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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

RICE

UPOV Code(s): ORYZA_SAT

Oryza sativa L.

*

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

Alternative names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Oryza sativa L.	Rice	Riz	Reis	Arroz

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 *Oryza sativa* 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 and panicles (if requested).

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

Seed: 2 kg
Panicles (if requested): 120

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 should contain a sufficient number of viable seeds to establish a satisfactory row of plants for observation.

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

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

3. Method of Examination

3.1 Number of Growing Cycles

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

3.1.2 The testing of a variety may be concluded when the competent authority can determine with certainty the outcome of the test.

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 Table of Characteristics. The stages of development denoted by each number are described in Chapter 8.

3.4 Test Design

3.4.1 In the case of sown trials, each test should be designed to result in a total of at least 1500 plants which should be divided between at least 2 replicates.

3.4.2 In the case of transplanted plants, each test should be designed to result in a total of at least 400 plants which should be divided between at least 2 replicates.

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

3.4.4 If tests on panicle rows are conducted, at least 100 panicle rows should be observed.

3.5 Additional Tests

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

4. Assessment of Distinctness, Uniformity and Stability

4.1 Distinctness

4.1.1 General Recommendations

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

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

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

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

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

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

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

4.1.2 Consistent Differences

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

4.1.3 Clear Differences

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

4.1.4 Number of Plants or Parts of Plants to be Examined

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

In the case of observations of parts taken from single plants, the number of parts to be taken from each of the plants should be 1.

4.1.5 Method of Observation

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

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

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

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

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

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

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

4.2 Uniformity

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

4.2.2 These Test Guidelines have been developed for the examination of self-pollinated and hybrid varieties. For varieties with other types of propagation, the recommendations in the General Introduction and document TGP/13 "Guidance for new types and species" Section 4.5 "Testing Uniformity" should be followed.

4.2.3 The assessment of uniformity for hybrid varieties depends on the type of hybrid and should be according to the recommendations for hybrid varieties in the General Introduction.

4.2.4 Where the assessment of a hybrid variety involves the parent lines, the uniformity of the hybrid variety should, in addition to an examination of the hybrid variety itself, also be assessed by examination of the uniformity of its parent lines.

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

A: sample size of 100 plants/parts of plants/panicle rows
B: sample size of 1500 plants/400 plants

4.2.6 For the assessment of uniformity of lines, 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 1500 plants, 4 off-types are allowed. In the case of a sample size of 400 plants, 2 off-types are allowed.

4.2.7 For the assessment of uniformity in a sample size of 100 panicle rows, plants or parts, 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, plants or parts of plants, 3 off-types are allowed. A panicle row is considered to be an off-type if there is more than one off-type plant within that panicle row.

4.2.8 For “A” characteristics, the assessment of uniformity can be done in 2 steps. In a first step, 20 panicle rows, plants or parts of plants are observed. If no off-types are observed, the variety is considered to be uniform. If more than 3 off-types are observed, the variety is considered not to be uniform. If 1 to 3 off-types are observed, an additional sample of 80 panicle rows, plants or parts of plants must be observed.

4.2.9 For the assessment of uniformity of hybrid varieties, a population standard of 1% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 1500 plants, 22 off-types are allowed. In case of sample size of 400 plants, 8 off-types is 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 further examined by testing a new seed stock to ensure that it exhibits the same characteristics as those shown by the initial material supplied.

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

5. Grouping of Varieties and Organization of the Growing Trial

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

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

5.3 The following have been agreed as useful grouping characteristics:

(a) Endosperm: type (characteristic 1)
(b) Leaf blade: anthocyanin coloration (characteristic 8)
(c) Time of panicle emergence (characteristic 12)
(d) Stem: length (characteristic 17)
(e) Lemma: color of tip (characteristic 25)
(f) Grain: ratio length/width (characteristic 41)
(g) Grain: color (characteristic 42)

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

6. Introduction to the Table of Characteristics

6.1 Categories of Characteristics

6.1.1 Standard Test Guidelines Characteristics

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

6.1.2 Asterisked Characteristics

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

6.2 States of Expression and Corresponding Notes

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

6.2.2 All relevant states of expression are presented in the characteristic.

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

6.3 Types of Expression

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

6.4 Example Varieties

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

6.5 Legend

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1 2	**3 4**	**5 6**	**7**			
	Name of characteristics in English	**Nom du caractère en français**	**Name des Merkmals auf Deutsch**	**Nombre del carácter en español**		
	states of expression	types d'expression	Ausprägungsstufen	tipos de expresión		

1 Characteristic number

2 (*) Asterisked characteristic – see Chapter 6.1.2

3 Type of expression
QL Qualitative characteristic – see Chapter 6.3
QN Quantitative characteristic – see Chapter 6.3
PQ Pseudo-qualitative characteristic – see Chapter 6.3

4 Method of observation (and type of plot, if applicable)
MG, MS, VG, VS – see Chapter 4.1.5

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

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

7 Growth stage key See Explanations on the Table of Characteristics in Chapter 8.3

A Sample size of 100 plants/parts of plants/panicle rows
B Sample size of 1500 plants/400 plants

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

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1. (*) PQ VG|A		**(+)**	**00**			
	Endosperm: type	**Endosperme : type**	**Endosperm: Typ**	**Endospermo: tipo**		
	glutinous	glutineux	mit Gluten	glutinoso	Ruriaoba, Sayomurasaki	1
	intermediate	intermédiaire	Zwischentyp	intermedio	Milky Summer	2
	non-glutinous	non glutineux	ohne Gluten	no glutinoso	Koshihikari, Takanari	3
2. (*) QN MG|A		**(+)**	**00**			
	Endosperm: content of amylose	**Endosperme : teneur en amylose**	**Endosperm: Amylosegehalt**	**Endospermo: contenido de amilosa**		
	very low	très faible	sehr gering	muy bajo	Ruriaoba, Sayomurasaki	1
	very low to low	très faible à faible	sehr gering bis gering	muy bajo a bajo		2
	low	faible	gering	bajo	Milky Summer	3
	low to medium	faible à moyenne	gering bis mittel	bajo a medio		4
	medium	moyenne	mittel	medio	Koshihikari	5
	medium to high	moyenne à élevée	mittel bis hoch	medio a alto		6
	high	élevée	hoch	alto	Hoshiyutaka	7
	high to very high	élevée à très élevée	hoch bis sehr hoch	alto a muy alto		8
	very high	très élevée	sehr hoch	muy alto	Koshinokaori	9
3. QN VG|A		**(+)**	**10-11**			
	Coleoptile: anthocyanin coloration	**Coléoptile : pigmentation anthocyanique**	**Keimscheide: Anthocyanfärbung**	**Coleóptilo: pigmentación antociánica**		
	absent or weak	absente ou faible	fehlend oder gering	ausente o débil	Koshihikari	1
	weak to medium	faible à moyenne	gering bis mittel	débil a media		2
	medium	moyenne	mittel	media	Murasakikoboshi	3
	medium to strong	moyenne à forte	mittel bis stark	media a fuerte		4
	strong	forte	stark	fuerte	Akaneasobi, Satsumakuromochi	5

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
4. (*)	**QN VG|B**	**(+)**	**40-49**			
	Plant: growth habit	**Plante : port**	**Pflanze: Wuchsform**	**Planta: hábito de crecimiento**		
	erect	dressé	aufrecht	erecto	Leafstar	1
	erect to semi-erect	dressé à demi-dressé	aufrecht bis halbaufrecht	erecto a semierecto		2
	semi-erect	demi-dressé	halbaufrecht	semierecto	Koshihikari, Momiroman	3
	semi-erect to intermediate	demi-dressé à intermédiaire	halbaufrecht bis mittel	semierecto a intermedio		4
	intermediate	intermédiaire	mittel	intermedio	Onari	5
	intermediate to semi-prostrate	intermédiaire à demi-étalé	mittel bis halbliegend	intermedio a semipostrado		6
	semi-prostrate	demi-étalé	halbliegend	semipostrado		7
	semi-prostrate to prostrate	demi-étalé à étalé	halbliegend bis liegend	semipostrado a postrado		8
	prostrate	étalé	liegend	postrado		9
5.	**QN VG|B**	**(a)**	**40-49**			
	Distal leaf sheath: anthocyanin coloration	**Gaine de la feuille distale : pigmentation anthocyanique**	**Distale Blattscheide: Anthocyanfärbung**	**Vaina de la hoja distal: pigmentación antociánica**		
	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Koshihikari	1
	very weak to weak	très faible à faible	sehr gering bis gering	muy débil a débil		2
	weak	faible	gering	débil	Murasakikoboshi, Sayomurasaki	3
	weak to medium	faible à moyenne	gering bis mittel	débil a media		4
	medium	moyenne	mittel	media	Minamiyutaka	5
	medium to strong	moyenne à forte	mittel bis stark	media a fuerte		6
	strong	forte	stark	fuerte	Beniasobi, Shikibumochi	7
	strong to very strong	forte à très forte	stark bis sehr stark	fuerte a muy fuerte		8
	very strong	très forte	sehr stark	muy fuerte		9
6.	**QN VG|B**	**(a)**	**40-49**			
	Basal leaf sheath: anthocyanin coloration	**Gaine de la feuille basale : pigmentation anthocyanique**	**Basale Blattscheide: Anthocyanfärbung**	**Vaina de la hoja basal: pigmentación antociánica**		
	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Koshihikari	1
	very weak to weak	très faible à faible	sehr gering bis gering	muy débil a débil		2
	weak	faible	gering	débil	Murasakikoboshi, Sayomurasaki	3
	weak to medium	faible à moyenne	gering bis mittel	débil a media		4
	medium	moyenne	mittel	media	Beniasobi	5
	medium to strong	moyenne à forte	mittel bis stark	media a fuerte		6
	strong	forte	stark	fuerte		7
	strong to very strong	forte à très forte	stark bis sehr stark	fuerte a muy fuerte		8
	very strong	très forte	sehr stark	muy fuerte		9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
7.		**QN VG|B**	**(a)**	**40-49**			
		Leaf blade: intensity of green color	**Limbe : intensité de la couleur verte**	**Blattspreite: Intensität der Grünfärbung**	**Limbo: intensidad del color verde**		
		very light	très claire	sehr hell	muy clara		1
		very light to light	très claire à claire	sehr hell bis hell	muy clara a clara		2
		light	claire	hell	clara	Koihonoka	3
		light to medium	claire à moyenne	hell bis mittel	clara a media		4
		medium	moyenne	mittel	media	Hinohikari, Koshihikari	5
		medium to dark	moyenne à foncée	mittel bis dunkel	media a oscura		6
		dark	foncée	dunkel	oscura	Hoshiyutaka, Takanari	7
		dark to very dark	foncée à très foncée	dunkel bis sehr dunkel	oscura a muy oscurs		8
		very dark	très foncée	sehr dunkel	muy oscura		9
8.	**(*)**	**QN VG|B**	**(a)**	**40-49**			
		Leaf blade: anthocyanin coloration	**Limbe : pigmentation anthocyanique**	**Blattspreite: Anthocyanfärbung**	**Limbo: pigmentación antociánica**		
		absent or weak	absente ou faible	fehlend oder gering	ausente o débil	Koshihikari	1
		weak to medium	faible à moyenne	gering bis mittel	débil a media		2
		medium	moyenne	mittel	media	Akaneasobi	3
		medium to strong	moyenne à forte	mittel bis stark	media a fuerte		4
		strong	forte	stark	fuerte		5
9.		**QN VG|B**	**(+) (a)**	**40-49**			
		Leaf blade: pubescence	**Limbe : pubescence**	**Blattspreite: Behaarung**	**Limbo: pubescencia**		
		absent or very sparse	absente ou très lâche	fehlend oder sehr locker	ausente o muy laxa	Leafstar	1
		sparse	lâche	locker	laxa		2
		medium	moyenne	mittel	media	Koshihikari	3
		dense	dense	dicht	densa		4
		very dense	très dense	sehr dicht	muy densa		5
10.		**PQ VG|B**	**(+) (a)**	**40-49**			
		Ligule: shape	**Ligule : forme**	**Ligula: Form**	**Lígula: forma**		
		truncate	tronquée	stumpf	truncada		1
		acute	aiguë	spitz	aguda	Murasakikoboshi	2
		lobed	lobée	gelappt	lobulada	Onari, Salt star	3
11.		**PQ VG|B**	**(a)**	**40-49**			
		Ligule: color	**Ligule : couleur**	**Ligula: Farbe**	**Lígula: color**		
		white	blanc	weiß	blanco	Koshihikari	1
		green	vert	grün	verde		2
		purple	violet	purpurn	púrpura	Beniasobi, Sayomurasaki	3

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
12. (*)	**QN MG|B**	**(+)**				
	Time of panicle emergence	**Époque de l'apparition de la panicule**	**Zeitpunkt des Rispenschiebens**	**Época de emergencia de las panículas**		
	very early	très précoce	sehr früh	muy temprana		1
	very early to early	très précoce à précoce	sehr früh bis früh	muy temprana a temprana		2
	early	précoce	früh	temprana	Koshihikari	3
	early to medium	précoce à moyenne	früh bis mittel	temprana a media		4
	medium	moyenne	mittel	media	Momiroman	5
	medium to late	moyenne à tardive	mittel bis spät	media a tardía		6
	late	tardive	spät	tardía	Leafstar	7
	late to very late	tardive à très tardive	spät bis sehr spät	tardía a muy tardía		8
	very late	très tardive	sehr spät	muy tardía		9
13.	**QN MS|B/VG|B**	**(+)**	**60-79**			
	Flag leaf: length of blade	**Dernière feuille : longueur du limbe**	**Fahnenblatt: Länge der Spreite**	**Hoja bandera: longitud del limbo**		
	very short	très courte	sehr kurz	muy corta		1
	very short to short	très courte à courte	sehr kurz bis kurz	muy corta a corta		2
	short	courte	kurz	corta	Ouukan 383	3
	short to medium	courte à moyenne	kurz bis mittel	corta a media		4
	medium	moyenne	mittel	media	Hinohikari	5
	medium to long	moyenne à longue	mittel bis lang	media a larga		6
	long	longue	lang	larga	Tachiaoba	7
	long to very long	longue à très longue	lang bis sehr lang	larga a muy larga		8
	very long	très longue	sehr lang	muy larga		9
14.	**QN MS|B/VG|B**	**(+)**	**60-79**			
	Flag leaf: width of blade	**Dernière feuille : largeur du limbe**	**Fahnenblatt: Breite der Spreite**	**Hoja bandera: anchura del limbo**		
	narrow	étroite	schmal	estrecha	Ouukan 383	1
	narrow to medium	étroite à moyenne	schmal bis mittel	estrecha a media		2
	medium	moyenne	mittel	media	Hinohikari	3
	medium to broad	moyenne à large	mittel bis breit	media a ancha		4
	broad	large	breit	ancha	Tachiaoba	5
15.	**QN VG|B**		**60-89**			
	Lemma: pubescence	**Glumelle inférieure : pubescence**	**Deckspelze: Behaarung**	**Lema: pubescencia**		
	absent or very sparse	absente ou très lâche	fehlend oder sehr locker	ausente o muy laxa	Leafstar	1
	sparse	lâche	locker	laxa	Murasakikoboshi	2
	medium	moyenne	mittel	media	Koshihikari	3
	dense	dense	dicht	densa		4
	very dense	très dense	sehr dicht	muy densa		5

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
16. (*)	**PQ VG|B**		**65**			
	Stigma: color	**Stigmate : couleur**	**Narbe: Farbe**	**Estigma: color**		
	white	blanc	weiß	blanco	Koshihikari	1
	green	vert	grün	verde		2
	yellow	jaune	gelb	amarillo		3
	purple	violet	purpurn	púrpura	Ouukan 383, Sayomurasaki	4
	black	noir	schwarz	negro	Murasakikoboshi, Shikibumochi	5
17. (*)	**QN MG|B/MS|B**	**(+)**	**70-79**			
	Stem: length	**Tige : longueur**	**Halm: Länge**	**Tallo: longitud**		
	very short	très courte	sehr kurz	muy corta		1
	very short to short	très courte à courte	sehr kurz bis kurz	muy corta a corta		2
	short	courte	kurz	corta	Takanari	3
	short to medium	courte à moyenne	kurz bis mittel	corta a media		4
	medium	moyenne	mittel	media	Hinohikari	5
	medium to long	moyenne à longue	mittel bis lang	media a larga		6
	long	longue	lang	larga	Koshihikari	7
	long to very long	longue à très longue	lang bis sehr lang	larga a muy larga		8
	very long	très longue	sehr lang	muy larga	Minamiyutaka	9
18. (*)	**QN VG|B**	**(+)**	**70-79**			
	Stem: thickness	**Tige : épaisseur**	**Halm: Dicke**	**Tallo: grosor**		
	very thin	très fine	sehr dünn	muy delgado		1
	very thin to thin	très fine à fine	sehr dünn bis dünn	muy delgado a delgado		2
	thin	fine	dünn	delgado	Murasakikoboshi	3
	thin to medium	fine à moyenne	dünn bis mittel	delgado a medio		4
	medium	moyenne	mittel	medio	Hinohikari, Koshihikari	5
	medium to thick	moyenne à épaisse	mittel bis dick	medio a grueso		6
	thick	épaisse	dick	grueso	Hoshiyutaka, Momiroman	7
	thick to very thick	épaisse à très épaisse	dick bis sehr dick	grueso a muy grueso		8
	very thick	très épaisse	sehr dick	muy grueso		9
19.	**QN VG|B**		**70-79**			
	Stem: anthocyanin coloration of nodes	**Tige : pigmentation anthocyanique des nœuds**	**Halm: Anthocyanfärbung der Knoten**	**Tallo: pigmentación antociánica de los nudos**		
	absent or weak	absente ou faible	fehlend oder gering	ausente o débil	Koshihikari	1
	weak to medium	faible à moyenne	gering bis mittel	débil a media		2
	medium	moyenne	mittel	media	Sayomurasaki	3
	medium to strong	moyenne à forte	mittel bis stark	media a fuerte		4
	strong	forte	stark	fuerte	Murasakikoboshi	5

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
20.	**QN VG|B**		**70-79**			
	Stem: anthocyanin coloration of internodes	**Tige : pigmentation anthocyanique des entrenœuds**	**Halm: Anthocyanfärbung der Internodien**	**Tallo: pigmentación antociánica de los entrenudos**		
	absent or weak	absente ou faible	fehlend oder gering	ausente o débil	Koshihikari	1
	weak to medium	faible à moyenne	gering bis mittel	débil a media		2
	medium	moyenne	mittel	media		3
	medium to strong	moyenne à forte	mittel bis stark	media a fuerte		4
	strong	forte	stark	fuerte	Shikibumochi	5
21.	**QN MS|B**		**70-79**			
	Plant: number of panicles	**Plante : nombre de panicules**	**Pflanze: Anzahl Rispen**	**Planta: número de panículas**		
	very few	très petit	sehr wenige	muy bajo		1
	very few to few	très petit à petit	sehr wenige bis wenige	muy bajo a bajo		2
	few	petit	wenige	bajo	Momiroman, Takanari	3
	few to medium	petit à moyen	wenige bis mittel	bajo a medio		4
	medium	moyen	mittel	medio	Koshihikari	5
	medium to many	moyen à grand	mittel bis viele	medio a alto		6
	many	grand	viele	alto	Ouukan 383	7
	many to very many	grand à très grand	viele bis sehr viele	alto a muy alto		8
	very many	très grand	sehr viele	muy alto		9
22. **(*)**	**QN VG|B**		**70-89**			
	Panicle: distribution of awns	**Panicule : répartition des arêtes**	**Rispe: Verteilung der Begrannung**	**Panícula: distribución de las aristas**		
	absent	absente	fehlend	ausentes	Momiroman, Onari	1
	apical quarter	quart apical	am apikalen Viertel	en el cuarto apical	Sari queen	2
	upper half	moitié supérieure	in der oberen Hälfte	en la mitad superior		3
	upper three quarters	trois-quarts supérieurs	an den oberen drei Vierteln	en los tres cuartos superiores	Beniroman	4
	whole length	longueur totale	auf der ganzen Länge	en toda la longitud	Saikaikan 246	5
23.	**QN VG|B**	**(+)**	**70-89**			
	Awns: length	**Arêtes : longueur**	**Grannen: Länge**	**Arista: longitud**		
	very short	très courte	sehr kurz	muy corta	Hinohikari	1
	short	courte	kurz	corta	Koshihikari	2
	medium	moyenne	mittel	media	Benizomemochi, Leafstar	3
	long	longue	lang	larga	Saikaikan 246	4
	very long	très longue	sehr lang	muy larga		5

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
24. (*) QN MS|B		**(+)**	**72-92**			
	Panicle: length	**Panicule : longueur**	**Rispe: Länge**	**Panícula: longitud**		
	very short	très courte	sehr kurz	muy corta		1
	very short to short	très courte à courte	sehr kurz bis kurz	muy corta a corta		2
	short	courte	kurz	corta	Shikibumochi	3
	short to medium	courte à moyenne	kurz bis mittel	corta a media		4
	medium	moyenne	mittel	media	Koshihikari, Leafstar	5
	medium to long	moyenne à longue	mittel bis lang	media a larga		6
	long	longue	lang	larga	Momiroman	7
	long to very long	longue à très longue	lang bis sehr lang	larga a muy larga		8
	very long	très longue	sehr lang	muy larga		9
25. (*) PQ VG|B			**80-92**			
	Lemma: color of tip	**Glumelle inférieure : couleur du sommet**	**Deckspelze: Farbe der Spitze**	**Lema: color del ápice**		
	white	blanc	weiß	blanco	Koshihikari	1
	yellowish	jaunâtre	gelblich	amarillento		2
	red	rouge	rot	rojo	Minamiyutaka	3
	purple	violet	purpurn	púrpura	Murasakikoboshi, Sayomurasaki	4
	brown	brun	braun	marrón	Koshinokaori, Leafstar	5
	black	noir	schwarz	negro		6
26. (*) QN VG|B		**(+)**	**80-92**			
	Flag leaf: attitude of blade	**Dernière feuille : port du limbe**	**Fahnenblatt: Haltung der Spreite**	**Hoja bandera: porte del limbo**		
	erect	dressé	aufrecht	erecto	Leafstar, Minamiyutaka	1
	erect to semi-erect	dressé à demi-dressé	aufrecht bis halbaufrecht	erecto a semierecto		2
	semi-erect	demi-dressé	halbaufrecht	semierecto	Momiroman, Onari	3
	semi-erect to horizontal	demi-dressé à horizontal	halbaufrecht bis waagerecht	semierecto a horizontal		4
	horizontal	horizontal	waagerecht	horizontal	Murasakikoboshi, Ouukan 383	5
	horizontal to moderately reflexed	horizontal à modérément réfléchi	waagerecht bis mäßig zurückgebogen	horizontal a moderadamente reflejo		6
	moderately reflexed	modérément réfléchi	mäßig zurückgebogen	moderadamente reflejo		7
	moderately reflexed to strongly reflexed	modérément réfléchi à fortement réfléchi	mäßig zurückgebogen bis stark zurückgebogen	moderadamente reflejo a muy reflejo		8
	strongly reflexed	fortement réfléchi	stark zurückgebogen	muy reflejo		9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
27.	**QN VG|B**		**90-92**			
	Panicle: density	**Panicule : densité**	**Rispe: Dichte**	**Panícula: densidad**		
	very lax	très lâche	sehr locker	muy laxa		1
	very lax to lax	très lâche à lâche	sehr locker bis locker	muy laxa a laxa		2
	lax	lâche	locker	laxa		3
	lax to medium	lâche à moyenne	locker bis mittel	laxa a media		4
	medium	moyenne	mittel	media	Koshihikari	5
	medium to dense	moyenne à dense	mittel bis dicht	media a densa		6
	dense	dense	dicht	densa	Hoshiyutaka, Takanari	7
	dense to very dense	dense à très dense	dicht bis sehr dicht	densa a muy densa		8
	very dense	très dense	sehr dicht	muy densa		9
28. (*)	**QN VG|B**	**(+)**	**90-92**			
	Panicle: attitude	**Panicule : port**	**Rispe: Haltung**	**Panícula: porte**		
	erect	dressé	aufrecht	erecto	Akaneasobi	1
	semi-erect	demi-dressé	halbaufrecht	semierecto	Ouukan 383	2
	semi-drooping	demi-retombant	halbüberhängend	semicolgante	Koshihikari	3
	drooping	retombant	überhängend	colgante		4
29. (*)	**QN VG|B**	**(+)**	**90-92**			
	Panicle: attitude of branches	**Panicule : port des ramifications**	**Rispe: Stellung der Seitenäste**	**Panícula: porte de las ramificaciones**		
	adpressed	appliqué	anliegend	adpreso	Habataki	1
	adpressed to erect	appliqué à dressé	anliegend bis aufrecht	adpreso a erecto		2
	erect	dressé	aufrecht	erecto	Murasakikoboshi	3
	erect to semi-erect	dressé à demi-dressé	aufrecht bis halbaufrecht	erecto a semierecto		4
	semi-erect	demi-dressé	halbaufrecht	semierecto		5
30.	**QN VG|B**	**(+)**	**90-92**			
	Panicle: number of secondary branches	**Panicule : nombre de ramifications secondaires**	**Rispe: Anzahl sekundäre Seitenäste**	**Panícula: número de ramificaciones secundarias**		
	absent or few	nul ou très petit	fehlend oder wenige	ausente o bajo		1
	medium	moyen	mittel	medio	Koshihikari	2
	many	grand	viele	alto	Takanari	3
31.	**QN VG|B**	**(+)**	**90-92**			
	Panicle: exsertion	**Panicule : déploiement**	**Rispe: Hervorstehen**	**Panícula: exerción**		
	enclosed	inclus	eingeschlossen	envuelta		1
	partly exserted	partiellement saillant	teilweise hervorstehend	parcialmente exerta	Tachisuzuka	2
	just exserted	tout juste saillant	gerade noch hervorstehend	apenas exerta	Minamiyutaka	3
	well exserted	bien saillant	deutlich hervorstehend	muy exerta	Koshihikari	4

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
32. **(*)**	**QN** **MG|B**	**(+)**				
	Time of maturity	**Époque de maturité**	**Zeitpunkt der Reife**	**Época de madurez**		
	very early	très précoce	sehr früh	muy temprana		1
	very early to early	très précoce à précoce	sehr früh bis früh	muy temprana a temprana		2
	early	précoce	früh	temprana	Koshihikari	3
	early to medium	précoce à moyenne	früh bis mittel	temprana a media		4
	medium	moyenne	mittel	media	Asahinoyume	5
	medium to late	moyenne à tardive	mittel bis spät	media a tardía		6
	late	tardive	spät	tardía	Leafstar	7
	late to very late	tardive à très tardive	spät bis sehr spät	tardía a muy tardía		8
	very late	très tardive	sehr spät	muy tardía		9
33.	**QN** **MG|B**	**(+)**	**90**			
	Time of senescence	**Époque de sénescence**	**Zeitpunkt des Absterbens**	**Época de senescencia**		
	early	précoce	früh	temprana	Onari	1
	medium	moyenne	mittel	intermedia	Salt star	2
	late	tardive	spät	tardía	Koshihikari	3
34. **(*)**	**PQ** **VG|B**		**92**			
	Lemma: color	**Glumelle inférieure : couleur**	**Deckspelze: Farbe**	**Lema: color**		
	white	blanc	weiß	blanca	Koshihikari	1
	yellowish	jaunâtre	gelblich	amarillento	Leafstar	2
	red	rouge	rot	rojo		3
	purple	violet	purpurn	púrpura	Ouukan 383, Satsumakuromochi	4
	brown	brun	braun	marrón	Beniasobi	5
	black	noir	schwarz	negro		6

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
35.	**QN VG|A**	**(+)**	**92**			
	Lemma: coloration with phenol	**Glumelle inférieure : coloration au phénol**	**Deckspelze: Phenolfärbung**	**Lema: coloración con fenol**		
	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Koshihikari, Momiroman	1
	very weak to weak	très faible à faible	sehr gering bis gering	muy débil a débil		2
	weak	faible	gering	débil		3
	weak to medium	faible à moyenne	gering bis mittel	débil a media		4
	medium	moyenne	mittel	media	Onari, Salt star	5
	medium to strong	moyenne à forte	mittel bis stark	media a fuerte		6
	strong	forte	stark	fuerte	Ruriaoba	7
	strong to very strong	forte à très forte	stark bis sehr stark	fuerte a muy fuerte		8
	very strong	très forte	sehr stark	muy fuerte		9
36.	**QN VG|B**	**(+)**	**92**			
	Glume: length	**Glume : longueur**	**Hüllspelze: Länge**	**Gluma: longitud**		
	short	courte	kurz	corta	Ruriaoba	1
	medium	moyenne	mittel	media	Koshihikari	2
	long	longue	lang	larga		3
37.	**PQ VG|B**		**92**			
	Glume: color	**Glume : couleur**	**Hüllspelze: Farbe**	**Gluma: color**		
	white	blanc	weiß	blanco	Koshihikari	1
	yellowish	jaunâtre	gelblich	amarillento		2
	red	rouge	rot	rojo		3
	purple	violet	purpurn	púrpura	Beniasobi, Ouukan 383	4
	brown	brun	braun	marrón		5
	black	noir	schwarz	negro		6
38. **(*)**	**QN MG|A**	**(+)** **(b)**	**92**			
	1000 seed weight	**Poids de 1000 grains**	**Tausendkorngewicht**	**Peso de 1000 semillas**		
	very low	très petit	sehr niedrig	muy bajo		1
	very low to low	très petit à petit	sehr niedrig bis niedrig	muy bajo a bajo		2
	low	petit	niedrig	bajo	Beniasobi, Sari queen	3
	low to medium	petit à moyen	niedrig bis mittel	bajo a medio		4
	medium	moyen	mittel	medio	Koshihikari, Takanari	5
	medium to high	moyen à grand	mittel bis hoch	medio a alto		6
	high	grand	hoch	alto	Momiroman	7
	high to very high	grand à très grand	hoch bis sehr hoch	alto a muy alto		8
	very high	très grand	sehr hoch	muy alto		9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
39. (*)	**QN MS|A**	**(b)**	**92**			
	Grain: length	**Grain : longueur**	**Korn: Länge**	**Grano: longitud**		
	very short	très courte	sehr kurz	muy corta		1
	very short to short	très courte à courte	sehr kurz bis kurz	muy corta a corta		2
	short	courte	kurz	corta	Murasakikoboshi	3
	short to medium	courte à moyenne	kurz bis mittel	corta a media		4
	medium	moyenne	mittel	media	Koshihikari	5
	medium to long	moyenne à longue	mittel bis lang	media a larga		6
	long	longue	lang	larga	Hoshiyutaka, Leafstar	7
	long to very long	longue à très longue	lang bis sehr lang	larga a muy larga		8
	very long	très longue	sehr lang	muy larga		9
40. (*)	**QN MS|A**	**(b)**	**92**			
	Grain: width	**Grain : largeur**	**Korn: Breite**	**Grano: anchura**		
	narrow	étroite	schmal	estrecha	Hoshiyutaka, Leafstar	1
	narrow to medium	étroite à moyenne	schmal bis mittel	estrecha a media		2
	medium	moyenne	mittel	media	Koshihikari	3
	medium to broad	moyenne à large	mittel bis breit	media a ancha		4
	broad	large	breit	ancha		5
41. (*)	**QN MS|A**	**(+) (b)**	**92**			
	Grain: ratio length/width	**Grain : rapport longueur/largeur**	**Korn: Verhältnis Länge/Breite**	**Grano: relación longitud/anchura**		
	low	bas	klein	baja	Akaneasobi	1
	low to medium	bas à moyen	klein bis mittel	baja a media	Koshihikari	2
	medium	moyen	mittel	media	Hoshiyutaka, Leafstar	3
	medium to high	moyen à élevé	mittel bis groß	media a alta		4
	high	élevé	groß	alta		5
42. (*)	**PQ VG|A**	**(b)**	**92**			
	Grain: color	**Grain : couleur**	**Korn: Farbe**	**Grano: color**		
	white	blanc	weiß	blanco	Ruriaoba	1
	red	rouge	rot	rojo	Benizomemochi	2
	brown red	rouge-brun	braunrot	rojo amarronado	Beniroman	3
	purple	violet	purpurn	púrpura		4
	light brown	brun clair	hellbraun	marrón claro	Koshihikari, Takanari	5
	dark brown	brun foncé	dunkelbraun	marrón oscuro	Leafstar	6
	black	noir	schwarz	negro	Murasakikoboshi, Sayomurasaki	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
43.		**QN MG|A**	**(+) (b)**	**92**			
		Grain: alkali digestion	**Grain : digestion par des alcalins**	**Korn: Zersetzung durch Alkali**	**Grano: digestión alcalina**		
		absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Koshinokaori	1
		weak	faible	gering	débil	Murasakikoboshi, Ouukan 383	2
		moderate	modérée	mäßig	moderada	Salt star	3
		strong	forte	stark	fuerte	Koshihikari	4
44.	**(*)**	**QN VG|A**	**(+) (b)**	**92**			
		Grain: aroma	**Grain : arôme**	**Korn: Aroma**	**Grano: aroma**		
		absent or weak	absent ou faible	fehlend oder gering	ausente o débil	Koshihikari	1
		medium	moyen	mittel	medio	Sari queen	2
		strong	fort	stark	fuerte		3

8. Explanations on the Table of Characteristics

8.1 Explanations covering several characteristics

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

(a) Observations should be made on the penultimate leaf.

(b) Observations should be made after removal of husks.

8.2 Explanations for individual characteristics

Ad. 1: Endosperm: type

The three states of expression can be simply defined by reaction to KI-I solution which is prepared by mixing 0.1% I_2 solution and 0.2% KI solution.

1 - glutinous: endosperm is stained reddish purple.
2 - intermediate: endosperm is stained reddish blue purple.
3 - non-glutinous: endosperm is stained dark blue purple.

Ad. 2: Endosperm: content of amylose

The amylose content of endosperm should be determined using the iodine color reaction according to ISO 6647.

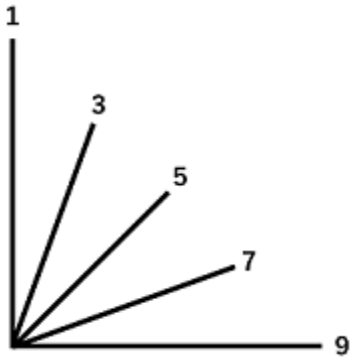
The absorbance of the amylose-iodine complex of endosperm starch formed by the iodine color reaction should be measured using a spectrophotometer.

The amylose mass fraction of the sample should be read from a calibration graph, which is prepared using mixtures of potato amylose and amylopectin to allow for the effect of amylopectin on the color of the amylose-iodine complex.

Ad. 3: Coleoptile: anthocyanin coloration

Non-dormant grains are placed on moistened filter paper and covered with a petri-dish lid during germination. After the coleoptiles have reached a length of about 5mm in darkness they are placed in artificial light (daylight equivalent) at 750-1250 lux continuously for 3 to 4 days, at a temperature of 25 to 30 degrees. The color of the coleoptiles is observed when they are fully developed at stage 09-11 (about 6 to 7 days).

Ad. 4: Plant: growth habit



1 = erect

3 = semi-erect

5 = intermediate

7 = semi-prostrate

9 = prostrate

Ad. 9: Leaf blade: pubescence

Observations should be made on the upper side of the blade.

Ad. 10: Ligule: shape

1
truncate

2
acute

3
lobed

Ad. 12: Time of panicle emergence

Time of panicle emergence is reached when the first spikelet is visible on 50% of panicles.

Ad. 13: Flag leaf: length of blade

Length and width should be assessed on the same leaf blade. Length should be measured from the tip to the base. Width should be measured at the widest part.

Ad. 14: Flag leaf: width of blade

See Ad. 13

Ad. 17: Stem: length

Measurements should be made from the base of the plant to the base of the panicle on the longest stem, excluding deep water rice.

Ad. 18: Stem: thickness

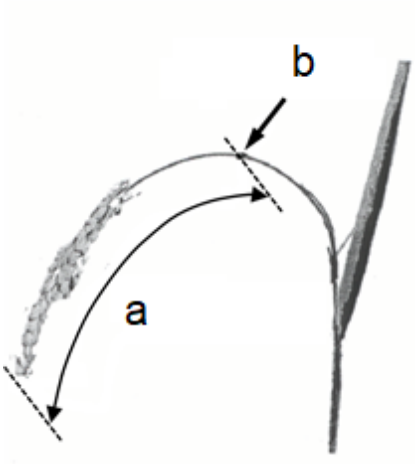
Observations should be made at the basal internode of the longest stem.

Ad. 23: Awns: length

Observations should be made on the longest awn in the panicle.

Ad. 24: Panicle: length

Length of panicle should be observed from panicle base to the top excluding awns.

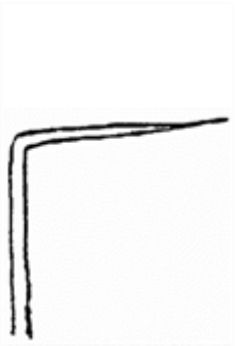


a = Length
b = Panicle base

Ad. 26: Flag leaf: attitude of blade

1
erect

3
semi-erect



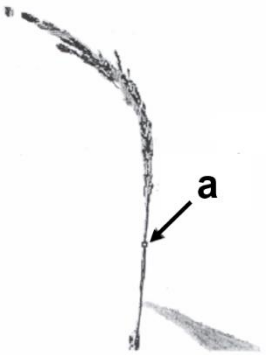
5
horizontal

7
moderately reflexed

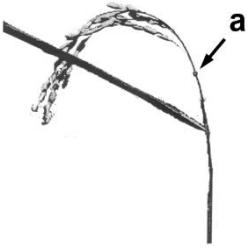
9
strongly reflexed

Ad. 28: Panicle: attitude

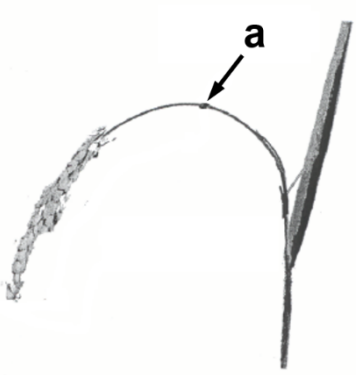
1
erect



2
semi-erect



3
semi-drooping



4
drooping

a = Panicle base

Ad. 29: Panicle: attitude of branches

1
adpressed

3
erect

5
semi-erect

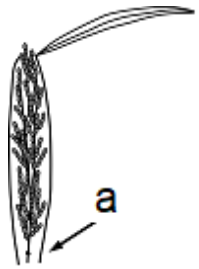
Ad. 30: Panicle: number of secondary branches

1
absent or few

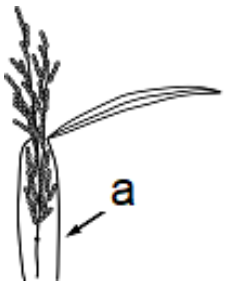
2
medium

3
many

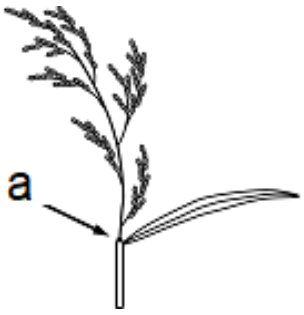
Ad. 31: Panicle: exsertion



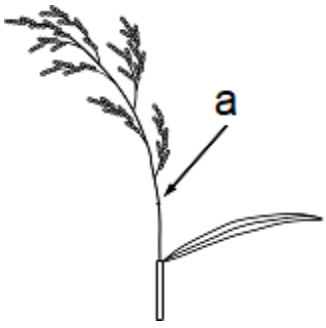
1
enclosed



2
partly exserted



3
just exserted



4
well exserted

a = Panicle base

Ad. 32: Time of maturity

Time of maturity is reached when 80% of the grains in a panicle can no longer be dented by thumbnail.

Ad. 33: Time of senescence

1 – early: All leaves are dead.
2 – medium: One leaf is still green.
3 – late: More than one leaf is still green.

Ad. 35: Lemma: coloration with phenol

Method of testing: Place hulls from grains into a petri dish and add 1.5% phenol solution. Cover the petri dish and keep at room temperature (not very cold) for one day.

Ad. 36: Glume: length

Measurements should be made on the longest glume.

Ad. 38: 1000 seed weight

Measurements should be calculated at 14% moisture.

Ad. 41: Grain: ratio length/width

1 - low: <1.50
2 - low to medium: 1.50-1.99
3 - medium: 2.00-2.49
4 - medium to high: 2.50-2.99
5 - high: >2.99

Ad. 43: Grain: alkali digestion

Observations should be made on unbroken grains. Place grains in a petri dish with 1.5% solution of KOH, keep still and at a temperature of around 25°C for approximately 24 hours.

1 - absent or very weak: Rice grains are not affected.
2 - weak: Only the margins of the grains are dissolved.
3 - moderate: Shape of grains become unclear, but incompletely dissolved.
4 - strong: No margin is identified between the core part and the outer skirt.

Ad. 44: Grain: aroma

The main component of the aroma in rice is the 2-acetyl-1-pirroline (AcPy). To vaporize this chemical, 10ml of a 1.7% solution of KOH should be added to 2g of decorticated grains. The aroma, which is similar to that in popcorn, is released within 10 minutes. The level of expression is determined by reference to the example varieties.

8.3 Decimal code for the growth stage codes of cereals

	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
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

	Germination
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 9 or more tillers

	Stem elongation
30	Pseudo stem erection[1]
31	1st node detectable
32	2nd node detectable
33	3rd node detectable
34	4th node detectable
35	5th node detectable
36	6th node detectable
37	Flag leaf just visible
38	-
39	Flag leaf ligule/collar just visible

	Booting
40	-
41	Flag leaf sheath extending
42	-
43	Boots just visibly swollen
44	-
45	Boots swollen
46	-
47	Flag leaf sheath opening
48	-
49	First awns visible

	Inflorescence emergence
50	-
51	First spikelet of inflorescence just visible
52	20% of inflorescence emerged
53	30% of inflorescence emerged
54	40% of inflorescence emerged
55	50% of inflorescence emerged
56	60% of inflorescence emerged
57	70% of inflorescence emerged
58	80% of inflorescence emerged
59	Emergence of inflorescence completed

	Anthesis
60	-
61	Beginning of anthesis
62	-
63	-
64	-
65	Anthesis half-way
66	-
67	-
68	-
69	Anthesis complete

	Milk development
70	-
71	Caryopsis watery ripe
72	-
73	Early milk
74	-
75	Medium milk
76	-
77	Late milk
78	-
79	-

	Dough development
80	-
81	-
82	-
83	Early dough
84	-
85	Soft dough
86	-
87	Hard dough
88	-
89	-

	Ripening
90	-
91	Caryopsis hard (difficult to divide by thumbnail) [2]
92	Caryopsis hard (can no longer be dented by thumbnail) [3] [4]
93	Caryopsis loosening in daytime
94	Over-ripe, straw dead and collapsing

	Ripening (continued)
95	Seed dormant
96	Viable seed giving 50% germination
97	Seed not dormant
98	Secondary dormancy induced
99	Secondary dormancy lost

Notes on the table
[1] Only applicable to cereals with a prostrate or semi-prostrate early growth habit.
[2] Ripeness for binder (ca. 16% water content). Chlorophyll of inflorescence largely lost.
[3] Ripeness for combine harvester (<16% water content).
[4] Optimum harvest time.

9. Literature

Matsuo, T. (edit.), 1993-97: Science of the Rice Plant. Nosan Gyoson Bunka Kyokai. Tokyo, JP
Vol. 1 Morphology (1993)
Vol. 2 Physiology (1995)
Vol. 3 Genetics (1997)

Zadoks, J.C., Chang, T.T., Konzak, C.F., 1974: A Decimal code for the Growth Stages of Cereals. Weed Research. NL, 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	*Oryza sativa* L.
1.2	Common name	Rice

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 variety)

(……..……..…) x (……..……..…)

female parent male parent

(b) partially known cross [ ]

(please state known parent variety(ies))

(……..……..…) x (……..……..…)

female parent male parent

(c) unknown cross [ ]

4.1.2 Mutation [ ]
(please state parent variety)

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

4.1.4 Other [ ]
(Please provide details)

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

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

4.2 Method of propagating the variety

4.2.1 Seed-propagated varieties

(a) Self-pollination [ ]
(b) Hybrid [ ]
(c) Other (please provide details) [ ]

4.2.2 Other [ ]
(Please provide details)

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

Single Hybrid

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

Three-Way Hybrid

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

and should identify in particular:

(a) any male sterile lines

(b) maintenance system of male sterile lines.

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 (1)	**Endosperm: type**		
	glutinous	Ruriaoba, Sayomurasaki	1 [ ]
	intermediate	Milky Summer	2 [ ]
	non-glutinous	Koshihikari, Takanari	3 [ ]
5.2 (8)	**Leaf blade: anthocyanin coloration**		
	absent or weak	Koshihikari	1 [ ]
	weak to medium		2 [ ]
	medium	Akaneasobi	3 [ ]
	medium to strong		4 [ ]
	strong		5 [ ]
5.3 (12)	**Time of panicle emergence**		
	very early		1 [ ]
	very early to early		2 [ ]
	early	Koshihikari	3 [ ]
	early to medium		4 [ ]
	medium	Momiroman	5 [ ]
	medium to late		6 [ ]
	late	Leafstar	7 [ ]
	late to very late		8 [ ]
	very late		9 [ ]
5.4 (17)	**Stem: length**		
	very short		1 [ ]
	very short to short		2 [ ]
	short	Takanari	3 [ ]
	short to medium		4 [ ]
	medium	Hinohikari	5 [ ]
	medium to long		6 [ ]
	long	Koshihikari	7 [ ]
	long to very long		8 [ ]
	very long	Minamiyutaka	9 [ ]

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

	Characteristics	Example Varieties	Note
5.5 (25)	**Lemma: color of tip**		
	white	Koshihikari	1 [ ]
	yellowish		2 [ ]
	red	Minamiyutaka	3 [ ]
	purple	Murasakikoboshi, Sayomurasaki	4 [ ]
	brown	Koshinokaori, Leafstar	5 [ ]
	black		6 [ ]
5.6 (41)	**Grain: ratio length/width**		
	low	Akaneasobi	1 [ ]
	low to medium	Koshihikari	2 [ ]
	medium	Hoshiyutaka, Leafstar	3 [ ]
	medium to high		4 [ ]
	high		5 [ ]
5.7 (42)	**Grain: color**		
	white	Ruriaoba	1 [ ]
	red	Benizomemochi	2 [ ]
	brown red	Beniroman	3 [ ]
	purple		4 [ ]
	light brown	Koshihikari, Takanari	5 [ ]
	dark brown	Leafstar	6 [ ]
	black	Murasakikoboshi, Sayomurasaki	7 [ ]

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	*Panicle: length*	*long*	*short to medium*

Comments:

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

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

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

Yes [ ] No [ ]

(If yes, please provide details)

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

Yes [ ] No [ ]

(If yes, please provide details)

7.3 Other information

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:

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.

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]