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UPOV

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

DRAFT

FOXTAIL MILLET *

UPOV code: SETAR_ITA

Setaria italica L.

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 thirty-sixth session, to be held in Budapest, Hungary, from May 28 to June 1, 2007

Alternative Names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Setaria italica L., *Setaria italica* (L.) P.Beauv.	Foxtail Bristle Grass, Italian Millet	Millet d'Italie, Millet des oiseaux, Sétaire d'Italie	Italienhirse, Kolbenhirse	Dana, Mijo de cola de zorro, Mijo de Hungria, Panizo

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 *Setaria italica* (L.).

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:

2.3.1 General: 1 kg.

2.3.2 Panicles

If requested by the competent authority, at least 100 panicles should also be submitted. The panicles should be well developed and not obviously affected by any pest or disease. They should contain a sufficient number of viable seeds to establish a satisfactory row of plants for observation.

2.4 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.

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

2.6 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

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.

3.3.1 Stage of development for the assessment

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 at the end of Chapter 8.

3.3.2 Type of observation – visual or measurement

The recommended method of observing the characteristic is indicated by the following key in the second column of the Table 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

3.4 Test Design

3.4.1 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.

3.4.2 Each test should be designed to result in a total of at least 1,000 plants, which should be divided between two or more replicates.

3.4.3 Single panicle-rows: if tests on panicle-rows are conducted, at least 50 panicle-rows should be observed.

3.5 Number of Plants / Parts of Plants to be Examined

Unless otherwise indicated, 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.

3.6 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.

4.2 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 of characteristics on the plot as a whole, a population standard of 0.1 % with an acceptance probability of at least 95% should be applied.

In the case of a sample size of 1,000 plants the maximum number of off-types allowed would be 3.

4.2.3 Single panicle-rows: For the assessment of uniformity of characteristics on single panicle-rows, plants or parts of plants, a population standard of 1% with an acceptance probability of at least 95% should be applied. In the case of a sample size of 100 panicle rows, the maximum number of aberrant panicle-rows should not exceed 3.

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 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.

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) Ecological type of the varieties (Spring millet or Summer millet,---)
(b) Time of heading (50% of plants with heads) (characteristic 6)
(c) Plant: natural height (characteristic ----)
(d) Plant: number of tillers with panicle (including the main stem) (characteristic 21)

5.4 Guidance for the use of grouping characteristics, in the process of examining distinctness, is provided through the General Introduction.

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

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.

6.3 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.

Regional sets of example varieties will be presented in an annex to these Test Guidelines to be published on the UPOV Website (www.upov.int)

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 3.3.2

(a) – (e) See Explanations on the Table of Characteristics in Chapter 8.1

(+) See Explanations on the Table of Characteristics in Chapter 8.2

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**	**Frest leaf: shape of tip**					
QN		pointed				Lianggu	1
		pointed to round				Ribenchixu	3
		round				Yugu 8	5
2.	**VG 15**	**Seedling leaf: anthocyanin color**					
QN	**(a)**	yellow green				Jingumi	1
		green				Ribenchixu	3
		light red				Yegu 5	5
		prple				Hongmiaoqing	7
		dark red					9
3. **(*)**	**VG 15**	**Seedling leaf:anthocyanin color of sheath**					
QN	**(b)**	yellow green				Jingumi	1
		green					3
		light red				Ribenchixu	5
		purple				Lianggu	7
		dark red				Hongmiaoqing	9
4. **(*)** **(+)**	**VG 18**	**Seedling leaf: attitude of blade of seedling**					
QN	**(c)**	erect				Wukelan	1
		semi-erect				Lianggu	3
		horizontal				Anai 3	5
		drooping					7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
5.	**VG**	**Culm: habit**					
(+)	**18**						
QL		erect				Yugu 1	1
		semi-erect				Hongruangu	3
		spreading				Yin 120	5
6.	**MS**	**Time of heading (50% of plants with heads)**					
(*)							
(+)	**45**						
QN		very early				Loulixiu	1
		early				Lianggu	3
		medium				Jinmiaogu	5
		late				Ribenchixu	7
		very late				W56	9
7.	**VG**	**Leaf: atitude of blade at heading**					
	47	**stage**					
PQ	**(d)**	erect				Anai 3	1
		semi-erect				Lianggu	3
		horizontal				Ribenchixu	5
		drooping					7
8.	**VG**	**Stem: anthocyanin coloration of brace**					
	45	**roots**					
PQ		green					1
		purple				Ribenchixu	9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
9. (*) (+)	**MS 65**	**Ear: length of bristle**					
QN		short				Yugu 8	1
		medium				Lianggu	3
		long				Ribenchixu	5
10.	**VG 65**	**Panicle: anthocyanin color of bristle**					
QL		yellow				Yugu 8	1
		green					3
		purple				Lianggu	5
11.	**VG 81**	**Glume: anthothynin color**					
QN		yellow green				Yanandali	1
		green				Yugu 8	3
		light purple				Hongshilixiang	5
		purple				Anai 3	7
12. (*)	**VG 65**	**Anther: anthothynin color**					
QL	**(e)**	white				Yugu 8	1
		orange				Hongmiaoqing	3
		brown				Yegu 5	5
13.	**VG**	**Stigma: color**					
QL		white				Yugu 8	1
		purple					2

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
14.	**MS**	**Leaf : length of flag leaf blade**					
(+)	**71**						
QN		very short					1
		short				Loulixiu	3
		medium				Lianggu	5
		long				Yegu 5	7
		very long					9
15.	**MS**	**Leaf : width of flag leaf blade**					
(+)	**71**						
QN		very narrow				Loulixiu	1
		narrow				Hongshilixiang	3
		medium				Anai 4	5
		broad					7
16.	**VG**	**Leaf : anthocynin color of leaf blade**					
	91	**and sheath**					
QL		yellow				Jinmiaogu	1
		green					3
		slightly purple					5
		purple					7
		dark purple				Ribenchixu	9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
17. **(*)** **(+)**	**MS** **71**	**Plant: natural height**					
QN		very short				Loulixiu	1
		short					3
		medium				Kenya	5
		long				Lianggu	7
		very long				Yintianhan	9
18. **(+)**	**MS** **71**	**Plant: stem diameter**					
QN		very thin				Loulixiu	1
		thin				Lianggu	3
		medium				Yintianhan	5
		thick					7
		very thick					9
19. **(*)** **(+)**	**MG** **92**	**Plant: number of elongated nodes**					
QN		very few				Kenya	1
		few				Hongshilixiang	3
		medium				Yegu 5	5
		many				W 77	7
		many more				Yijntianhan	9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
20. (+)	**MG** **91**	**Plant: layer number of brace roots**					
QN		no brace roots				Kenya	1
		few				Lianggu	3
		medium				Yintianhan	5
		many					7
		many more					
21. (+) (*)	**MG** **91**	**Plant: number of tillers (including main stem) with panicle**					
QN		one (only the main stem)				Yugu 8	1
		few				Lianggu	3
		medium				Loulixiu	5
		many					7
		many more				Romania 5	9
22. (+)	**VG** **91**	**Plant: attitude of nodular beneath the panicle**					
PQ	**(c)**	erect				Lazhutai	1
		slightly drooping				Yugu 8	3
		drooping				Lianggu	5
		curved					7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
23. **(+)**	**MS 91**	**Plant: length of nodular beneath the panicle**					
QN		very short					1
		short				Ai 88	3
		medium				Anai 17	5
		long				Anai 3	7
		very long				Lianggu	9
24. **(*)** **(+)**	**VG 81**	**Panicle: type of the main stem panicle**					
QN		conical				Hongfengu	1
		spindle				Kenya	2
		cylindical				Ai 88	3
		club				Taohuami	4
		duck mouth				W 59	5
		cat foot				Maotigu	6
		branched				Foshougu	7
25. **(*)** **(+)**	**MS 92**	**Panicle: length of the main stem panicle**					
QN		very short					1
		short				Loulixiu	3
		medium				Hongshilixiang	5
		long				Yintianhan	7
		very long				W 77	9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
26.	**MS**	**Panicle: diameter of the main stem**					
(+)	**92**	**panicle**					
QN		very thin				Loulixiu	1
		thin				Kenya	3
		medium				Hongmiaoqing	5
		thick				W 59	7
		very thick				W 77	9
27.	**MG**	**Panicle: density of spikelet of the main**					
(*)							
(+)	**92**	**stem panicle**					
QN		very loose				Foshougu	1
		loose				Jinmiaogu	3
		medium				Lianggu	5
		dense				Yugu 8	7
		very dense				Zhangai 10	9
28.	**MG**	**Panicle: grain number of one**					
(+)	**92**	**spikelet of the main stem panicle**					
PQ		very few				Kenya	1
		few				Ribenchixu	3
		medium				Lianggu	5
		many				W 77	7
		many more				Jigu 5	9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
29. (*) (+)	**MS 92**	**Panicle: weight of panicle of the main stem**					
QN		very light				Loulixiu	1
		light				Anai 3	3
		medium				Lianggu	5
		heavy				Yintianhan	7
		very heavy				Mengzao 1	9
30. (*) (+)	**MS 92**	**Panicle: grain weight of the panicle of the main stem**					
QN		very light				Loulixiu	1
		light				Hongshilixiang	3
		medium				Yugu 8	5
		heavy				Yintianhan	7
		very heavy					9
31. (*) (+)	**MS 92**	**Grain: weight of 1000 grains**					
QN		very small					1
		small				W 67	3
		medium				Hongmiaoqing	5
		large				Lianggu	7
		very large					9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
32.	**VG 92**	**Grain: shape of grain**					
QL		round				Lianggu	1
		broad elliptic					3
		narrow elliptic					5
33. (*)	**VG 92**	**Grain: color of grain**					
PQ		white				Anai 3	1
		white yellow				Jinmiaogu	3
		yellow				Ribenchixu	5
		red				Hongmiaoqing	7
		black				Heiniangu	9
34. (*)	**VG**	**Kernel: color of kernel (not polished)**					
PQ		white				Taohuami	1
		lightly yellow				Lianggu	3
		yellow				Yugu 8	5
		orange				Jigu 5	7
		grey				Hongmiaoqing	9
35.	**VS 47**	**Leaf: resistance to leaf rust**					
QN		immune					1
		resistant					3
		slight susceptible					5
		susceptible					7
		heavily susceptible					9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
36.	**VS**	**Plant: resistance to**					
	92						
		immune					1
		resistant					3
		slightly susceptible					5
		susceptible					7
		heavily susceptible					9
37.	**VS**	**Panicle: resistance to**					
	92						
		immune					1
		resistant					3
		slightly susceptible					5
		susceptible					7
		heavily susceptible					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) The observation should be made on the 4th leaf after the 5th leaf fully developed.
(b) The observation should be made on the third leaf 's sheath after the 5th leaf fully developed.
(c) The observation should be made on the 4th and 5th leaf after the 8th leaf fully developed.
(d) The observation should be made on the 3 top leaves at the heading time, and see the criteria of Ad. 4.
(e) The observation should be made before the anther split and no more than 30 minutes after anthesis.

8.2 Explanations for individual characteristics

Ad. 1: First leaf: shape of the leaf tip

1 pointed | 3 pointed to round | 5 round

Ad. 4: Seedling leaf: attitude of blade

1 erect | 3 semi-erect | 5 horizontal | 7 drooping

Ad. 5: Plant: growth habit

Angle between culm and horizontal	90°	90° - 45°	<45°
	1	3	5
	erect	semi-erect	spreading

Ad. 6: Time of heading: number of days from sowing to heading

Summer millet:	<36	36-43	44-50	51-58	>58
Spring millet:	<45	46-65	66-80	81-100	>100
	1	3	5	7	9
	very early	early	medium	late	very late

Ad. 9: Panicle: length of bristle (mm)

<0-4	5-7	>7
1	3	5
short	medium	long

Ad. 14: Leaf: length of flag leaf blade (cm)

Summer millet:	<15.0	15.1-25.0	25.1-40.0	40.1-60.0	>60.0
Spring millet:	<25.0	25.1-40.0	40.1-50.0	50.1-60.1	>60.0
	1	3	5	7	9
	very short	short	medium	long	very long

Ad. 15: Leaf: width of flag leaf blade, the widest part of the blade (cm)

Summer millet:	<1.5	1.6-2.5	2.6-4.0	>4.0
Spring millet:	<2.0	2.0-2.5	2.6-4.0	>4.0
	1	3	5	7
	very narrow	narrow	medium	broad

Ad. 17: Plant natural height, from the natural base of the main stem to the bottom of the panicle (cm)

Summer millet:	<60.0	60.1- 80.0	80.1-100	100.1-130.0	>130.0
Spring millet:	<100.0	100.1-120.0	120.1-130.0	130.1-150.0	>150.0
	1	3	5	7	9
	very short	short	medium	long	very long

Ad. 18: Stem diameter, the thickest part of the first elongated nodular (mm)

<3.0	3.1-5.0	5.1-8.0	8.1-12.0	>12.0
1	3	5	7	9
very thin	thin	medium	thick	very thick

Ad. 19: Plant: number of elongated nodes

<8.0	8.1-10.0	10.1-13.0	13.1-16.0	>16.0
1	3	5	7	9
very few	few	medium	many	many more

Ad. 20: Plant: layer number of brace roots

0	1.0-3.0	3.1-5.0	5.1-8.0	>8.0
1	3	5	7	9
no brace root	few	medium	many	many more

Ad. 21: Plant: number of tillers with panicle (including the main stem)

1	1.1-4.0	4.1-6.0	6.1-9.0	>9.0
1	3	5	7	9
no tiller	few	medium	many	many more

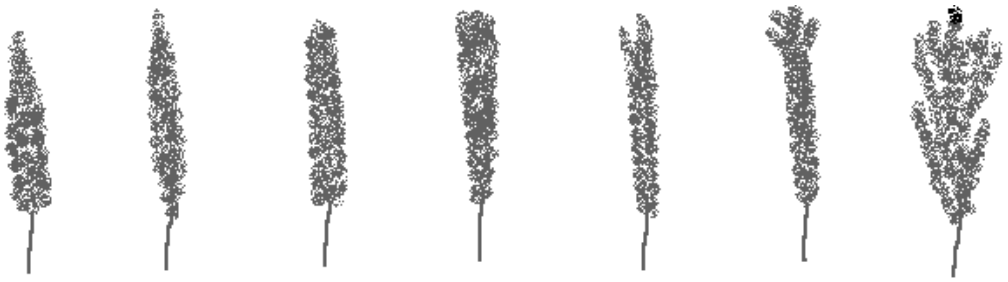
Ad. 22: Plant: attitude of nodular beneath the panicle

1	3	5	7
erect	slightly drooping	drooping	curved

Ad.23: Plant: length of nodular beneath the panicle of the main stem

Summer millet:	<7.0	7.1-12.0	12.1-17.0	17.1-23.0	>23.0
Spring millet:	<15.0	15.1-20.0	20.1-25.0	25.1-30.0	>30.0
	1	3	5	7	9
	very short	short	medium	long	very long

Ad.24: Panicle: type of the main stem panicle



1	2	3	4	5	6	7
conical	spindle	cylindrical	club	duck mouth	cat foot	branched

Ad.25: Panicle: length of the main stem panicle (cm)

Summer millet:	<9.0	9.1-16.0	16.1-23.0	23.1-30.0	>30.0
Spring millet:	<15.0	15.1-23.0	23.1-31.0	31.1-39.0	>39.0
	1	3	5	7	9
	very short	short	medium	long	very long

Ad.26: Panicle: length of the main stem panicle (cm)

<1.5	1.6-2.1	2.2-2.8	2.9-3.5	>3.5
1	3	5	7	9
very short	short	medium	long	very long

Ad.27: Panicle: density of spikelet of the main stem panicle, the number of the spikelet per centimeter of the panicle in the middle part

<2.0	2.1-4.0	4.1-6.0	6.1-8.0	>8.0
1	3	5	7	9
very loose	loose	medium	dense	very dense

Ad.28: Panicle: grain number of one spikelet of the main stem panicle

<20.0	20.1-50.0	50.1-80.0	80.1-120.0	>120.0
1	3	5	7	9
very few	few	medium	many	many more

Ad.29: Panicle: weight of the main stem panicle (gram, naturally dried panicle)

Summer millet:	<5.0	5.1-10.0	10.1-15.0	25.1-20.0	>20.0
Spring millet:	<5.0	5.1-15.0	15.1-25.0	25.1-35.0	>35.0
	1	3	5	7	9
	very light	light	medium	heavy	very heavy

Ad.30: Panicle: grain weight of the main stem panicle (gram, naturally dried grain)

Summer millet:	<4.0	4.1-9.0	9.1-14.0	14.1-20.0	>20.0
Spring millet:	<4.0	4.1-13.0	13.1-21.0	21.1-30.0	>30.0
	1	3	5	7	9
	very light	light	medium	heavy	very heavy

Ad.31: Grain: weight of 1000 grains (gram, naturally dried grain)

Summer millet:	<1.00	1.01-1.80	1.81-2.60	2.61-3.50	>3.50
Spring millet:	<2.00	2.01-2.60	2.61-3.20	3.21-3.90	>3.90
	1	3	5	7	9
	very small	small	medium	large	very large

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	
35	5th node detectable	
36	6th node detectable	
37	7th node detectable	
38	8th node detectable	
39	Flag leaf/collor 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-ripe, straw dead and collapsing	
95	Seed dormant	
96	Viable seed giving 50% germination	
97	Seed dormancy ended	

9. Literature

Xianmin Diao, Wei Li, Zhihai Zhao, Wenying Zhang, Hui Zhi, Yongfang Wang, Runqi Wang and 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

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

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 (species)	*Setaria italica* (L.) P. Beauv. Other (Please state)
1.2 Common name	Foxtail Millet

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

Variety resulting from:

4.1.1 Crossing

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

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

(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

[#] 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:

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 (4)	**Seedling leaf: atitude of blade of seedling**		
	erect	Wukelan	1 [ ]
	semi-erect	Lianggu	3 [ ]
	horizontal	Anai 3	5 [ ]
	drooping		7 [ ]
5.2 (6)	**Plant: time of heading (50% of plants with heads)**		
	very early	Loulixiu	1 [ ]
	eraly	Lianggu	3 [ ]
	medium	Jinmiaogu	5 [ ]
	late	Ribenchixu	7 [ ]
	very late	W 56	9 [ ]
5.3 (17)	**Plant: natural height**		
	very short	Loulixiu	1 [ ]
	short		3 [ ]
	medium	Kenya	5 [ ]
	long	Lianggu	7 [ ]
	very long	Yintianhan	9 [ ]

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

	Characteristics	Example Varieties	Note
5.4 (21)	**Plant: number of tillers with panicle (including the main stem)**		
	one (only the main stem)	Yugu 8	1 [ ]
	few	Lianggu	3 [ ]
	medium	Loulixiu	5 [ ]
	many		7 [ ]
	many more	Romania 5	9 [ ]
5.5 (24)	**Panicle: type of the main stem panicle**		
	conical	Hongfengu	1 [ ]
	spindle	Kenya	2 [ ]
	cylindical	Ai 88	3 [ ]
	club	Taohuami	4 [ ]
	duck mouth	W 59	5 [ ]
	cat foot	Maotigu	6 [ ]
	branched	Foshougu	7 [ ]
5.6 (31)	**Grain: weight of 1000 grains**		
	very small		1 [ ]
	small	W 67	3 [ ]
	medium	Hongmiaoqin	5 [ ]
	large	Lianggu	7 [ ]
	very large		9 [ ]

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

	Characteristics	Example Varieties	Note
5.7 (33)	**Grain: color of grain**		
	white	Anai 3	1 [ ]
	white yellow	Jinmiaogu	3 [ ]
	yellow	Ribenchixu	5 [ ]
	red	Hongmiaoqing	7 [ ]
	black	Heiniangu	9 [ ]
5.8 (34)	**Kernel: color of kernel (not polished)**		
	white	Taohuami	1 [ ]
	lightly yellow	Lianggu	3 [ ]
	yellow	Yugu 8	5 [ ]
	orange	Jigu 5	7 [ ]
	grey	Hongmiaoqing	9 [ ]

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

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	Leaf: attitude	*upwards*	*downwards*

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”.

……

9.3 Has the plant material to be examined been tested for the presence of virus or other pathogens?

Yes [ ]

(please provide details as specified by the Authority)

No [ ]

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]