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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

DRAFT

Wheat

UPOV Code: TRITI_AES

Triticum aestivum L. emend. Fiori et Paol.

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by experts from France

to be considered by the

Technical Working Party for Agricultural Crops
at its forty-first session, to be held in Angers, France, from May 21 to 25, 2012

Alternative Names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Triticum aestivum L. emend. Fiori et Paol.	Wheat			

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 *Triticum aestivum* L. emend. Fiori et Paol..

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:

Seeds: 5 kg
Ears (if requested): 100

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.

If ear is requested, it 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

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

3.2 Testing Place

Tests are normally conducted at one place. In the case of tests conducted at more than one place, guidance is provided in TGP/9 “Examining Distinctness”.

3.3 Conditions for Conducting the Examination

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

3.3.2 Stage of development for the assessment

The optimum stage of development for the assessment of each characteristic is indicated by a number in the second column of the Table of Characteristics. The stages of development denoted by each number are described in Chapter 8.3.

3.4 Test Design

3.4.1 Each test should be designed to result in a total of at least 2000 plants. The assessment for the characteristics “Seasonal type” should be carried out on at least 300 plants.

3.4.2 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.

3.4.3 Single ear rows: if tests on ear rows are conducted, at least 100 ear rows should be observed.

3.4.4 In case of hybrids, the parent lines have to be included in the test and should be tested and assessed as any other self-pollinating variety. The observations on the hybrid variety itself should be made on at least 200 plants.

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 / Parts of Plants to be Examined

Unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 20 plants or parts taken from each of 20 plants and any other observations made on all plants in

the test, 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 second column of 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 Indication of sample size in the Table of Characteristics

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/ear-rows
B sample size of 2000 plants or parts of plants

4.2.3 Uniformity assessment on all plants in the test

For the assessment of uniformity in a sample of 2000 plants, a population standard of 0.3% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 2000 plants, 10 off-types are allowed.

4.2.4 Uniformity assessment on a sub-sample

For the assessment of uniformity in a sample of 100 ear-rows, plants or parts of plants, 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 ear-rows, plants or parts of plants, 3 off-types are allowed.

An ear-row is considered to be an off-type ear-row if there is more than 1 off-type plant within that ear-row.

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

4.2.6 Uniformity assessment where the parent formula is used

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.

For the assessment of uniformity of hybrids, a population standard of 10% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 200 plants, 27 off-types are allowed.

4.3 Stability

4.3.1 In practice, it is not usual to perform tests of stability that produce results as certain as those of the testing of distinctness and uniformity. However, experience has demonstrated that, for many types of variety, when a variety has been shown to be uniform, it can also be considered to be stable.

4.3.2 Where appropriate, or in cases of doubt, stability may be 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 Stability assessment: hybrid varieties

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) Straw: pith in cross section (characteristic 11)
(b) Awns or scurs: presence (characteristic 15)
(c) Ear: color (characteristic 17)
(d) Seasonal type (characteristic 25)

5.4 An alternative method to grouping characteristics is GAIA method. It has been developed to optimize trials, by avoiding the growing of some of the varieties in the variety collection. The principle is to compute a phenotypic distance between each pair of varieties, this distance being a sum of distances on each individual observed characteristic. The background of the method relies on the possibility given to the crop expert to express his confidence on the differences observed, by giving weights to the difference for each observed characteristic.
GAIA method is mainly used after a first growing cycle to identify those varieties in the variety collection which can be excluded from the subsequent growing cycle(s) because they are “Distinct Plus” (see TGP/8/1 Part II section 1.3.2.1) from all the candidate varieties. GAIA can also identify similar varieties, on which the DUS examiner will need to focus attention in the subsequent growing cycle.

5.5 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 In the case of qualitative and pseudo-qualitative characteristics (see Chapter 6.3), all relevant states of expression are presented in the characteristic. However, in the case of quantitative characteristics with 5 or more states, an abbreviated scale may be used to minimize the size of the Table of Characteristics. For example, in the case of a quantitative characteristic with 9 states, the presentation of states of expression in the Test Guidelines may be abbreviated as follows:

State	Note
small	3
medium	5
large	7

However, it should be noted that all of the following 9 states of expression exist to describe varieties and should be used as appropriate:

State	Note
very small	1
very small to small	2
small	3
small to medium	4
medium	5
medium to large	6
large	7
large to very large	8
very large	9

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

(*) Asterisked characteristic – see Chapter 6.1.2

QL Qualitative characteristic – see Chapter 6.3
QN Quantitative characteristic – see Chapter 6.3
PQ Pseudo-qualitative characteristic – see Chapter 6.3

MG, MS, VG, VS – see Chapter 4.1.5

A, B – see Chapter 4.2

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

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

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

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1. **(+)**	**00** **VG**	**Seed: coloration with phenol**	**Semence : coloration au phenol**	**Samen: Phenolfärbung**	**Semilla: color con phenol**		
QN	**A**	none or very light	Nulle ou très faible	Fehlend oder sehr hell			1
		light	Faible	Hell	claro	Soissons	3
		medium	moyenne	mittel	medio	Aerobic	5
		dark	Forte	Dunkel	Oscuro	Excelcior	7
		very dark	Très foncée	Sehr dunkel	Muy oscuro	Sideral	9
2. **(+)**	**09-11** **VG**	**Coleoptile: anthocyanin coloration**	**Coléoptile: pigmentation anthocyanique**	**Keimscheide: Anthocyanfärbung**	**Coleóptilo: pigmentación antociánica**		
QN	**A**	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Altigo	1
		weak	Faible	Gering	débil	Accor	3
		medium	Moyenne	Mittel	media	Premio	5
		strong	Forte	Stark	Fuerte	Arezzo	7
		very strong	Très forte	Sehr stark	Muy fuerte	Caphorn	9
3. **(*)** **(+)**	**25-29** **VG**	**Plant: growth habit**	**Plante: port au tallage**	**Pflanze: Wuchsform**	**Planta: porte**		
QN	**B**	erect	dressé	aufrecht	erecto	Bandera	1
		semi erect	demi-dressé	halbaufrecht	semierecto	Esperia	3
		intermediate	demi-dressé à demi-étalé	mittel	medio	Crousty	5
		semi prostrate	demi-étalé	halbliegend	semipostrado	Euclide	7
		prostrate	étalé	liegend	postrado	Instinct	9
4. **(+)**	**47-51** **VG**	**Plant: frequency of plants with recurved flag leaves**	**Plante : fréquence de plantes avec la dernière feuille retombante**	**Pflanze: Häufigkeit von Pflanzen mit gebogenen obersten Blättern**	**Planta: frequencia de plantas con ¿**		
QN	**B**	absent or very low	nulle ou très faible	fehlend oder sehr gering	ausente o muy débil	Sorrial	1
		low	faible	gering	débil	Arezzo	3
		medium	moyenne	mittel	media	Courtot	5
		high	forte	stark	fuerte	Saturnus	7
		very high	très forte	sehr stark	muy fuerte	MV kolo	9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
5. (*) (+)	**50-52 MG**	**Time of ear emergence**	**Époque d'épiaison**	**Zeitpunkt des Ährenschiebens**	**Época de ¿**		
QN	**B**	very early	très précoce	sehr früh	muy temprana	Accor	1
		early	précoce	früh	temprana	Caphorn	3
		medium	moyenne	mittel	media	Richepain	5
		late	tardive	spät	tardía	Boncap	7
		very late	très tardive	sehr spät	muy tardía		9
6. (*)	**60-65 VG**	**Flag leaf: glaucosity of sheath**	**Dernière feuille : glaucescence de la gaine**	**Oberstes Blatt: Bereifung der Blattscheide**	**Ultima hoja: ¿ de la vaina**		
QN	**B**	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Benedict	1
		weak	faible	gering	débil	Aerobic	3
		medium	moyenne	mittel	medio	Pakito	5
		strong	forte	stark	fuerte	Solehio	7
		very strong	très forte	sehr stark	muy fuerte	Illico	9
7.	**60-65 VG**	**Flag leaf: glaucosity of blade (lower side)**	**Dernière feuille : glaucescence du limbe (face inférieure)**	**Oberste Blatt: Bereifung der Blattspreite**	**Ultima hoja: ¿ del limbo**		
QN	**B**	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Courtot	1
		weak	faible	gering	débil	Bologna	3
		medium	moyenne	mittel	medio	Amador	5
		strong	forte	stark	fuerte	Cezanne	7
		very strong	très forte	sehr stark	muy fuerte	Goncourt	9
8. (*)	**60-69 VG**	**Ear: glaucosity**	**Epi : glaucescence**	**Aehre: Bereifung**	**¿: ¿**		
QN	**B**	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Soissons	1
		weak	faible	gering	débil	Bologna	3
		medium	moyenne	mittel	medio	Solehio	5
		strong	forte	stark	fuerte	Premio	7
		very strong	très forte	sehr stark	muy fuerte	Exelcior	9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
9.	**60-69 VG**	**Culm: glaucosity of neck**	**Tige : glaucescence du col de l'épi**	**Halme: Bereifung des obersten Internodiums**	**¿: ¿**		
QN	**B**	absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Benedict	1
		weak	faible	gering	débil	Saturnus	3
		medium	moyenne	mittel	medio	Aubusson	5
		strong	forte	stark	fuerte	Arezzo	7
		very strong	très forte	sehr stark	muy fuerte	Exelcior	9
10. (*) (+)	**75-92 MG**	**Plant: length**	**Plante: longueur**	**Pflanze: Lange**	**Planta: altura (?)**		
QN	**B**	very short	très courte	sehr niedrig	muy corta	Cordiale	1
		short	courte	niedrig	corta	Renan	3
		medium	moyenne	mittel	media	Intérêt	5
		long / tall	longue / haute	lang / hoch	larga	Bagatelle 007	7
		very long / very tall	très longue / très haute	sehr lang / sehr hoch	muy larga		9
11. (+)	**80-92 VG**	**Straw: pith in cross section**	**Paille : moëlle en section transversale**	**Halm: Füllung im Querschnitt**	**Tallo: grosor**		
PQ	**A**	absent or very thin	Absente ou très mince	fehlend oder sehr dünn	Ausente o muy delgado	Pakito	1
		medium	moyenne	mittel	medio	Saturnus	2
		very thick or filled	Très épaisse ou pleine	Sehr dick oder ?	Muy grueso o ¿	Aerobic	3
12. (+)	**92 VG**	**Ear: shape in profile**	**Epi: forme en vue de profil**	**Aehre : form in Seiten-ansicht**			
PQ	**B**	tapering	Pyramidal	Pyramiden-förmig		Sankara	1
		fusiform	Fusiforme	Spindle-förmig		Arezzo	2
		parallel sided	À bords parallèles	Parallel		Viscount	3
		semi clavate	En demi-massue	Halb keulenförmig		Aura	4
		clavate	En massue	keulenförmig		Apache	5

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
13. (*) (+)	**80-92**	**Ear: density**	**Epi: compacité**	**Aehr: Dichte**			
QN	**VG,B or MS, A**	very lax	Très lâche	Sehr locker		Magno	1
		lax	Lâche	Locker		Sponsor	3
		medium	Demi-lâche à demi-compact	Mittel		Aubusson	5
		dense	Compact	Dicht		Premio	7
		very dense	Très compact	Sehr dicht		Rehti	9
14. (+)	**80-92 VG**	**Ear: length**	**Epi: longueur**	**Aehre : länge**			
QN		very short	Très court	Sehr kurz			1
	B	short	Court	Kurz		Ambello	3
		medium	Moyen	Mittel		Soissons	5
		long	Long	Lang		Aubusson	7
		very long	Très long	Sehr lang		Folklor	9
15. (*) (+)	**80-92 VG**	**Awns or scurs: presence**	**Barbes ou arêtes: présence**	**Grannen oder Spelzen-spitzen: Vorhandensein**			
QL	**B**	both absent	Toutes les deux absentes	Beide fehlend		Genoveva	1
		scurs present	Arêtes présentes	Spelzenspitzen vorhanden		Aubusson	2
		awns present	Barbes présentes	Grannen vorhanden		Arezzo	3
16. (*) (+)	**80-92 VG**	**Awns or scurs at tip of ear: length**	**Barbes ou arêtes à l'extrémité de l'épi: longueur**	**Grannen oder Spelzen-spitzen an der Aehrenspitze : länge**			
QN	**B**	very short	Très courtes	Sehr kurz		Ephoros	1
		short	Courtes	Kurz		Graindor	3
		medium	Moyennes	Mittel		Pakito	5
		long	Longues	Lang		As de cœur	7
		very long	Très longues	Sehr lang		Arezzo	9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
17. (*) (+)	**80-92**	**Ear: color**	**Epi: couleur**	**Aehre: Farbe**			
QL	VG	white	Blanc	Weiss		Arezzo	1
	B	colored	Coloré	gefärbt		Segor	2
18. (+)	**80-92 VG**	**Apical rachis segment: extend of hairiness of convex surface**	**Article terminal du rachis: étendue de la pilosité de la face externe**	**Oberstes Spindelglied : äussere Behaarung**			
QN	**A**	absent or very weak	Nulle ou très faible	Fehlend oder sehr gering		Graindor	1
		weak	Faible	Gering		Crousty	3
		medium	Moyenne	Mittel		Sirtaki	5
		strong	Forte	Stark		Cadenza	7
		very strong	Très forte	Sehr stark		KWS Scirocco	9
19. (+)	**80-92 VG**	**Lower glume: shoulder width**	**Glume inférieure: largeur de la troncature**	**Hüllspelze : Schulter-breite**			
QN	**A**	absent or very narrow	Nulle ou très étroite	Fehlend oder sehr schmal		Courtot	1
	(a)	narrow	Étroite	Schmal		Altigo	3
		medium	Moyenne	Mittel		Apache	5
		broad	Large	Breit		Orvantis	7
		very broad	Très large	Sehr breit		Aglika	9
20. (+)	**80-92 VG**	**Lower glume: shoulder shape**	**Glume inférieure: forme de la troncature**	**Hüllspelze : chulterform**			
QN	**A**	sloping	Inclinée	Abfallend		Ambello	1
	(a)	slightly sloping	Légèrement inclinée	Leicht abfallend		Soissons	3
		straight	Droite	Gerade		Apache	5
		elevated	Echancrée	Gehoben		Aubusson	7
		strongly elevated with 2nd point present	Fortement échancrée avec présence d'un 2ème bec	Stark gehoben mit vorhandener zweiter spitze		Fiorenzo	9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
21. **(+)**	**80-92 VG**	**Lower glume: beak length**	**Glume inférieure: longueur du bec**	**Hüllspelze : Zahnlänge**			
QN	**A**	very short	Très court	Sehr kurz		Graindor	1
	(a)	short	Court	Kurz		Sollario	3
		medium	Moyen	Mittel		Quality	5
		long	Long	Lang		Soissons	7
		very long	Très long	Sehr lang		Bandera	9
22. **(*)** **(+)**	**80-92 VG**	**Lower glume: beak shape**	**Glume inférieure: forme du bec**	**Hüllspelze : zahnform**			
QN	**A**	straight	Droit	Gerade		Premio	1
	(a)	slightly curved	Légèrement coudé	Leicht gebogen		Altigo	3
		moderately curved	Demi-coudé	Mittel gebogen		Sponsor	5
		strongly curved	Fortement coudé	Stark gebogen		Quebon	7
		geniculate	Genouillé	geknickt		Velocity	9
23. **(*)** **(+)**	**80-92 VG**	**Lower glume: extent of hairiness of internal surface**	**Glume inférieure: étendue de la pilosité de la face interne**	**Hüllspelze : verbreitung der inneren behaarung**			
QN	**A**	weak	Faible	Gering		Altigo	1
	(a)	medium	Moyenne	Mittel		Alixan	3
		strong	Forte	stark		Quality	5
24. **(+)**	**92 VG**	**Grain: color**	**Graine: couleur**	**Korn: farbe**			
QL	**A**	white	Blanc	Weiss		Recital	1
		red	Roux	rot		Apache	2
25. **(*)** **(+)**	**- VG**	**Seasonal type**	**Type de développement**	**Wechselverhalten**			
PQ		winter type	Type hiver	Winterform		Aubusson	1
		alternative type	Type alternatif	Wechselform		Cezanne	2
		spring type	Type printemps	sommerform		Josselin	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) Characteristics on lower glume must be observed at midthird of ear spikelet.

8.2 Explanations for individual characteristics

Ad. 1: Seed: coloration with phenol

Method for Determination of Phenol Reaction

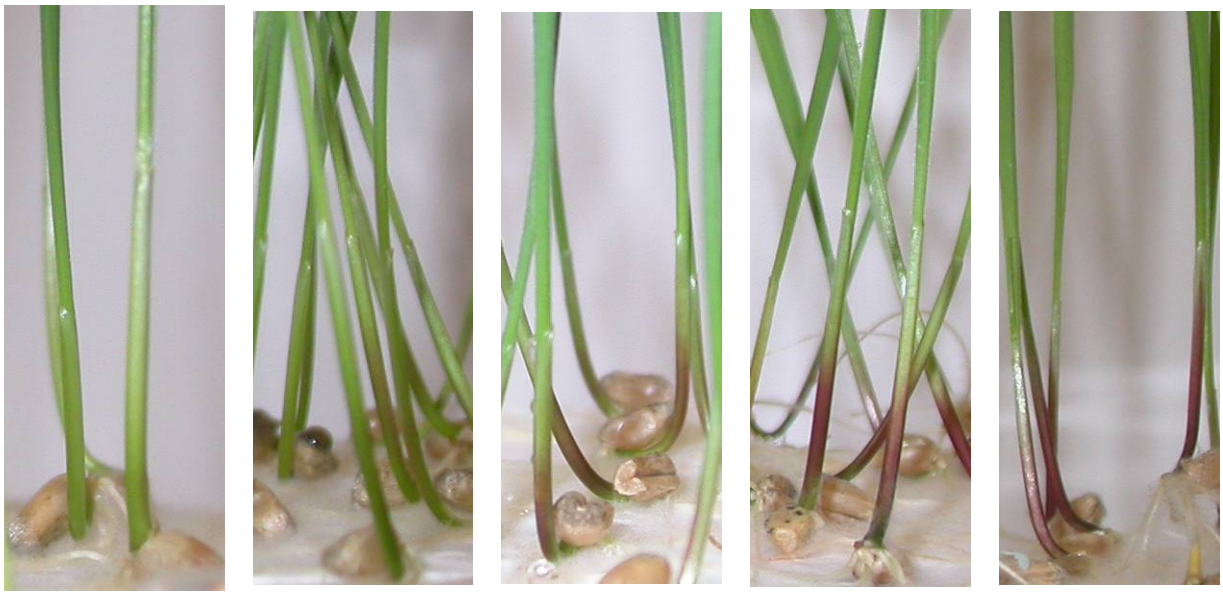
Number of grains per test:	100 grains. The grains should not have been treated chemically
Concentration of solution:	1 per cent Phenol-solution (freshly made up)
Preparation of grains:	Soak grains in phenol solution during 4 hours with a constant move. Rinse out 4 or 5 times with clean water. Drain in half-light during at least 10 hours (reaction occurs in contact with air).
Amount of solution:	Whole grain surface must be in contact with phenol solution.
Place:	Laboratory
Light:	Half-light, out of direct sunshine
Temperature:	15 to 25°C
Time of recording:	At least10 hours after rinsing
Note:	At least two of the example varieties should be included as a control

1	3	5	7	9
none or very light	light	medium	dark	very dark

Ad. 2: Coleoptile: anthocyanin coloration

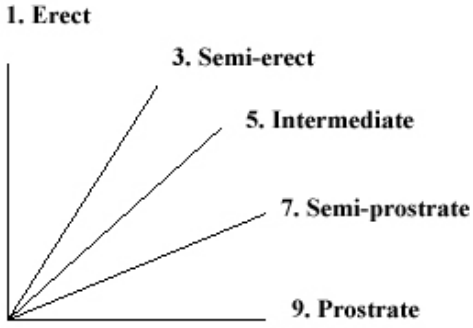
Method for the Determination of Anthocyanin Coloration

Number of grains per test:	100 grains
Preparation of grains:	Set up non-dormant grains on moistened filter paper covered with a Petri dish lid during germination
Place:	Climate room with controlled temperature
Light:	Since the beginning of the test, 12h day / 12h night. Light intensity: 12000-15000 lux.
Temperature:	19°C
Time of recording:	Coleoptiles fully developed (about 10 days) at stage 09-11
Note:	At least two of the example varieties should be included as a control when testing for distinctness



1	3	5	7	9
absent or very weak	weak	medium	strong	very strong

Ad. 3: Plant: growth habit



The growth habit should be assessed visually from the attitude of the leaves and tillers. The angle formed by the outer leaves and the tillers with an imaginary vertical axis should be used.

1	3	5	7	9
erect	semi erect	intermediate	semi prostrate	prostrate

Ad. 4: Plant: frequency of plants with recurved flag leaves

1 all flag leaves are rectilinear

3 about 1/4 of the plants with recurved flag leaves

5 about 1/2 of the plants with recurved flag leaves

7 about 3/4 of the plants with recurved flag leaves

9 all flag leaves are recurved

1	3	5	7	9
absent or very low	low	medium	high	very high

Ad. 5: Time of ear emergence

Time of ear emergence should be scored when the first spikelet is visible on 50% of ears.

Ad. 10: Plant: length

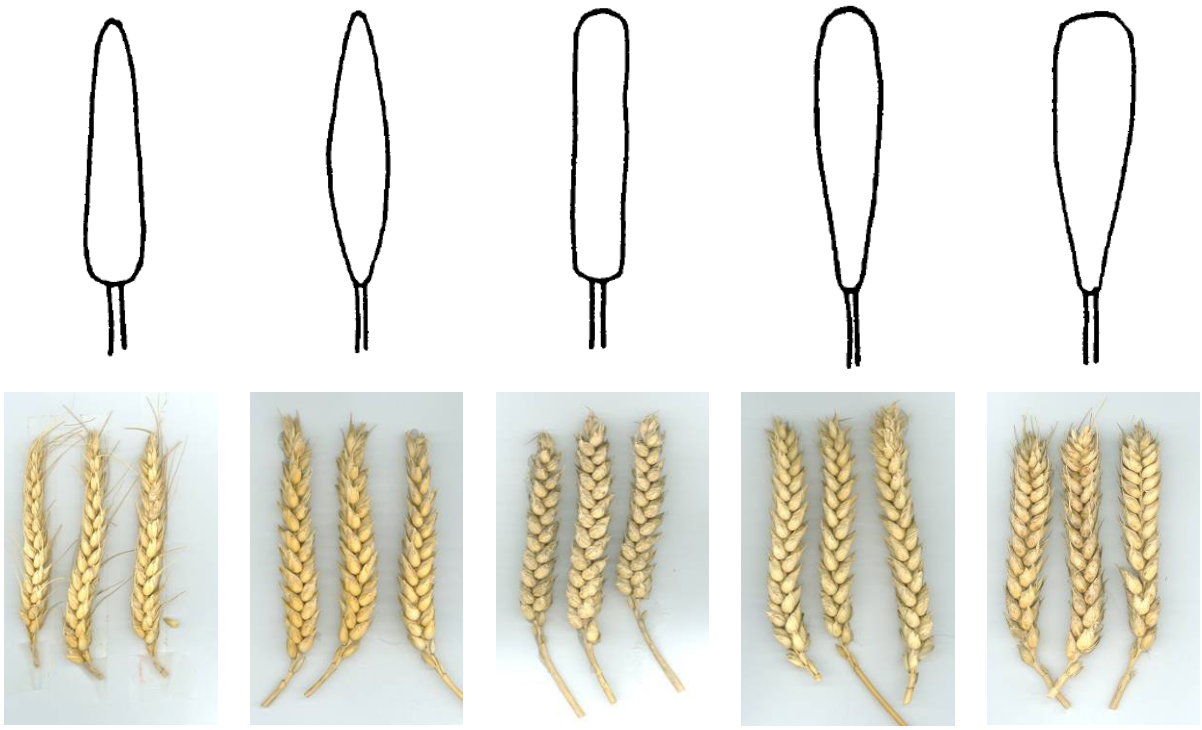
The length of plant includes stem, ear, awns and scurs.

Ad. 11: Straw: pith in cross section

Pith in cross section should be observed halfway between base of ear and stem node below.

1	2	3
absent or very thin	medium	very thick or filled

Ad. 12: Ear: shape in profile



1	2	3	4	5
tapering	fusiform	parallel sided	semi clavate	clavate

Ad. 13: Ear: density

The density can be assessed either visually or as measurement of the ratio of the number of spikelets/ear length.

1	3	5	7	9
very lax	lax	medium	dense	very dense

Ad. 14: Ear: length

Length of ear should be observed excluding awns and scurs.

1
very short

3
short

5
medium

7
long

9
very long

Ad. 15: Awns or scurs: presence

1
both absent

2
scurs present

3
awns present

Ad. 16: Awns or scurs at tip of ear: length

1
very short

3
short

5
medium

7
long

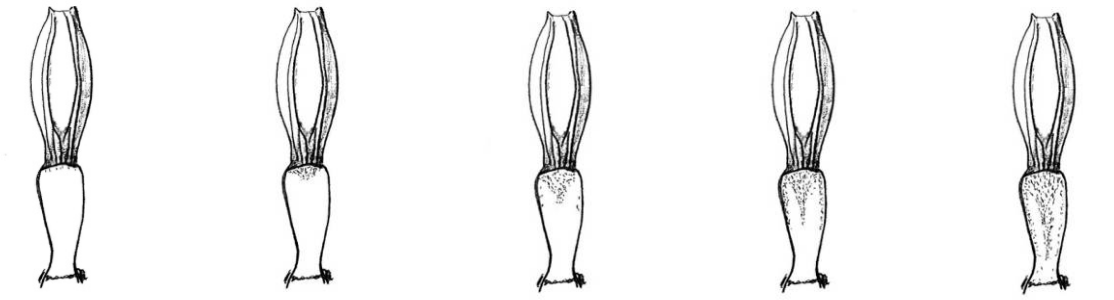
9
very long

Ad. 17: Ear: color

1
white

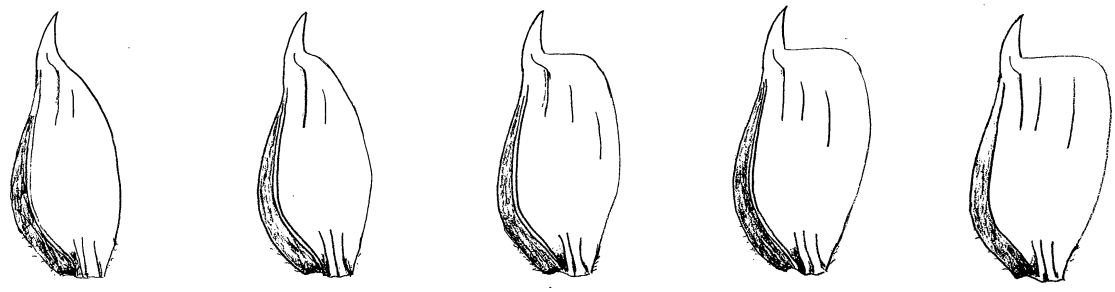
2
colored

Ad. 18: Apical rachis segment: extend of hairiness of convex surface



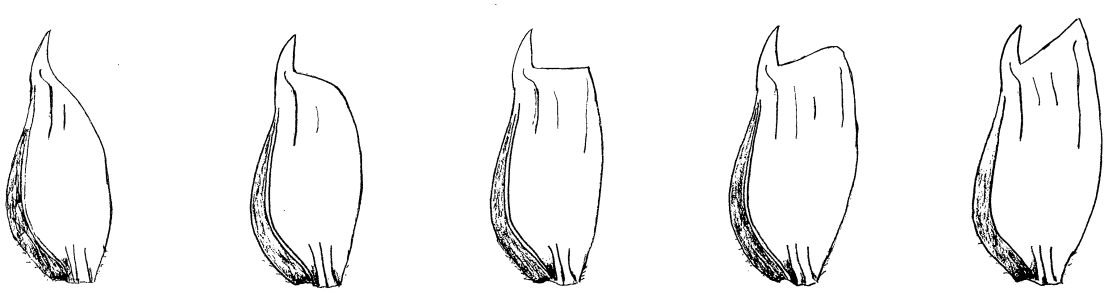
1	3	5	7	9
absent or very weak	weak	medium	strong	very strong

Ad. 19: Lower glume: shoulder width



1	3	5	7	9
absent or very narrow	narrow	medium	broad	very broad

Ad. 20: Lower glume: shoulder shape



1	3	5	7	9
sloping	slightly sloping	straight	elevated	strongly elevated with 2nd point present

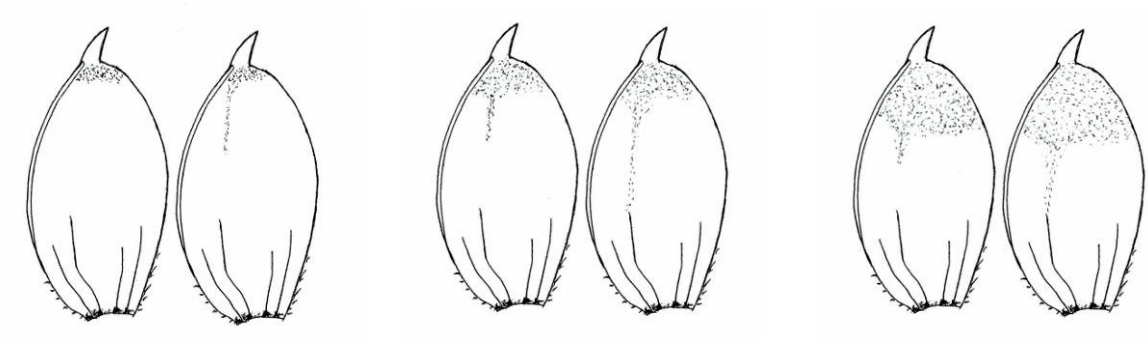
Ad. 21: Lower glume: beak length

1	3	5	7	9
very short	short	medium	long	very long

Ad. 22: Lower glume: beak shape

1	3	5	7	9
straight	slightly curved	moderately curved	strongly curved	geniculate

Ad. 23: Lower glume: extent of hairiness of internal surface



1
weak

3
medium

5
strong

Ad. 24: Grain color

1
white

2
red

Ad. 25: Seasonal type

The seasonal type should be assessed on one or several plots sown in springtime. Example varieties should always be included in the plots. When the example varieties behave according to its description, the varieties under study can be described. At the time when the latest springtype variety is fully mature (stage 91/92 of the Zadoks decimal code), the growth stage reached by the respective variety should be assessed. The states of expression are defined as follows:

Winter type: Winter type: the plants have reached stage 45 of the Zadoks decimal code (boots swollen) at maximum

Alternative type: Alternative type: the plants have exceeded stage 45 of the Zadoks decimal code---as a rule they have exceeded stage 75---and have reached stage 90 at maximum

Spring type: Spring type: the plants have exceeded stage 90 of the Zadoks decimal code.

8.3 The descriptions of the growth stages of the Zadoks decimal code for cereals

Zadoks Decimal code	**Description**
00	Dry seed
01	Start of imbibition
03	Imbibition complete
05	Radicle emerged from seed
07	Coleoptile emerged from seed
09	Leaf just at coleoptile tip
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
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
30	Pseudo stem erection
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
39	Flag leaf ligule/collar just visible
40	-
41	Flag leaf sheath extending
45	Boots just swollen
47	Flag leaf sheath opening
49	First awns visible
50	First spikelet of inflorescence visible
53	1/4 of inflorescence emerged
55	1/2 of inflorescence emerged
57	3/4 of inflorescence emerged
59	Emergence of inflorescence completed
60	Beginning on anthesis
65	Anthesis half-way
69	Anthesis completed
70	-
71	Kernel watery ripe
73	Early milk
75	Medium milk
77	Late milk
80	-
83	Early dough
85	Soft dough
87	Hard dough
90	-
91	Kernel hard (difficult to divide with thumbnail)
92	Kernel hard (no longer dented with thumbnail)
93	Kernel loosening in daytime
94	Overripe, straw dead and collapsing
95	Seed dormant
96	Viable seed giving 50% germination
97	Seed not dormant
98	Secondary dormancy induced
99	Secondary dormancy lost

9. Literature

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Briggle, L.W., Reitz, L.P., 1963: Classification of Triticum Species and of Wheat Varieties Grown in the United States. United States Department of Agriculture, Technical Bulletin No. 1278, US

Bustarret, J.,1944: Variétés et variations. Annales agronomiques, 14ème année, FR, pp. 336, pp. 365

De Backer, A., 1983: L'homogénéité des variétés de Blé. Mémoire de fin d'études, 122e promotion Beauvais, FR

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Friedberg, L. 1958

Hervey-Murray, C.G., 1980: The Identification of Cereal Varieties. Cambridge University Press, GB

Jonard, P., 1951: Les blés tendres (Triticum vulgare vill) cultivés en France. Institut National de la Recherche Agronomique, Paris, FR

Milatz, R., 1970: Kriterien der Getreidearten einschliesslich Mais und ihre Bewertung zur Sortenidentifizierung. Verband Deutscher Pflanzenzüchter, Bonn, DE

Percival, J., 1921: The Wheat Plant. monograph, Duckworth and Co., London, GB

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

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.

1. Subject of the Technical Questionnaire

1.1 Botanical name	*Triticum aestivum* L. emend. Fiori et Paol.
1.2 Common name	Wheat

2. Applicant

Name	
Address	
Telephone No.	
Fax No.	
E-mail address	
Breeder (if different from applicant)	

3. Proposed denomination and breeder's reference

Proposed denomination (if available)	
Breeder's reference	

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

[#]4. Information on the breeding scheme and propagation of the variety

4.1 Breeding scheme

Variety resulting from:

4.1.1 Crossing

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

(……..……..) 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 (25)	**Seasonal type**		
	winter type	Aubusson	1[ ]
	alternative type	Cezanne	2[ ]
	spring type	Josselin	3[ ]
5.2 (5)	**Time of ear emergence**		
	very early	Accor	1[ ]
	very early to early		2[ ]
	early	Caphorn	3[ ]
	early to medium		4[ ]
	medium	Richepain	5[ ]
	medium to late		6[ ]
	late	Boncap	7[ ]
	late to very late		8[ ]
	very late		9[ ]
5.3 (10)	**Plant: length**		
	very short	Cordiale	1[ ]
	very short to short		2[ ]
	short	Renan	3[ ]
	short to medium		4[ ]
	medium	Intérêt	5[ ]
	medium to long / tall		6[ ]
	long / tall	Bagatelle 007	7[ ]
	long /tall to very long / very tall		8[ ]
	very long / very tall		9[ ]

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

	Characteristics	Example Varieties	Note
5.4 (11)	**Straw: pith in cross section**		
	absent or very thin	Pakito	1[ ]
	medium	Saturnus	2[ ]
	very thick or filled	Aerobic	3[ ]
5.5 (15)	**Awns or scurs: presence**		
	both absent	Genoveva	1[ ]
	scurs present	Aubusson	2[ ]
	awns present	Arezzo	3[ ]
5.6 (17)	**Ear: color**		
	white	Arezzo	1[ ]
	colored	Segor	2[ ]

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
	Coleoptile: anthocyanin coloration	*9*	*6*

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

A representative color image of the variety should accompany the Technical Questionnaire.

8. Authorization for release

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

Yes [ ] No [ ]

(b) Has such authorization been obtained?

Yes [ ] No [ ]

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

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

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

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

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

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

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

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

……

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

Applicant’s name

Signature Date

[End of document]