [ ]
	late to very late		8 [ ]
	very late		9 [ ]
5.3 (10)	**Stigma: color**		
	white	P8500	1 [ ]
	light yellow	Albita	2 [ ]
	medium yellow	Argence, Dorado E	3 [ ]
	dark yellow	Digestivo, Nutri Honey	4 [ ]
	grey	Nectar, Vidan 697	5 [ ]
5.4 (13)	**Flower: self-fertility**		
	absent or very low		1 [ ]
	medium		2 [ ]
	high	Aneto, P8500	3 [ ]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

	Characteristics	Example Varieties	Note
5.5 (16)	**Lemma: length of arista**		
	absent or very short	Dorado E, Grazer	1 [ ]
	very short to short		2 [ ]
	short	Lussi, Nectar	3 [ ]
	short to medium		4 [ ]
	medium	Digestivo, SF 2003	5 [ ]
	medium to long		6 [ ]
	long	Vidan 697	7 [ ]
	long to very long		8 [ ]
	very long		9 [ ]
5.6 (17)	**Dry anther: color**		
	light yellow		1 [ ]
	greyish pink		2 [ ]
	orange	Dorado DR, Gardavan	3 [ ]
	orange red	Elite, PR82G55	4 [ ]
	red		5 [ ]
	red brown		6 [ ]
5.7 (18)	**Plant: length**		
	dwarf		1 [ ]
	dwarf to extremely short		2 [ ]
	extremely short	Sibelus	3 [ ]
	extremely short to very short	Aruski	4 [ ]
	very short	PR88Y20	5 [ ]
	very short to short	Albita	6 [ ]
	short	PR84G62	7 [ ]
	short to medium	PR82G55	8 [ ]
	medium	Jumak	9[ ]
	medium to tall	Topsilo	10[ ]
	tall	Zöldike	11[ ]
	tall to very tall	Zöldozön	12[ ]
	very tall	Rona 1	13[ ]
	very tall to extremely tall	Agnes	14[ ]
	extremely tall	Gardavan	15[ ]
	extremely tall to giant		16[ ]
	giant		17[ ]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

	Characteristics	Example Varieties	Note
5.8 (25)	**Panicle: density <u>at maturity</u>**		
	very sparse	DK18, Gardavan	1 [ ]
	very sparse to sparse		2 [ ]
	sparse	Grazer, SF2003	3 [ ]
	sparse to medium		4 [ ]
	medium	Argence	5 [ ]
	medium to dense		6 [ ]
	dense	Nectar, PR85G85	7 [ ]
	dense to very dense		8 [ ]
	very dense	Albita, Velox 701	9 [ ]
5.9 (26)	**Panicle: position of broadest part**		
	very low		1 [ ]
	low	PR84G62	2 [ ]
	medium	Nutri Honey	3 [ ]
	high	Beefbuilder	4 [ ]
	very high	Vidan 697	5 [ ]
5.10 (27)	**Glume: color <u>at maturity</u>**		
	white		1 [ ]
	light yellow	PR88Y20	2 [ ]
	medium yellow	Dorado E, Nectar	3 [ ]
	light brown	Grazer	4 [ ]
	reddish brown	Argence, P8500	5 [ ]
	dark brown	PR82G55, Velox 701	6 [ ]
	black	Digestivo, Vidan 697	7 [ ]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

	Characteristics	Example Varieties	Note
5.11 (29)	**Grain: color**		
	white	Choice	1 [ ]
	yellowish white	Aralba, PR88Y20	2 [ ]
	grey white	Albita	3 [ ]
	light yellow	Beefbuilder, Gardavan	4 [ ]
	orange	Argence, PR85G85	5 [ ]
	orange red	PR82G55, PR83G66	6 [ ]
	light brown	Velox 701	7 [ ]
	red brown	Nutri Honey, PR82G10	8 [ ]
	dark brown	Nicol, Vidan 697	9 [ ]
	purple		10 [ ]
	black		11[ ]
5.12 (36)	**Plant: photoperiod sensitivity**		
	insensitive	Albita	1 [ ]
	sensitive	Teide	9 [ ]

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6. Similar varieties and differences from these varieties

Please use the following table and box for comments to provide information on how your candidate variety differs from the variety (or varieties) which, to the best of your knowledge, is (or are) most similar. This information may help the examination authority to conduct its examination of distinctness in a more efficient way.

Denomination(s) of variety(ies) similar to your candidate variety	Characteristic(s) in which your candidate variety differs from the similar variety(ies)	Describe the expression of the characteristic(s) for the **similar** variety(ies)	Describe the expression of the characteristic(s) for **your** candidate variety
Example	*Plant: time of panicle emergence*	*early*	*early to medium*

Comments:

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

[#]7. Additional information which may help in the examination of the variety

7.1 In addition to the information provided in sections 5 and 6, are there any additional characteristics which may help to distinguish the variety?

Yes [ ] No [ ]

(If yes, please provide details)

7.2 Are there any special conditions for growing the variety or conducting the examination?

Yes [ ] No [ ]

(If yes, please provide details)

7.3 Other information

8. Authorization for release

(a) Does the variety require prior authorization for release under legislation concerning the protection of the environment, human and animal health?

Yes [ ] No [ ]

(b) Has such authorization been obtained?

Yes [ ] No [ ]

If the answer to (b) is yes, please attach a copy of the authorization.

[#] Authorities may allow certain of this information to be provided in a confidential section of the Technical Questionnaire.

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

9. Information on plant material to be examined or submitted for examination.

9.1 The expression of a characteristic or several characteristics of a variety may be affected by factors, such as pests and disease, chemical treatment (e.g. growth retardants or pesticides), effects of tissue culture, different rootstocks, scions taken from different growth phases of a tree, etc.

9.2 The plant material should not have undergone any treatment which would affect the expression of the characteristics of the variety, unless the competent authorities allow or request such treatment. If the plant material has undergone such treatment, full details of the treatment must be given. In this respect, please indicate below, to the best of your knowledge, if the plant material to be examined has been subjected to:

(a)	Microorganisms (e.g. virus, bacteria, phytoplasma)	Yes [ ]	No [ ]
(b)	Chemical treatment (e.g. growth retardant, pesticide)	Yes [ ]	No [ ]
(c)	Tissue culture	Yes [ ]	No [ ]
(d)	Other factors	Yes [ ]	No [ ]

Please provide details for where you have indicated “yes”.

……

10. I hereby declare that, to the best of my knowledge, the information provided in this form is correct:

Applicant’s name

Signature Date

[End of document]