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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

DRAFT

FOXTAIL MILLET

UPOV Code: SETAR_ITA

Setaria italica (L.) Beauv.

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

*prepared by an expert from China**to be considered by the**Technical Working Party for Agricultural Crops
at its forty-first session, to be held in Angers, France, from May 21 to 25, 2012*Alternative Names:^{*}

<i>Botanical name</i>	<i>English</i>	<i>French</i>	<i>German</i>	<i>Spanish</i>
<i>Setaria italica</i> L., <i>Setaria italica</i> (L.) Beauv.	Foxtail Millet, Italian Millet, Hungary Millet	Millet d'Italie, Millet des oiseaux, Setaire d'Italie	Italienhirse, Kolbenhirse	Dana, Mijo de cola de zorro, Moha de Hungria

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 of *Setaria italica* (L.) Beauv..

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 and, if required by the competent authority, panicles with a sufficient number of viable seeds to establish a satisfactory row of plants for observation.

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

100 g and 50 panicles (if required by the competent authorities).

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 1,000 plants, which should be divided between at least two replicates.

3.4.2 Single panicle-rows: if tests on panicle-rows are conducted, at least 50 panicle-rows should be observed. Each panicle row should be sown with at least 200 seeds.

3.4.3 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.

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

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.

4.1.5 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 Row Plots: for the assessment of uniformity in a sample of 1,000 plants, a population standard of 1% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 1,000 plants 15 off-types are allowed.

4.2.3 Single panicle-rows: for the assessment of uniformity of panicle-rows, a population standard of 1% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 50 panicle rows, 2 off-type panicle rows are allowed. A panicle row is considered to be an off-type panicle row if there is more than one off-type plant within that panicle row.

4.2.4 The recommended sample size for the assessment of uniformity is indicated by the following key in the table of characteristics:

- (A) sample size of 1,000 plants
- (B) sample size of 50 panicle-rows

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 may be further examined by testing a new seed stock to ensure that it exhibits the same characteristics as those shown by the initial material supplied.

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) Seedling: anthocyanin coloration of basal leaf sheath (characteristic 2)
- (b) Time of heading (characteristic 6)
- (c) Stem: length (characteristic 15)
- (d) Grain: color (characteristic 27)
- (e) Endosperm: type (characteristic 29)

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*

- (*) Asterisk 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) See Explanations on the Table of Characteristics in Chapter 8.1
- (+) See Explanations on the Table of Characteristics in Chapter 8.2
- 11-92 See Explanations on the Table of Characteristics in Chapter 8.3

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

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
1. (+)	VG 11	First leaf: shape of tip	Première feuille : forme du sommet	Erstes Blatt: Form der Spitze	Primera hoja: forma del ápice	
PQ	pointed	pointue	spitz	puntiaguda	Lianggu	1
	pointed to rounded	pointue à arrondie	spitz bis abgerundet	puntiaguda a redondeada	Ribenchixu	2
	rounded	arrondie	abgerundet	redondeada	Yugu 8	3
2. (*) (+)	VG 15	Seedling: anthocyanin coloration of basal leaf sheath	Plantule : pigmentation anthocyanique de la gaine de la feuille basale	Sämling: Anthocyanfärbung der basalen Blattscheide	Plántula: pigmentación antocianica de la vaina de la hoja basal	
QN	absent or weak	absente ou faible	fehlend oder sehr gering	ausente o débil	Jingumi	1
	medium	moyenne	mittel	media	Ribenchixu	2
	strong	forte	stark	fuerte	Lianggu	3
3.	VG 35	Foliage: intensity of green color	Feuillage : intensité de la couleur verte	Laub: Intensität der Grünfärbung	Follaje: intensidad del color verde	
QN	light	claire	hell	claro	Jinmiaogu	1
	medium	moyenne	mittel	medio	Yugu 1	3
	dark	foncée	dunkel	oscuro	Jingumi	5
4. (+)	VG 35	Plant: growth habit	Plante : port	Pflanze: Wuchsform	Planta: porte	
QN	erect	dressée	aufgerichtet	erecto	Yugu 1	1
	semi-erect	demi-dressée	halbaufrecht	semierecto	Hongruangu	2
	spreading	étalée	breitwüchsig	extendido	Yin 120	3
5. (+)	VG 35	Plant: anthocyanin coloration of leaf pedestal	Plante : pigmentation anthocyanique du pédestal de la feuille	Pflanze: Anthocyanfärbung des Blattknotens	Planta: pigmentación antocianica de la base de la hoja	
QN	absent or weak	absente ou faible	fehlend oder sehr gering	ausente o débil	Jinmiaogu	1
	medium	moyenne	mittel	media	Lianggu	2
	strong	forte	stark	fuerte	Hongmiaoqing	3

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
6. (*) (+)	MG	Time of heading	Époque d'épiaison	Zeitpunkt des Ährenschiebens	Época de espigado	
QN	very early	très précoce	sehr früh	muy temprana	Loulixu	1
	early	précoce	früh	temprana	Lianggu	3
	medium	moyenne	mittel	media	Jinmiaogu	5
	late	tardive	spät	tardía	Ribenchixu	7
	very late	très tardive	sehr spät	muy tardía	W56	9
7.	VG 45	Stem: anthocyanin coloration of brace roots	Tige : pigmentation anthocyanique des racines	Blüte: Anthocyanfärbung der Kronenwurzeln	Tallo: pigmentacion antocianica de las raíces de anclaje	
QL	absent	absente	fehlend	ausente	Yugu 8	1
	present	présente	vorhanden	presente	Ribenchixu	9
8. (*) (+)	VG 47	Leaf: attitude of blade	Feuille : port du limbe	Blatt: Haltung der Blattspreite	Hoja: porte del limbo	
QN	erect	dressé	aufgerichtet	erecto	Anai 3	1
	semi erect	demi-dressé	halbaufrecht	semierecto	Lianggu	2
	horizontal	horizontal	waagrecht	horizontal	Ribenchixu	3
	drooping	retombant	überhängend	colgante	Jinmiaogu	4
9. (*) (+)	VG 65	Panicle: length of bristles	Panicule : longueur des épines	Rispe: Länge der Stachelborsten	Panícula: longitud de las aristas	
QN	short	courte	kurz	corta	Yugu 8	1
	medium	moyenne	mittel	media	Lianggu	3
	long	longue	lang	larga	Ribenchixu	5
10.	VG 65	Panicle: anthocyanin coloration of bristles	Panicule : pigmentation anthocyanique des épines	Rispe: Anthocyanfärbung der Stachelborsten	Panícula: pigmentación antocianica de las aristas	
QL	absent	absente	fehlend	ausente	Yugu 8	1
	present	présente	vorhanden	presente	Baishagu	9
11. (*) (+)	VG 65	Anther: color	Anthère : couleur	Staubbeutel: Farbe	Antera: color	
PQ	white	blanche	weiß	blanco	Yugu 8	1
	orange	orange	orange	naranja	Hongmiaoqing	2
	brown	brune	braun	marrón	Yegu 5	3

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
12.	MG 71	Flag leaf : length of blade	Dernière feuille : longueur du limbe	Fahnenblatt: Länge der Blattspreite	Última hoja: longitud del limbo	
QN	short	courte	kurz	corto	Loulixiu	3
	medium	moyenne	mittel	medio	Lianggu	5
	long	longue	lang	largo	Yegu 5	7
13.	MG 71 (+)	Flag leaf : width of blade	Dernière feuille : largeur du limbe	Fahnenblatt: Breite der Blattspreite	Última hoja: anchura del limbo	
QN	very narrow	très étroite	sehr schmal	muy estrecho	Loulixiu	1
	medium	moyenne	mittel	medio	Hongshilixiang	3
	very broad	très large	sehr breit	muy ancho	Anai 4	5
14.	VG 71	Flag leaf: anthocyanin coloration of blade	Dernière feuille : pigmentation anthocyanique du limbe	Fahnenblatt: Anthocyanfärbung der Blattspreite	Última hoja: pigmentación antocianica del limbo	
QN	weak	faible	gering	débil	Jinmiaogu	1
	medium	moyenne	mittel	media	Lianggu	3
	strong	forte	stark	fuerte	Bianganhuang	5
15.	MG 71 (* (+)	Stem: length	Tige : longueur	Halm: Länge	Tallo: longitud	
QN	very short	très courte	sehr kurz	muy corto	Loulixiu	1
	short	courte	kurz	corto	Zhangai 10	3
	medium	moyenne	mittel	medio	Kenya	5
	long	longue	lang	largo	Lianggu	7
	very long	très longue	sehr lang	muy largo	Yintianhan	9
16.	MG 71 (+)	Stem: diameter	Tige : diamètre	Halm: Durchmesser	Tallo: diámetro	
QN	small	petit	klein	pequeño	Loulixiu	1
	medium	moyen	mittel	medio	Lianggu	3
	large	grand	groß	grande	Yintianhan	5
17.	VG 81	Glume: anthocyanin coloration	Glume : pigmentation anthocyanique	Hüllspelze: Anthocyanfärbung	Gluma: pigmentación antocianica	
QL	absent	absente	fehlend	ausente	Yanandali	1
	present	présente	vorhanden	presente	Yugu 8	9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
18. MG (+)	Plant: number of elongated internodes	Plante : nombre d'entre-noeuds allongés	Pflanze: Anzahl der langgezogenen Internodien	Planta: número de entrenudos alargados		
QN	few	petit	gering	bajo	Hongshilixiang	3
	medium	moyen	mittel	mediano	Yegu 5	5
	many	élevé	groß	alto	W 77	7
19. VG (*) (+)	Panicle: attitude in relation to stem	Panicule : port par rapport à la tige	Rispe: Haltung im Vergleich zum Halm	Panícula: porte en relación con el tallo		
QN (a)	erect	dressée	aufgerichtet	erecto	Anai 3	1
	semi erect	demi-dressée	halbaufrecht	semierecto	Yugu 8	2
	horizontal	horizontale	waagrecht	horizontal	Lianggu	3
	drooping	légèrement retombante	mäßig überhängend	moderadamente colgante	Ribenchixu	4
20. MG (*) (+)	Plant: length of peduncle	Plante : longueur du pédoncule	Frucht: Länge des Blütenstiels	Planta: longitud del pedúnculo		
QN (a)	short	courte	kurz	corto	Ai 88	3
	medium	moyenne	mittel	medio	Anai 17	5
	long	longue	lang	largo	Anai 3	7
21. VG (*) (+)	Panicle: shape	Panicule : forme	Rispe: Form	Panícula: forma		
PQ (a)	conical	conique	konisch	cónica	Hongfengu	1
	spindle	fusiforme	spindelförmig	fusiforme	Kenya	2
	cylindrical	cylindrique	zylindrisch	cilíndrica	Ai 88	3
	club	en massue	klump	claviforme	Taohuami	4
	duck mouth	bec de canard	Entenschnabel	en forma de boca de pato	W 59	5
	cat foot	patte de chat	Katzenpfote	en forma de pie de gato	Maotigu	6
	branched	ramifiée	verzweigt	ramificada	Foshougu	7
22. MG (*)	Panicle: length	Panicule : longueur	Rispe: Länge	Panícula: longitud		
QN (a)	short	courte	kurz	corta	Loulixiu	3
	medium	moyenne	mittel	media	Hongshilixiang	5
	long	longue	lang	larga	Yintianhan	7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
23. (*) (+)	MG 92	<u>Excluding varieties with panicle shape: branched: Panicle: density</u>	<u>À l'exclusion des variétés avec forme en panicule : ramifiée : panicule : densité</u>	<u>Ohne Sorten mit Form der Rispe: verzweigt: Rispe: Dichte</u>	<u>Excluidas las variedades con forma de panícula: ramificada: panícula: densidad</u>	
QN	(a)	lax	lâche	locker	laxa	Jinmiaogu 1
		medium	moyenne	mittel	media	Lianggu 3
		dense	dense	dicht	densa	Yugu 8 5
24. (+)	MS 92	Panicle: number of grains on secondary branch	Panicule : nombre de grains sur la ramification secondaire	Rispe: Anzahl der Köner am Sekundärast	Panícula: número de granos en la rama secundaria	
QN	(a)	few	faible	gering	bajo	Ribenchixu 3
		medium	moyen	mittel	medio	Lianggu 5
		many	élevé	groß	alto	W 77 7
25. (*)	MG 92	1000 grain weight	Poids de 1 000 grains	1000- Korngewicht	Peso de 1.000 granos	
QN		low	petit	gering	pequeño	W 67 3
		medium	moyen	mittel	medio	Hongmiaoqing 5
		high	grand	hoch	grande	Lianggu 7
26. (*) (+)	VG 92	Grain: shape	Grain : forme	Korn: Form	Grano: forma	
PQ		narrow ovate	ovale étroit	schmal eiförmig	oval estrecho	1
		medium ovate	ovale moyen	mittel eiförmig	oval medio	2
		circular	circulaire	kreisförmig	circular	3
27. (*)	VG 92	Grain: color	Grain : couleur	Korn: Farbe	Grano: color	
PQ		whitish	blanchâtre	weißlich	blanquecino	Anai 3 1
		grey	gris	grau	gris	Kenya 2
		yellow	jaune	gelb	amarillo	Jinmiaogu, Ribenchixu 3
		brown	brun	braun	marrón	Yugu 8 4
		red	rouge	rot	rojo	Hongmiaoqing 5
		black	noir	schwarz	negro	Heiniangu 6

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
28. (*)	VG 92	Dehusked grain: color (not polished)	Grain décortiqué : couleur (sans polissage)	Entspelztes Korn: Farbe (nicht poliert)	Grano descascarado: color (sin pulir)	
PQ	whitish	blanchâtre	weißlich	blanquecino	Taohuami	1
	grey	gris	grau	gris	Hongmiaoqing	2
	yellow	jaune	gelb	amarillo	Lianggu, Yugu 8	3
29. (*)(+)	VG 92	Endosperm: type	Endosperme : type	Endosperm: Typ	Endospermo: tipo	
QL	waxy	cireux	wachsig	ceroso		1
	non-waxy	non cireux	nicht-wachsig	no ceroso		2

8. Explanations on the Table of Characteristics

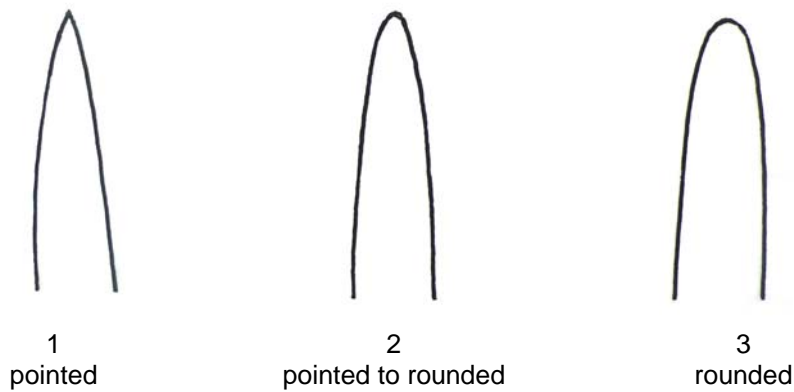
8.1 *Explanations covering several characteristics*

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

- (a) To be observed on the panicle of the main stem.

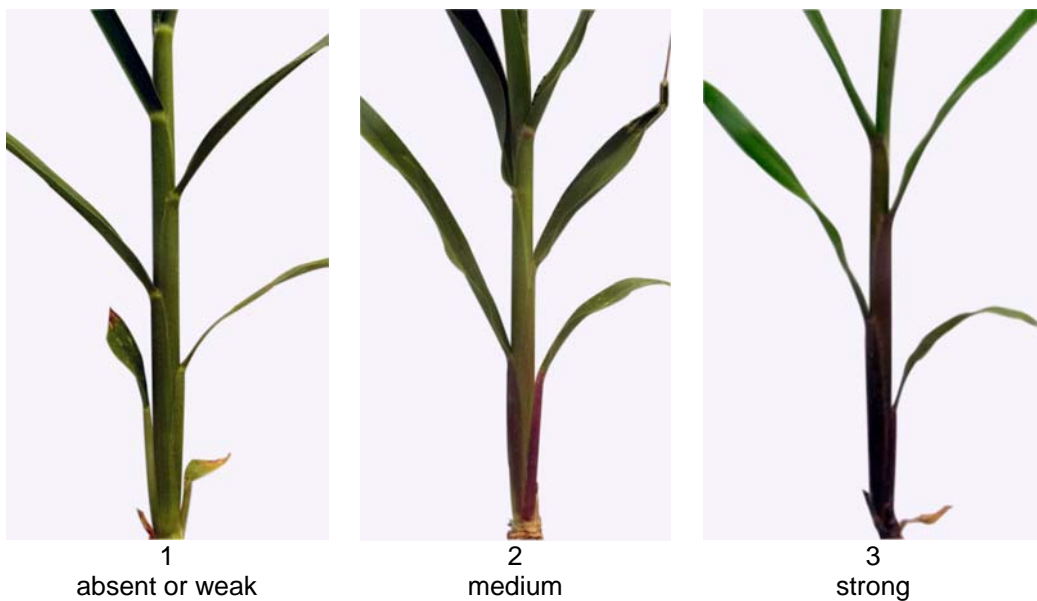
8.2 *Explanations for individual characteristics*

Ad. 1: First leaf: shape of tip

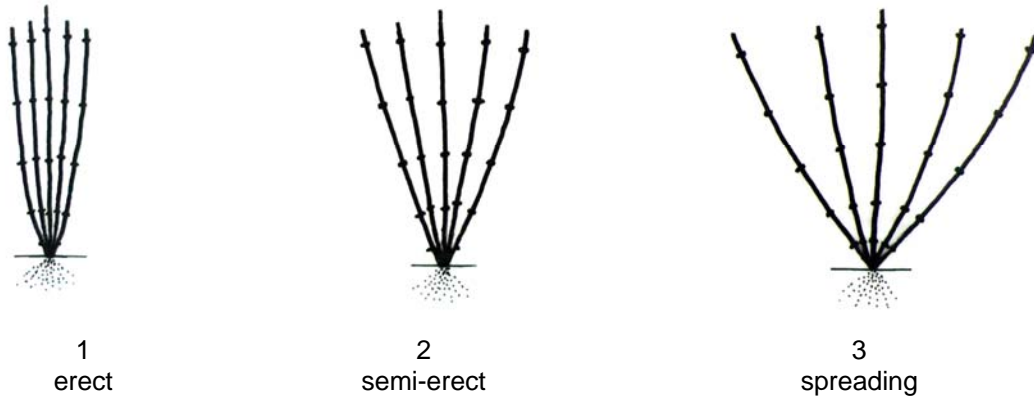


Ad. 2: Seedling: anthocyanin coloration of basal leaf sheath

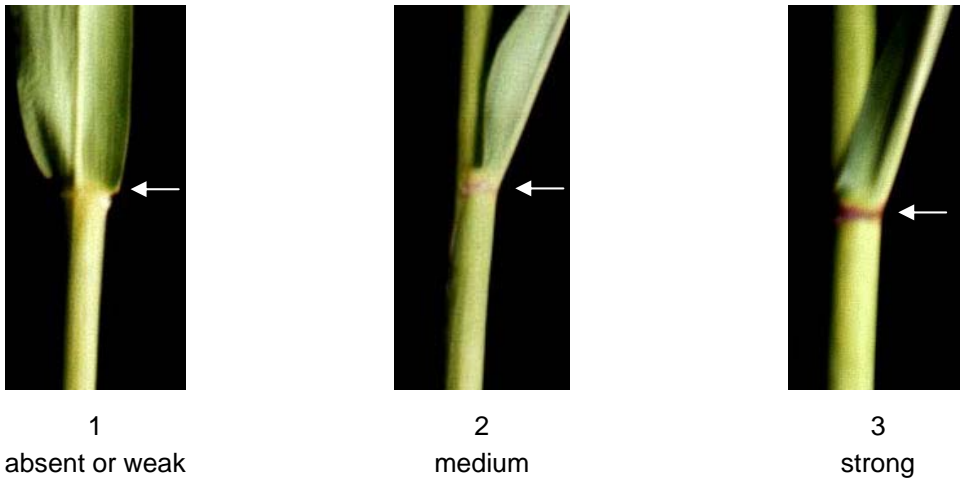
The observation should be made on the bottom of shoot after the 7th leaf fully developed.



Ad. 4: Plant: growth habit



Ad. 5: Plant: anthocyanin coloration of leaf pedestal

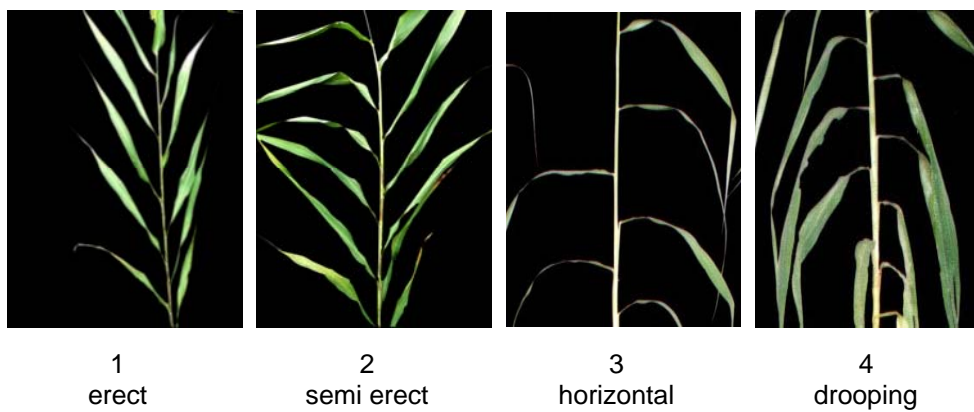


Ad. 6: Time of heading

Time of heading is the time when 50% of plants have reached stage 45.

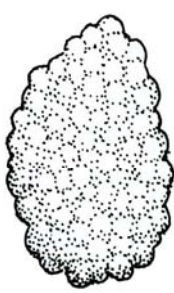
Ad. 8: Leaf: attitude of blade

The observation should be made on the middle third leaves of the stem.

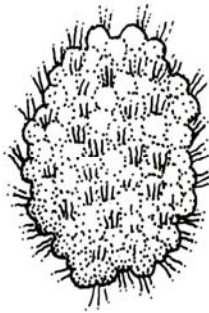


Ad. 9: Panicle: length of bristles

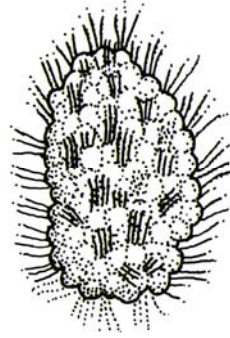
Bristles in foxtail millet originated from the sterile spikelets.



1
short



3
medium



5
long

Ad. 11: Anther: color

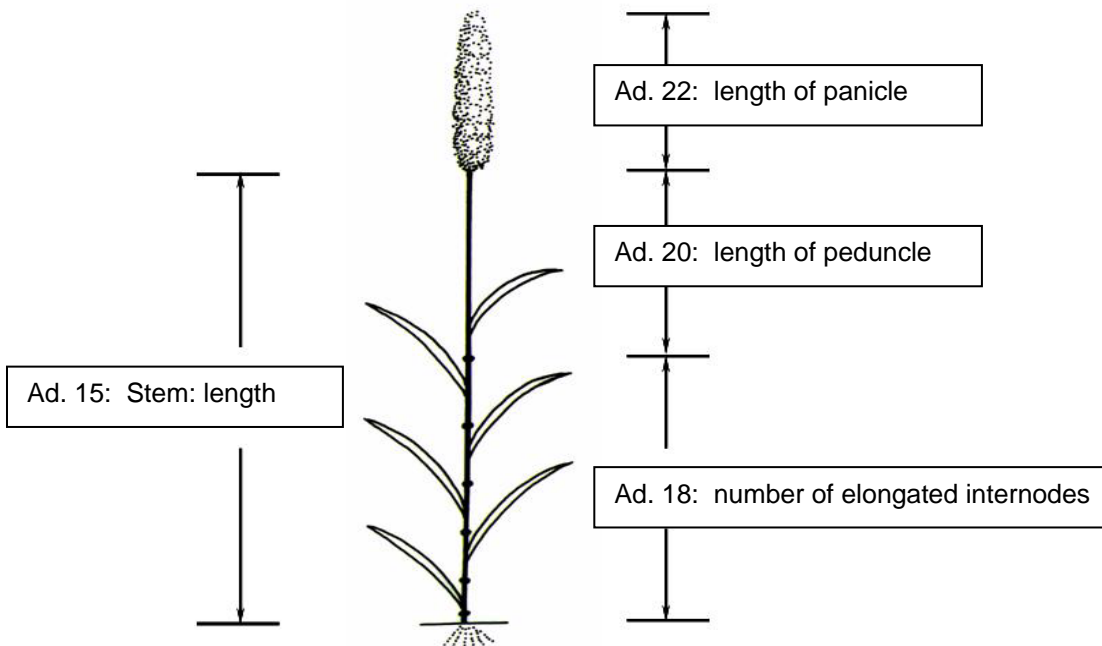
The observation should be made early in the morning before the anthers splits.

Ad. 13: Flag leaf: width of blade

The observation should be made at the broadest part of the blade.

Ad. 15: Stem: length

Plant length to be observed from the natural base of the main stem to the bottom point of the panicle (cm).



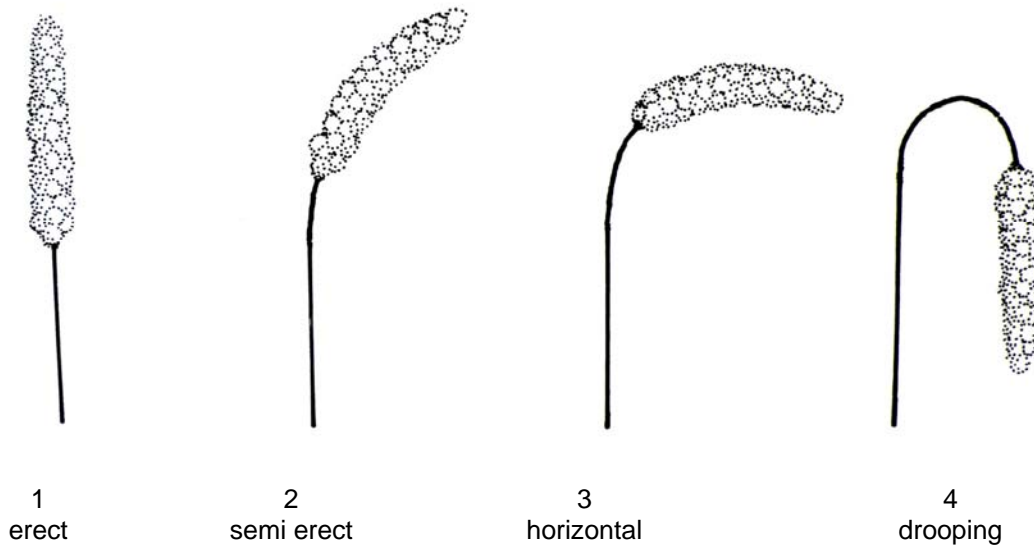
Ad. 16: Stem: diameter

To be observed at the third elongated nodes from the base.

Ad. 18: Plant: number of elongated internodes

See explanation at Ad. 15. Count the elongated internodes, excluding the peduncle.

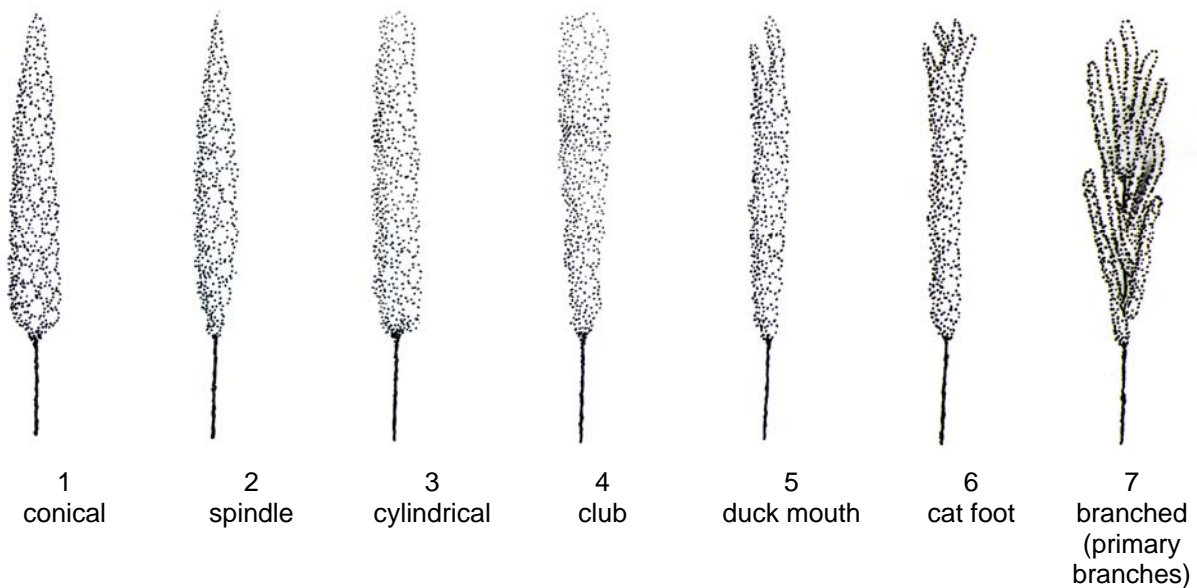
Ad. 19: Panicle: attitude in relation to stem



Ad. 20: Plant: length of peduncle

See explanation at Ad. 15. The length of peduncle should be observed from the base of the panicle to the flag leaf node.

Ad. 21: Panicle: shape



Ad. 22: Panicle: length

See explanation at Ad. 15.

Ad. 23: Excluding varieties with panicle shape: branched: panicle: density

The density of the main stem panicle is the number of rachis per centimeter in the middle third of the panicle.

Ad. 24: Panicle: number of grains on secondary branch

The number of grains should be counted on a secondary branch taken from the middle third of a main stem panicle.

Ad. 26: Grain: shape



1
narrow ovate



2
medium ovate



3
circular

Ad. 29: Endosperm: type

The characteristic is observed by reaction to Potassium Iodide solution: waxy type endosperm is stained reddish purple; non-waxy type endosperm is stained blue purple.

8.3 *Decimal Code for the Growth Stages of Cereals (Foxtail Millet)*

2-digit Code	General Description	
1	2	
Germination		
00	Dry seed	
01	Start of imbibition	
02		
03	Imbibition complete	
04		
05	Radicle emerged from caryopsis	
06		
07	Coleoptile emerged from caryopsis	
08		
09	Leaf just at coleoptile tip	
Seedling growth		
10	First leaf emerge 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	Main shoot only	
21	Main shoot and 1 tiller	
22	Main shoot and 2 tillers	
23	Main shoot and 3 tillers	
24	Main shoot and 4 tillers	
25	Main shoot and 5 tillers	
26	Main shoot and 6 tillers	
27	Main shoot and 7 tillers	
28	Main shoot and 8 tillers	
29	Main shoot and 8 tillers	
Stem elongation		
30	Pseudo stem erection	
31	1st node detectable	
32	2ed node detectable	
33	3rd node detectable	
34	4th node detectable	

2-digit Code	General Description	
35	5th node detectable	
36	6th node detectable	
37	7th node detectable	
38	8th node detectable	
39	Flag leaf/collar just visible	
Booting and inflorescence emergence		
40		
41	Boots swollen	
43	10% of inflorescence visible/emerged	
45	50% of inflorescence visible/emerged	
47	All inflorescence visible/emerged	
49		
Anthesis		
60	Beginning of anthesis	
65	Anthesis half-way	
69	Anthesis complete	
Milk development		
70		
71	Caryopsis watery ripe	
73	Early milk	
75	Medium milk	
77	Late milk	
Dough development		
80		
81	Early dough	
85	Soft dough	
89	Hard dough	
Ripening		
90		
91	Caryopsis hard (difficult to divide by thumbnail)	
92	Caryopsis hard (can no longer be dented by thumbnail)	
93	Caryopsis loosening in daytime	
94	Over-rip, straw dead and collapsing	
95	Seed dormant	
96	Viable seed giving 50% germination	
97	Seed dormancy ended	

9. Literature

Institute of Plant Germplasm, CAAS, 1985: Catalogue of Chinese Land Races of Foxtail Millet. Agriculture Press. Beijing, CN.

Ping Lu, 2006: Descriptors and Data standard for foxtail millet (*Setaria italica* (L.) Beauv.). China Agriculture Press. Beijing, CN.

Xianmin Diao, Wei Li, Zhihai Zhao, Wenying Zhang, Hui Zhi, Yongfang Wang, Runqi Wang, Peng Wang, 2005: Guidelines for the Conduct of Test for Distinctness, Uniformity and Stability of Foxtail Millet (*Setaria italica* Beauv.). Chinese standard, in Chinese.

Yinmei Li et al., 1997: Breeding of Foxtail Millet. Agriculture Press. Beijing, CN.

Zadoks, J.C., Chang, T.T., Konzak, C.F., 1974: A decimal code for the growth stages of cereals. Weed Research 14: pp. 415-421.

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 Botanical name	<input type="text" value="Setaria italica (L.) Beauv."/>	
1.2 Common name	<input type="text" value="Foxtail millet"/>	
2. Applicant		
Name	<input type="text"/>	
Address	<input type="text"/>	
Telephone No.	<input type="text"/>	
Fax No.	<input type="text"/>	
E-mail address	<input type="text"/>	
Breeder (if different from applicant)	<input type="text"/>	
3. Proposed denomination and breeder's reference		
Proposed denomination (if available)	<input type="text"/>	
Breeder's reference	<input type="text"/>	

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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#4. Information on the breeding scheme and propagation of the variety

4.1 Breeding scheme

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)"

.....

4.2 Method of propagating the variety

Type of material

- (a) line
 - male fertile line []
 - male sterile line []
- (b) hybrid []
- (c) other (specify) []

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.

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:
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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 Seedling: anthocyanin coloration of basal leaf sheath (2)		
absent or weak	Jingumi	1 []
medium	Ribenchixu	2 []
strong	Lianggu	3 []
5.2 Time of heading (6)		
very early	Loulixu	1 []
very early to early		2 []
early	Lianggu	3 []
early to medium		4 []
medium	Jinmiaogu	5 []
medium to late		6 []
late	Ribenchixu	7 []
late to very late		8 []
very late	W 56	9 []
5.3 Stem: length (15)		
very short	Loulixu	1 []
very short to short		2 []
short	Zhangai 10	3 []
short to medium		4 []
medium	Kenya	5 []
medium to tall		6 []
long	Lianggu	7 []
long to very long		8 []
very long	Yintianhan	9 []

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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Characteristics	Example Varieties	Note
5.4 Grain: color (27)		
whitish	Anai 3	1 []
grey	Kenya	2 []
yellow	Jinmiaogu, Ribenchixu	3 []
brown	Yugu 8	4 []
red	Hongmiaoqing	5 []
black	Heiniangu	6 []
5.5 Endosperm:type (29)		
waxy		1 []
non-waxy		2 []

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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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 the characteristic(s) for your candidate variety
<i>Example</i>	<i>Leaf: attitude of blade</i>	<i>erect</i>	<i>semi erect</i>

Comments:

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