

UPOV

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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

DRAFT

MILLET

(Panicum miliaceum L.)

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

Prepared by experts from Ukraine

*to be considered by the
Technical Working Party for Agricultural Crops at its thirty-fourth session
to be held in Christchurch, New Zealand, from October 31 to November 4, 2005*

Alternative Names: *

<i>Latin</i>	<i>English</i>	<i>French</i>	<i>German</i>	<i>Spanish</i>
<i>Panicum miliaceum</i> L.	Common Millet	Millet commun, Panic millet, Panic faux millet	Rispenhirse	Mijo común

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 guidelines ("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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Field Code Changed

1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Panicum miliaceum* L. of the family *Poaceae*.

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 seeds and panicles if requested by the authority.

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

seeds: 1kg

panicles: if requested by the competent authority, at least 50
panicles should also be submitted

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. 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.

2.5 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*

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 at the end of Chapter 8.

3.3.3 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

3.3.4 Because daylight varies, color determinations made against a color chart should be made either in a suitable cabinet providing artificial daylight or in the middle of the day in a room without direct sunlight. The spectral distribution of the illuminant for artificial daylight should conform with the CIE Standard of Preferred Daylight D 6500 and should fall within the tolerances set out in the British Standard 950, Part I. These determinations should be made with the plant part placed against a white background.

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 1,00 plants, which should be divided between two or more replicates.

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 should be made on 20 plants or parts taken from each of 20 plants.

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. The 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 For the assessment of uniformity on a row plot, a population standard of 0.5 % and 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 9.

4.2.3 For the assessment of uniformity on single "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 plants, 4 off-type rows are allowed.

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) Panicle: time of heading (no less than 50% of plants with panicles) (characteristic 1)
- (b) Plant: height (including panicle) (characteristic 10)
- (c) Spikelet glum: anthocyanum coloration (characteristic 22)
- (d) Panicle: angle of branches (characteristic 11)
- (e) Grain: color of flower glumes (characteristic 25)

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.

6.5 *Legend*

(*) Asterisked characteristic – see Section 6.1.2

QL Qualitative characteristic – see Section 6.3

QN Quantitative characteristic – see Section 6.3

PQ Pseudo-qualitative characteristic – see Section 6.3

MG: single measurement of a group of plants or parts of plants – see Section 3.3.3

MS: measurement of a number of individual plants or parts of plants – see Section 3.3.3

VG: visual assessment by a single observation of a group of plants or parts of plants
– see Section 3.3.3

VS: visual assessment by observation of individual plants or parts of plants
– see Section 3.3.3

(+) See Explanations on the Table of Characteristics in Chapter 8.

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

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielsorten/ Variedades ejemplo	Note/ Nota
1. (*)	56-59 MG	Leaf: attitude of blade				
QN	erect				Saratovske 8	1
	semi-erect				Kyivske 87, Veselopodilske 16	3
	horizontal				Kyivske 96, Myronivske 51	5
	drooping				Voronizke 899	7
2. (*)	56-59 MG	Leaf: anthocyanin coloration				
QL	absent				Sonyachne	1
	present				Lilove	9
3.	56-59 MG	Leaf: intensity of anthocyanin coloration				
QN	weak				Lilove, Veselopodolyanske 305-54	3
	medium				Veselopodolyanske 403	5
	strong				Irtyskske 201	7
4.	56-59 MG	Flag leaf: length				
QN	short				Veselopodilske 16, Charivne	3
	medium				Kyivske 87, Myronivske 51	5
	long				Kharkivske 71	7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
5.	56-59	Flag leaf: width				
	MG					
QN	narrow				Omske 9, Kharkivske 10	3
	medium				Veselopodolyanske 16, Novo Kyivske 01	5
	broad				Kharkivske 86, Omriyane	7
6.	70-79	Stem: number of nodes				
	MS					
QN	very few				Omske 9	1
	few				Myronivske 51, Kyivske 96	3
	medium				Veselopodilske 16, Kharkivske 86, Novo Kyivske 01	5
	many				Kharkivske kormove	7
7.	70-79	Peduncle: length				
	VG-MS					
QN	short				Veselopodolyanske 534	3
	medium				Myronivske 51, Novo Kyivske 01, Slobozhanske	5
	long				Charivne, Kharkivske 72	7
8.	70-79	Peduncle: thickness				
	VG-MS					
QN	thin				Omske	3
	medium				Veselopodolyanske 632	5
	thick				Myronivske 94, Veselopodilske 16	7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
9. (*)	51-55 VG	Panicle: time of heading				
QN	very early				Omske 9	1
	early				Kyivske 96	3
	medium				Kharkivske 56	5
	late				Kharkivske kormove	7
	very late				Illichovske	9
10. (*)	81-92 MG	Plant: height (including panicle)				
QN	short				Karlik 305, Orlovskiy karlik	3
	medium				Kyivske 96, Kharkivske 86	5
	long				Veselopodilske 16, Kharkivske 57	7
11. (*) (+)	65-69 VG	Panicle: angle of branches				
PQ	acute				Pikulovytske	1
	right angle				Chornomorske	2
	moderately obtuse				Kyivske 87, Veselopodilske 16	3
	strongly obtuse				Omske 9	4
12. (*)	65-69 VG	Panicle: attitude				
PQ	erect				Omske 9	1
	semi-erect				Veselopodolyanske 305- 54, Charivne	2
	slightly drooping				Kyivske 96	3
	drooping				Kharkivske 57	4

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
13.	81-89	Panicle: length				
	MS					
QN	very short				Pikulovytske	1
	short				Charivne	3
	medium				Kyivske 96	5
	long				Myronivske 94, Novokyivske 01	7
	very long				Kyivske 87, Veselopodolyanske 176	9
14.	65-69	Panicle: width				
	MS					
QN	narrow				Novokyivske 01, Kharkivske 57	3
	medium				Myronivske 94, Slobozhanske	5
	broad				Kyivske 87, Veselopodolyanske 305- 54	7
15.	65-79	Panicle: density				
	MS					
	(*) (+)					
QN	loose				Myronivske 51	3
	medium				Charivne	5
	dense				Pikulovytske	7
16.	65-69	Panicle: direction of trail of branches				
	VG					
	(+)					
PQ	deflect in one direction				Horlynka	1
	deflect in two directions				Voronizhske 972, Saratovske 8	2
	deflect in three directions				Novokyivske 01, Slobozhanske	3
	deflect in all directions				Veselopodilske 16, Kyivske 87	4

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
17.	65-69	Panicle:				
(+)	VG	Branches: degree of trailing				
QN	absent or very weak				Charivne	1
	weak				Raduha, Kharkivske 71	3
	medium				Novokyivske 01, Slobzhanske	5
	strong				Myronivske 51, Kharkivske 31	7
	very strong				Veselopodolyanske 38	9
18.	73-79	Panicle: presence of pillows				
	VS					
PQ	absent				Charivne, Omriyane	1
	present					9
18a.	73-79	Panicle: presence of pillows on branches				
	VS					
QN	1-2 branches only				Myronivske 51, Novokyivske 01	1
	up to 1/2 of panicle				Sredneruske	3
	up to 2/3 of panicle				Zoryane, Imunne 366	5
	present in all				Syayvo, Veselopodolyanske 632	7
19.	65-79	Panicle:				
(+)	MG	Branches: length of primary branches				
QN	very short				Pikulovyske	1
	short				Charivne, Kharkivske 86	3
	medium				Myronivske 51, Veselopodilske 16,	5
	long				Veselopodolyanske 176, Slobzhanske	7
	very long				Voronizhske 884	9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
20.	81-92	Spikelet: shape				
	VS					
PQ		oblong-elliptical			Sonyachne	1
		elliptical			Veselopodolyanske 176, Lilove	2
		orbicular			Charivne	3
21.	80-92	Spikelets: intensity of yellow coloring				
	VG					
QN		light			Raduha	3
		medium			Sonyachne	5
		dark			Kyivske 96	7
22.	70-79	Spikelets glume: anthocyanin coloration				
(*)	VG					
QL		absent			Myronivske 51	1
		present			Lilove	9
23.	70-79	Spikelets glume: intensity of anthocyanin coloration				
	VG					
QN		weak			Veselopodolyanske 403	3
		medium			Podolyanske 24/273	5
		strong			Lilove	7
24.	60-65	Stigma: coloring				
	VG					
PQ		light pink			Kyivske 96, Kharkivske 31	1
		violet			Lilove	2

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	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
25. (*)	90-92 VG	Grain: glume color				
PQ	white				Tonkoplivchaste 048	1
	cream				Novokyivske 01	2
	light yellow				Veselopodolyanske 38	3
	yellow				Myronivske 51	4
	dark yellow				Saratovske 2	5
	golden				Zolotyste	6
	light red					7
	red				Lilove	8
	dark red				Veselopodolyanske 305-54	9
	chestnut				Chomosimyanne 1	10
	brown				Amurske mistseve	11
26. (*)	90-92 VG	Grain: glume spotting				
QL	absent					1
	present				Charivne	9
27. (*) (+)	90-92 VS	Grain: shape				
PQ	globular				Novokyivske, Charivne, Veselopodolyanske 63201	1
	ovate				Myronivske 94, Kyivske 96, Myronivske 51, Kyivske 87	2
	oblong					3

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
28.	90-92 VG	Grain: size of sport				
QN	small					3
	medium					5
	large				Charivne	7
29. (*) (+)	90-92 VS	Grain: size				
QN	small				Omske 9	3
	medium				Myronivske 51, Syayvo	5
	large				Veselopodolyanske 176, Kyivske 96	7
	very large				Horlinka	9
30. (*)	90-92 MG	Weight per 1000 kernels				
QN	very low					1
	low				Ostrohovske 9	3
	medium				Sonyachne	5
	high				Myronivske 51, Kharkivske 86	7
	very high				Kyivske 96, Veselopodilske 16	9
31.	90-92 VG	Kernel (ungrinded): coloring				
PQ	whitish				Veselopodolyanske 176	1
	light yellow				Kyivske 96	2
	yellow				Omriyane	3
	bright yellow					4
	green-yellowish					5

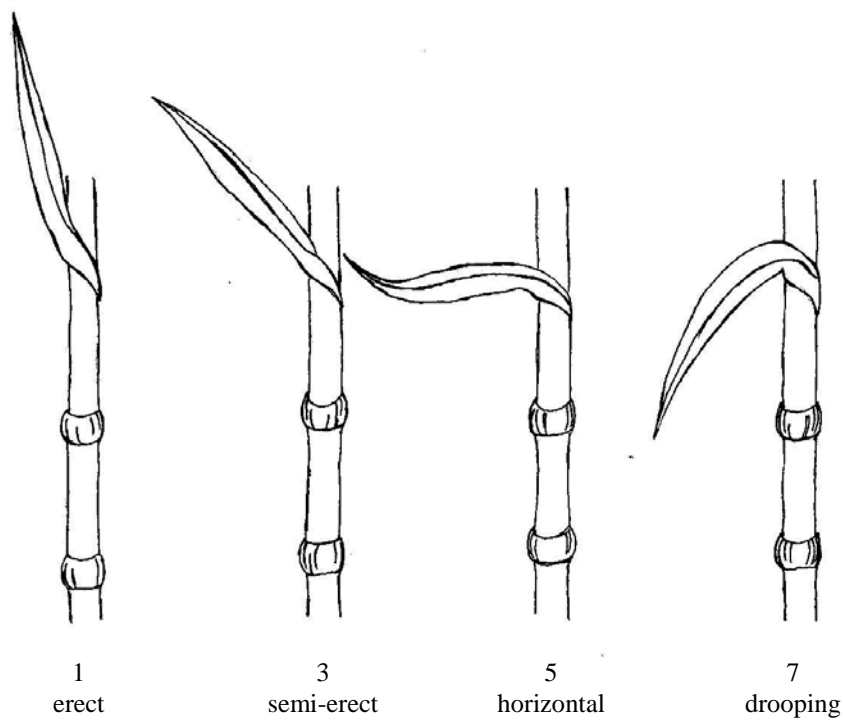
	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
32.	92	Kernel: intensity of brown coloring of placental spot				
	VG					
QN	light				Sonyachne	3
	medium				Myronivske 51	5
	dark (almost dark)				Novokyivske 01	7
33.1	57-59	Resistance to affection by smut races (Sporisorium destruens: Yank)				
	VS					
(+)						
QL	Race 1					
	absent				Myronivske 51	1
	present				Raduha	9
33.2	57-59	Resistance to affection by smut races (Sporisorium destruens: Yank)				
	VS					
(+)						
QL	Race 2					
	absent				Myronivske 51	1
	present				Novokyivske 01	9
33.3	57-59	Resistance to affection by smut races (Sporisorium destruens: Yank)				
	VS					
(+)						
QL	Race 3					
	absent				Myronivske 51	1
	present				Kharkivske 56	9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
33.4	57-59	Resistance to affection by smut races (Sporisorium destruens: Yank)				
(+)	VS					
QL		Race 4				
		absent			Myronivske 51	1
		present			Kyivske 87	9
33.5	57-59	Resistance to affection by smut races (Sporisorium destruens: Yank)				
(+)	VS					
QL		Race 5				
		absent			Myronivske 51	1
		present			Kyivske 87	9
33.6	57-59	Resistance to affection by smut races (Sporisorium destruens: Yank)				
(+)	VS					
QL		Race 6				
		absent			Myronivske 51	1
		present			Kyivske 87	9

8. Explanations on the Table of Characteristics

8.1 *Explanations for individual characteristics*

Ad. 1. Leaf: attitude of blade



Ad. 2. Leaf: anthocyanin coloration

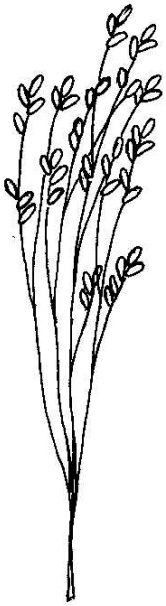
absent (1)
present (9)

Ad. 3. Leaf: intensity of anthocyanin coloration

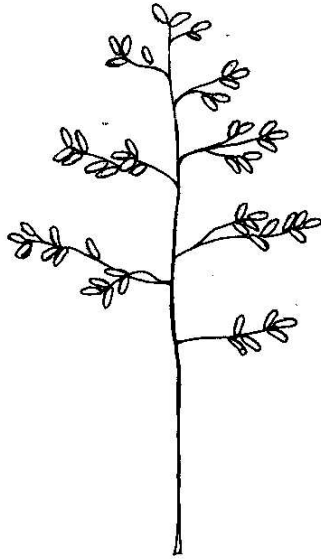
According to the TGP/7/1 document (annex 3, point 3.6 Coloration) different leaf anthocyanin coloration intensity is given in accordance with:

weak (3)
medium (5)
strong (7)

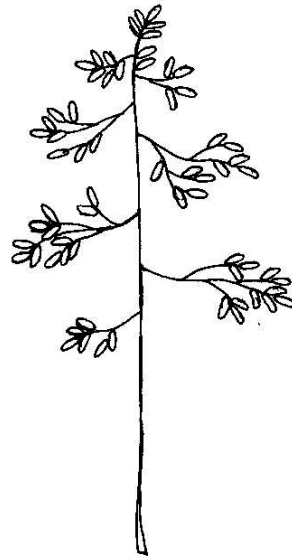
Ad. 11: Panicle: angle of branches



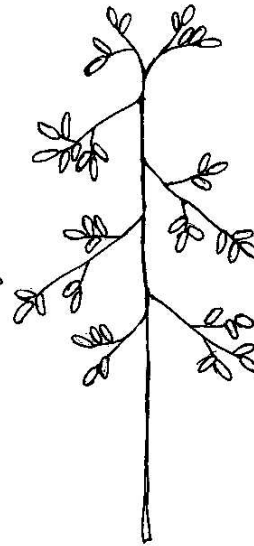
1
acute



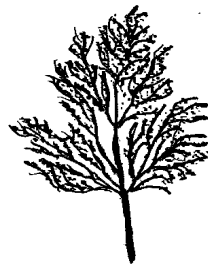
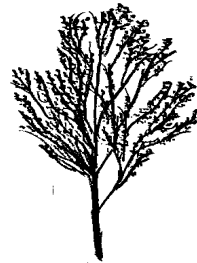
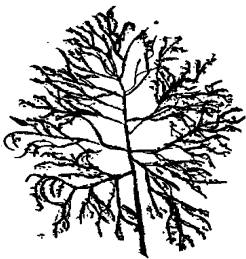
2
right angle



3
moderate obtuse



4
strongly obtuse



Ad. 15. Panicle: density

The density of panicle is determined by the division of the number of primary branches into length of a principal axis of panicle.



Ad. 16. Panicle: direction of trail of branches

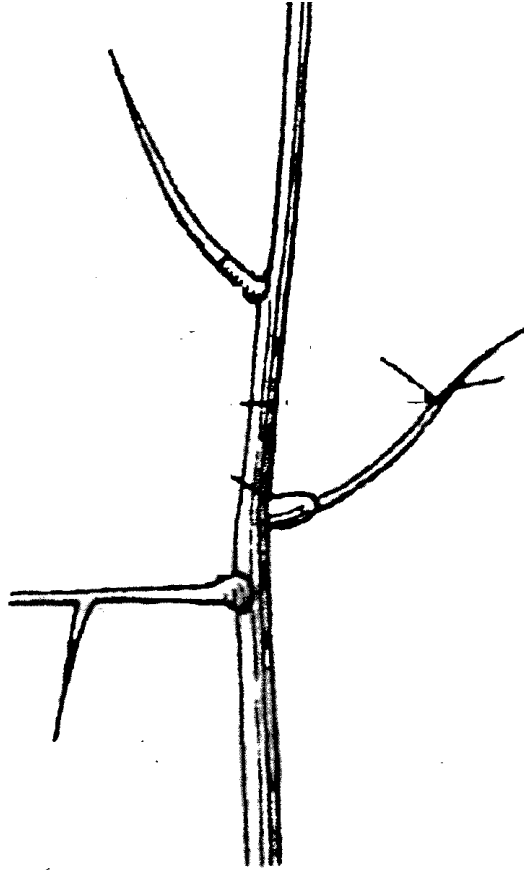
- in one direction (1)
- in two directions (2)
- in three directions (3)
- in all directions (4)

Ad. 17. Branches: degree of trailing

- absent or very weak (1), when branches are pressed to the main axis of panicle;
- weak (3), when branches are partly deviated from the main axis of panicle;
- medium (5), when branches are weakly drooping, more in the lower part;
- strong (7), when 1 branches are strongly drooping along whole axis;
- very strong (9), when 1 and 2 branches are strongly drooping.

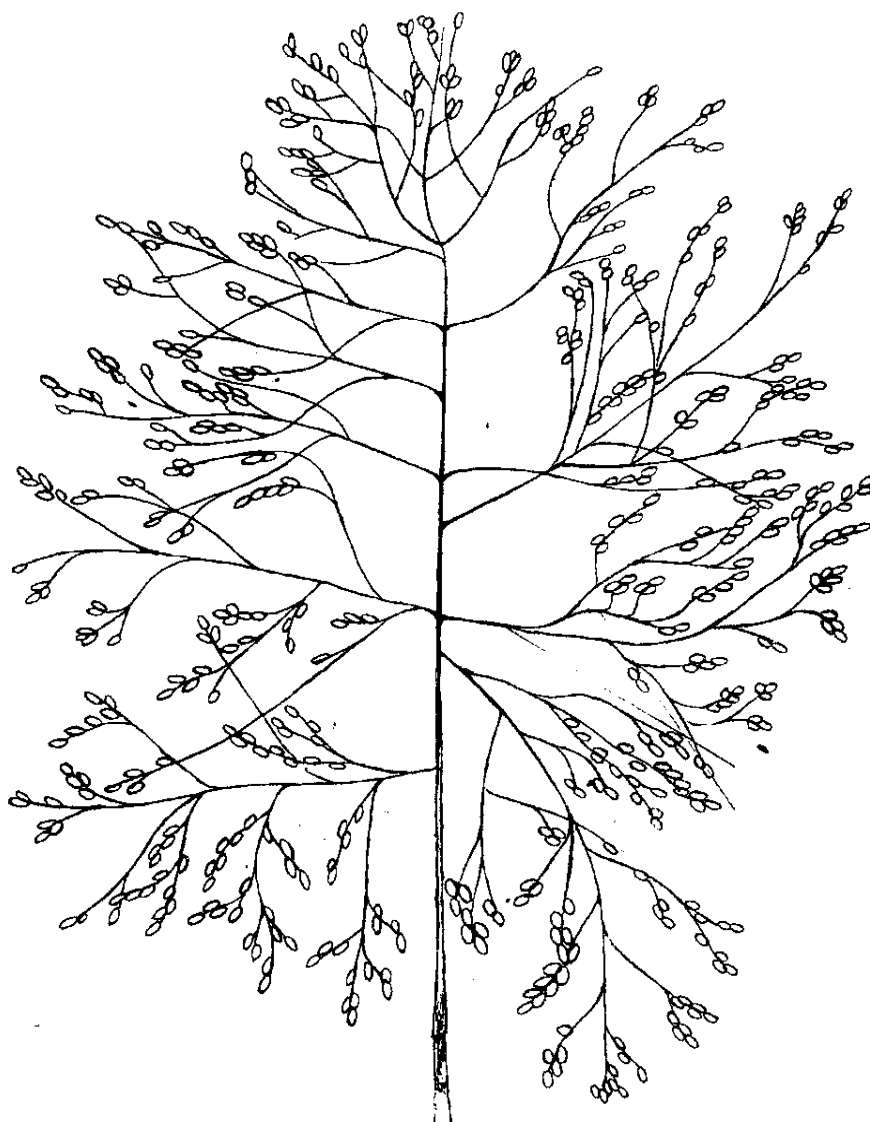
Ad. 18. Panicle: presence of pillows in accordance with:

- absent (1), absent or weakly expressed;
- present (9), principally meet in the lower part of panicle or present on the basis of every branch.



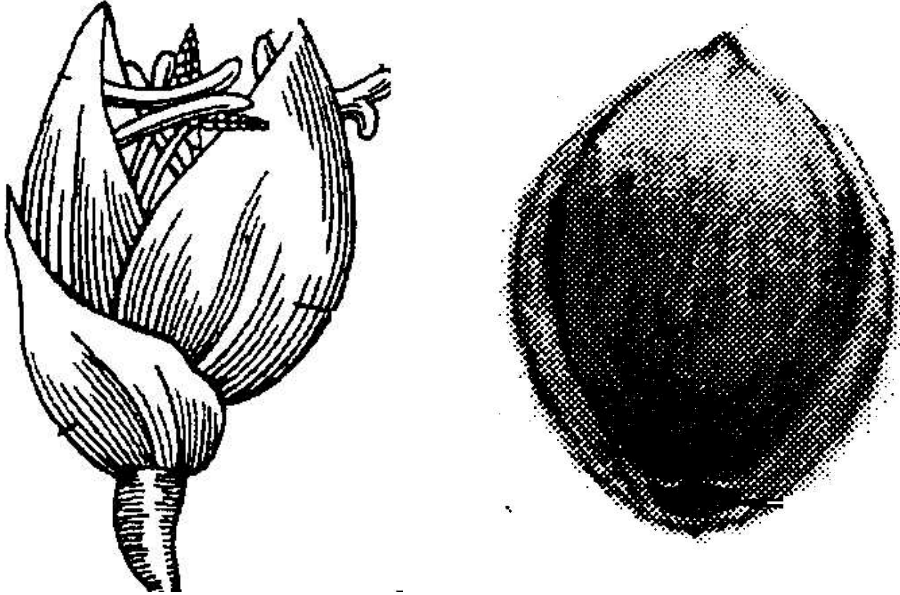
Ad. 19. Branches: length of primary branches

very short	(1)	<8,0 cm;
short	(3)	8,1-12,0 cm;
medium	(5)	12,1-16,0 cm;
long	(7)	16,1-20,0 cm;
very long	(9)	>20,0 cm.



Ad. 24. Stigma: coloring

- light pink (1)
- violet (3)



Ad. 32. Kernel: intensity of brown coloring of placental spot



1
light



2
medium



3
dark

Ad. 27. Grain: shape

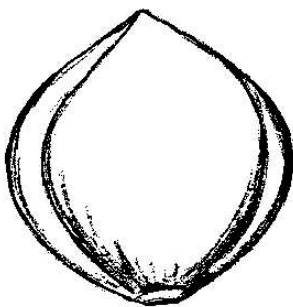
The shape of grain (V_{gc}) is calculated as a part of real grain volume from theoretical one of globe

$$V = \frac{V_{fact}}{V_{the}} \quad (1)$$

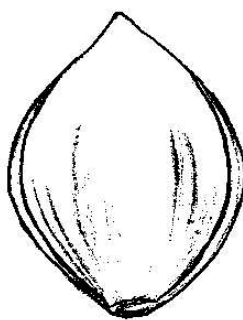
$$V_{theor.} = 1 \times 0,5236, \text{ where} \quad (2)$$

$$V_{fact} = 0,5236 \times (l/w/t), \quad (3)$$

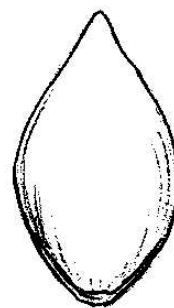
where l = length; t = thickness (t) and w = width of the grain



1
globular



2
ovate



3
oblong

Ad. 29. Grain: size

The grain size is its geometrical quantity (GQC), which is determined by a formula:

$GQC = \sqrt{l \times w \times t}$, where l , t , w , accordingly measurable parameters of length (l), thickness (t) and width (w) of the grain.

-very small	(3)	<2,0mm.
-small	(5)	2,01-2,5mm.
-large	(7)	2,51-2,7mm.
-very large	(9)	>2,7mm.

Ad. 33.1 – 33.6: Resistance to affection by smut races (*Sporisorium destruens*: Yank)

Method for determination of resistance to affection by smut races

Type of medium	Conditions for inoculation
Smut races for use	1, 2, 3, 4, 5, 6
Inoculum	The spores must be viable and ripe for using of each race separately
Method of inoculation	Mechanical one: before sowing grains and smut spores carefully are mixed either hands or in paper packets, heavily shaking 100 seeds are infected with each race
Infectious load	Non less than 0,2% spores to seed weight
Place of growing	Field or hothouse conditions
Observations	Evaluation (resistance, susceptibility) and description of a response (normal or pathomorphous, dwarf plants) are carried out in a full heading phase at typical healthy plants. On each strain sample against each race specific background the number of healthy (R) and affected (S) plants is calculated the degree of affection in percent is determined. If the affected plants are not revealed (of the single affected plants are revealed), the variety is evaluated as resistant to specific race. All other results a response “susceptibility” (non-resistance) from affected plants, which tested and attributed to the spore material of smut.
Remark:	It is possible to receive races for testing at the Institute of Agriculture (Chabany, Kyevo-Svyatoshynskyi district, Kyiv region 08162, Ukraine).

8.2 Code for the growth stage

Decimal Code for the Growth Stages of Cereals

2-digit Code	General Description	Feekes Scale
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 through coleoptile	1
11	First leaf unfolded	1
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	3
24	Main shoot and 4 tillers	3
25	Main shoot and 5 tillers	3
26	Main shoot and 6 tillers	3
27	Main shoot and 7 tillers	3
28	Main shoot and 8 tillers	3
29	Main shoot and 9 or more tillers	
Stem elongation		
30	Pseudo stem erection (2)	4-5
31	1st node detectable	6
32	2nd node detectable	7
33	3rd node detectable	
34	4th node detectable	
35	5th node detectable	

36	6th node detectable	
37	Flag leaf just visible	8
38		
39	Flag leaf/collor just visible	9
Booting		
40		
41	Flag leaf sheath extending	
42		
43	Boots just visible swollen	10
44		10
45	Boots swollen	10
46		
47	Flag leaf sheath	10,1
48		-/-
49	First awns visible	-/-
Inflorescence emergence		
50	First spikelet of inflorescence just visible	-/-
51	-/- -/- -/-	-/-
52	1/4 of inflorescence emerged	10,2
53	-/- -/- -/-	-/-
54	1/2 of inflorescence emerged	10,3
55	-/- -/- -/-	-/-
56	3/4 of inflorescence emerged	10,4
57	-/- -/- -/-	-/-
58	Emergence of inflorescence completed	10,5
59	-/- -/- -/-	-/-
Anthesis		
60	Beginning of anthesis	10,51
61	-/- -/- -/-	-/-
62		
63		
64	Anthesis half-way	10,52
65	-/- -/- -/-	-/-
66		
67		
68	Anthesis complete	10,53
69	-/- -/- -/-	-/-
Milk development		
70		
71	Caryopsis watery ripe	
72		
73	Early milk	11,1
74		
75	Medium milk	11,1
76		
77	Late milk	11,1
78		

79		
Dough development		
80		
81		
82		
83	Early dough	11,2
84		
85	Soft dough	11,2
86		
87	Hard dough	11,2
88		
89		
Ripening		
90		
91	Caryopsis hard (difficult to divide by thumbnail) (3)	11,3
92	Caryopsis hard (can no longer be dented by thumbnail) (4)	11,4
93	Caryopsis loosening in daytime	
94	Over-ripe, straw dead and collapsing	
95	Seed dormant	
96	Viable seed giving 50% germination	
97	Seed not dormant	
98	Secondary dormancy induced	
99	Secondary dormancy lost	
T1	Unrooting of seedlings	
T2		
T3	Rooting	
T4		
T5		
T6		
T7	Recovery of shoots	
T8		
T9	Resumption of vegetative growth	

9. Literature

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13. Document UPOV TG/26/4 Rev. “Harmonization of States of Expression and Notes Of Characteristics”. Geneva. - 1990. -17 p.

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="Panicum miliaceum L."/>	
1.2 Common name	<input type="text" value="Common 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

(i) 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

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 Leaf: attitude of blade		
(1)		
erect	Saratovske 8	1[...]
semi-erect	Veselopodilske 16, Kyivske 87	3[...]
horizontal	Myronivske 51, Kyivske 596	5[...]
drooping	Voronizke 899	7[...]

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

Characteristics	Example Varieties	Note
5.2 Leaf: anthocyanin coloration (2)		
absent	Sonyachne	1
present	Lilove	9
5.3 Panicle: angle of branches (11)		
acute	Pikulovytske	1[...]
right angle	Chomomorske	2[...]
moderately obtuse	Kyivske 87, Veselopodilske 16	3[...]
strongly obtuse	Omske 9	4[...]
5.4 Panicle: attitude (12)		
erect	Omske 9	1[...]
semi-erect	Veselopodolianske 304-54, Charivne	2[...]
slightly drooping	Kyivske 96	3[...]
drooping	Kharkivske 57	4[...]
5.6 Panicle: density (15)		
loose	Myronivske 51	3[...]
medium	Charivne	5[...]
dense	Pikulovytske	7[...]
5.5 Panicle: direction of trail of branches (16)		
deflect in one direction	Horlynka	1[...]
deflect in two directions	Voronizhske 972, Saratovske 8	2[...]
deflect in three directions	Novokyivske 01, Slobozhanske	3[...]
deflect in all directions	Veselopodilske 16, Kyivske 87	4[...]

Characteristics	Example Varieties	Note
5.7 Spikelet: shape (20)		
oblong-elliptical	Sonyachne	1[...]
elliptical	Veselopodolyanske 176,	2[...]
orbicular	Lilo harivne	3[...]
5.8 Spikelets glume: anthocyanin coloration (22)		
absent	Myronivske 51	1[...]
present	Lilove	9[...]
5.9 Grain: glume color (25)		
white	Tonkoplivchaste 048	1[...]
cream	Novokyivske 01	2[...]
light yellow	Veselopodolyanske 38	3[...]
yellow	Myronivske 51	4[...]
dark yellow	Saratovske 2	5[...]
golden	Zolotyste	6[...]
light red		7[...]
red	Lilove	8[...]
dark red	Veselopodolyanske 305-54	9[...]
chestnut	Chornosimyanne 1	10[...]
brown	Amurske mistseve	11[...]
5.10 Grain: glume spotting (26)		
absent		1[...]
present	Charivne	9[...]
Characteristics	Example Varieties	Note
5.10 Grain: shape (27)		
globular	Novokyivske, Charivne, Veselopodolyanske 63201	1[...]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
ovate		Myronivske 94, Kyivske 96, 2[...] Myronivske 51, Kyivske 87
oblong		3[...]
5.11 Grain: size (28)		
small		Omske 9 3[...]
medium		Myronivske 51, Syayvo 5[...]
large		Veselopodolianske 176, 7[...] Kyivske 96
very large		Horlinka 9[...]
5.12 Weight per 1000 kernels (30)		
very low		
low		Ostrohovske 9 3[...]
medium		Sonyachne 5[...]
high		Myronivske 51, Kharkivske 7[...] 86
very high		Kyivske 96, 9[...] Veselopodolianske 16
5.13 Kernel (ungrinded): coloring (31)		
whitish		Veselopodolyanske 176 1[...]
light yellow		Kyivske 96 2[...]
yellow		Omriyane 3[...]
bright yellow		4[...]
green-yellowish		5[...]

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 your candidate variety
<i>Example</i>			
Comments:			

whitis
h

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
<p>#7. Additional information which may help in the examination of the variety</p> <p>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?</p> <p>Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p>(If yes, please provide details)</p> <p>7.2 Are there any special conditions for growing the variety or conducting the examination?</p> <p>Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p>(If yes, please provide details)</p> <p>7.3 Other information</p>		
<p>8. Authorization for release</p> <p>(a) Does the variety require prior authorization for release under legislation concerning the protection of the environment, human and animal health?</p> <p>Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p>(b) Has such authorization been obtained?</p> <p>Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p>If the answer to (b) is yes, please attach a copy of the authorization.</p>		

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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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 of 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]