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UPOV

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS
GENEVA

DRAFT

MAIZE

UPOV Code: ZEAAA_MAY

Zea mays L.

*

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by experts from France and Hungary

to be considered by the Technical Working Party for Vegetables (TWV)
at its fortieth session to be held in Guanajuato, Guanajuato State, Mexico,
from June 12 to 16, 2006

and the Technical Working Party for Agricultural Crops (TWA)
at its thirty-fifth session to be held in Beijing, China, from July 3 to 7, 2006

Alternative Names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Zea mays L.	Maize	Maïs	Maïs	

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 *Zea mays* L. (inbred lines, hybrids, open pollinated varietes, excluding ornamental varieties.

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:

1,500 grains for inbred lines;
1 kg for hybrids and open pollinated varieties

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.

2.4 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 grwoing 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

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

Sweet corn varieties only: All observations on the developed ear and the kernel should be made at optimum harvesting time (medium milk) (growth stage: 75, exact description are given at growing stages).

3.3.2 Type of observation

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

Each test should be designed to result in a total of at least 40 plants in the case of inbred lines and single hybrids and 60 plants in the case of other hybrids and open pollinated varieties. The test for each should be divided between 2 replicates.

3.5 Number of Plants / Parts of Plants to be Examined

Unless otherwise indicated, in case of inbred lines and single hybrids, all observations on single plants (VS, MS) should be made on 10 plants or parts taken from each of 10 plants and all other observations made on all plants in the test. 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.
[CPVO asks why this part of sentence has been added]

Unless otherwise indicated, in case of other types of hybrids or open pollinated varieties, all observations on single plants (VS, MS) should be made on 40 plants or parts taken from each of 40 plants and all other observations made on all plants in the test. 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.
[CPVO asks why this part of sentence has been added]

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.

To assess distinctness of hybrids, a pre-screening system on the basis of the parental lines and the formula may be established according to the following recommendations:

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

(ii) check of the originality of the parental lines in comparison with the reference collection, based on the characteristics in Section 7 in order to screen the closest inbred lines;

(iii) check of the originality of the hybrid formula in comparison with those of the hybrids in common knowledge, taking into account the closest inbred lines;

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

[FR supports this proposal]

4.1.2 Consistent Differences

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

4.1.3 Clear Differences

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

4.2 Uniformity

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:

For the assessment of uniformity of inbred lines and single hybrids, a population standard of 3% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 10 plants, 1off-type is allowed.

For the assessment of uniformity for other hybrid varieties, a population standard of 5% an acceptance probability of at least 95% should be applied. In the case of a sample size of 60 plants, 6 off-types are allowed.
[This text has been modified to answer a question put by CPVO]

Out crosses in case of inbred lines and selfings in case of hybrids are counted as off types.
[This text has been added to answer a question put by CPVO]

The assessment of uniformity for open pollinated varieties should be according to the recommendations for cross-pollinated varieties in the General Introduction.
[What about the use of COY U?]

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 of inbred lines or open pollinated varieties 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.

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

5. Grouping of Varieties and Organization of the Growing Trial

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

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

5.3 The following have been agreed as useful grouping characteristics:
[to be discussed later]

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

6. Introduction to the Table of Characteristics

6.1 Categories of Characteristics

6.1.1 Standard Test Guidelines Characteristics

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

6.1.2 Asterisked Characteristics

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

6.2 States of Expression and Corresponding Notes

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

6.3 Types of Expression

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

6.4 Example Varieties

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

6.5 Legend

(*) Asterisked characteristic – see 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

(S): Segregation in the expression of certain characteristics

MG: single measurement of a group of plants or parts of plants – see Chapter 3.3.2
MS: measurement of a number of individual plants or parts of plants – see Chapter 3.3.2
VG: visual assessment by a single observation of a group of plants or parts of plants – Chapter 3.3.2
VS: visual assessment by observation of individual plants or parts of plants –see Chapter 3.3.2

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

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

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
1.	**VG**	**First leaf: anthocyanin coloration of sheath**	**Première feuille: pigmentation anthocyanique de la gaine**	**Primärblatt: Anthocyan-färbung der Blattscheide**			
QN	**14 (S)**	absent or very weak	nulle ou très faible	fehlend oder sehr gering			1
		weak	faible	gering		F113	3
		medium	moyenne	mittel		F2	5
		strong	forte	stark		F816	7
		very strong	très forte	sehr stark			9
2. **(+)**	**VG**	**First leaf: shape of tip**	**Première feuille: forme du sommet**	**Primärblatt: Form der Spitze**			
PQ	**14**	pointed	pointu	spitz			1
		pointed to round	pointu à arrondi	spitz bis abgerundet			2
		round	arrondi	abgerundet		F816	3
		round to spatulate	arrondi à spatulé	abgerundet bis stumpf		F259	4
		spatulate	spatulé	stumpf		EP1	5
2(a)	**VG**	**Foliage: intensity of green color**	**Feuillage: intensité de la couleur verte**	**Laub: Intensität der Grünfärbung**			
QN	**51-59**	light	claire	hell		Jubilee, W182e	3
		medium	moyenne	mittel		Royalty, W117	5
		dark	foncée	dunkel		Merkur W401	7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
3. **(+)**	**VG**	**Leaf: angle between blade and stem (on leaf just above upper ear)**	**Feuille: angle entre le limbe et la tige (sur la feuille juste au-dessus de l'épi le plus haut)**	**Blatt: Winkel zwischen Blattspreite und Stengel (am Blatt unmittelbar oberhalb des obersten Kolbens)**			
QN	**65-69**	very small	très petit	sehr klein			1
		small	petit	klein		A188	3
		medium	moyen	mittel		F195	5
		large	grand	gross		F186	7
		very large	très grand	sehr gross			9
4. **(+)**	**VG**	**Leaf: attitude of blade (as for 3)**	**Feuille: port du limbe (comme pour 3)**	**Blatt: Haltung der Spreite(wie unter 3)**			
QL	**65-69**	straight	droit	gerade		WD36	1
		slightly recurved	légèrement incurvé	gering gebogen		A619	3
		recurved	incurvé	gebogen		W117	5
		strongly recurved	fortement incurvé	stark gebogen		W79A	7
		very strongly recurved	très fortement incurvé	sehr stark gebogen			9
~~**5.**~~		~~**Stem: degree of zig-zag**~~	~~**Tige: degré du zig-zag**~~	~~**Stengel: Zickzack-ausprägung**~~			
~~**QL**~~	~~**65**~~	~~absent or very slight~~	~~nul ou très faible~~	~~fehlend oder sehr mässig~~		~~Eva, Ivana~~	~~1~~
		~~slight~~	~~faible~~	~~mässig~~		~~Sabrina~~	~~2~~
		~~strong~~	~~fort~~	~~deutlich~~		~~Dea, F252~~	~~3~~

[deletion of this characteristic]

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
6.	**VG**	**Stem: anthocyanin coloration of brace roots(on well-developed and fresh roots present on 50% of plants)**	**Tige: pigmentation anthocyanique des racines d'ancrage**	**Stängel: Anthocyanfärbung der Stelzwurzeln**			
QN	**65-75 (S)**	absent or very weak	nulle ou très faible	fehlend oder sehr gering		F16	1
		weak	faible	gering		W117	3
		medium	moyenne	mittel		WD36	5
		strong	forte	stark		EP1	7
		very strong	très forte	sehr stark			9
7. (*)	**MG**	**Tassel: time of anthesis (on middle third of main branch, 50% of plants)**	**Panicule: époque de floraison mâle (au tiers moyen du brin maître 50% des plantes)**	**Rispe: Zeitpunkt der männlichen Blüte (im mittleren Drittel des Mittelastes, 50% der Pflanzen)**			
QN	**65**	very early	très précoce	sehr früh			1
		very early to early	très précoce à précoce	sehr früh bis früh		KW1069	2
		early	précoce	früh		F257, Spirit	3
		early to medium	précoce à moyenne	früh bis mittel		F259, Boston	4
		medium	moyenne	mittel		F522, Jubilee	5
		medium to late	moyenne à tardive	mittel bis spät		A632, Empire	6
		late	tardive	spät		B73, Bonus	7
		late to very late	tardive à très tardive	spät bis sehr spät		GH2547	8
		very late	très tardive	sehr spät			9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
8. **(+)**	**VG**	**Tassel: anthocyanin coloration at base of glume (in middle third of main branch)**	**Panicule: bourrelet (anneau anthocyanique) juste en-dessous de la glume (au tiers moyen du brin maître)**	**Rispe: Anthocyanfärbung an der Basis der Hüllspelze (im mittleren Drittel der Mittelastes)**			
QN	**65 (S)**	absent or very weak	nulle ou très faible	fehlend oder sehr gering		W117	1
		weak	faible	gering		F66	3
		medium	moyenne	mittel		F107	5
		strong	forte	stark		EP1	7
		very strong	très forte	sehr stark			9
9.	**VG**	**Tassel: anthocyanin coloration of glumes excluding base(as for 8)**	**Panicule: pigmentation anthocyanique des glumes à l'exclusion de la base (comme pour 8)**	**Rispe: Anthocyanfärbung der Hüllspelze ohne Basis (wie unter 8)**			
QN	**65 (S)**	absent or very weak	nulle ou très faible	fehlend oder sehr gering		F259	1
		weak	faible	gering		F2	3
		medium	moyenne	mittel		WD36	5
		strong	forte	stark		W79A	7
		very strong	très forte	sehr stark			9
10.	**VG**	**Tassel: anthocyanin coloration of anthers (as for 8; on fresh anthers)**	**Panicule: pigmentation anthocyanique des anthères (comme pour 8; sur anthères fraîches)**	**Rispe: Anthocyanfärbung der Antheren (wie unter 8; an frischen Antheren)**			
QN	**65 (S)**	absent or very weak	nulle ou très faible	fehlend oder sehr gering		A654	1
		weak	faible	gering		F2	3
		medium	moyenne	mittel		F66	5
		strong	forte	stark			7
		very strong	très forte	sehr stark			9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
11.	**VG**	**Tassel: density of spikelets (as for 8)**	**Panicule: densité des épillets (comme pour 8)**	**Rispe: Dichte der Ährchen (wie unter 8)**			
QN	**69**	lax	lâche	locker		F16	3
		medium	moyenne	mittel		W401	5
		dense	compacte	dicht		F259	7
12. (*) (+)	**VG**	**Tassel: angle between main branch and lateral branches (at the level of the second lateral branch from the bottom**	**Panicule: angle entre l'axe central et les ramifications latérales (au niveau de la seconde ramification latérale)**	**Rispe: Winkel zwischen der Mittelachse und den Seitenästen (im unteren Rispendrittel)**			
QN	**65-69**	very small	très petit	sehr klein		F492	1
		small	petit	klein		EP1	3
		medium	moyen	mittel		F186	5
		large	grand	gross			7
		very large	très grand	sehr gross			
13. (*) (+)	**VG**	**Tassel: attitude of lateral branches (as for 12)**	**Panicule: port des ramifications (comme pour 12)**	**Rispe: Haltung der Seitenäste (wie unter 12)**			
QL	**65-69 (S)**	straight	droit	gerade		F257	1
		slightly recurved	légèrement incurvé	gering gebogen			3
		recurved	incurvé	gebogen		W182E	5
		strongly recurved	fortement incurvé	stark gebogen		F66	7
		very strongly recurved	très fortement incurvé	sehr stark gebogen			9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
14. (*)	**MG**	**Tassel: number of primary lateral branches**	**Panicule: nombre de ramifications primaires**	**Rispe: Anzahl der Seitenäste erster Ordnung**			
QN	**65**	absent or very few	nul ou très petit	fehlend oder sehr gering		F7	1
		few	petit	gering		F252	3
		medium	moyen	mittel		F244	5
		many	grand	gross		A188	7
		very many	très grand	sehr gross			9
15.	**MG**	**Ear: time of silk emergence (50% of plants)**	**Epi: époque d'apparition des soies (50% des plantes)**	**Kolben: Zeitpunkt des Erscheinens der Narbenfäden (50% der Pflanzen)**			
QN	**65**	very early	très précoce	sehr früh			1
		very early to early	très précoce à précoce	sehr früh bis früh		KW1069	2
		early	précoce	früh		F257	3
		early to medium	précoce à moyenne	früh bis mittel		F259	4
		medium	moyenne	mittel		F522	5
		medium to late	moyenne à tardive	mittel bis spät		A632	6
		late	tardive	spät		B73	7
		late to very late	tardive à très tardive	spät bis sehr spät			8
		very late	très tardive	sehr spät			9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
~~**16. (*)**~~		~~**Ear: anthocyanin coloration of silks**~~	~~**Epi: pigmentation anthocyanique des soies**~~	~~**Kolben: Anthocyanfärbung der Narbenfäden**~~			
~~**QL**~~	~~**65 (S)**~~	~~absent~~	~~absente~~	~~fehlend~~		~~F7~~	~~1~~
		~~present~~	~~présente~~	~~vorhanden~~		~~F2~~	~~9~~
		[SP and FR propose to delete this characteristic]					
17 (*)	**VG**	**Ear: intensity of anthocyanin coloration of silks**	**Epi: intensité de la pigmentation antho-cyanique des soies**	**Kolben: Intensität der Anthocyanfärbung der Narbenfäden**			
QN	**65 (S)**	absent or very weak	absente ou très faible	fehlend oder sehr gering		F7	1
		weak	faible	gering		F66	3
		medium	moyenne	mittel		A654	5
		strong	forte	stark		CM7	7
		very strong	très forte	sehr stark			9
18.	**69-73 (S)**	**Leaf: anthocyanin coloration of sheath (in middle of plant)**	**Feuille: pigmentation anthocyanique de la gaine (au milieu de la plante)**	**Blatt: Anthocyanfärbung der Blattscheide (in der Mitte der Pflanze)**			
QN	**VG**	absent or very weak	nulle ou très faible	fehlend oder sehr gering		F252	1
		weak	faible	gering		F107	3
		medium	moyenne	mittel		F257	4
		strong	forte	stark		EP1	7
		very strong	très forte	sehr stark			9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
18(a).	**VG**	**Stem: anthocyanin Coloration of internode(in middle of plant)**					
QN	**71-75 (S)**	absent or very weak	nulle ou très faible	fehlend oder sehr gering		F522	1
		weak	faible	gering		F107	3
		medium	moyenne	mittel		W79A	5
		strong	forte	stark		F257	7
		very strong	très forte	sehr stark			9
19.	**MG**	**Tassel: length of main branch axis above <u>lowest</u> side branch**	**Panicule: longueur de l'axe central au-dessus du rameau <u>inférieur</u>**	**Rispe: Länge der Mittelachse oberhalb des <u>untersten</u> Seitenastes**			
QN	**71**	very short	très court	sehr kurz			1
		short	court	kurz		EP1	3
		medium	moyen	mittel		F244	5
		long	long	lang		F492	7
		very long	très long	sehr lang			9
20. (*)	**MG**	**Tassel: length of main branch axis above <u>upper</u> side branch**	**Panicule: longueur de l'axe central au-dessus du rameau <u>supérieur</u>**	**Rispe: Länge der Mittelachse oberhalb des <u>obersten</u> Seitenastes**			
QN	**71**	very short	très court	sehr kurz			1
		short	court	kurz		EP1	3
		medium	moyen	mittel		W182E	5
		long	long	lang		F492	7
		very long	très long	sehr lang			9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
21.	**MG**	**Tassel: length of side branche (as for 12)**	**Panicule: longueur des rameau (comme pour 12)**	**Rispe: Länge der Seitenäste (wie unter 12)**			
QN	**71**	very short	très court	sehr kurz			1
		short	court	kurz		EP1	3
		medium	moyen	mittel		F16	5
		long	long	lang			7
		very long	très long	sehr lang			9
22.1 (*)	**MG**	**<u>In-bred lines</u> Plant: length (tassel included)**	**<u>Seulement lignées</u>: Plante: longueur (panicule comprise)**	**<u>Nur Inzuchtlinien</u>: Pflanze: Länge (einschliesslich Rispe)**			
QN	**75**	very short	très courte	sehr kurz		F7	1
		short	courte	kurz		W117	3
		medium	moyenne	mittel		F244	5
		long	longue	lang		WD36	7
		very long	très longue	sehr lang			9
22.2 (*)	**MG**	**<u>Hybrids and open pollinated varieties only:</u> Plant: length: (tassel included)**	**<u>Seulement hybrides et variétés à fécondation libre</u>: Plante: longueur (panicule comprise)**	**<u>Nur Hybriden und freiabblühende Sorten</u>: Pflanze: Länge (einschliesslich Rispe)**			
QN	**75**	very short	très courte	sehr kurz		Nano-Dos	1
		short	courte	kurz		DK232	3
		medium	moyenne	mittel		Magister	5
		long	longue	lang		Cecilia	7
		very long	très longue	sehr lang		Alimare	9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
23.	**MG**	**Plant: ratio height of insertion of peduncle of upper ear to plant length**	**Plante: hauteur d'insertion du péoncule de l'épi le plus haut par rapport à la longueur de la plante**	**Pflanze: Verhältnis der Ansatzhöhe des Kolbens zur Pflanzenlänge**			
PQ	**75**	very small	très petit	sehr klein			1
		small	petit	klein		F816	3
		medium	moyen	mittel		F252	5
		large	grand	gross		F481	7
		very large	très grand	sehr gross			9
24.	**MG**	**Leaf: width of blade (leaf of upper ear on the widest part)**	**Feuille: largeur du limbe (feuille de l'épi le plus haut)**	**Blatt: Breite der Spreite (Blatt des obersten Kolbens)**			
QN	**75**	very narrow	très étroit	sehr schmal			1
		narrow	étroit	schmal		F16	3
		medium	moyen	mittel		F244	5
		wide	large	breit		A654	7
		very wide	très large	sehr breit			9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
24(a).	**MS**	**<u>Sweetcorn varieties only</u>: time of picking maturity (medium milk)**					
QN	**75**	very early	très précoce	sehr früh		Korai arany	1
		very early to early	très précoce à précoce	sehr früh bis früh		Spirit	2
		early	précoce	früh		Boston	3
		early to medium	précoce à moyenne	früh bis mittel		Puma	4
		medium	moyenne	mittel		Jubilee	5
		medium to late	moyenne à tardive	mittel bis spät		Empire	6
		late	tardive	spät		Bonus	7
		late to very late	tardive à très tardive	spät bis sehr spät		GH 2547	8
		very late	très tardive	sehr spät			9
		[See comments in Endnote]					
24(b).	**VG**	**<u>Sweetcorn varieties only</u>: Tiller: length**	**Taille: longueur**	**Trieb: Länge**			
QN	**75**	short	courte	kurz		Centurion	3
		medium	moyen	mittel		Jubilee	5
		long	longue	lang		Dorado	7
		[See comments in Endnote]					
25.	**VG**	**Ear: length of peduncle**	**Epi: longueur du pédoncule**	**Kolben: Stiellänge**			
QN	**75-85**	very short	très court	sehr kurz			1
	sweet-corn 75	short	court	kurz		KW1069	3
		medium	moyen	mittel		A654	5
		long	long	lang		F107	7
		very long	très long	sehr lang			9
		[The indication 75 for sweet corn is not necessary]					

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
26. (*)	**MG**	**Ear: length (without husks)**	**Epi: longueur (sans spathes)**	**Kolben: Länge (ohne Lieschen)**			
QN	**92**	very short	très court	sehr kurz			1
	sweet-corn 75	short	court	kurz		F2	3
		medium	moyen	mittel		A654	5
		long	long	lang		MO17	7
		very long	très long	sehr lang			9
27.	**MG**	**Ear: diameter (in middle)**	**Epi: diamètre (au milieu)**	**Kolben: Dicke (in der Kolbenmitte)**			
QN	**92**	very small	très petit	sehr dünn			1
	sweet-corn 75	small	petit	dünn		F7	3
		medium	moyen	mittel		W117	5
		large	grand	dick		F481	7
		very large	très grand	sehr dick			9
28.	**VG**	**Ear: shape**	**Epi: forme**	**Kolben: Form**			
PQ	**92**	conical	conique	konisch		F16	1
	sweet-corn 75	conico-cylindrical	cylindro-conique	konisch-zylindrisch		F7	2
		cylindrical	cylindrique	zylindrisch		F66	3
		[See comments in Endnote]					
28(a).		**Sweetcorn varieties only: Ear: shape of apex**					
PQ		pointed				Jubilee	1
		pointed to blunt				Boston	2
		blunt				Champ	3
		[See comments in Endnote]					

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
29.	**MS**	**Ear: number of rows of grain**	**Epi: nombre de rangs**	**Kolben: Kornreihenzahl**			
QN	**92**	very few	très petit	sehr gering			1
	sweet-corn 75	few	petit	gering		F252	3
		medium	moyen	mittel		F16	5
		many	grand	gross		B73	7
		very many	très grand	sehr gross			9
29(a).	**VG**	**Sweet corn varieties only: Ear: number of colours of grains**					
	75	one				Jubilee	1
		two				Goldenpearl	2
		[See comments in Endnote]					
29(b). (*)	**VG**	**Sweetcorn varieties only: Kernel: intensity of yellow color**					
QN	**75**	light	claire	hell		Jaguar	3
		medium	moyenne	mittel		HMX5371	5
		dark	foncée	dunkel		Jubilee	7
		[See comments in Endnote]					
29(c).	**MS**	**Sweetcorn varieties only: Kernel: length**	**Grain: longueur**	**Korn : Länge**			
QN	**75**	short	courte	kurz		Gyöngymazsola	3
		medium	moyen	mittel		Boston	5
		long	longue	lang		Empire	7
		[See comments in Endnote]					

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
29(d).	**MS**	**<u>Sweetcorn varieties only</u>: Kernel: width**	**grain: largeur**	**korn**			
QN	**75**	narrow	étroit	schmal		Bonus	3
		medium	moyen	mittel		Jubilee	5
		broad	large	breit		Mv Aranyos	7
		[See comments in Endnote]					
29(e). (*) (+)	**MS?**	**<u>Sweetcorn varieties only</u>: Kernel: total sugar content**					
QN	**75**	very low				El Toro	1
		low				Royalty	3
		medium				Monarchy	5
		high				Dessert 73	7
		very high				Dynasty	9
		[See comments in Endnote]					
30. (*)	**VG**	**Ear: type of grain (in middle third of ear)**	**Epi: type de grain (au tiers moyen de l'épi)**	**Kolben: Korntyp (im mittleren Drittel des Kolbens)**			
QL	**92 (S)**	flint	corné	Hartmais		F2	1
		flint-like	corné à corné-denté	hartmais-ähnlich		F252	2
		intermediate	corné-denté	Zwischentyp		F107	3
		dent-like	corné-denté à denté	zahnmais-ähnlich		A654	4
		dent	denté	Zahnmais		W182E	5
		sweet	sucré	Zuckermais		Jubilee	6
		pop	pop	Popcorn		Iowa Pop	7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
31. (*)	**VG**	**Ear: color of top of grain**	**Epi: couleur du sommet du grain**	**Kolben: Farbe der Kornkrone**			
QL	**92 (S)**	white	blanc	weiss		A188, Snowbelle	1
	sweet-corn 75	yellowish white	blanc jaunâtre	gelblich weiss			2
		yellow	jaune	gelb		F259, Jubilee	3
		yellow orange	jaune orangé	gelborange		F2	4
		orange	orange	orange		F257	5
		red orange	rouge orangé	rotorange			6
		red	rouge	rot			7
		dark red	rouge foncé	dunkelrot			8
		blue black	noir-bleu	blauschwarz			9
		[See comments in Endnote]					
32.	**VG**	**Ear: color of dorsal side of grain**	**Epi: couleur de la face dorsale du grain**	**Kolben: Farbe der Kornrückseite**			
QL	**92 (S)**	white	blanc	weiss		F481	1
		yellowish white	blanc jaunâtre	gelblich weiss		A188	2
		yellow	jaune	gelb			3
		yellow orange	jaune orangé	gelborange		F66	4
		orange	orange	orange		EP1	5
		red orange	rouge orangé	rotorange			6
		red	rouge	rot			7
		dark red	rouge foncé	dunkelrot			8
		blue black	noir-bleu	blauschwarz			9
		[See comments in Endnote]					

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
~~**33. (*)**~~		~~**Ear: anthocyanin coloration of glumes of cob**~~	~~**Epi: pigmentation anthocyanique des glumes de la rafle**~~	~~**Kolben: Anthocyanfärbung der Spelzen der Spindel**~~			
	~~**93 (S)**~~	~~absent~~	~~absente~~	~~fehlend~~		~~F2~~	~~1~~
		~~present~~	~~présente~~	~~vorhanden~~		~~W117~~	~~9~~
		[Deletion of this characteristic and combine with the next one]					
34.	**VG**	**Ear: intensity of anthocyanin coloration of glumes of cob**	**Epi: intensité de la pigmentation anthocyanique des glumes de la rafle**	**Kolben: Intensität der Anthocyanfärbung der Spelzen der Spindel**			
QN	**93 (S)**	absent or very weak	nulle ou très faible	sehr gering		F7	1
		weak	faible	gering			3
		medium	moyenne	mittel		F252	5
		strong	forte	stark		W117	7
		very strong	très forte	sehr stark		A632	9
34(a).	**VG**	**<u>Popcorn varieties only:</u> Type of popped grain**					
QL	**93**	butterfly					1
		intermediate					2
		globular					3
		[An explanation is necessary and how to assess this characteristic]					

8. Explanations on the Table of Characteristics

"8.1 Explanations covering several characteristics

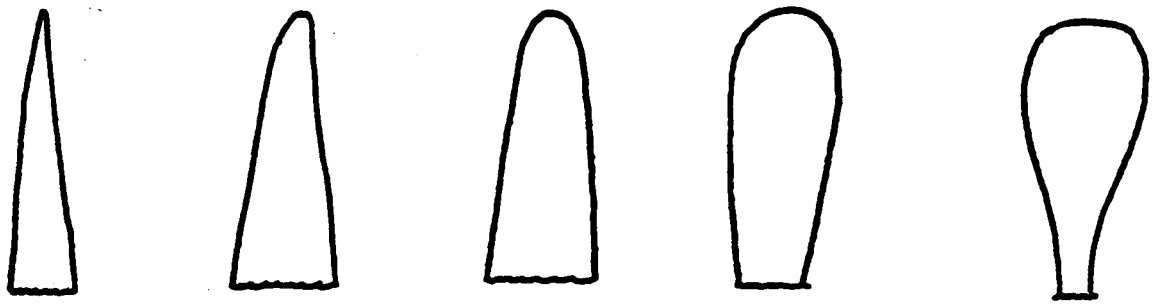
"Characteristics containing the following key in the second column of the Table of Characteristics should be examined as indicated below:

(a)
(b) etc.

"8.2 Explanations for individual characteristics

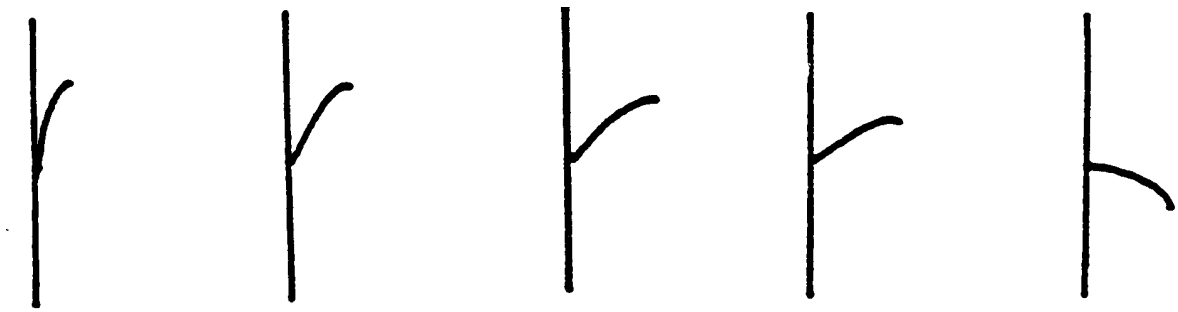
Ad. 1 etc."

Ad. 2: First leaf: shape of tip



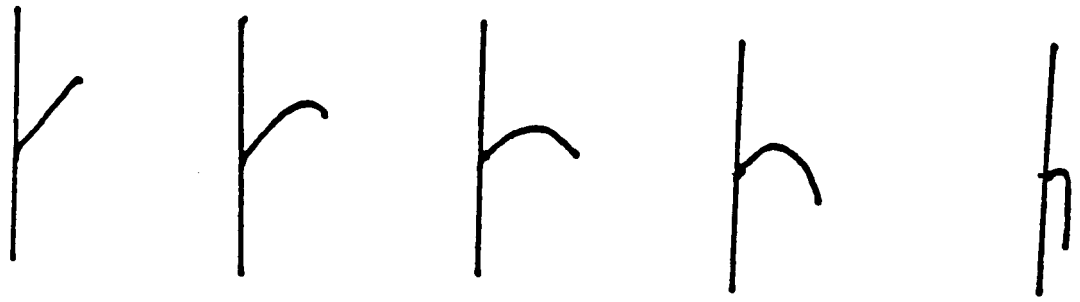
1	2	3	4	5
pointed	pointed to round	round	round to spatulate	spatulate

Ad. 3: Leaf: angle between blade and stem (on leaf just above upper ear)
Ad. 12: Tassel: angle between main branch and lateral branches (at the leel of the second lateral branch from the bottom)



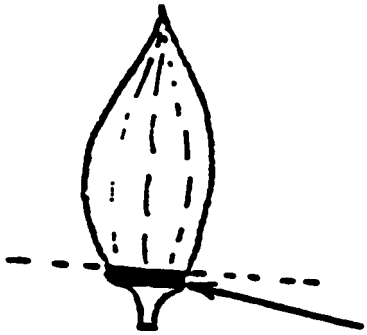
1	3	5	7	9
very small (< 5°)	small (± 25°)	medium (± 50°)	large (± 75°)	very large (> 90°)

Ad. 4: Leaf: attitude of blade
Ad. 13: Tassel: attitude of lateral branches



1	3	5	7	9
straight	slightly recurved	recurved	strongly recurved	very strongly

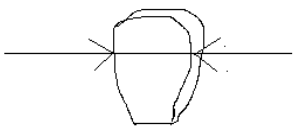
Ad. 8: Tassel: anthocyanin coloration at base of glume



Ad. 29(e): Sweetcorn varieties only: Kernel: total sugar content

The assay of total sugar content is made by Luff-Schoorl method.

Ad. 29(d): Sweet corn varieties only: Kernel: width



Decimal Code for the Growth Stages*

The joined document 'Phenological growth stages and BBCH-identification keys of Zea mays L' should be considered with regard to a possible inclusion in this TG instead of the table below.

In the new one stage 75 means about 40% dry matter content, in the old one stage 75 was medium milk , which means at sweet corn lower dry matter content (normal sweet about 31% (69% water), super sweet 24% (76% water).

"Kernels in middle of cob yellowish-white" Is this description not confusing for the not yellow colored varieties?

[FR prefers to keep the Zadocks scale as it was in the previous TG F]

CODE	GENERAL DESCRIPTION		DESCRIPTION
	Germination	Germination	Keimung
00	Dry seed	Grain sec	Trockene Saat
	Seedling growth	Croissance de la plantule	Wachstum des Keimlings
12	2 leaves unfolded	2 feuilles étalées	2 Blätter entfaltet
14	4 leaves unfolded	4 feuilles étalées	4 Blätter entfaltet
	Tillering	Tallage	Bestockung
	Stem elongation	Elongation de la tige (montaison)	Schossen
	Booting	Gonflement	Schwellstadium
	Inflorescence emergence	Epiaison	Erscheinen des Blütenstands
51 (♂,♀)	Inflorescence just visible	Inflorescence à peine visible	Blütenstand gerade sichtbar
(♂,♀)	Anthesis	Anthèse	Blüte
61	Beginning of anthesis	Début de l'anthèse	Beginn der Blüte
65 (♂,♀)	Anthesis halfway	Mi-floraison	Mitte der Blüte
	Milk development	Stade lauteux	Entwicklung der Milchreife
71	Caryopsis watery ripe	State aqueux de la maturation du caryopse	Karyopse wasserreif

75	Medium milk	Mi-laiteux	Mitte der Milchreife

Sweetcorn varieties only:

Standard water content

-su$_1$ (normal sweet varieties) } ***69 ±0,5% a different approach would lead to two different characteristics***

-se (sugary enhanced var.) ***69 ±0,5%***

-sh$_2$ (super sweet varieties) ***76 ±0,5%*** The different genetic types require different water content to the optimal stage, this is not a different approach.

In case of other genetic construction as the breeder gives it.

	Dough development	Stade pâteux	Entwicklung der Teigreife
85	Soft dough	Pâteux tendre	weich teigreif
	Ripening	Maturation	Das Reifen
92	Caryopsis hard (can no longer be dented by thumbnail)	Le caryopse est dur (ne peut plus du tout être entamé par l'ongle)	Karyopse hart (nicht mehr mit dem Daumennagel ein- zudellen)
93	Caryopsis loosening in daytime	Caryopse se détachant dans la journée	Karyopse tagsüber lockernd

---

* Extracted from J.C. Zadoks, T.T. Chang and C.F. Konzak, Decimal Code for the Growth States of Cereals, EUCARPIA Bulletin No. 7, 1974, pp. 42-52. The French translation has been kindly furnished by Mrs. R. Cassini, Mr. R. Cassini and Mr. R. Marie. The German translation has been kindly furnished by Mr. A.O. Klomp and Mrs. I. Volk.

* Extrait de J.C. Zadoks, T.T. Chang et C.F. Konzak, Decimal Code for the Growth States of Cereals, EUCARPIA Bulletin No. 7, 1974, pp. 42-52. La traduction française a été aimablement fournie par Mme R. Cassini, M. R. Cassini et M. R. Marie. La traduction allemande a été aimablement fournie par M. A.O. Klomp et Mme I. Volk.

* Auszug von J.C. Zadoks, T.T. Chang und C.F. Konzak, Decimal Code for the Growth States of Cereals, EUCARPIA Bulletin No. 7, 1974, pp. 42-52. Die französische Uebersetzung wurde freundlicherweise von Frau R. Cassini, Herrn R. Cassini und Herrn R. Marie überlassen. Die deutsche Uebersetzung wurde freundlicherweise von Herrn A.O. Klomp und Frau I. Volk überlassen.

9. Literature

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10. Technical Questionnaire

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
		Application date: (not to be filled in by the applicant)

TECHNICAL QUESTIONNAIRE
to be completed in connection with an application for plant breeders' rights

1. Subject of the Technical Questionnaire

1.1 Botanical name	*Zea mays* L.
1.2 Common name	Maize

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

(i) inbred line/lignée/Inzuchtlinie [ ]
(ii) single-cross hybrid/hybride simple/Einfachkreuzung
(iii) three-way cross hybrid/hybride trois voies/Dreiweghybride
(iv) double-cross hybrid/hybride double/Doppelhybride
(v) open-pollinated variety/variété à fécondation libre/Freiabblühende Sorte
(vi) other (indicate formula)/autre (préciser la formule)/Andere (Formel angeben) [ ]

(a) Alternative 1

"Variety resulting from:

"4.1.1 Crossing

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

"(b) partially known cross [ ]
(please state known parent variety(ies))

"(c) unknown cross [ ]

"4.1.2 Mutation [ ]
(please state parent variety)

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

"4.1.4 Other [ ]"
(please provide details)"

[ ]

[#] 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:

(b) *Alternative 2*

"Variety resulting from:

"4.1.1 Crossing

"(a) controlled cross [ ]
(please state parent varieties)
"(b) partially known cross [ ]
(please state known parent variety(ies))
"(c) unknown cross [ ]

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

"4.1.3 Other [ ]"
(please provide details)"

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

4.2 Method of propagating the variety

GN 31

The examples below indicate how this section can be formatted and some appropriate terms which can be used:

Example 1

"4.2.1 Seed-propagated varieties

"(a) Self-pollination [ ]

"(b) Cross-pollination
(i) population [ ]
(ii) synthetic variety [ ]

"(c) Hybrid [ ]
{…*see GN 32 for example*...}

"(d) Other [ ]
(please provide details)"

"4.2.2 Vegetatively propagated varieties

{...*see Example 2*...} [... ... ...]

"4.2.3 Other [ ]"
(please provide details)"

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

Example 2

"4.2.1 Vegetative propagation

"(a) cuttings [ ]

"(b) *in vitro* propagation [ ]

"(c) other (state method) [ ]

"4.2.2 Seed [ ]

"4.2.3 Other [ ]"
(please provide details)"

GN 32

"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."

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 (7)	**Tassel: time of anthesis (on middle third of main axis, 50% of plants)**		
	very early		1 [ ]
	very early to early	KW1069	2 [ ]
	early	F257 Spirit	3 [ ]
	early to medium	F259 Boston	4 [ ]
	medium	F522 Jubilee	5 [ ]
	medium to late	A632 Empire	6 [ ]
	late	B73 Bonus	7 [ ]
	late to very late	GH2547	8 [ ]
	very late		9 [ ]
5.2 (17)	**Ear: intensity of anthocyanin coloration of silks**		
	absent or very weak	F7	1 [ ]
	weak	F66	3 [ ]
	medium	A654	5 [ ]
	strong	CM7	7 [ ]
	very strong		9 [ ]
5.3I (22.1)	**<u>In-bred lines</u>: Plant: length (tassel included)**		
	very short	F7	1 [ ]
	short	W117	3 [ ]
	medium	F244	5 [ ]
	long	WD36	7 [ ]
	very long		9 [ ]

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

	Characteristics	Example Varieties	Note
5.3ii	**Hybrids and open pollinated varieties only: Plant: length (tassel included)**		
(22.2)	very short	Nano-Dos	1 [ ]
	short	DK232	3 [ ]
	medium	Magister	5 [ ]
	long	Cecilia	7 [ ]
	very long	Alimare	9 [ ]
5.4 (30)	**Ear: type of grain (in middle third of ear)**		
	flint	F2	1 [ ]
	flint-like	F252	2 [ ]
	intermediate	F107	3 [ ]
	dent-like	A654	4 [ ]
	dent	W182E	5 [ ]
	sweet	Jubilee	6 [ ]
	pop	Iowa Pop	7 [ ]
5.5 (34)	**Ear: intensity of anthocyuanin coloration of glumes of cob**		
	absent or very weak	F7	1 [ ]
	weak		3 [ ]
	medium	F252	5 [ ]
	strong	W117	7 [ ]
	very strong	A634	9 [ ]
5.6	**<u>Sweetcorn varieties only</u>: genetic construction**		
	su_1 (normal sweet varieties)		1 [ ]
	se (sugary enhanced var.)		2 [ ]
	sh_2 (supersweet varieties)		3 [ ]
	other (give it)		4 [ ]

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

	Characteristics	Example Varieties	Note
34(a)	**<u>Popcorn varieties only</u>: Type of popped grain**		
	butterfly		1 [ ]
	intermediate		2 [ ]
	globular		3 [ ]

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
GN 33 [Note 1] *Example*	*[e.g. Flower color]*	*[e.g. orange]*	*[e.g. orange red]*

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

GN 34 [Note 2]

Example 1

7.3.1 Main use

(a) seed [ ]
(b) forage [ ]
(c) other [ ]
(please provide details)

Example 2

7.3.1 Main use

(a) garden plant [ ]
(b) pot plant [ ]
(c) cut-flower [ ]
(d) other [ ]
(please provide details)

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"A representative color photograph of the variety should accompany the Technical Questionnaire."

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

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

8. Authorization for release

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

Yes [ ] No [ ]

(b) Has such authorization been obtained?

Yes [ ] No [ ]

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

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".

……

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"9.3 Has the plant material to be examined been tested for the presence of virus or other pathogens?

Yes [ ]

(please provide details as specified by the Authority)

No [ ] "

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

Applicant's name

Signature Date

11. ENDNOTES

Comment on characteristic 24 (a): Sweetcorn varieties only: time of picking maturity (medium milk)

This characteristic is very correlated with time of anthesis. It is difficult to define precisely the time of stage "medium milk". To use moisture content, it's necessary to do a lot of measurements Moreover without phenotypic approach feasibility seems to be very difficult (workload). It is more correlated with the silking but in case of other species the time of flowering and the time of maturity are used as characteristics too. The heat units could show better differences, because 1day difference in hot weather is not the same as in colder one. For the evaluation of sweet corn ears we need to harvest the sample at medium milk stage, so for this characteristic we only have to write the harvest date. Moisture content helps harvesting the ears at the optimal stage. Because of the breeding concentrate to the characteristics of the milky ripened ears, we can see differences at this stage.

Comment on characteristic 24 (b): Sweetcorn varieties only: Tiller: length

We have experience with this characteristic for which there is a genetic control but also a very large effect of the sowing density and more generally of the environmental conditions. From one cycle to another, it is not easy to identify a real genetic effecton which distinctness could be based.So we are not in favour of this caracteritic. It could be interesting to have the opinion of the breeders on this characteristic, because lillering is probably a default for sweet corn production. Border plants can look completely different to the inner part of a plot showing a pseudo lack of uniformity.
To be put before preceeding characteristic 'Time of picking maturity of ear'.
To explain whether to observe all tillers or only the longest one.
In the DUS trials we use the same sowing density for every variety and observe the longest tillers inside the plots. Tillering is more the characteristic of the sweet corn than the normal maize. The environmental conditions has an effect, but there is a genetic control, which is visible. Logical order: before the time of maturity

Comment on characteristic 28: Ear: shape

DE and FR propose to delete this characteristic because susceptible to the quality of grain set and with poor discriminative power

At sweet corn this char. is important

Comment on characteristic 28(a): Sweetcorn varieties only: Ear: shape of apex

This characteristic is very susceptible to the quality of grain set and so difficult to assess in many cases. As a consequence of the deletion of the preceding characteristic, this one must also be deleted.

At sweet corn hybrids it is normally assessable

Comment on characteristic 29(a): Sweet corn varieties only: Ear: number of colors of grains

Change of definition in order to be in line with definition of characteristic 31 as one grain (kernel) will have only one color. To explain which combinations of two colors are expected (only combinations with white or also e.g. yellow with yellow orange or orange?). Are there more than two colors possible?
To clarify whether to use 'grain' or 'kernel' (see also for the following characteristics).

Ear: number of kernel colors At sweet corn "kernel" should be the right wording in milky reipened stage. There are varieties with one color (white or yellow) and with two (white and yellow)

Comment on characteristic 29(b): Sweet corn varieties only: Kernel: intensity of yellow color

Change of definition in order to be in line with definition of characteristic 31.
To check whether 'yellow' covers the complex of 'yellowish white', 'yellow', yellow orange' and 'orange' (see ch. 31). If so the definition of the characteristic should read 'Sweet corn varieties only: Ear: color of top of grain' and the true colors should be indicated. In the case of two colors per ear both colors would have to be described. In this case also an option for white would be necessary.
This two characteristics must be discussed. in relation with the phenomenon of xenia and with the genetic structure.

In case of sweet corn there is no difference between the color of the top and the dorsal side. There are big differences among the yellow colors (light, medium, dark). There should be little differences among white colors. At the normal maize used colors ('yellowish white', 'yellow', yellow orange' and 'orange') are not fit for sweet corn very much. Avoiding xenia phenomenon we use at sweet corn hybrids 8 rows plots and pick the samples from the middle part.

Comment on characteristic 29(c): Sweet corn varieties only: Kernel: length

Necessity to define where the observation must be done (middle of ear?)
What is the discrimination power of this characteristic?

The ears have to break in the middle and the kernel length is measured by calliper rule. The discrimination power is that this is one of the main breeding aim at sweet corn varieties for the processing. (To get more kernels from one ha.)

Comment on characteristic 29(d): Sweet corn varieties only: Kernel: width

Necessity to define where the observation must be done (middle of ear?). Is it width or thickness? What is the discrimination power of this characteristic?

Observation should be made in the middle of ear. The width was mentioned here, please see drawing. It depends on the number of rows and the diameter of the cob.

Comment on characteristic 29(e): Sweet corn varieties only: Kernel: total sugar content

It is necessary to get an explicite description of the Luff-Schoorl method. What is the discrimination power of this characteristic?
With regard to the comments for characteristic 'date of picking matutity of ear' a precise timing for taking samples seems to be nececessary and needs to be explained in order to get comparable data. Could one imagine a simple grouping in normal sweet (note 1), sugary enhanced (2) and super sweet (3) with a clear separation by border example varieties?
The Luff –Schoorl method is used internationally for specify the sugar content of food. This moment we have only long description from the Hungarien standard. We will provide later a description. There are many different genetic type of sweet corn with different sugar content.
In the former draft IV. Methods and Observations 4. it was mentioned "Sweet corn varieties only: The observations on the ear should be made at optimum harvesting time (medium milk)(growth stage: 75, exact description are given at growing stages)."

Comment on characteristic 31: Ear: color of top of grain

With regard to prior comments to sweet corn characteristic 'intensity of yellow color' it should be discussed whether to exclude sweet corn varieties for ch. 31. The observation of sweet corn varieties at stage 92 seems to be not comparable to other grain types and would not be a good alternative.

It is suggested to observe all ear characteristics of the sweet corn at the same stage (75).

Comment on characteristic 32: Ear: color of dorsal side of grain

With regard to prior comments to sweet corn characteristic 'intensity of yellow color' it should be discussed whether to exclude sweet corn varieties for ch. 31. The observation of sweet corn varieties at stage 92 seems to be not comparable to other grain types and would not be a good alternative.

Sweet corn could be excluded for ch.32.

[End of document]