



These Test Guidelines have been superseded by a later version. The latest adopted version of Test Guidelines can be found at [http://www.upov.int/test\\_guidelines/en/list.jsp](http://www.upov.int/test_guidelines/en/list.jsp)

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Ces principes directeurs d'examen ont été remplacés par une version ultérieure. La version adoptée la plus récente des principes directeurs d'examen figure à l'adresse suivante : [http://www.upov.int/test\\_guidelines/fr/list.jsp](http://www.upov.int/test_guidelines/fr/list.jsp)

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Diese Prüfungsrichtlinien wurden durch eine neuere Fassung ersetzt. Die neueste angenommene Fassung von Prüfungsrichtlinien ist unter [http://www.upov.int/test\\_guidelines/de/list.jsp](http://www.upov.int/test_guidelines/de/list.jsp) zu finden.

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Las presentes directrices de examen han sido reemplazadas por una versión posterior. La versión de las directrices de examen de más reciente aprobación está disponible en [http://www.upov.int/test\\_guidelines/es/list.jsp](http://www.upov.int/test_guidelines/es/list.jsp).



**UPOV**

**TG/16/8**

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**INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS**

GENEVA

**RICE**

*(Oryza sativa L.)*

\*

**GUIDELINES**

**FOR THE CONDUCT OF TESTS**

**FOR DISTINCTNESS, UNIFORMITY AND STABILITY**

Alternative Names: \*

<i>Latin</i>	<i>English</i>	<i>French</i>	<i>German</i>	<i>Spanish</i>
<i>Oryza sativa L.</i>	Rice	Riz	Reis	Arroz

**ASSOCIATED DOCUMENTS**

These 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](http://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.

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

2.3.1 General

2 kg.

2.3.2 Hybrid varieties

If requested, an additional 2 kg of seed of each component should be submitted.

2.3.2 Panicles

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

2.4 The seed should meet the minimum requirements for germination, species and analytical purity, health and moisture content, specified by the competent authority. In cases where the seed is to be stored, the germination capacity should be as high as possible and should be stated by the applicant.

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

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

3. Method of Examination

3.1 *Duration of Tests*

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

### 3.2 *Testing Place*

The tests should normally be conducted at one place. If any characteristics of the variety, which are relevant for the examination of DUS, cannot be observed at that place, the variety may be tested at an additional place.

### 3.3 *Conditions for Conducting the Examination*

The tests should be carried out under conditions ensuring satisfactory growth for the expression of the relevant characteristics of the variety and for the conduct of the examination.

#### 3.3.1 Stage of development for the assessment

The optimal stage of development for the assessment of each characteristic is indicated by a number in the second column of the Table of Characteristics. The stages of development denoted by each number are described at the end of Chapter 8.

#### 3.3.2 Type of observation – visual or measurement

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

MG: single measurement of a group of plants or parts of plants

MS: measurement of a number of individual plants or parts of plants

VG: visual assessment by a single observation of a group of plants or parts of plants

VS: visual assessment by observation of individual plants or parts of plants

### 3.4 *Test Design*

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

3.4.2 Each test should be designed to result in a total of, at least 1500 plants, which should be divided between two or more replicates.

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

### 3.5 *Number of Plants / Parts of Plants to be Examined*

Unless otherwise indicated, all observations made on individual plants or determined by measurement or counting should be made on at least 20 plants or parts taken from each of the 20 plants.

### 3.6 *Additional Tests*

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

## 4. Assessment of Distinctness, Uniformity and Stability

### 4.1 *Distinctness*

#### 4.1.1 General Recommendations

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

#### 4.1.2 Consistent Differences

The minimum duration of tests recommended in Section 3.1 reflects, in general, the need to ensure that any differences in a characteristic are sufficiently consistent.

#### 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 Self-pollinated varieties

(a) *Plots*: For the assessment of uniformity of characteristics on the plot as a whole, a population standard of 0.1 % with an acceptance probability of at least 95% should be applied. In the case of a sample size of 1,500 plants the maximum number of off-types allowed would be 4.

(b) *Single panicle-rows*: For the assessment of uniformity of characteristics on single panicle-rows, plants or parts of plants, a population standard of 1% with an acceptance probability of at least 95% should be applied. In the case of a sample size of 50 panicle rows, the maximum number of aberrant panicle-rows should not exceed 2.

#### 4.2.3 Hybrid varieties

For the assessment of uniformity of single hybrids, a population standard of 1% with an acceptance probability of at least 95% should be applied. In the case of a sample size of 1,500 plants the maximum number of off-types allowed would be 39.

### 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 is 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) Leaf: anthocyanin coloration of auricles (characteristic 9)
- (b) Time of heading (50% of plants with heads) (characteristic 19)
- (c) Non-prostrate varieties only: Stem: length (excluding panicle) (characteristic 26)
- (d) Decorticated grain: length (characteristic 58)
- (e) Decorticated grain: color (characteristic 61)
- (f) Decorticated grain: aroma (characteristic 65)

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

## 6. Introduction to the Table of Characteristics

### 6.1 *Categories of Characteristics*

#### 6.1.1 Standard Test Guidelines Characteristics

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

#### 6.1.2 Asterisked Characteristics

Asterisked characteristics (denoted by \*) are those included in the Test Guidelines which are important for the international harmonization of variety descriptions and should

always be examined for DUS and included in the variety description by all members of the Union, except when the state of expression of a preceding characteristic or regional environmental conditions render this inappropriate.

## 6.2 *States of Expression and Corresponding Notes*

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

## 6.3 *Types of Expression*

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

## 6.4 *Example Varieties*

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

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

## 6.5 *Legend*

(\*) Asterisked characteristic – see Section 6.1.2

QL Qualitative characteristic – see Section 6.3

QN Quantitative characteristic – see Section 6.3

PQ Pseudo-qualitative characteristic – see Section 6.3

MG Single measurement of a group of plants or parts of plants – see Section 3.3.1

MS Measurement of a number of individual plants or parts of plants – see Section 3.3.1

VG Visual assessment by a single observation of a group of plants or parts of plants – see Section 3.3.1

VS Visual assessment by observation of individual plants or parts of plants – see Section 3.3.1

(a) See Explanations on the Table of Characteristics in Chapter 8, Section 8.1

(+) See Explanations on the Table of Characteristics in Chapter 8, Section 8.2

Stage of development: see Section 3.3.2



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

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>1.</b>	<b>10</b>	<b>Coleoptile:</b>	<b>Coléoptile:</b>	<b>Keimscheide:</b>	<b>Coleóptilo:</b>	
<b>(+)</b>	<b>VS</b>	<b>anthocyanin coloration</b>	<b>pigmentation anthocyanique</b>	<b>Anthocyanfärbung</b>	<b>pigmentación antociánica</b>	
<b>QN</b>	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil		1
	weak	faible	gering	débil		3
	strong	forte	stark	fuerte		5
<b>2.</b>	<b>40</b>	<b>Basal leaf: sheath color</b>	<b>Feuille basilaire: couleur de la gaine</b>	<b>Basisblatt: Farbe der Blattscheide</b>	<b>Hoja basal: color de la vaina</b>	
<b>VS</b>						
<b>PQ</b>	green	verte	grün	verde		1
	green with purple lines	verte à stries violettes	grün mit purpurfarbenen Linien	verde con líneas púrpura		2
	light purple	violet clair	hellpurpurn	púrpura claro		3
	purple	violette	purpurn	púrpura		4
<b>3.</b>	<b>40</b>	<b>Leaf: intensity of green color</b>	<b>Feuille: intensité de la couleur verte</b>	<b>Blatt: Intensität der Grünfärbung</b>	<b>Hoja: intensidad del color verde</b>	
<b>VG</b>						
<b>QN</b>	<b>(a)</b> light	claire	hell	claro		3
	medium	moyenne	mittel	medio		5
	dark	foncée	dunkel	oscuro		7
<b>4.</b>	<b>40</b>	<b>Leaf: anthocyanin coloration</b>	<b>Feuille: pigmentation anthocyanique</b>	<b>Blatt: Anthocyan- färbung</b>	<b>Hoja: pigmentación antociánica</b>	
<b>VG</b>						
<b>QL</b>	<b>(a)</b> absent	absente	fehlend	ausente		1
	present	présente	vorhanden	presente		9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>5.</b>	<b>40 VG</b>	<b>Leaf: distribution of anthocyanin coloration</b>	<b>Feuille: répartition de la pigmentation anthocyanique</b>	<b>Blatt: Verteilung der Anthocyanfärbung</b>	<b>Hoja: distribución de la pigmentación antociánica</b>	
<b>PQ</b>	(a)	on tips only	seulement au sommet	nur an der Spitze	sólo en el extremo	1
		on margins only	seulement en bordure	nur an den Rändern	sólo en los bordes	2
		in blotches only	seulement en taches	nur in Flecken	sólo en manchas	3
		even	uniforme	gleichmäßig	uniforme	4
<b>6.</b>	<b>40 VG</b>	<b>Leaf sheath: anthocyanin coloration</b>	<b>Gaine de la feuille: pigmentation anthocyanique</b>	<b>Blattscheide: Anthocyanfärbung</b>	<b>Vaina de la hoja: pigmentación antociánica</b>	
<b>QL</b>	(a)	absent	absente	fehlend	ausente	1
		present	présente	vorhanden	presente	9
<b>7.</b>	<b>40 VG</b>	<b>Leaf sheath: intensity of anthocyanin coloration</b>	<b>Gaine de la feuille: intensité de la pigmentation anthocyanique</b>	<b>Blattscheide: Stärke der Anthocyanfärbung</b>	<b>Vaina de la hoja: intensidad de la pigmentación antociánica</b>	
<b>QN</b>	(a)	very weak	très faible	sehr gering	muy débil	1
		weak	faible	gering	débil	3
		medium	moyenne	mittel	media	5
		strong	forte	stark	fuerte	7
<b>8.</b>	<b>40 VS</b>	<b>Leaf blade: pubescence of surface</b>	<b>Limbe: pubescence de la surface</b>	<b>Blattspreite: Behaarung der Oberfläche</b>	<b>Limbo: pubescencia de la superficie</b>	
<b>QN</b>	(a)	absent or very weak	nulle ou très faible	fehlend oder sehr gering	ausente o muy débil	1
		weak	faible	gering	débil	3
		medium	moyenne	mittel	media	5
		strong	forte	stark	fuerte	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>9. (*)</b>	<b>40 VS</b>	<b>Leaf: anthocyanin coloration of auricles</b>	<b>Feuille: pigmentation anthocyanique des oreillettes</b>	<b>Blatt: Anthocyanfärbung der Blattöhrchen</b>	<b>Hoja: pigmentación antociánica de las aurículas</b>	
<b>QL</b>	(a)	absent	absente	fehlend	ausente	1
		present	présente	vorhanden	presente	9
<b>10.</b>	<b>40 VS</b>	<b>Leaf: anthocyanin coloration of collar</b>	<b>Feuille: pigmentation anthocyanique de la collerette</b>	<b>Blatt: Anthocyanfärbung des Kragens</b>	<b>Hoja: pigmentación antociánica del collar</b>	
<b>QL</b>	(a)	absent	absente	fehlend	ausente	1
		present	présente	vorhanden	presente	9
<b>11. (+)</b>	<b>40 VS</b>	<b>Leaf: shape of ligule</b>	<b>Feuille: forme de la ligule</b>	<b>Blatt: Form des Blatthäutchens</b>	<b>Hoja: forma de la lígula</b>	
<b>PQ</b>	(a)	truncate	tronquée	stumpf	truncada	1
		acute	pointue	spitz	aguda	2
		cleft	divisée	gespalten	hendida	3
<b>12.</b>	<b>40 VS</b>	<b>Leaf: color of ligule</b>	<b>Feuille: couleur de la ligule</b>	<b>Blatt: Farbe des Blatthäutchens</b>	<b>Hoja: color de la lígula</b>	
<b>PQ</b>	(a)	colorless	incolore	farblos	incolora	1
		green	verte	grün	verde	2
		green with purple lines	verte à stries violettes	grün mit purpurfarbenen Linien	verde con líneas púrpura	3
		light purple	violet clair	hellpurpurn	púrpura claro	4
		purple	violette	purpurn	púrpura	5
<b>13.</b>	<b>40 MS</b>	<b>Leaf blade: length</b>	<b>Limbe: longueur</b>	<b>Blattspreite: Länge</b>	<b>Limbo: longitud</b>	
<b>QN</b>	(a)	short	court	kurz	corto	3
		medium	moyen	mittel	medio	5
		long	long	lang	largo	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>14.</b>	<b>40 MS</b>	<b>Leaf blade: width</b>	<b>Limbe: largeur</b>	<b>Blattspreite: Breite</b>	<b>Limbo: anchura</b>	
<b>QN</b>	(a)	narrow	étroit	schmal	estrecho	3
		medium	moyen	mittel	medio	5
		broad	large	breit	ancho	7
<b>15.</b>	<b>60 VG</b>	<b>Flag leaf: attitude of blade (early observation)</b>	<b>Dernière feuille: port du limbe (observation précoce)</b>	<b>Fahnenblatt: Haltung der Spreite (frühe Erfassung)</b>	<b>Hoja bandera: porte del limbo (observación temprana)</b>	
<b>QN</b>		erect	dressé	aufrecht	erecto	1
		semi-erect	demi dressé	halbaufrecht	semierecto	Galatxo 3
		horizontal	horizontal	waagrecht	horizontal	Veta 5
		recurved	recourbé	zurückgebogen	recurvado	7
<b>16.</b>	<b>90 VG</b>	<b>Flag leaf: attitude of blade (late observation)</b>	<b>Dernière feuille: port du limbe (observation tardive)</b>	<b>Fahnenblatt: Haltung der Spreite (späte Erfassung)</b>	<b>Hoja bandera: porte del limbo (observación tardía)</b>	
<b>QN</b>		erect	dressé	aufrecht	erecto	1
		semi-erect	demi dressé	halbaufrecht	semierecto	Fonsa 3
		horizontal	horizontal	waagrecht	horizontal	Puebla 5
		recurved	recourbé	zurückgebogen	recurvado	7
<b>17.</b>	<b>40 VS</b>	<b>Culm: habit</b>	<b>Tige: port</b>	<b>Seitentrieb: Wuchsform</b>	<b>Macollo: porte</b>	
<b>PQ</b>	(+)	erect	dressé	aufrecht	erecto	1
		semi-erect	demi dressé	halbaufrecht	semierecto	3
		open	ouvert	offen	abierto	5
		spreading	étalé	breitwüchsig	extendido	7
		prostrate	rampant	liegend	postrado	9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>18.</b>	<b>40</b>	<b><u>Prostrate varieties</u></b>	<b><u>Variétés rampantes</u></b>	<b><u>Nur liegende Sorten:</u></b>	<b><u>Variedades</u></b>	
(+)	<b>VS</b>	<b><u>only: Culm: kneeling ability</u></b>	<b><u>seulement: Tige: géniculation</u></b>	<b><u>Seitentrieb: Biegsamkeit</u></b>	<b><u>postradas solamente: Macollo: capacidad de emergencia de los tallos</u></b>	
<b>QL</b>	absent	absente	fehlend	ausente		1
	present	présente	vorhanden	presente		9
<b>19.</b>	<b>55</b>	<b><u>Time of heading (50% of plants with heads)</u></b>	<b><u>Époque d'épiaison (50% des plantes avec des panicules)</u></b>	<b><u>Zeitpunkt des Ährenschiebens (50% der Pflanzen mit Rispen)</u></b>	<b><u>Época de espigado (50% de las plantas con panículas)</u></b>	
(*)	<b>VG</b>					
<b>QN</b>	very early	très précoce	sehr früh	muy temprana	Loto	1
	early	précoce	früh	temprana	Albada, Cripto	3
	medium	moyenne	mittel	media	Ariete, Bahia	5
	late	tardive	spät	tardía	Bomba, Puntal	7
<b>20.</b>	<b>60</b>	<b><u>Male sterility</u></b>	<b><u>Stérilité mâle</u></b>	<b><u>Männliche Sterilität</u></b>	<b><u>Androesterilidad</u></b>	
(+)	<b>VS/ MS</b>					
<b>PQ</b>	absent	absente	fehlend	ausente		1
	partially male sterile	stérilité mâle partielle	teilweise männlich-steril	parcialmente androestéril		2
	male sterile	mâle stérile	männlich-steril	androestéril		3
<b>21.</b>	<b>65.</b>	<b><u>Lemma: anthocyanin coloration of keel (early observation)</u></b>	<b><u>Glumelle inférieure: pigmentation anthocyanique de la carène (observation précoce)</u></b>	<b><u>Deckspelze: Anthocyanfärbung des Kiels (frühe Erfassung)</u></b>	<b><u>Lema: pigmentación antociánica de la quilla (observación temprana)</u></b>	
(+)	<b>VS</b>					
<b>QN</b>	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil		1
	weak	faible	gering	débil		3
	medium	moyenne	mittel	media		5
	strong	forte	stark	fuerte		7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>22.</b> (+)	<b>65. Lemma:</b> <b>VS anthocyanin</b> <b>coloration of area</b> <b>below apex (early</b> <b>observation)</b>	<b>Glumelle inférieure:</b> <b>pigmentation</b> <b>anthocyanique de la</b> <b>zone sous l'apex</b> <b>(observation</b> <b>précoce)</b>	<b>Deckspelze: Antho-</b> <b>cyanfärbung der</b> <b>Fläche unterhalb</b> <b>der Spitze (frühe</b> <b>Erfassung)</b>	<b>Lema:</b> <b>pigmentación</b> <b>antociánica de la</b> <b>zona bajo el ápice</b> <b>(observación</b> <b>temprana)</b>		
<b>QN</b>	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil		1
	weak	faible	gering	débil		3
	medium	moyenne	mittel	media		5
	strong	forte	stark	fuerte		7
<b>23.</b> (* (+)	<b>65. Lemma:</b> <b>VS anthocyanin</b> <b>coloration of apex</b> <b>(early observation)</b>	<b>Glumelle inférieure:</b> <b>pigmentation</b> <b>anthocyanique de</b> <b>l'apex (observation</b> <b>précoce)</b>	<b>Deckspelze: Antho-</b> <b>cyanfärbung der</b> <b>Spitze (frühe</b> <b>Erfassung)</b>	<b>Lema:</b> <b>pigmentación</b> <b>antociánica del ápice</b> <b>(observación</b> <b>temprana)</b>		
<b>QN</b>	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Ariete, Bomba	1
	weak	faible	gering	débil	Thaibonnet	3
	medium	moyenne	mittel	media	Cripto	5
	strong	forte	stark	fuerte	Elio, Puntal	7
	very strong	très forte	sehr stark	muy fuerte	Arborio	9
<b>24.</b> (* (*)	<b>65. Spikelet: color of</b> <b>VS stigma</b>	<b>Épillet: couleur du</b> <b>stigmat</b>	<b>Ährchen: Farbe der</b> <b>Narbe</b>	<b>Espiguilla: color del</b> <b>estigma</b>		
<b>PQ</b>	white	blanc	weiß	blanco	Ariete, Bahia	1
	light green	vert clair	hellgrün	verde claro		2
	yellow	jaune	gelb	amarillo		3
	light purple	violet clair	hellpurpurn	púrpura claro		4
	purple	violet	purpurn	púrpura	Vialone Nano	5

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>25.</b>	<b>70.</b>	<b>Stem: thickness</b>	<b>Tige: épaisseur</b>	<b>Halm: Dicke</b>	<b>Tallo: grosor</b>	
(+)	VS					
<b>QN</b>	thin	mince	dünn	delgado		3
	medium	moyenne	mittel	medio		5
	thick	épaisse	dick	grueso		7
<b>26.</b>	<b>70</b>	<b><u>Non-prostrate varieties only</u>: Stem length (excluding panicle)</b>	<b><u>Variétés non rampantes seulement</u>: Tige: longueur (panicule non comprise)</b>	<b><u>Nur nicht liegende Sorten</u>: Halm: Länge (ohne Rispe)</b>	<b><u>Variedades no postradas solamente</u>: Tallo: longitud (excluida la panícula)</b>	
(*)	VS					
<b>QN</b>	very short	très courte	sehr kurz	muy corto	Lampo, Leda	1
	short	courte	kurz	corto	Loto, Thaibonnet	3
	medium	moyenne	mittel	medio	Ariete, Bahia	5
	long	longue	lang	largo	Baldo	7
	very long	très longue	sehr lang	muy largo	Carnaroli	9
<b>27.</b>	<b>70</b>	<b>Stem: anthocyanin coloration of nodes</b>	<b>Tige: pigmentation anthocyanique des nœuds</b>	<b>Halm: Anthocyanfärbung der Knoten</b>	<b>Tallo: pigmentación antociánica de los nudos</b>	
(*)	VS					
<b>QL</b>	absent	absente	fehlend	ausente		1
	present	présente	vorhanden	presente		9
<b>28.</b>	<b>70</b>	<b>Stem: intensity of anthocyanin coloration of nodes</b>	<b>Tige: intensité de la pigmentation anthocyanique des nœuds</b>	<b>Halm: Intensität der Anthocyanfärbung der Knoten</b>	<b>Tallo: intensidad de la pigmentación antociánica de los nudos</b>	
	VS					
<b>QN</b>	weak	faible	gering	débil		3
	medium	moyenne	mittel	media		5
	strong	forte	stark	fuerte		7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>29.</b>	<b>70 VS</b>	<b>Stem: anthocyanin coloration of internodes</b>	<b>Tige: pigmentation anthocyanique des entre-nœuds</b>	<b>Halm: Anthocyanfärbung der Internodien</b>	<b>Tallo: pigmentación antocianica de los entrenudos</b>	
<b>QL</b>	absent	absente	fehlend	ausente		1
	present	présente	vorhanden	presente		9
<b>30.</b>	<b>72-90 MS</b>	<b>Panicle: length of main axis</b>	<b>Panicule: longueur de l'axe central</b>	<b>Rispe: Länge der Hauptachse</b>	<b>Panícula: longitud del eje principal</b>	
<b>QN</b>	short	court	kurz	corto	Ariete, Lido	3
	medium	moyen	mittel	medio	Thaibonnet, Thainato	5
	long	long	lang	largo	Carnaroli, Lemont	7
<b>31.</b>	<b>70 MS</b>	<b>Panicle: number per plant</b>	<b>Panicule: nombre par plante</b>	<b>Rispe: Anzahl pro Pflanze</b>	<b>Panícula: número por planta</b>	
<b>QN</b>	few	petit	gering	bajo		3
	medium	moyen	mittel	medio		5
	many	grand	groß	alto		7
<b>32.</b>	<b>60 VS</b>	<b>Panicle: awns</b>	<b>Panicule: arêtes</b>	<b>Rispe: Grannen</b>	<b>Panícula: aristas</b>	
<b>QL</b>	absent	absentes	fehlend	ausentes		1
	present	présentes	vorhanden	presentes		9



	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>33. 60 VS</b>	<b>Panicle: color of awns (early observation)</b>	<b>Panicule: couleur des arêtes (observation précoce)</b>	<b>Rispe: Farbe der Grannen (frühe Erfassung)</b>	<b>Panícula: color de las aristas (observación temprana)</b>		
<b>PQ</b>	light gold	doré clair	hellgolden	dorado claro		1
	gold	dorées	gelblichbraun	dorado		2
	brown	brunes	braun	marrón		3
	reddish brown	brun rougeâtre	rötlichbraun	marrón rojizo		4
	light red	rouge clair	hellrot	rojo claro		5
	red	rouges	rot	rojo		6
	light purple	violet clair	hellpurpurn	púrpura claro		7
	purple	violettes	purpurn	púrpura		8
	black	noires	schwarz	negro		9
<b>34. 70-80 (*) VS</b>	<b>Panicle: distribution of awns</b>	<b>Panicule: répartition des arêtes</b>	<b>Rispe: Verteilung der Begrannung</b>	<b>Panícula: distribución de las aristas</b>		
<b>PQ</b>	tip only	au sommet seulement	nur an der Spitze	sólo en el ápice	Thaimato, Senia	1
	upper quarter only	sur le quart supérieur seulement	nur am oberen Viertel	en el cuarto superior solamente	Galaxto	2
	upper half only	sur la moitié supérieure seulement	nur in der oberen Hälfte	en la mitad superior	Puebla	3
	upper three quarters only	sur les trois quarts supérieurs seulement	nur an den oberen drei Vierteln	en los tres cuartos superiores solamente		4
	whole length	sur toute la longueur	auf der ganzen Länge	a todo lo largo	Bomba, Carnaroli	5

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>35.</b>	<b>70-80 VS</b>	<b>Panicule: longueur des arêtes les plus longues</b>	<b>Rispe: Länge der längsten Grannen</b>	<b>Panícula: longitud de las aristas más largas</b>		
<b>QN</b>	very short	très courtes	sehr kurz	muy cortas		1
	short	courtes	kurz	cortas		3
	medium	moyennes	mittel	medias		5
	long	longues	lang	largas		7
	very long	très longues	sehr lang	muy largas		9
<b>36. (*)</b>	<b>60-80 VS</b>	<b>Épillet: pubescence de la glumelle inférieure</b>	<b>Ährchen: Behaarung der Deckspelze</b>	<b>Espiguilla: pubescencia de la lema</b>		
<b>QN</b>	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Puntal, Thaibonnet	1
	weak	faible	gering	débil	Guadamar, Thaibonnet	3
	medium	moyenne	mittel	media	Galatxo, Vialone Nano	5
	strong	forte	stark	fuerte	Bomba, Calca, S. Andrea	7
	very strong	très forte	sehr stark	muy fuerte		9
<b>37. (+)</b>	<b>80-90 VS</b>	<b>Épillet: couleur du sommet de la glumelle inférieure</b>	<b>Ährchen: Farbe der Spitze der Deckspelze</b>	<b>Espiguilla: color del extremo de la lema</b>		
<b>PQ</b>	white	blanc	weiß	blanco		1
	yellowish	jaunâtre	gelblich	amarillento		2
	brown	brun	braun	marrón		3
	red	rouge	rot	rojo		4
	purple	pourpre	purpurn	púrpura		5
	black	noir	schwarz	negro		6

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>38.</b>	<b>90 VS</b>	<b>Panicle: color of awns (late observation)</b>	<b>Panicule: couleur des arêtes (observation tardive)</b>	<b>Rispe: Farbe der Grannen (späte Erfassung)</b>	<b>Panícula: color de las aristas (observación tardía)</b>	
<b>PQ</b>	light gold	doré clair	hellgolden	dorado claro		1
	gold	dorées	golden	dorado		2
	brown	brunes	braun	marrón		3
	reddish brown	brun rougeâtre	rötlichbraun	marrón rojizo		4
	light red	rouge clair	hellrot	rojo claro		5
	red	rouges	rot	rojo		6
	light purple	violet clair	hellpurpurn	púrpura claro		7
	purple	violettes	purpurn	púrpura		8
	black	noires	schwarz	negro		9
<b>39.</b>	<b>90 (*) VG (+)</b>	<b>Panicle: attitude in relation to stem</b>	<b>Panicule: port par rapport à la tige</b>	<b>Rispe: Haltung im Verhältnis zum Halm</b>	<b>Panícula: porte en relación con el tallo</b>	
<b>PQ</b>	upright	dressée	aufrecht	erecto	Elio, Roncolo	1
	semi-upright	demi dressée	halbaufrecht	semierecto	Ariete, Lido	2
	slightly drooping	légèrement retombante	etwas überhängend	ligeramente colgante	Guadamar, Thaibonnet	3
	strongly drooping	fortement retombante	stark überhängend	fuertemente colgante	Galatxo, Vialone Nano	4
<b>40.</b>	<b>90 VS (+)</b>	<b>Panicle: presence of secondary branching</b>	<b>Panicule: présence de ramification secondaire</b>	<b>Rispe: Vorhandensein der sekundären Verzweigung</b>	<b>Panícula: presencia de ramificación secundaria</b>	
<b>QL</b>	absent	absente	fehlend	ausente		1
	present	présente	vorhanden	presente		9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>41.</b>	<b>90 VS</b>	<b>Panicle: type of secondary branching</b>	<b>Panicule: type de la ramification secondaire</b>	<b>Rispe: Typ der sekundären Verzweigung</b>	<b>Panícula: tipo de ramificación secundaria</b>	
(+)						
<b>PQ</b>	type 1	type 1	Typ 1	tipo 1		1
	type 2	type 2	Typ 2	tipo 2		2
	type 3	type 3	Typ 3	tipo 3		3
<b>42.</b>	<b>90 VS</b>	<b>Panicle: attitude of branches</b>	<b>Panicule: port des ramifications</b>	<b>Rispe: Stellung der Seitenäste</b>	<b>Panícula: porte de las ramificaciones</b>	
(*)						
(+)						
<b>QN</b>	erect	dressé	aufrecht	erectas		1
	semi-erect	demi dressé	halbaufrecht	semierectas	Bahia	3
	spreading	étalé	breitwüchsig	extendidas	Koral	5
<b>43.</b>	<b>90 VG</b>	<b>Panicle: exertion</b>	<b>Panicule: déploiement</b>	<b>Rispe: Hervorstehen</b>	<b>Panícula: ejerción</b>	
(+)						
<b>QN</b>	enclosed	inclue	eingeschlossen	envuelta		1
	partly exerted	partiellement saillante	teilweise hervorstehend	parcialmente exerta		3
	just exerted	tout juste saillante	gerade noch hervorstehend	apenas exerta		5
	moderately-well exerted	moyennement saillante	mäßig deutlich hervorstehend	moderadamente exerta		7
	well exerted	bien saillante	deutlich hervorstehend	muy exerta		9
<b>44.</b>	<b>90 VG</b>	<b>Time of maturity</b>	<b>Époque de maturité</b>	<b>Zeitpunkt der Reife</b>	<b>Época de madurez</b>	
<b>QN</b>	very early	très précoce	sehr früh	muy temprana		1
	early	précoce	früh	temprana		3
	intermediate	intermédiaire	mittel	media		5
	late	tardive	spät	tardía		7
	very late	très tardive	sehr spät	muy tardía		9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>45.</b>	<b>92 VG</b>	<b>Leaf: time of senescence</b>	<b>Feuille: époque de sénescence</b>	<b>Blatt: Zeitpunkt des Alterns</b>	<b>Hoja: época de senescencia</b>	
(+)						
<b>QN</b>	early	précoce	früh	precoz		3
	intermediate	intermédiaire	mittel	intermedia		5
	late	tardive	spät	tardía		7
<b>46.</b>	<b>VS</b>	<b>Lemma: color</b>	<b>Glumelle inférieure: couleur</b>	<b>Deckspelze: Farbe</b>	<b>Lema: color</b>	
<b>PQ</b>	light gold	doré clair	hellgolden	dorado claro		1
	gold	dorée	golden	dorado		2
	brown	brune	braun	marrón		3
	reddish to light purple	rougeâtre à violet clair	rötlich bis hellpurpurn	rojizo a púrpura claro		4
	purple	violette	purpurn	púrpura		5
	black	noire	schwarz	negro		6
<b>47.</b>	<b>VS</b>	<b>Lemma: ornamentation</b>	<b>Glumelle inférieure: ornementation</b>	<b>Deckspelze: Ornamentierung</b>	<b>Lema: ornamentación</b>	
<b>PQ</b>	absent	absente	Fehlend	ausente		1
	gold furrows	sillons dorés	goldene Furchen	surcos dorados		2
	brown furrows	sillons bruns	braune Furchen	surcos marrones		3
	purple spots	taches violettes	purpurfarbene Flecken	puntos púrpura		4
	purple furrows	sillons violets	purpurfarbene Furchen	surcos púrpura		5

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>48.</b>	<b>92. Lemma: VS anthocyanin coloration of keel (late observation)</b>	<b>Glumelle inférieure: pigmentation anthocyanique de la carène (observation tardive)</b>	<b>Deckspelze: Antho- cyanfärbung des Kiels (späte Erfassung)</b>	<b>Lema: pigmentación antociánica de la quilla (observación tardía)</b>		
(+)						
<b>QN</b>	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil		1
	weak	faible	gering	débil		3
	medium	moyenne	mittel	media		5
	strong	forte	stark	fuerte		7
<b>49.</b>	<b>92. Lemma: VS anthocyanin coloration of area below apex (late observation)</b>	<b>Glumelle inférieure: pigmentation anthocyanique de la zone sous l'apex (observation tardive)</b>	<b>Deckspelze: Antho- cyanfärbung der Fläche unterhalb der Spitze (späte Erfassung)</b>	<b>Lema: pigmentación antociánica de la zona bajo el ápice (observación tardía)</b>		
(+)						
<b>QN</b>	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil		1
	weak	faible	gering	débil		3
	medium	moyenne	mittel	media		5
	strong	forte	stark	fuerte		7
	very strong	très forte	sehr stark	muy fuerte		9
<b>50.</b>	<b>92. Lemma: VS anthocyanin coloration of apex (late observation)</b>	<b>Glumelle inférieure: pigmentation anthocyanique de l'apex (observation tardive)</b>	<b>Deckspelze: Antho- cyanfärbung der Spitze (späte Erfassung)</b>	<b>Lema: pigmentación antociánica del ápice (observación tardía)</b>		
(+)						
<b>QN</b>	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil		1
	weak	faible	gering	débil		3
	medium	moyenne	mittel	media		5
	strong	forte	stark	fuerte		7
	very strong	très forte	sehr stark	muy fuerte		9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>51.</b>	<b>92 MS</b>	<b>Glume: length</b>	<b>Glume: longueur</b>	<b>Hüllspelze: Länge</b>	<b>Gluma: longitud</b>	
(+)						
<b>QN</b>	short	courte	kurz	corta		3
	medium	moyenne	mittel	media		5
	long	longue	lang	larga		7
<b>52.</b>	<b>92 MS</b>	<b>Glume: color</b>	<b>Glume: couleur</b>	<b>Hüllspelze: Farbe</b>	<b>Gluma: color</b>	
(+)						
<b>PQ</b>	straw	paille	strohfarben	pajizo		1
	gold	dorée	golden	dorado		2
	red	rouge	rot	rojo		3
	purple	pourpre	purpurn	púrpura		4
<b>53.</b>	<b>92 MS</b>	<b>Grain: weight of 1000 (fully developed grains)</b>	<b>Grain: poids de 1000 (grains complètement développés)</b>	<b>Korn: Tausend-kornmasse (voll entwickelter Körner)</b>	<b>Grano: peso de 1.000 (granos completamente desarrollados)</b>	
(+)						
<b>QN</b>	low	petit	niedrig	pequeño		3
	medium	moyen	mittel	medio		5
	high	grand	hoch	grande		7
<b>54.</b>	<b>92 MS</b>	<b>Grain: length</b>	<b>Grain: longueur</b>	<b>Korn: Länge</b>	<b>Grano: longitud</b>	
<b>QN</b>	short	court	kurz	corto		3
	medium	moyen	mittel	medio		5
	long	long	lang	largo		7
<b>55.</b>	<b>92 MS</b>	<b>Grain: width</b>	<b>Grain: largeur</b>	<b>Korn: Breite</b>	<b>Grano: anchura</b>	
<b>QN</b>	narrow	étroit	schmal	estrecho		3
	medium	moyen	mittel	medio		5
	broad	large	breit	ancho		7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>56.</b>	<b>92</b>	<b>Lemma: phenol</b>	<b>Glumelle inférieure:</b>	<b>Deckspelze:</b>	<b>Lema: reacción al</b>	
(+)	<b>VG</b>	<b>reaction</b>	<b>réaction au phénol</b>	<b>Phenolreaktion</b>	<b>fenol</b>	
<b>QL</b>	absent	absente	fehlend	ausente		1
	present	présente	vorhanden	presente		9
<b>57.</b>	<b>92</b>	<b>Lemma: intensity of</b>	<b>Glumelle inférieure:</b>	<b>Deckspelze:</b>	<b>Lema: intensidad</b>	
(+)	<b>VS</b>	<b>phenol reaction</b>	<b>intensité de la</b>	<b>Intensität der</b>	<b>de la reacción al</b>	
			<b>réaction au phénol</b>	<b>Phenolreaktion</b>	<b>fenol</b>	
<b>QN</b>	light	claire	hell	clara		3
	medium	moyenne	mittel	media		5
	dark	foncée	dunkel	oscura		7
<b>58.</b>	<b>92</b>	<b>Decorticated grain:</b>	<b>Caryopse: longueur</b>	<b>Geschältes Korn:</b>	<b>Cariópside:</b>	
(*)	<b>MS</b>	<b>length</b>		<b>Länge</b>	<b>longitud</b>	
<b>QN</b>	short	court	kurz	corta	Balilla, Bomba	3
	medium	moyen	mittel	media	Bahia, Lido	5
	long	long	lang	larga	Puntal, Thaibonnet	7
<b>59.</b>	<b>92</b>	<b>Decorticated grain:</b>	<b>Caryopse: largeur</b>	<b>Geschältes Korn:</b>	<b>Cariópside:</b>	
	<b>MS</b>	<b>width</b>		<b>Breite</b>	<b>anchura</b>	
<b>QN</b>	narrow	étroit	schmal	estrecha		3
	medium	moyen	mittel	media		5
	broad	large	breit	ancha		7



	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>60.</b> (*) (+)	<b>92 VS</b>	<b>Decorticated grain: shape (in lateral view)</b>	<b>Caryopse: forme (de profil)</b>	<b>Geschältes Korn: Form (in Seitenansicht)</b>	<b>Cariópside: forma (vista lateral)</b>	
<b>PQ</b>	round	arrondi	rund	redonda		1
	semi-round	demi arrondi	halbrund	semi redonda	Bahia	2
	half spindle-shaped	demi fusiforme	halb spindelförmig	medio fusiforme	Lido	3
	spindle-shaped	fusiforme	spindelförmig	fusiforme	Ariete	4
	long spindle-shaped	très fusiforme	lang spindelförmig	muy fusiforme	Thaibonnet	5
<b>61.</b> (*)	<b>92 VS</b>	<b>Decorticated grain: color</b>	<b>Caryopse: couleur</b>	<b>Geschältes Korn: Farbe</b>	<b>Cariópside: color</b>	
<b>PQ</b>	white	blanc	weiß	blanco	Bahia, Senia	1
	light brown	brun clair	hellbraun	marrón claro		2
	variegated brown	brun panaché	panachiert braun	marrón variegado		3
	dark brown	brun foncé	dunkelbraun	marrón oscuro	Venere	4
	light red	rouge clair	hellrot	rojo claro		5
	red	rouge	rot	rojo		6
	variegated purple	pourpre panaché	panachiert purpurn	púrpura variegado		7
	purple	pourpre	purpurn	púrpura		8
	dark purple/black	pourpre foncé/noir	dunkelpurpurn/ schwarz	púrpura oscuro/negro		9
<b>62.</b> (+)	<b>92 VS</b>	<b>Endosperm: type</b>	<b>Endosperme: type</b>	<b>Endosperm: Typ</b>	<b>Endospermo: tipo</b>	
<b>PQ</b>	glutinous	glutineux	mit Gluten	glutinoso		1
	intermediate	intermédiaire	Zwischentyp	intermedio		2
	non-glutinous	non glutineux	ohne Gluten	no glutinoso		3

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
<b>63.</b>	<b>92</b>	<b>Endosperm: content</b>	<b>Endosperme:</b>	<b>Endosperm:</b>	<b>Endospermo:</b>	
(+)	<b>MG</b>	<b>of amylose</b>	<b>contenu en amylose</b>	<b>Amylosegehalt</b>	<b>contenido de amilosa</b>	
<b>PQ</b>	State 1	Niveau 1	Stufe 1	Nivel 1		1
	State 2	Niveau 2	Stufe 2	Nivel 2		2
	State 3	Niveau 3	Stufe 3	Nivel 3		3
	State 4	Niveau 4	Stufe 4	Nivel 4		4
	State 5	Niveau 5	Stufe 5	Nivel 5		5
	State 6	Niveau 6	Stufe 6	Nivel 6		6
	State 7	Niveau 7	Stufe 7	Nivel 7		7
<b>64.</b>	<b>92</b>	<b>Alkali digestion</b>	<b>Digestion par des</b>	<b>Zersetzung durch</b>	<b>Digestión alcalina</b>	
(+)	<b>MG</b>		<b>alcalis</b>	<b>Alkali</b>		
<b>QN</b>	not digested	non digérés	nicht ausgelaugt	no digerido		1
	low digested	peu digérés	wenig ausgelaugt	poco digerido		3
	intermediate	moyennement digérés	mittel ausgelaugt	intermedia		5
	completely digested	totalemment digérés	vollständig ausgelaugt	completamente digerido		7
<b>65.</b>	<b>92</b>	<b>Decorticated grain:</b>	<b>Caryopse: arôme</b>	<b>Geschältes Korn:</b>	<b>Carióside: aroma</b>	
(*)	<b>MG</b>	<b>aroma</b>		<b>Aroma</b>		
(+)						
<b>QN</b>	absent or very weak	absent ou très faible	fehlend oder sehr gering	ausente o muy débil	Bahia, Thaibonnet	1
	weak	faible	gering	débil		2
	strong	fort	stark	fuerte	Arome, Gange	3

8. Explanations on the Table of Characteristics

8.1 *Explanations covering several characteristics*

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

- (a) Unless otherwise indicated, all observations on the leaf should be made on the penultimate leaf.

8.2 *Explanations for individual characteristics*

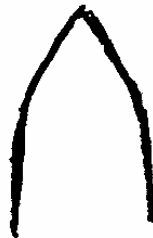
Ad. 1: Coleoptile: anthocyanin coloration

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 5 mm 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 Centigrade. The color of the coleoptiles is observed when they are fully developed at stage 09-11 (about 6 to 7 days).

Ad. 11: Leaf: shape of ligule



1  
truncate

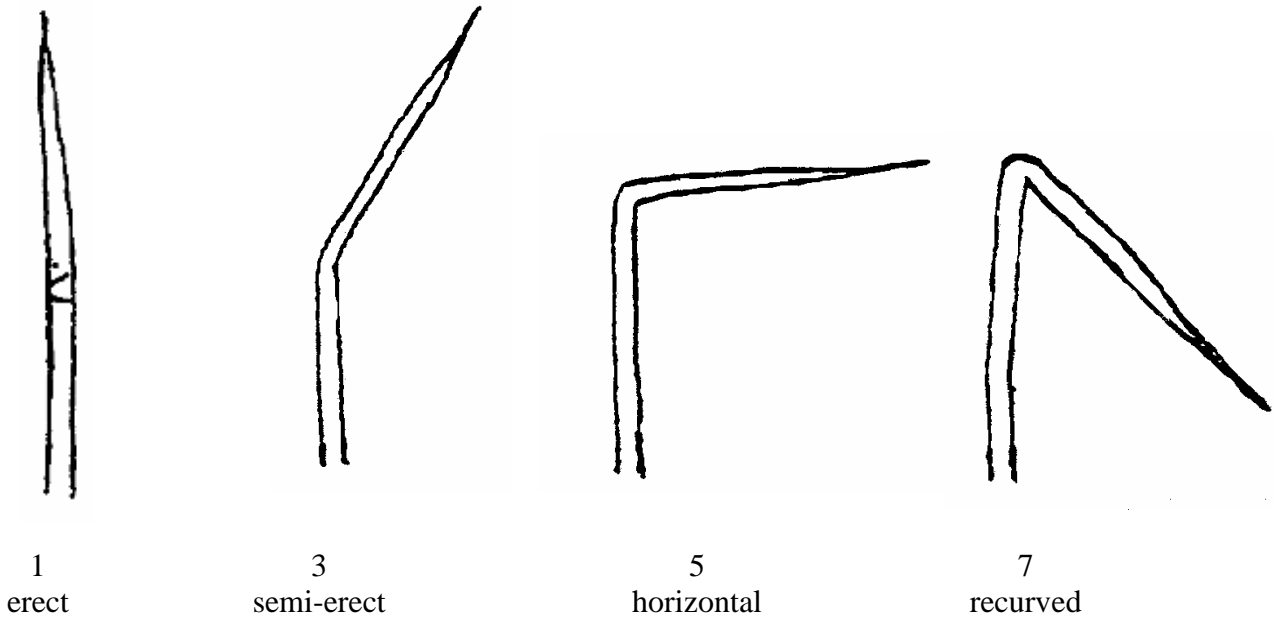


2  
acute

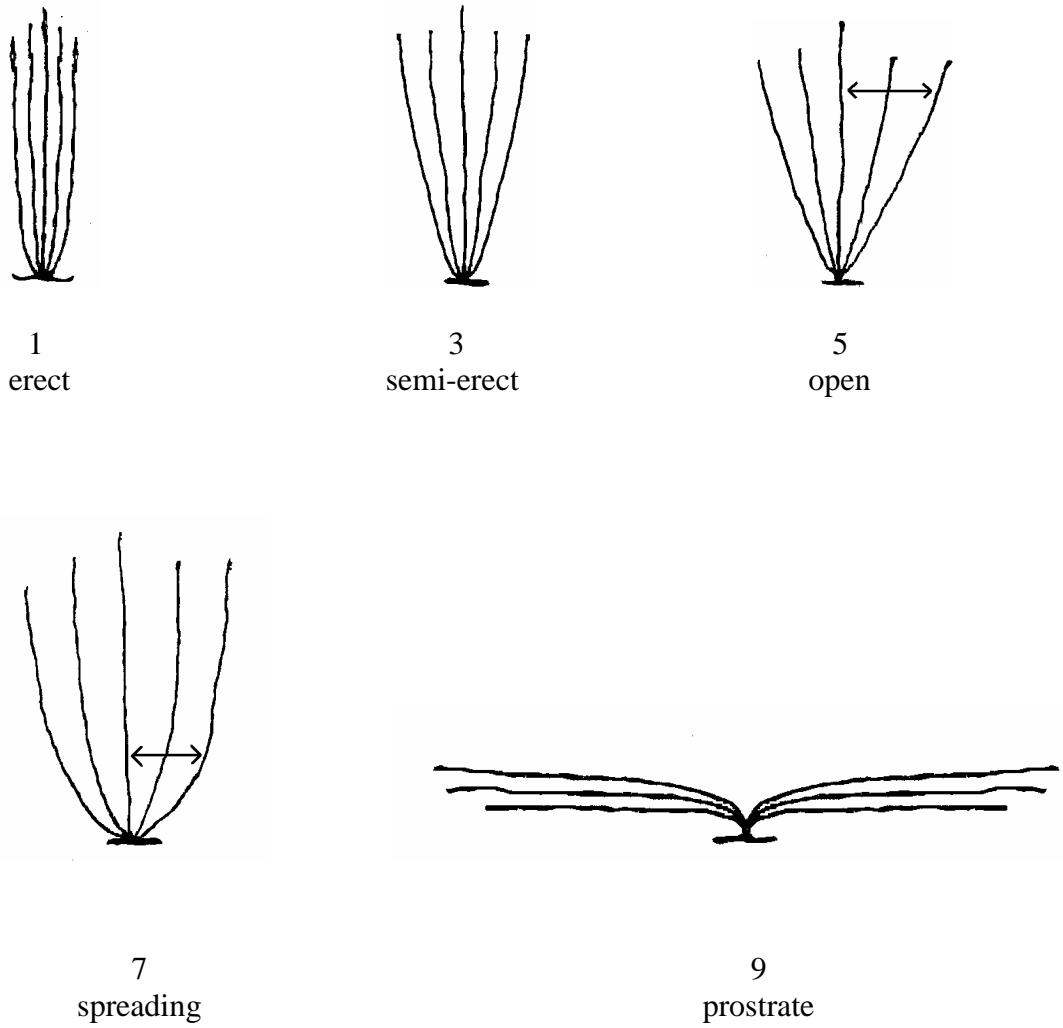


3  
cleft

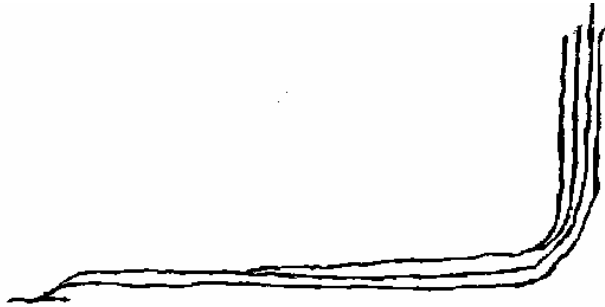
Ad. 15 and 16: Flag leaf: attitude of blade (early and late observation)



Ad. 17: Culm: habit



Ad. 18: Prostrate varieties only: Culm: kneeling ability

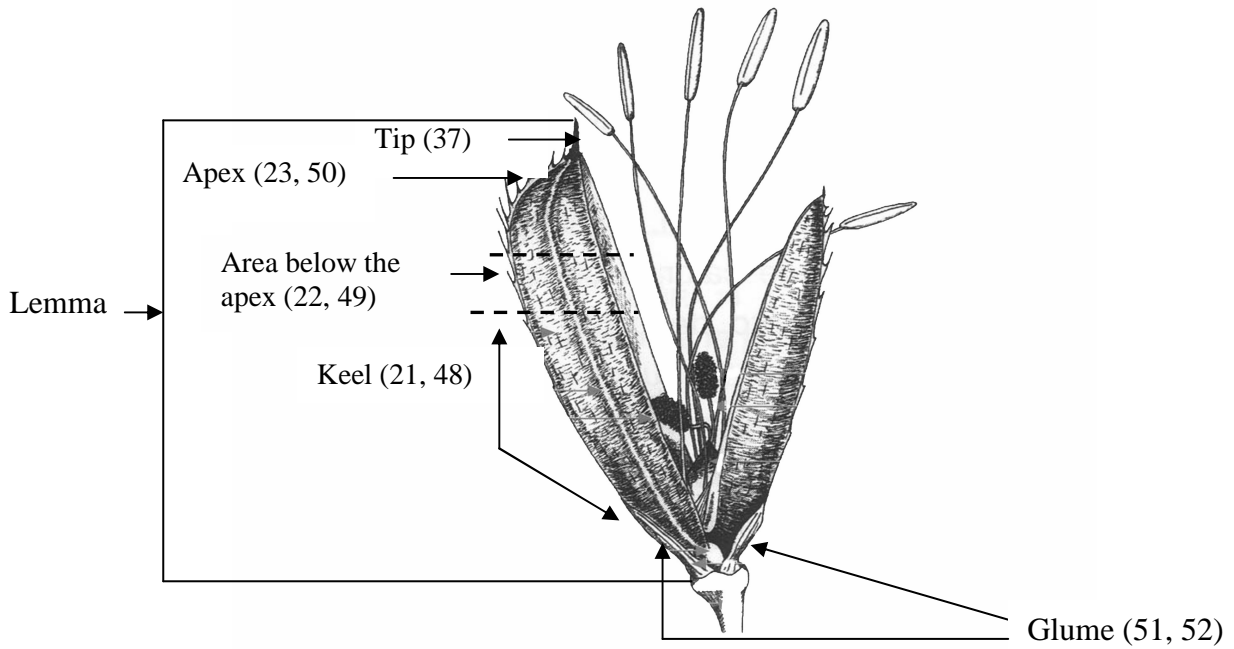


Kneeing ability is one of the most important characteristics for deep water/floating types of rice. After falling flat due to receding water flow, the stems of varieties with kneeling ability start to grow upright with 3 to 4 nodes and bear panicles.

Ad. 20: Male sterility

absent	less than 25 % sterile pollen	1
partially male sterile	25 to 95 % sterile pollen	2
male sterile	more than 95 % sterile pollen	3

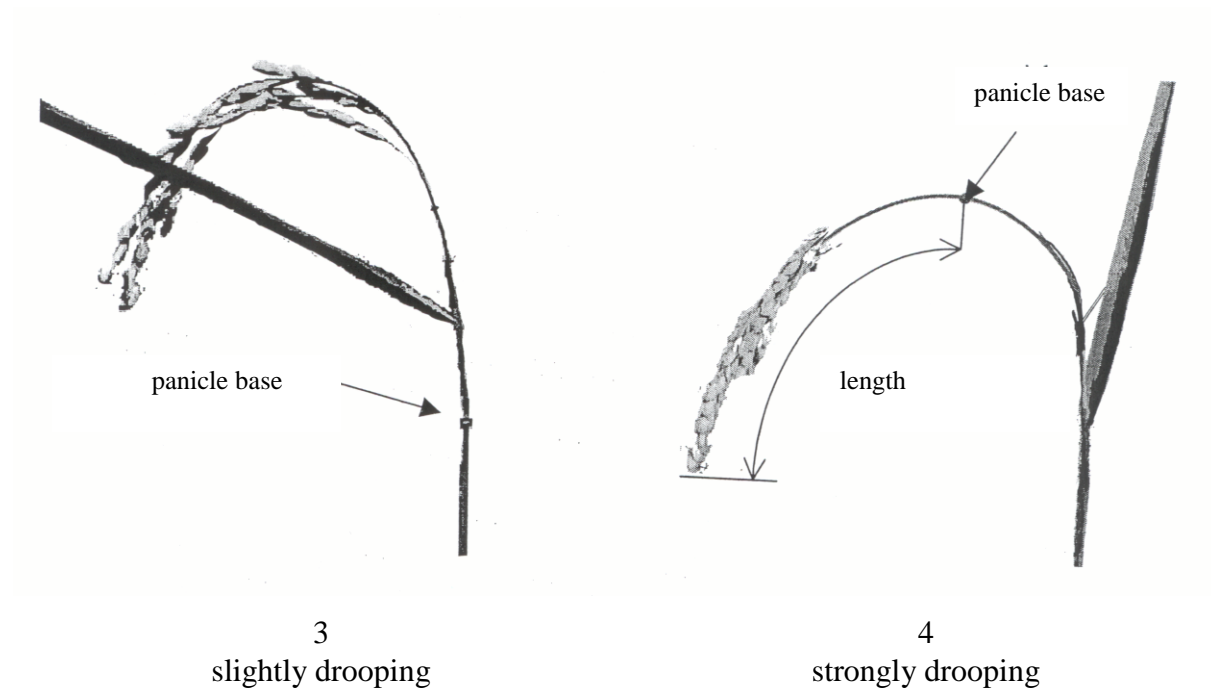
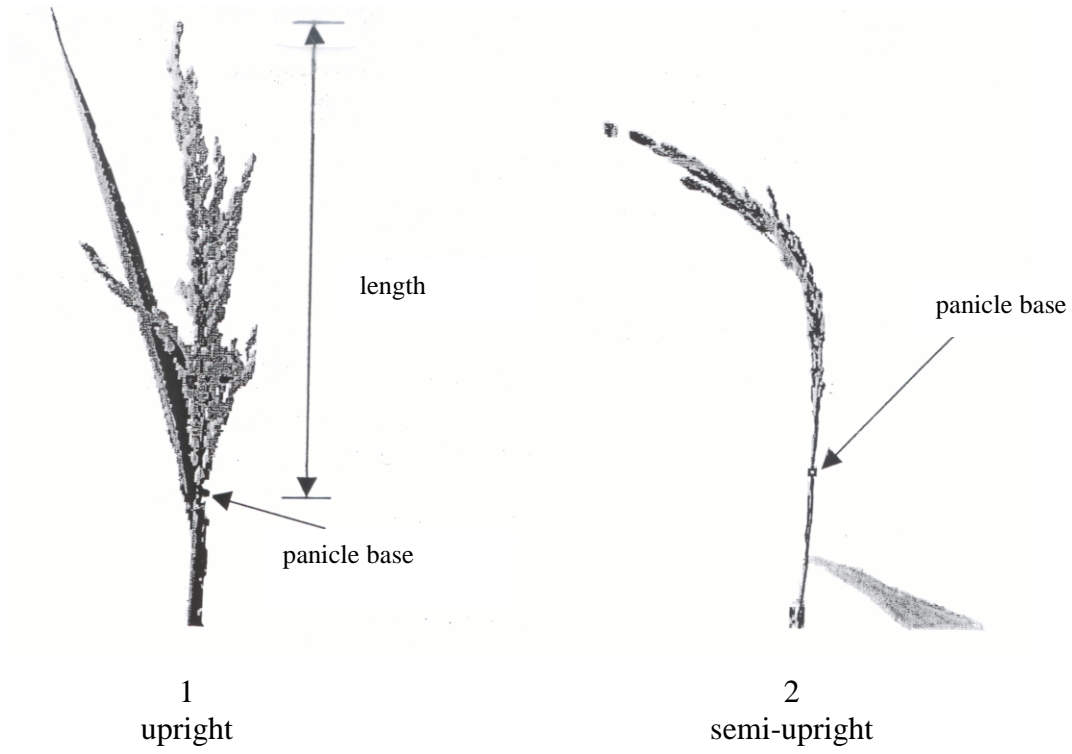
Ads. 21, 22, 23 and 48, 49, 50: Lemma: anthocyanin coloration (early and late observation);  
Ad. 37: Spikelet: color of tip; Ads 51 and 52: Glume: length (51) and color (52)



Ad. 25: Stem: thickness

At the lowest internode.

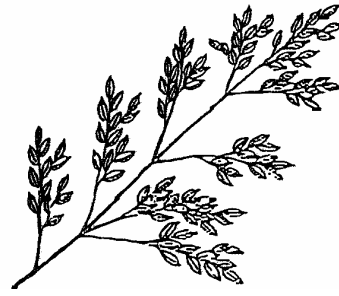
Ads. 30 and 39: Panicle: length of main axis (30) and attitude in relation to stem (39)



Ad. 40: Panicle: presence of secondary branching

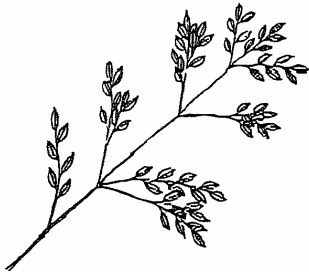


1  
absent



9  
present

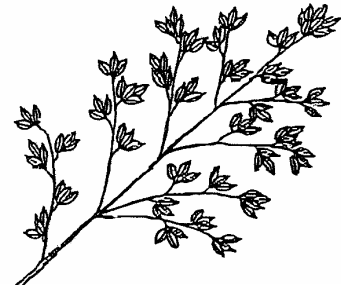
Ad. 41: Panicle: type of secondary branching



1  
type 1



2  
type 2



3  
type 3

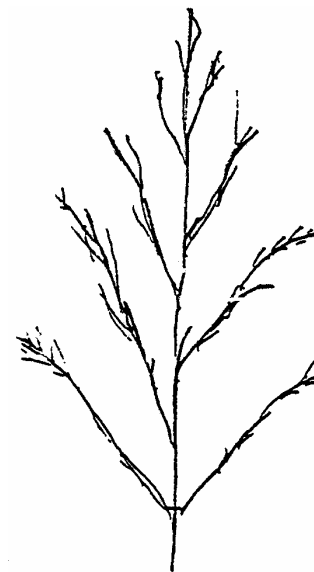
Ad. 42: Panicle: attitude of branches: to be observed on a flat, horizontal surface



1  
erect



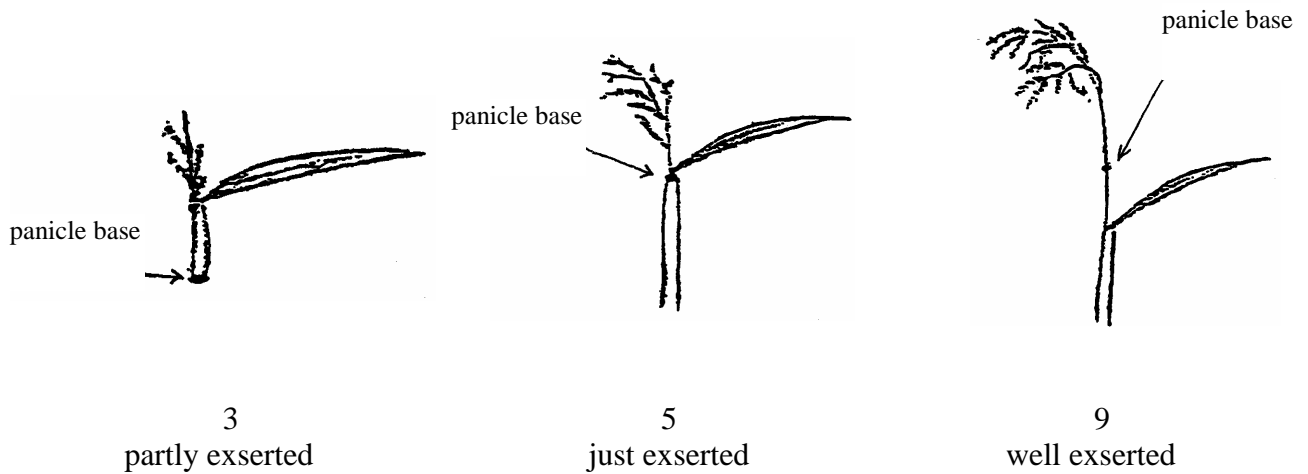
3  
semi-erect



5  
spreading



Ad. 43: Panicle: exsertion



Ad. 45: Leaf: time of senescence

The leaves below the flag leaf are observed at the time of harvest for their retention of greenness. State (3), leaves are dead when the grains have become fully ripened; state (5), intermediate (there must be 1 leaf which retains its color); state (7), 2 or more leaves retain their color at maturity.

Ad. 51: Glume: length

The measurement is made on each of the two glumes.

Ad. 53: Grain: weight of 1000 (fully developed grains)

To be calculated at 14% moisture.

Ads. 56 and 57: Lemma: phenol reaction (56) and intensity of phenol reaction (57)

Method of Testing: Place hulls from 10 grains into a petri dish of 5 cm diameter, and add 5 ml of 1.5% phenol solution; cover the petri dish, and keep at room temperature (not very cold) for one day.

Ad. 60: Decorticated grain: shape (in lateral view)

		<u>length/width</u>
round	1	< 1.50
semi-round	2	1.50-1.99
half spindle-shaped	3	2.00-2.49
spindle-shaped	4	2.50-2.99
long spindle-shaped	5	≥ 3.00

Ad. 62: Endosperm: type

The three states of expression can be simply defined by reaction to KI-I solution; glutinous type endosperm is stained to reddish purple, non-glutinous type to dark blue purple, and intermediate type to reddish blue purple.

One can observe that glutinous rice has waxy grains, and non-glutinous rice has non-waxy to transparent grains, with various grades according to the amylose content of the endosperm. When it is necessary to differentiate glutinous rice and rice with very low amylose content, chemical analysis is needed.

Note: In general, the amylose content of pure line varieties of glutinous rice is 0%. However, many commercial varieties, especially local and traditional varieties may contain between 1% and 4% of amylose. This is because the waxy gene is recessive, and when outcrossed by non-glutinous rice, the endosperm becomes non-glutinous. Also, some methods of testing may result in a low % of amylose. Research on chemical structure of waxy rice is still in progress in Japan. Recently, various genes (named "dull" genes) for producing semi-waxy rice have been identified. At present, amylose content of those semi-waxy rice varieties is not less than 5%, though it is not sure if further lower amylose lines will be bred in the future.

Intermediate rice is non-glutinous but with very low amylose.

KI-I solution is prepared by mixing 0.1 % I<sub>2</sub> solution and 0.2 % KI solution.

Ad. 63: Endosperm: content of amylose

Method ISO 6647 should be used.

Modified from IRRI system by rounding due to variability of data especially in cool climates, and adding a rank of very high amylose content considering rice in some area of southern India.

State 1	<5%
State 2	5-10%
State 3	11-15%
State 4	16-20%
State 5	21-25%
State 6	25-30%
State 7	>30%

Ad. 64: Alkali digestion

Put 10 milled complete (unbroken) rice grains in a petri dish with 1.5% solution of KOH, and keep still under room temperature of around 25°C for about 24 hours.

- |                               |  |
|-------------------------------|--|
| Note 1 (not digested):        | rice grains are not affected.                                      |
| Note 3 (low digested):        | only the margin of the grains are dissolved.                       |
| Note 5 (intermediate):        | shape of grains become unclear, but incompletely dissolved.        |
| Note 7 (completely digested): | no margin is identified between the core part and the outer skirt. |

Ad. 65: Decorticated grain: aroma

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

Decimal Code for the Growth Stages of Cereals\*

2-digit Code	General Description	Feekes' Scale	Additional Remarks on Wheat, Barley, Rye, Oats and Rice
<u>Germination</u>			
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		
<u>Seedling growth</u>			
10	First leaf through coleoptile	} 1	Second leaf visible (less than 1 cm)
11	First leaf unfolded (1)		
12	2 leaves unfolded	} 50% of laminae 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		
<u>Germination</u>			
20	Main shoot only	} 2	This section to be used to supplement records from other sections of the table: "concurrent codes"
21	Main shoot and 1 tiller		
22	Main shoot and 2 tillers	} 3	
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		

\* Reproduced from EUCARPIA Bulletin No. 7, 1974, pages 49 - 52, with the kind permission of the authors. For further information, see J.C. Zadoks, T.T. Chang and C.F. Konzak, EUCARPIA Bulletin No 7, 1974, pages 42 - 52.

2-digit Code	General Description	Feekes' Scale	Additional Remarks on Wheat, Barley, Rye, Oats and Rice
<u>Stem elongation</u>			
30	Pseudo stem erection (2)	4 - 5	In rice: vegetative lag phase
31	1st node detectable	6	
}			
}			
}			
32	2nd node detectable	7	Jointing stage
}			
33	3rd node detectable	7	Above crown nodes
34	4th node detectable		
35	5th node detectable		
36	6th node detectable		
37	Flag leaf just visible		
38	-	8	
39	Flag leaf ligule/collar just visible	9	Pre-boot stage In rice: opposite auricle stage
<u>Booting</u>			
40	-		Little enlargement of the inflorescence, early-boot stage
41	Flag leaf sheath extending		
42	-		
43	Boots just visibly swollen	}	Mid-boot stage
44	-		
45	Boots swollen	}	Late-boot stage
46	-		
47	Flag leaf sheath opening	}	
48	-		
49	First awns visible	}	In awned forms only
<u>Inflorescence emergence</u>			
50	} First spikelet of inflorescence just visible	}	N
51			
}			
52	} ¼ of inflorescence emerged	}	N
53			
}			
54	} ½ of inflorescence emerged	}	N
55			
}			
56	} ¾ of inflorescence emerged	}	N
57			
}			
58	} Emergence of inflorescence completed	}	N
59			

N = non-synchronous crops

S = synchronous crops

2-digit Code	General Description	Feekes' Scale	Additional Remarks on Wheat, Barley, Rye, Oats and Rice
	<u>Anthesis</u>		
60	{	{ N	
	{ Beginning of anthesis	{ 10.51	
61	{	{ S	Not easily detectable in barley. In rice: Usually immediately following heading
62	-		
63	-		
64	{	{ N	
	{ Anthesis half-way	{ 10.52	
65	{	{ S	
66	-		
67	-		
68	{	{ N	
	{ Anthesis complete	{ 10.53	
69	{	{ S	
	<u>Milk development</u>		
70	-		
71	Caryopsis watery ripe	10.54	
72	-		
73	Early milk	{	
74	-	{	
75	Medium milk	{ 11.1	{ Increase in solids of liquid endosperm { notable when crushing the caryopsis { between fingers
76	-	{	
77	Late milk	{	
78	-		
79	-		
	<u>Dough development</u>		
80	-		
81	-		
82	-		
83	Early dough	{	Fingernail impression not held.
84	-	{	
85	Soft dough	{ 11.2	
86	-	{	
87	Hard dough	{	
88	-		Fingernail impression held, inflorescence losing chlorophyll
89	-		
	<u>Ripening</u>		
90	-		In rice: Terminal spikelets ripened.
91	Caryopsis hard (difficult to divide by thumbnail) (3)	11.3	In rice: 50% of spikelets ripened
92	Caryopsis hard (can no longer be dented by thumbnail) (4)	11.4	In rice: Over 90% of spikelets ripened (5)
93	Caryopsis loosening in daytime		Risk of grain loss by shedding
94	Over-ripe, straw dead and collapsing		

2-digit Code	General Description	Feekes' Scale	Additional Remarks on Wheat, Barley, Rye, Oats and Rice
<u>Ripening (continued)</u>			
95	Seed dormant		
96	Viable seed giving 50% germination		
97	Seed not dormant		
98	Secondary dormancy induced		
99	Secondary dormancy lost		
<u>Transplanting and recovery (rice only)</u>			
T1	Uprooting of seedlings		
T2	-		
T3	Rooting		
T4	-		
T5	-		
T6	-		
T7	Recovery of shoots		
T8	-		
T9	Resumption of vegetative growth		

### Notes on the Table

- (1) Stage of seedling inoculation with rust in the greenhouse.
- (2) Only applicable to cereals with a prostrate or semi-prostrate early growth habit.
- (3) Ripeness for binder (ca. 16% water content). Chlorophyll of inflorescence largely lost.
- (4) Ripeness for combine harvester (< 16% water content).
- (5) Optimum harvest time.

9. Literature

T. Matsuo (edit.), 1993-97: Science of the Rice Plant (volume 1-3), Nosan Gyoson Bunka Kyokai (Nobunkyo), Tokyo, JP

Vol. 1 Morphology (1993)  
Vol. 2 Physiology (1995)  
Vol. 3 Genetics (1997)  
Indices (1997)



10. Technical Questionnaire

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
		Application date: (not to be filled in by the applicant)
<p>TECHNICAL QUESTIONNAIRE to be completed in connection with an application for plant breeders' rights</p> <p>In the case of hybrid varieties which are the subject of an application for plant breeders' rights, and where the parent lines are to be submitted as a part of the examination of the hybrid variety, this Technical Questionnaire should be completed for each of the parent lines, in addition to being completed for the hybrid variety.</p>		
1. Subject of the Technical Questionnaire		
1.1 Latin Name	<input type="text" value="Oryza sativa L"/>	
1.2 Common Name	<input type="text" value="Rice"/>	
2. Applicant		
Name	<input type="text"/>	
Address	<input type="text"/>	
Telephone No.	<input type="text"/>	
Fax No.	<input type="text"/>	
E-mail address	<input type="text"/>	
Breeder (if different from applicant)	<input type="text"/>	
3. Proposed denomination and breeder's reference		
Proposed denomination (if available)	<input type="text"/>	
Breeder's reference	<input type="text"/>	

4. Information on the breeding scheme and propagation of the variety

4.1 Breeding scheme

4.2 Method of propagating the variety

4.2.1 Type of material

(a) line

male fertile line [ ]

male sterile line [ ]

(b) hybrid [ ]

(c) other (specify) [ ]

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

*Single Hybrid*

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

*Three-Way Hybrid*

(... female line ...) x (... male line ...)

=> single hybrid used as female parent x (... male parent ...)

and should identify in particular:

- (a) any male sterile lines
- (b) maintenance system of male sterile lines

4.3 Other information

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
<b>5.1 Basal leaf: sheath color</b> (2)		
green		1[ ]
green with purple lines		2[ ]
light purple		3[ ]
purple		4[ ]
<b>5.2 Leaf: anthocyanin coloration of auricles</b> (9)		
absent		1[ ]
present		9[ ]
<b>5.3 Time of heading (50% of plants with heads)</b> (19)		
very early	Loto	1[ ]
early	Albada, Cripto	3[ ]
medium	Ariete, Bahia	5[ ]
late	Bomba, Puntal	7[ ]
<b>5.4 <u>Non-prostrate varieties only</u>: Stem length (excluding panicle)</b> (26)		
very short	Lampo, Leda	1[ ]
short	Loto, Thaibonnet	3[ ]
medium	Ariete, Bahia	5[ ]
long	Baldo	7[ ]
very long	Carnaroli	9[ ]

TECHNICAL QUESTIONNAIRE		Page {x} of {y}	Reference Number:
	<b>Characteristics</b>	<b>Example Varieties</b>	<b>Note</b>
<b>5.5</b>	<b>Decorticated grain: length</b>		
<b>(58)</b>			
	short	Balilla, Bomba	3[ ]
	medium	Bahia, Lido	5[ ]
	long	Puntal, Thaibonnet	7[ ]
<b>5.6</b>	<b>Decorticated grain: color</b>		
<b>(61)</b>			
	white	Bahia, Senia	1[ ]
	light brown		2[ ]
	variegated brown		3[ ]
	dark brown	Venere	4[ ]
	light red		5[ ]
	red		6[ ]
	variegated purple		7[ ]
	purple		8[ ]
	dark purple/black		9[ ]

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

6. Similar varieties and differences from these varieties

*Please use the table, and space provided for comments, below 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 <b>similar</b> variety(ies)	Describe the expression of the characteristic(s) for <b>your</b> candidate variety
<i>Example</i>	<i>Decorticated grain: length</i>	<i>short</i>	<i>medium</i>

Comments:

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
<p>7. Additional information which may help in the examination of the variety</p> <p>7.1 In addition to the information provided in sections 5 and 6, are there any additional characteristics which may help to distinguish the variety?</p> <p>Yes [ ] No [ ]</p> <p>(If yes, please provide details)</p> <p>7.2 Special conditions for the examination of the variety</p> <p>7.2.1 Are there any special conditions for growing the variety or conducting the examination?</p> <p>Yes [ ] No [ ]</p> <p>7.2.2 If yes, please give details:</p> <p>7.3 Other information</p>		
<p>8. Authorization for release</p> <p>(a) Does the variety require prior authorization for release under legislation concerning the protection of the environment, human and animal health?</p> <p>Yes [ ] No [ ]</p> <p>(b) Has such authorization been obtained?</p> <p>Yes [ ] No [ ]</p> <p>If the answer to (b) is yes, please attach a copy of the authorization.</p>		

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

9. Information on plant material to be examined.

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 or pesticide) | Yes [ ] | No [ ] |
| (c) Tissue culture  | Yes [ ] | No [ ] |
| (d) Other factors   | Yes [ ] | No [ ] |

Please provide details of where you have indicated "yes".

.....

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

Applicant's name

Signature

Date

[End of document]