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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS
GENEVA

COMMON MILLET UPOV Code: PANIC_MIL <i>Panicum miliaceum</i> L.	*
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GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

Alternative Names:*

<i>Botanical name</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 document TG/1/3, “General Introduction to the Examination of Distinctness, Uniformity and Stability and the Development of Harmonized Descriptions of New Varieties of Plants” (hereinafter referred to as 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 *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 phyto-sanitary requirements are complied with.

2.2 The material is to be supplied in the form of seeds and, if requested by the competent authority, panicles should also be submitted.

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

seed: 1 kg; and
panicles (if requested): 100.

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. Panicles 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.

3.3.3 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

3.4 *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 100 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 should be 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 on row plots, a population standard of 0.1% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 1,000 plants, 3 off-types are allowed.

4.2.3 Single panicle rows: 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 100 panicle rows, 3 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) Time of panicle emergence (characteristic 9)
- (b) Plant: natural height (characteristic 10)
- (c) Panicle: angle of branches (characteristic 11)
- (d) Glume: anthocyanin coloration (characteristic 21)
- (e) Grain: color (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*

(*) 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 3.3.3

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

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

56-92 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. 56-59 VG (+)	Flag leaf: attitude of blade	Dernière feuille : port du limbe	Oberstes Blatt: Haltung der Blattspreite	Hoja bandera: porte del limbo		
PQ	erect	dressé	aufrecht	erecto	Saratovske 8	1
	semi-erect	demi-dressé	halbaufrecht	semierecto	Kyivske 87, Veselopodilske 16	3
	horizontal	horizontal	waagrecht	horizontal	Kyivske 96, Myronivske 51	5
	semi-drooping	demi-retombant	halbüberhängend	semidescendente	Voronizke 899	7
2. 56-59 VG (*)	Flag leaf: anthocyanin coloration	Dernière feuille : pigmentation anthocyanique	Oberstes Blatt: Anthocyanfärbung	Hoja bandera: coloración antociánica		
QL	absent	absente	fehlend	ausente	Sonyachne	1
	present	présente	vorhanden	presente	Lilove	9
3. 56-59 VG (*)	Flag leaf: intensity of anthocyanin coloration	Dernière feuille : intensité de la pigmentation anthocyanique	Oberstes Blatt: Intensität der Anthocyanfärbung	Hoja bandera: intensidad de la coloración antociánica		
QN	weak	faible	gering	débil	Lilove, Veselopodolyanske 305	3
	medium	moyenne	mittel	media	Veselopodolyanske 403	5
	strong	forte	stark	fuerte	Irtyskske 201	7
4. 56-59 MS	Flag leaf: length	Dernière feuille : longueur	Oberstes Blatt: Länge	Hoja bandera: longitud		
QN	short	courte	kurz	corta	Charivne, Veselopodilske 16,	3
	medium	moyenne	mittel	media	Kyivske 87, Myronivske 51	5
	long	longue	lang	larga	Kharkivske 71	7

	English	français	Deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
5.	56-59 MS	Flag leaf: width	Dernière feuille : largeur	Oberstes Blatt: Breite	Hoja bandera: anchura	
QN	narrow	étroite	schmal	estrecha	Kharkivske 10, Omske 9	3
	medium	moyenne	mittel	media	Novo Kyivske 01, Veselopodolyanske 16	5
	broad	large	breit	ancha	Kharkivske 86, Omriyane	7
6.	70-79 MS	Stem: number of nodes	Tige : nombre de nœuds	Halm: Anzahl Knoten	Tallo: número de nudos	
QN	very few	très petit	sehr gering	muy bajo	Omske 9	1
	few	petit	gering	bajo	Kyivske 96, Myronivske 51	3
	medium	moyen	mittel	medio	Kharkivske 86, Novo Kyivske 01 Veselopodilske 16	5
	many	grand	groß	alto	Kharkivske kormove	7
7. (* (+)	70-79 VG/ MS	Stem: length of upper internode	Tige : longueur de l'entre-nœud supérieur	Halm: Länge des oberen Internodiums	Tallo: longitud del entrenudo superior	
QN	short	court	kurz	corto	Veselopodolyanske 534	3
	medium	moyen	mittel	medio	Myronivske 51, Novo Kyivske 01, Slobozhanske	5
	long	long	lang	medio	Charivne, Kharkivske 72	7
8. (+)	70-79 VG/ MS	Stem: thickness of internode	Tige : épaisseur de l'entre-nœud	Halm: Dicke des Internodiums	Tallo: grosor del entrenudo	
QN	thin	mince	dünn	delgado	Omske	3
	medium	moyenne	mittel	medio	Veselopodolyanske 632	5
	thick	épaisse	dick	grueso	Myronivske 94, Veselopodilske 16	7

	English	français	Deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
9. (*)(+)	MG	Time of panicle emergence	Époque de l'apparition de la panicule	Zeitpunkt des Rispenschiebens	Época de emergencia de la panícula	
QN	very early	très précoce	sehr früh	muy temprana	Omske 9	1
	early	précoce	früh	temprana	Kyivske 96	3
	medium	moyenne	mittel	media	Kharkivske 56	5
	late	tardive	spät	tardía	Kharkivske kormove	7
	very late	très tardive	sehr spät	muy tardía	Illichovske	9
10. (*)(+)	81-92 MG	Plant: natural height	Plante : hauteur naturelle	Pflanze: natürliche Höhe	Planta: altura	
QN	short	basse	niedrig	baja	Karlik 305, Orlovskiy karlik	3
	medium	moyenne	mittel	media	Kharkivske 86, Kyivske 96	5
	long	haute	hoch	alta	Kharkivske 57, Veselopodilske 16	7
11. (*)(+)	65-69 VG	Panicle: angle of branches	Panicule : angle des ramifications	Rispe: Winkel der Seitenäste	Panícula: ángulo de las ramas	
QN	very acute	très aigu	sehr spitz	muy agudo	Pikulovytske	1
	moderately acute	moyennement aigu	mäßig spitz	moderadamente agudo		2
	right angle	angle droit	rechtwinklig	recto	Chornomorske	3
	moderately obtuse	moyennement obtus	mäßig stumpf	moderadamente obtuso	Kyivske 87, Veselopodilske 16	4
	very obtuse	très obtus	sehr stumpf	muy obtuso	Omske 9	5

	English	français	Deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
12. 65-69 (*) VG (+)	Panicle: attitude	Panicule : port	Rispe: Haltung	Panícula: porte		
PQ	erect	dressé	aufrecht	erecta	Omske 9	1
	semi-erect	demi-dressé	halbaufrecht	semierecta	Charivne, Veselopodolyanske 305-54	2
	moderately drooping	moyennement retombant	leicht überhängend	moderadamente colgante	Kyivske 96	3
	strongly drooping	fortement retombant	stark überhängend	fuertemente colgante	Kharkivske 57	4
13. 65-69 (+) MS	Panicle: length (excluding peduncle)	Panicule : longueur (pédoncule non compris)	Rispe: Länge (ohne Blütenstandsstiel)	Panícula: longitud (excluido el pedúnculo)		
QN	very short	très courte	sehr kurz	muy corta	Pikulovytske	1
	short	courte	kurz	corta	Charivne	3
	medium	moyenne	mittel	media	Kyivske 96	5
	long	longue	lang	larga	Myronivske 94, Novokyivske 01	7
	very long	très longue	sehr lang	muy larga	Kyivske 87, Veselopodolyanske 176	9
14. 65-69 (+) MS	Panicle: width	Panicule : largeur	Rispe: Breite	Panícula: anchura		
QN	narrow	étroite	schmal	estrecha	Kharkivske 57, Novokyivske 01	3
	medium	moyenne	mittel	media	Myronivske 94, Slobozhanske	5
	broad	large	breit	ancha	Kyivske 87, Veselopodolyanske 305-54	7
15. 65-69 (*) VG (+)	Panicle: density	Panicule : densité	Rispe: Dichte	Panícula: densidad		
QN	lax	lâche	locker	laxa	Myronivske 51	3
	medium	demi-lâche	mittel	media	Charivne	5
	dense	dense	dicht	densa	Pikulovytske	7

	English	français	Deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
16. 65-69 VG (+)	Panicle: degree of curvature of lateral branches	Panicule : degré de courbure des ramifications latérales	Rispe: Grad der Krümmung der Seitenäste	Panícula: grado de curvatura de las ramas laterales		
QN	absent or very weak	nul ou très faible	fehlend oder sehr gering	ausente o muy débil	Charivne	1
	weak	faible	gering	débil	Raduha, Kharkivske 71	3
	medium	moyen	mittel	media	Novokyivske 01, Slobozhanske	5
	strong	fort	stark	fuerte	Kharkivske 31, Myronivske 51	7
	very strong	très fort	sehr stark	muy fuerte	Veselopodolyanske 38	9
17. 65-69 VG (+)	Panicle: number of pillows	Panicule : nombre de coussins	Rispe: Anzahl Kissen	Panícula: número de almohadillas		
QN	none or very few	aucun ou très peu	fehlend oder sehr gering	nulo o muy bajo	Charivne, Omriyane	1
	few	peu	gering	bajo	Myronivske 51, Novokyivske 01	3
	medium	moyennement nombreux	mittel	medio	Sredneruske	5
	many	nombreux	groß	alto	Imunne 366, Zoryane	7
	very many	très nombreux	sehr groß	muy alto	Syayvo, Veselopodolyanske 632	9
18. 65-69 VG (+)	Panicle: length of primary branches	Panicule : longueur des ramifications principales	Rispe: Länge der Äste erster Ordnung	Panícula: longitud de las ramas primarias		
QN	very short	très courtes	sehr kurz	muy cortas	Pikulovytske	1
	short	courtes	kurz	cortas	Charivne, Kharkivske 86	3
	medium	moyennes	mittel	medias	Myronivske 51, Veselopodilske 16	5
	long	longues	lang	largas	Slobozhanske, Veselopodolyanske 176	7
	very long	très longues	sehr lang	muy largas	Voronizhske 884	9

	English	français	Deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
19. 81-92 (*) VG (+)	Spikelet: shape	Épillet : forme	Ährchen: Form	Espiguilla: forma		
QN	narrow elliptic	elliptique étroite	schmal elliptisch	elíptica estrecha	Sonyachne	1
	broad elliptic	elliptique large	breit elliptisch	elíptica ancha	Lilove, Veselopodolyanske 176	2
	circular	circulaire	kreisförmig	circular	Charivne	3
20. 80-92 VG	Spikelet: intensity of yellow color	Épillet : intensité de la couleur jaune	Ährchen: Intensität der Gelbfärbung	Espiguilla: intensidad del color amarillo		
QN	light	claire	hell	claro	Raduha	3
	medium	moyenne	mittel	medio	Sonyachne	5
	dark	foncée	dunkel	oscuro	Kyivske 96	7
21. 70-79 (*) VG	Glume: anthocyanin coloration	Glume : pigmentation anthocyanique	Hüllspelze: Anthocyanfärbung	Gluma: coloración antocianica		
QN	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy ausente	Myronivske 51	1
	weak	faible	gering	débil	Veselopodolyanske 403	3
	medium	moyenne	mittel	media	Podolyanske 24/273	5
	strong	forte	stark	fuerte	Lilove	7
22. 60-65 VG	Stigma: color	Stigmate : couleur	Narbe: Farbe	Estigma: color		
QL	light pink	rose clair	hellrosa	rosa claro	Kharkivske 31, Kyivske 96	1
	violet	violet	violett	violeta	Lilove	2
23. 90-92 (*) MS (+)	Grain: size	Grain : taille	Korn: Größe	Grano: tamaño		
QN	small	petite	klein	pequeño	Omske 9	3
	medium	moyenne	mittel	medio	Myronivske 51, Syayvo	5
	large	grande	groß	grande	Kyivske 96, Veselopodolyanske 176	7
	very large	très grande	sehr groß	muy grande	Horlinka	9

	English	français	Deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
24. 90-92 Grain: shape (*) VG (+)		Grain : forme	Korn: Form	Grano: forma		
QN	narrow elliptic	elliptique étroite	schmal elliptisch	elíptica estrecha	Kostiantynivske	1
	broad elliptic	elliptique large	breit elliptisch	elíptica ancha	Kyivske 87, Kyivske 96, Myronivske 51, Myronivske 94	2
	circular	circulaire	kreisförmig	circular	Charivne, Novokyivske, Veselopodolyanske 63201	3
25. 90-92 Grain: color (*) VG		Grain : couleur	Korn: Farbe	Grano: color		
PQ	white	blanc	weiß	blanco	Tonkoplivchaste 048	1
	whitish	blanchâtre	weißlich	blanquecino	Novokyivske 01	2
	light yellow	jaune clair	hellgelb	amarillo claro	Veselopodolyanske 38	3
	medium yellow	jaune moyen	mittelgelb	amarillo medio	Myronivske 51	4
	dark yellow	jaune foncé	dunkelgelb	amarillo oscuro	Saratovske 2	5
	golden	doré	goldfarben	dorado	Zolotyste	6
	light red	rouge clair	hellrot	rojo claro	Tavriyske	7
	medium red	rouge moyen	mittelrot	rojo medio	Lilove	8
	dark red	rouge foncé	dunkelrot	rojo oscuro	Veselopodolyanske 305-54	9
	red brown	rouge-brun	rotbraun	marrón rojizo	Chornosimyanne 1	10
	brown	brun	braun	marrón	Amurske mistseve	11
	black	noir	schwarz	negro	Hexiaoyingmizi	12
26. 90-92 Grain: presence of VG spotting		Grain : taches	Korn: Vorhandensein von Flecken	Grano: presencia de manchas		
QL	absent	absentes	fehlend	ausentes	Denkivske, Lana	1
	present	présentes	vorhanden	presentes	Charivne	9

	English	français	Deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota	
27.	90-92 VG	Grain: size of spots	Grain : taille des taches	Korn: Größe der Flecken	Grano: tamaño de las manchas		
QN	small	petites	klein	pequeño	Skhidne	3	
	medium	moyennes	mittel	medio	Omriane, Zolushka	5	
	large	grandes	groß	grande	Charivne	7	
28.	90-92 MG (*)	Weight per 1000 grains	Grain : poids de 1000 grains	Tausendkorn-gewicht	Peso de 1.000 granos		
QN	very low	très petit	sehr niedrig	muy pequeño	Tonkoplivchaste 048	1	
	low	petit	niedrig	pequeño	Ostrohovske 9	3	
	medium	moyen	mittel	medio	Sonyachne	5	
	high	grand	hoch	grande	Kharkivske 86, Myronivske 51,	7	
	very high	très grand	sehr hoch	muy grande	Kyivske 96, Veselopodilske 16	9	
29.	90-92 VG (*)	Kernel (not polished): color	Cerneau (non poli) : couleur	Nacktes Korn (nicht poliert): Farbe	Cariópside (sin pulir): color		
QN	(a)	whitish	blanchâtre	weißlich	blanquecino	Veselopodolyanske 176	1
		light yellow	jaune clair	hellgelb	amarillo claro	Kyivske 96	2
		medium yellow	jaune moyen	mittelgelb	amarillo medio	Omriyane	3
30.	92 VG (+)	Kernel: intensity of brown color of hilum	Cerneau : intensité de la couleur brune du hile	Nacktes Korn: Intensität der Braunfärbung des Nabels	Cariópside: intensidad del color marrón del hilo		
QN	(a)	light	claire	hell	claro	Sonyachne	3
		medium	moyenne	mittel	medio	Myronivske 51	5
		dark	foncée	dunkel	oscuro	Novokyivske 01	7
31.	92 VG (+)	Kernel: type of endosperm	Cerneau : type d'endosperme	Nacktes Korn: Typ des Endosperms	Cariopse: tipo de endosperma		
QL	(a)	waxy	cireux	wachsig	ceroso		1
		non waxy	non cireux	nicht wachsig	no ceroso		2

	English	français	Deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
32. 57-59 VS	Resistance to smut (<i>Sporisorium destruens</i>: Yank)	Résistance au charbon (<i>Sporisorium destruens</i>)	Resistenz gegen Brand (<i>Sporisorium destruens</i>: Brand an Rispenhirse)	Resistencia al hongo (<i>Sporisorium destruens</i>: Yank)		
32.1	Race 1	Race 1	Pathotyp 1	Raza 1		
QN	susceptible	sensible	anfällig	sensible	Raduha	1
	moderately resistant	modérément résistant	mäßig resistent	moderadamente resistente		2
	highly resistant	très résistant	hoch resistent	muy resistente	Myronivske 51	3

32.2	Race 2	Race 2	Pathotyp 2	Raza 2		
QN	susceptible	sensible	anfällig	sensible	Novokyivske 01	1
	moderately resistant	modérément résistant	mäßig resistent	moderadamente resistente		2
	highly resistant	très résistant	hoch resistent	muy resistente	Myronivske 51	3

32.3	Race 3	Race 3	Pathotyp 3	Raza 3		
QN	susceptible	sensible	anfällig	sensible	Kharkivske 56	1
	moderately resistant	modérément résistant	mäßig resistent	moderadamente resistente		2
	highly resistant	très résistant	hoch resistent	muy resistente	Myronivske 51	3

32.4	Race 4	Race 4	Pathotyp 4	Raza 4		
QN	susceptible	sensible	anfällig	sensible	Kyivske 87	1
	moderately resistant	modérément résistant	mäßig resistent	moderadamente resistente		2
	highly resistant	très résistant	hoch resistent	muy resistente	Myronivske 51	3

32.5	Race 5	Race 5	Pathotyp 5	Raza 5		
QN	susceptible	sensible	anfällig	sensible	Kyivske 87	1
	moderately resistant	modérément résistant	mäßig resistent	moderadamente resistente		2
	highly resistant	très résistant	hoch resistent	muy resistente	Myronivske 51	3

	English	français	Deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
32.6	Race 6	Race 6	Pathotyp 6	Raza 6		
QN	susceptible	sensible	anfällig	sensible	Kyivske 87	1
	moderately resistant	modérément résistant	mäßig resistant	moderadamente resistente		2
	highly resistant	très résistant	hoch resistant	muy resistente	Myronivske 51	3

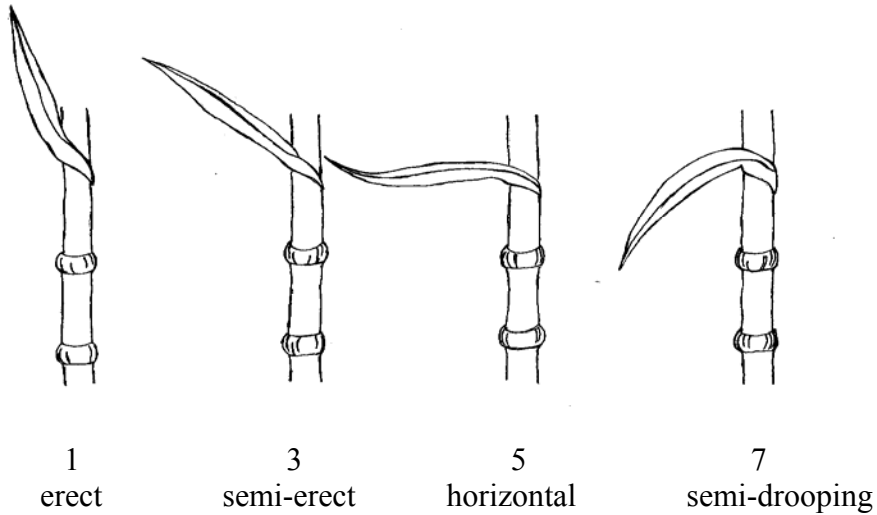
8. Explanations on the Table of Characteristics

8.1 *Explanations covering several characteristics*

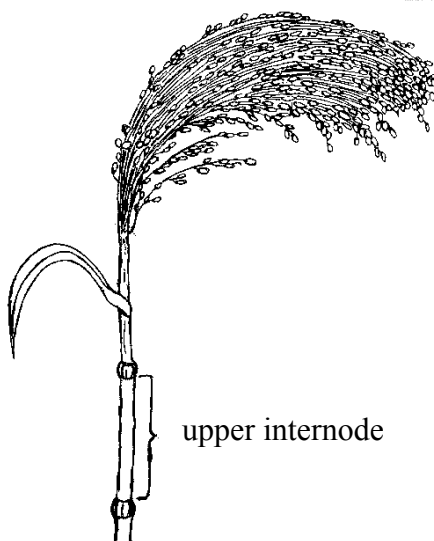
(a) to be observed on dehusked grain without polishing.

8.2 *Explanations for individual characteristics*

Ad. 1: Flag leaf: attitude of blade

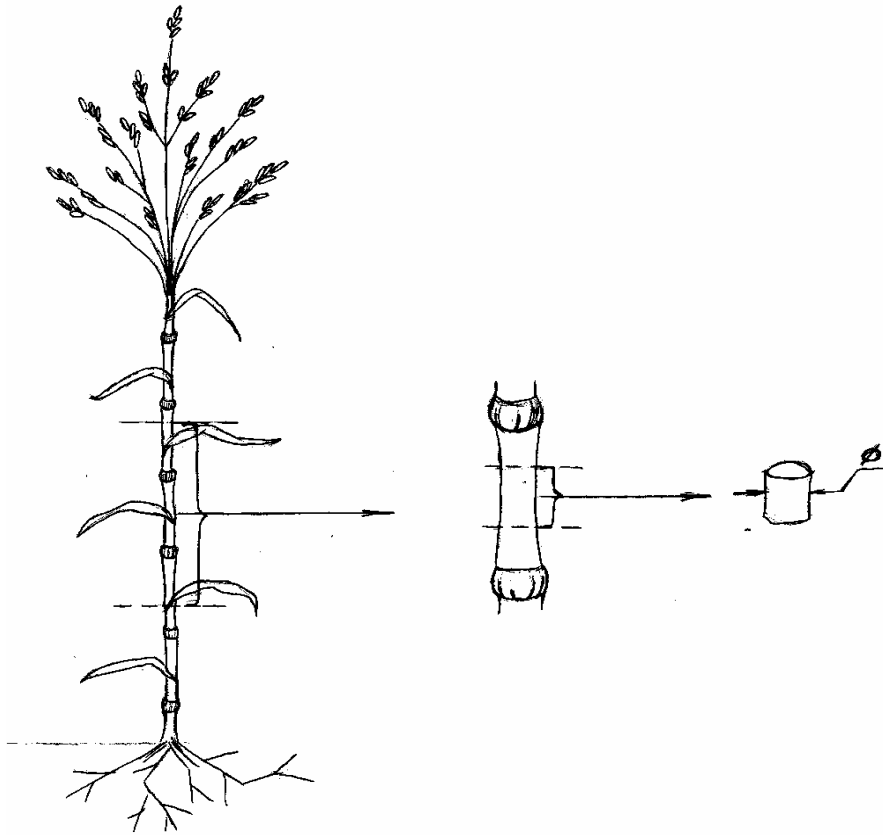


Ad. 7: Stem: length of upper internode



Ad. 8: Stem: thickness of internode

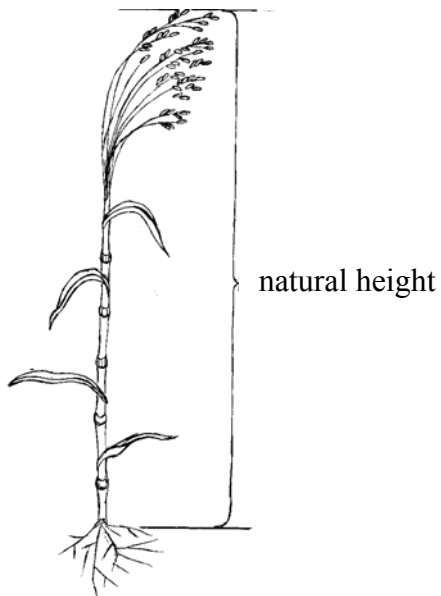
To be observed on the middle third of the plant.



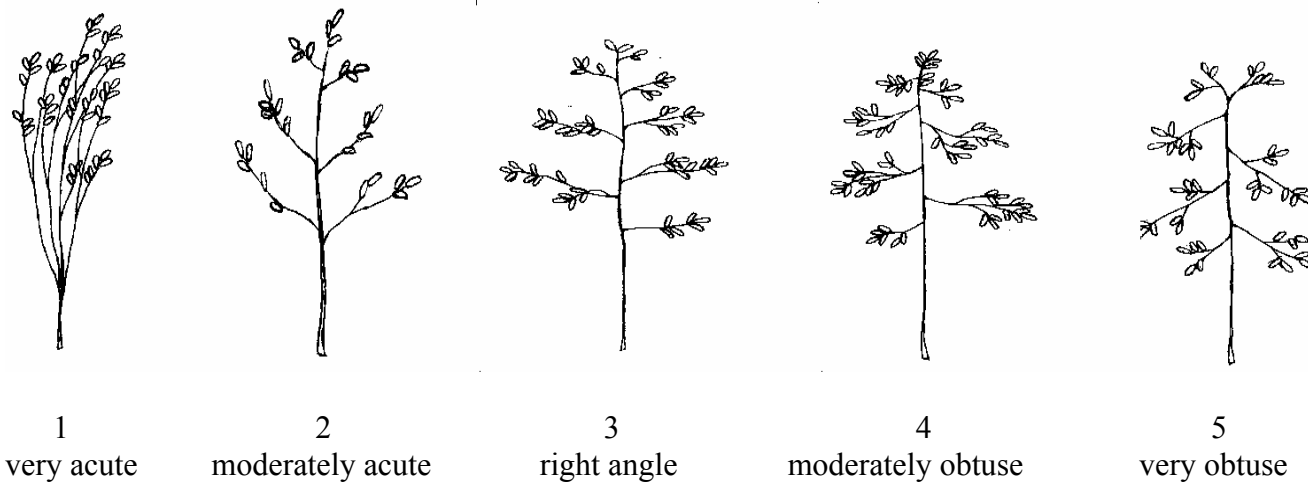
Ad. 9: Time of panicle emergence

The time of panicle emergence is when the first spikelet is visible in 50% of the plants.

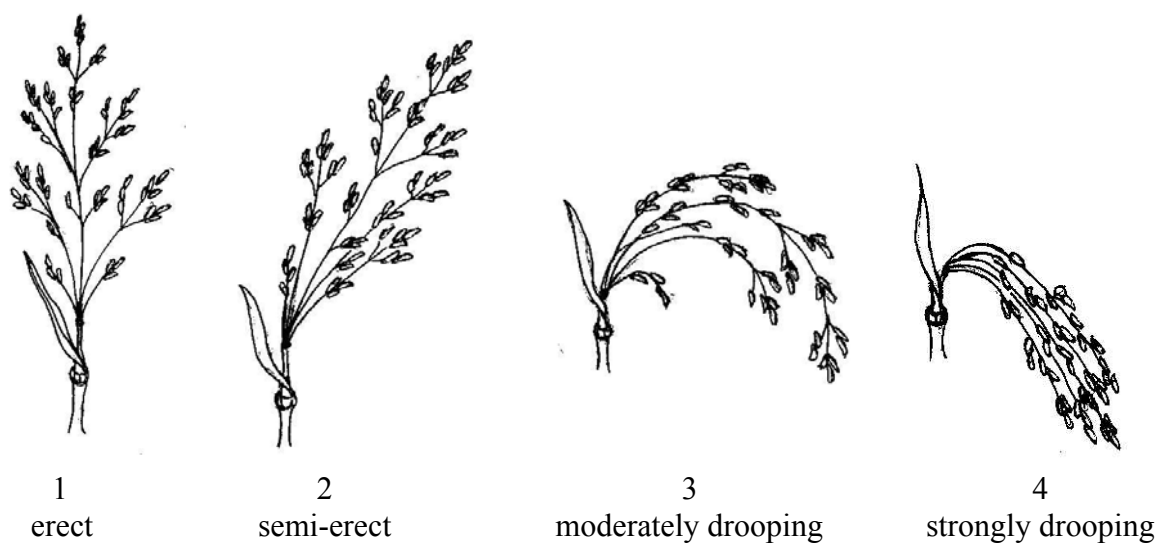
Ad. 10: Plant: natural height



Ad. 11: Panicle: angle of branches

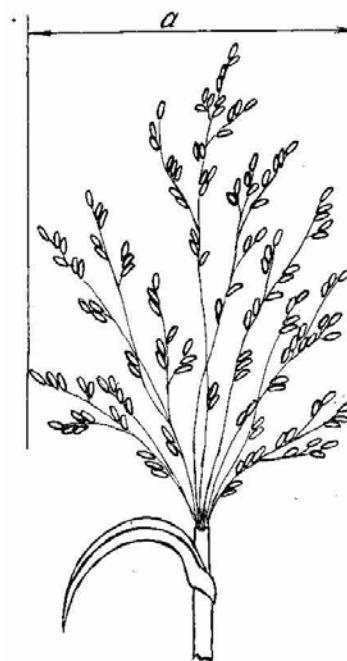
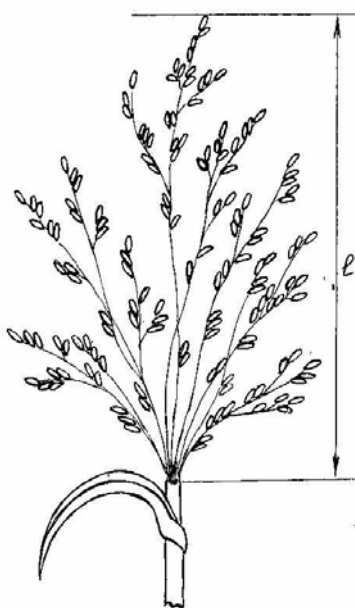


Ad. 12: Panicle: attitude



Ad. 13: Panicle: length (excluding peduncle)

Ad. 14: Panicle: width



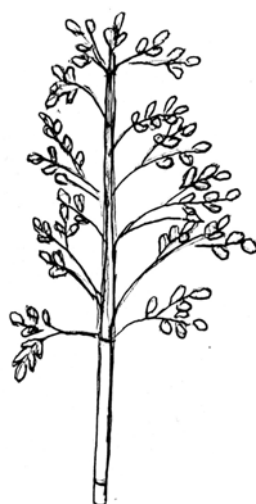
To be observed on 20 harvested panicles on a table.

Ad. 15: Panicle: density

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



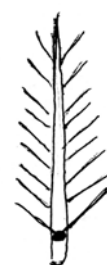
3
lax



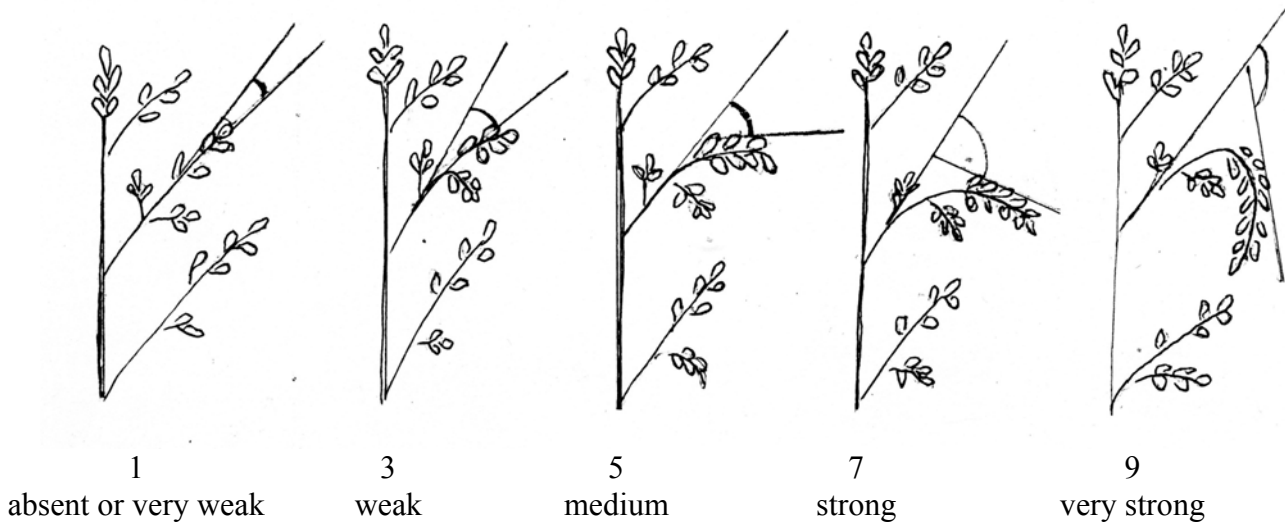
5
medium



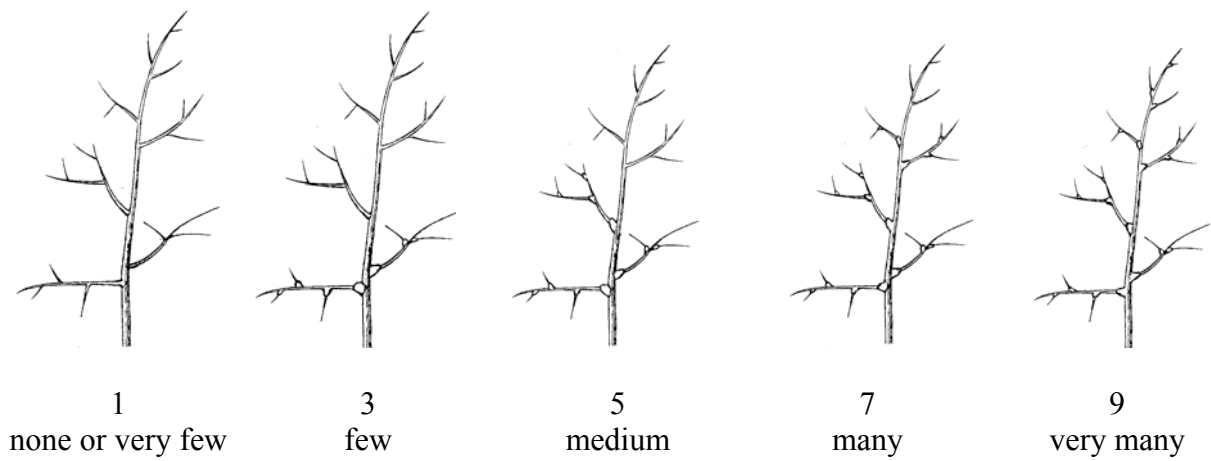
7
dense



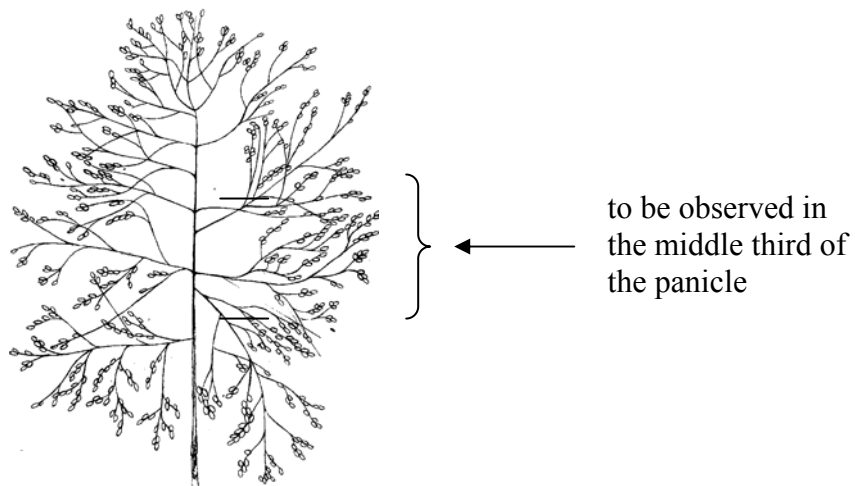
Ad. 16: Panicle: degree of curvature of lateral branches



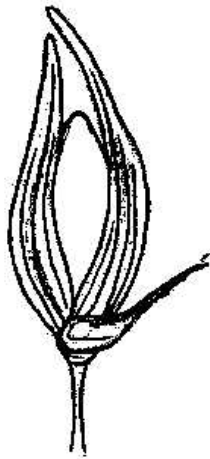
Ad. 17: Panicle: number of pillows



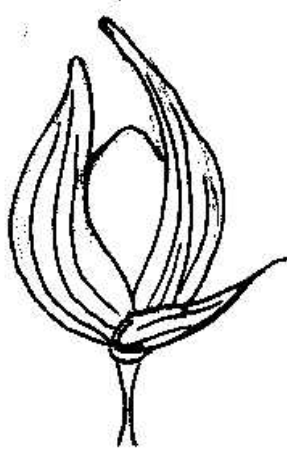
Ad. 18: Panicle: length of primary branches



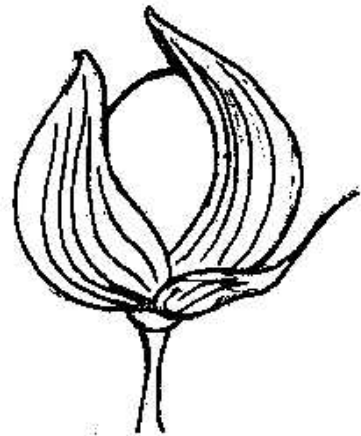
Ad. 19: Spikelet: shape



1
narrow elliptic



2
broad elliptic

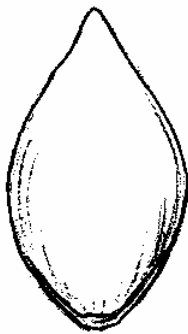


3
circular

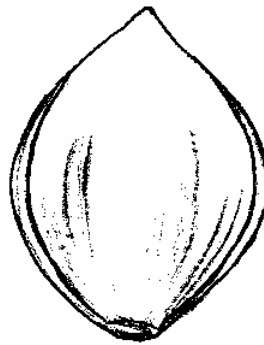
Ad. 23: Grain: size

The grain size should be measured in millimeters.

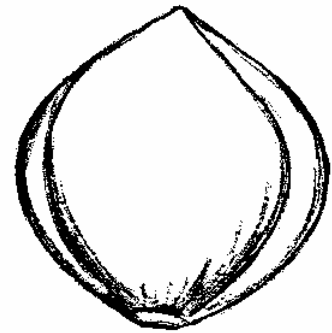
Ad. 24: Grain: shape



1
narrow elliptic

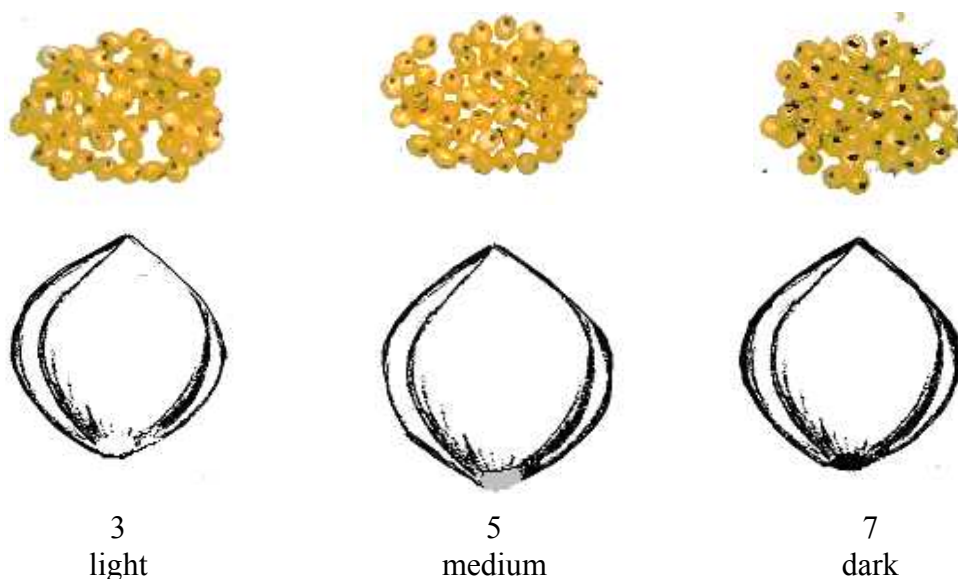


2
broad elliptic



3
circular

Ad. 30: Kernel: intensity of brown color of hilum



Ad. 31: Kernel: type of endosperm

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.

Ad. 32.1 - 32.6: Resistance to smut (*Sporisorium destruens*: Yank)

Method for determination of resistance to infection by smut races:

Inoculum: The spores must be viable and ripe. Each race (1, 2, 3, 4, 5, 6) to be used separately.

Method of inoculation: Before sowing, grains and smut spores are mixed carefully by shaking thoroughly. 100 seeds are infected with each race.

Infection load: 0,2% spores in relation to seed weight

Place of growing: Field

Observations: Observations should be made on healthy plants when inflorescences are fully emerged. For each variety, the number of affected plants is observed. The response of the variety to a specific smut race is described as follows:

Note 1 – susceptible (>50% affected plants)

Note 2 – moderately resistant (5-50% affected plants)

Note 3 – highly resistant (<5% affected plants)

Remark: It is possible to obtain races for testing from the Institute of Agriculture (Chabany, Kyevo-Svyatoshynskyi district, Kyiv region 08162, Ukraine).

8.3 Decimal Code for the Growth Stages of Cereals

2-digit Code (Zadoks Scale)	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		

2-digit Code (Zadoks Scale)	General Description	Feekes Scale
39	Flag leaf/collar 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		

2-digit Code (Zadoks Scale)	General Description	Feekes Scale
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

Артюшенко З.Т., Федоров А. А. Атлас по описательной морфологии высших растений. – Л.: Наука. -1986. -392с.

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Лякин Г.Ф. Биометрия.- М.: Высшая школа, 1990. - 349с.

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Шмидт В. М. Математические методы в ботанике. Издательство Ленинградского университета, 1984.- 285с.

Широкий унифицированный классификатор СЭВ и Международный классификатор СЭВ. Вид *Panicum Miliaceum* L. - Л., 1982. – 24с.

Zadoks, J.C., Chang T.T. and 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	Panicum miliaceum L.	
1.2 Common name	Common 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:
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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)
- (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:
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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 Flag leaf: anthocyanin coloration (2)		
absent	Sonyachne	1[]
present	Lilove	9[]
5.2 Flag leaf: intensity of anthocyanin coloration (3)		
weak	Lilove, Veselopodolyanske 305	3[]
medium	Veselopodolyanske 403	5[]
strong	Irtyskske 201	7[]
5.3 Stem: length of upper internode (7)		
short	Veselopodolyanske 534	3[]
medium	Myronivske 51, Novo Kyivske 01, Slobozhanske	5[]
long	Charivne, Kharkivske 72	7[]
5.4 Time of panicle emergence (9)		
very early	Omske 9	1[]
early	Kyivske 96	3[]
medium	Kharkivske 56	5[]
late	Kharkivske kormove	7[]
very late	Illichovske	9[]

TECHNICAL QUESTIONNAIRE		Page {x} of {y}	Reference Number:
Characteristics	Example Varieties	Note	
5.5 Plant: natural height (10)			
short	Karlik 305, Orlovskiy karlik	3[]	
medium	Kharkivske 86, Kyivske 96	5[]	
long	Kharkivske 57, Veselopodilske 16	7[]	
5.6 Panicle: angle of branches (11)			
very acute	Pikulovytske	1[]	
moderately acute		2[]	
right angle	Chornomorske	3[]	
moderately obtuse	Kyivske 87, Veselopodilske 16	4[]	
very obtuse	Omske 9	5[]	
5.7 Panicle: attitude (12)			
erect	Omske 9	1[]	
semi-erect	Charivne, Veselopodolyanske 305-54	2[]	
moderately drooping	Kyivske 96	3[]	
strongly drooping	Kharkivske 57	4[]	
5.8 Panicle: density (15)			
lax	Myronivske 51	3[]	
medium	Charivne	5[]	
dense	Pikulovytske	7[]	

TECHNICAL QUESTIONNAIRE		Page {x} of {y}	Reference Number:
Characteristics	Example Varieties	Note	
5.9 Spikelet: shape (19)			
narrow elliptic	Sonyachne	1[]	
broad elliptic	Lilove, Veselopodolyanske 176	2[]	
circular	Charivne	3[]	
5.10 Glume: anthocyanin coloration (21)			
absent or very weak	Myronivske 51	1[]	
weak	Veselopodolyanske 403	3[]	
medium	Podolyanske 24/273	5[]	
strong	Lilove	7[]	
5.11 Grain: size (23)			
small	Omske 9	3[]	
medium	Myronivske 51, Syayvo	5[]	
large	Kyivske 96, Veselopodolyanske 176	7[]	
very large	Horlinka	9[]	
5.12 Grain: shape (24)			
narrow elliptic	Kostiantynivske	1[]	
broad elliptic	Kyivske 87, Kyivske 96, Myronivske 51, Myronivske 94	2[]	
circular	Charivne, Novokyivske, Veselopodolyanske 63201	3[]	

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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Characteristics	Example Varieties	Note
5.13 Grain: color (25)		
white	Tonkoplivchaste 048	1[]
whitish	Novokyivske 01	2[]
light yellow	Veselopodolyanske 38	3[]
medium yellow	Myronivske 51	4[]
dark yellow	Saratovske 2	5[]
golden	Zolotyste	6[]
light red	Tavriyske	7[]
medium red	Lilove	8[]
dark red	Veselopodolyanske 305-54	9[]
red brown	Chornosimyanne 1	10[]
brown	Amurske mistseve	11[]
black	Hexiaoyingmizi	12[]
5.14 Weight per 1000 grains (28)		
very low	Tonkoplivchaste 048	1[]
low	Ostrohovske 9	3[]
medium	Sonyachne	5[]
high	Kharkivske 86, Myronivske 51	7[]
very high	Kyivske 96, Veselopodilske 16	9[]
5.15 Kernel (not polished): color (29)		
whitish	Veselopodolyanske 176	1[]
light yellow	Kyivske 96	2[]
medium yellow	Omriyane	3[]

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
<i>Example</i>	<i>Panicle: density</i>	<i>lax</i>	<i>medium</i>

Comments:

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

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

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

Yes ☐ No ☐

(If yes, please provide details)

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

Yes ☐ No ☐

(If yes, please provide details)

7.3 Other information

8. Authorization for release

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

Yes ☐ No ☐

(b) Has such authorization been obtained?

Yes ☐ No ☐

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

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

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

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

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

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

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

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

.....

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

Applicant's name

Signature Date

[End of document]