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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS
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DRAFT

SUGARCANE

UPOV code: SACCH

(*Saccharum* L.)

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by an expert from Brazil

*to be considered by the Technical Committee at its forty-first session,
 to be held in Geneva, Switzerland, from April 4 to 6, 2005*

Alternative Names:^{*}

<i>Botanical name</i>	<i>English</i>	<i>French</i>	<i>German</i>	<i>Spanish</i>
<i>Saccharum</i> L.	Sugarcane	Canne à sucre	Zuckerrohr	Caña de azúcar

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 vegetatively propagated varieties of *Saccharum* L. of the family *Gramineae* (*Poaceae*).

2. Material Required

2.1 The competent authorities decide on the quantity and quality of the plant material required for testing the variety and when and where it is to be delivered. Applicants submitting material from a State other than that in which the testing takes place must ensure that all customs formalities and phytosanitary requirements are complied with.

2.2 The material is to be supplied from plants which are about 8 to 12 months old.

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

12 segments of culm used for vegetative propagation of sugarcane with 3 buds each, properly packaged to minimize damage to the buds.

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 a single growing cycle.

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 In particular, plants should be observed in the first vegetative cycle of the crop, from when the cane is planted to its first harvest (plant cane) and all characteristics observed on plants between 10 to 12 months of age.

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

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

3.4 *Test Design*

3.4.1 Each test should be designed to result in a total of at least 24 culms, all from different stools, which should be divided between two or more replicates. A stool is a cluster of culms (and their leaves) derived from a single segment of culm used for vegetative propagation of sugarcane. It also includes the underground position of the culms (rhizomes and roots) and is analogous to a single plant.

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.

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

3.5.1 Unless otherwise indicated, all observations for qualitative characteristics should be made on 6 culms or parts taken from 6 culms.

3.5.2 Unless otherwise indicated, all observations for quantitative characteristics should be made on 24 culms or parts taken from each of 24 culms.

3.5.3 Unless otherwise indicated, all observations on single culms should be made on 6 culms or parts taken from each of 6 culms and any other observations made on all culms in the test.

3.6 *Additional Tests*

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

4. Assessment of Distinctness, Uniformity and Stability

4.1 *Distinctness*

4.1.1 General Recommendations

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

4.1.2 Consistent Differences

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

sufficiently consistent is to examine the characteristic in at least two independent growing cycles.

4.1.3 Clear Differences

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

4.2 *Uniformity*

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

4.2.2 For the assessment of uniformity, a population standard of 1% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 6 culms 1 off-type is allowed. In the case of a sample size of 24 culms, 1 off-type is allowed.

4.3 *Stability*

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

4.3.2 Where appropriate, or in cases of doubt, stability may be tested, either by growing a further generation, or by testing a new plant stock to ensure that it exhibits the same characteristics as those shown by the previous material supplied.

5. Grouping of Varieties and Organization of the Growing Trial

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

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

5.3 The following have been agreed as useful grouping characteristics:

- (a) Internode: color where not exposed to sun (characteristic 13)
- (b) Node: shape of bud, excluding wings (characteristic 21)

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

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

(a)-(c) 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 Exemples Beispielssorten Variedades ejemplo	Varieties Note/ Nota
1. Plant: stool growth habit	Plante: port de la souche	Pflanze: Wuchstyp der Mutterpflanze	Planta: porte de la cepa		
erect	dressé	aufrecht	erecto	Q186, Q 121	1
semi-erect	demi-dressé	halbaufrecht	semierecto	Q96, RB72-454	3
intermediate	demi-dressé à demi-étalé	mittel	intermedio		5
semi-prostrate	demi-étalé	halbliiegend	semipostrado	H56-752	7
prostrate	étalé	liegend	postrado		9
2. Plant: adherence of (*) leaf sheath (+)	Plante: adhérence de la gaine de la feuille	Pflanze: Anhaften der Blattscheide	Planta: adherencia de la vaina		
weak	faible	gering	débil	H56-752, Q96	3
medium	moyenne	mittel	media	Q124, Q186	5
strong	forte	stark	fuerte	Q120, NC ₀ 310, Q201	7
3. Plant: tillering	Plante: tallage	Pflanze: Bestockung	Planta: macollaje		
weak	faible	gering	débil	Q124	3
medium	moyen	mittel	medio	RB72-454	5
strong	fort	stark	fuerte	Q138	7
4. Plant: number of suckers	Plante: nombre de drageons	Pflanze: Anzahl Stockausschlag	Planta: número de chupones		
very few	très faible	sehr wenig	muy pocos	Q117, RB72-454	1
few	faible	wenig	pocos	Q121	3
medium	moyen	mittel	medios	BN81-1394	5
many	fort	viel	muchos		7

English	français	deutsch	español	Example Exemples Beispielssorten Variedades ejemplo	Varieties Note/ Nota
5. Plant: leaf canopy	Plante: feuillage	Pflanze: Blattlaub	Planta: cierre		
very sparse	très clairsemé	sehr locker	muy abierto	RB72-454	1
sparse	clairsemé	locker	abierto	H56-752	3
medium	moyen	mittel	medio	Q96, Q115	5
dense	dense	dicht	denso		7
6. Plant: intensity of green color of leaf canopy	Plante: intensité de la couleur verte du feuillage	Pflanze: Intensität der Grünfärbung des Blattlaubs	Planta: intensidad del color verde del cierre		
light	claire	hell	claro		3
medium	moyenne	mittel	medio		5
dark	foncée	dunkel	oscuro		7
7. Culm: height (+) (from the base to the TVD leaf)	Tige de canne: hauteur (de la base à la dernière feuille dont l'ochréa est visible)	Halm: Höhe (von der Basis bis zum TVD-Blatt)	Caña: altura (desde la base hasta el collar superior)		
MS short	courte	kurz	corta	Q117	3
medium	moyenne	mittel	mediana	Q124, Q138, Q170	5
long	longue	lang	larga	Q136, RB72-454	7
8. Internode: length on (+) MS the bud side	Entre-nœud: longueur du côté du bourgeon	Internodium: Länge an der Knospenseite	Entrenudo: longitud del lado de la yema		
(a) short	court	kurz	corto	Q117	3
medium	moyen	mittel	mediano	Q138, Q170	5
long	long	lang	largo	Q124	7
9. Internode: diameter (+) MS (* as for 8)	Entre-nœud: diamètre (comme pour 8)	Internodium: Durchmesser (wie für 8)	Entrenudo: diámetro (como para 8)		
(a) thin	petit	dünn	delgado	Q136	3
medium	moyen	mittel	medio	Q124, H56-752, Q170	5
thick	grand	dick	grueso	Q117	7

English	français	deutsch	español	Example Exemples Beispielssorten Variedades ejemplo	Varieties Note/ Nota
10. Internode: shape (* (+)	Entre-nœud: forme	Internodium: Form	Entrenudo: forma		
(a) cylindrical	cylindrique	zylindrisch	cilíndrico	Q169, RB72-454	1
tumescant	renflé	geschwollen	hinchado		2
bobbin-shaped	en forme de bobine	spulenförmig	abobinado	H56-752	3
conoidal	conoïde	kegelförmig	conoidal		4
obconoidal	obconique	verkehrt kegelförmig	conoidal invertido	H60-3802	5
concave-convex	concave-convexe	konkav-konvex	cóncavo-convexo	Q115	6
11. Internode: cross-section (+)	Entre-nœud: section transversale	Internodium: Querschnitt	Entrenudo: sección transversal		
(a) circular	circulaire	rund	circular	Q121, RB72-454	1
ovate	ovoïde	eiförmig	ovada	Q96, Q186, Q152	2
12. Internode: color (* (+)	Entre-nœud: couleur du côté <u>exposé</u> au soleil	Internodium: Farbe an den der Sonne <u>ausgesetzten</u> Stellen	Entrenudo: color de la parte <u>expuesta</u> al sol		
(a) RHS Color chart (indicate reference number)	Code RHS des couleurs (indiquer le numéro de référence)	RHS-Farbkarte (Nummer angeben)	Carta de colores RHS (indíquese el número de referencia)		
13. Internode: color (* (+)	Entre-nœud: couleur du côté <u>non exposé</u> au soleil	Internodium: Farbe an den der Sonne <u>nicht ausgesetzten</u> Stellen	Entrenudo: color de la parte <u>no expuesta</u> al sol		
(a) RHS Color chart (indicate reference number)	Code RHS des couleurs (indiquer le numéro de référence)	RHS-Farbkarte (Nummer angeben)	Carta de colores RHS (indíquese el número de referencia)		

English	français	deutsch	español	Example Exemples Beispielssorten Variedades ejemplo	Varieties Note/ Nota
14. Internode: depth of growth crack (+)	Entre-nœud: profondeur de la fente de croissance	Internodium: Tiefe des Wachstumsrisses	Entrenudo: profundidad de la rajadura de crecimiento		
(a) absent or very shallow	absente ou très peu profonde	fehlend oder sehr flach	ausente o muy poco profunda	RB72-454, H56-752	1
shallow	peu profonde	flach	poco profunda	Q124	3
medium	moyenne	mittel	media	Q121	5
deep	profonde	tief	profunda	Q179	7
15. Internode: (*) expression of zigzag alignment (+)	Entre-nœud: expression de l'alignement en zigzag	Internodium: Ausprägung der Zickzackausrichtung	Entrenudo: expresión de la alineación en zig zag		
(a) absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Q124	1
weak	faible	gering	débil	Q135, Q152	3
moderate	moyenne	mittel	moderada	Q117	5
strong	forte	stark	fuerte	H56-752	7
16. Internode: appearance (rind surface) (+)	Entre-nœud: apparence (surface de l'écorce)	Internodium: Aussehen (Oberfläche der Schale)	Entrenudo: aspecto (superficie de la corteza)		
(a) smooth	lisse	glatt	lisa		3
medium	moyenne	mittel	media		5
rough (corky)	rugueuse (subéreuse)	rauh (korkartig)	rugosa (suberosa)		7
17. Internode: waxiness (+)	Entre-nœud: pruine	Internodium: Wachsschicht	Entrenudo: cerosidad		
(a) absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil	Q179	1
weak	faible	gering	débil	Q138	3
medium	moyenne	mittel	media	Q121, RB72-454	5
strong	forte	stark	fuerte	H56-752, Q117	7

English	français	deutsch	español	Example Exemples Beispielssorten Variedades ejemplo	Varieties Note/ Nota
18. Node: width of root band (+)	Nœud: largeur de la zone radicaire	Nodium: Breite der Wurzelzone	Nudo: anchura de la banda radicular		
(a) narrow	étroite	schmal	estrecha	Q121	3
medium	moyenne	mittel	mediana	Q124	5
broad	large	breit	ancha	H56-752	7
19. Node: color of root band (+)	Nœud: couleur de la zone radicaire	Nodium: Farbe der Wurzelzone	Nudo: color de la banda radicular		
(a) RHS Color chart (indicate reference number)	Code RHS des couleurs (indiquer le numéro de référence)	RHS-Farbkarte (Nummer angeben)	Carta de colores RHS (indíquese el número de referencia)		
20. Node: wax ring (+)	Nœud: zone cireuse	Nodium: Wachsring	Nudo: anillo ceroso		
(a) absent or very narrow	absente ou très étroite	fehlend oder sehr schmal	ausente o muy estrecho	Q179	1
narrow	étroite	schmal	estrecho		3
medium	moyenne	mittel	mediano	Q113, Q96, RB72-454	5
wide	large	breit	ancho	Q115, Q138	7
very wide	très large	sehr breit	muy ancho		9
21. Node: shape of bud, excluding wings (* (+)	Nœud: forme du bourgeon, à l'exclusion des ailes	Nodium: Form der Knospe, ohne Flügel	Nudo: forma de la yema, excluyendo la quilla		
(a) triangular-pointed	triangulaire-pointue	dreieckig-spitz	triangular-puntiaguda	RB72-454	1
oval	ovale	elliptisch	oval	Q138	2
obovate	obovale	verkehrt eiförmig	trasovada		3
pentagonal	pentagonale	fünfeckig	pentagonal		4
rhomboid	rhoïdale	rhomboid	romboide		5
round	ronde	rund	redonda	Q179, Q124	6
ovate	ovoïde	eiförmig	ovada	Q170, Q115, Q186	7
rectangular	rectangulaire	rechteckig	rectangular		8
beaked	becquée	schnabelförmig	en pico		9

English	français	deutsch	español	Example Exemples Beispielssorten Variedades ejemplo	Varieties Note/ Nota
22. Node: width of bud, excluding wings (+)	Nœud: largeur du bourgeon, à l'exclusion des ailes	Nodium: Breite der Knospe, ohne Flügel	Nudo: anchura de la yema, excluyendo la quilla		
(a) very narrow	très étroit	sehr schmal	muy estrecha		1
narrow	étroit	schmal	estrecha	Q138	3
medium	moyen	mittel	mediana		5
wide	large	breit	ancha	Q121, Q124	7
very wide	très large	sehr breit	muy ancha	Q136, H56-752	9
23. Node: bud prominence (on second senescent leaf from the top) (+)	Nœud: proéminence du bourgeon (sur la deuxième feuille sénescente à partir du sommet)	Nodium: Knospenausbildung (am zweiten alternden Blatt von oben)	Nudo: prominencia de la yema (en la segunda hoja senescente a partir de la parte superior)		
(a) very weak	très faible	sehr gering	muy débil	Q152	1
weak	faible	gering	débil	RB72-454	3
medium	moyenne	mittel	media	Q121, H56-752	5
strong	forte	stark	fuerte	Q136	7
24. Node: depth of bud groove (+)	Nœud: profondeur du sillon du bourgeon	Nodium: Tiefe der Knospenfurche	Nudo: profundidad del canal de la yema		
(a) absent or very shallow	absent ou très peu profond	fehlend oder sehr flach	ausente o muy poco profundo	Q121, Q186, Q117	1
shallow	peu profond	flach	poco profundo	RB72-454, Q170, Q138	3
medium	moyen	mittel	medio	Q179	5
deep	profond	tief	profundo		7
25. Node: length of bud groove (+)	Nœud: longueur du sillon du bourgeon	Nodium: Länge der Knospenfurche	Nudo: longitud del canal de la yema		
(a) short	court	kurz	corta	Q121	3
medium	moyen	mittel	media	Q135, Q138	5
long	long	lang	larga	Q179, Q96, H56-752	7

English	français	deutsch	español	Example Exemples Beispielssorten Variedades ejemplo	Varieties Note/ Nota
26. Node: position of bud tip in relation to growth ring (+)	Nœud: position du sommet du bourgeon par rapport à l'anneau de croissance	Nodium: Stellung der Knospenspitze im Verhältnis zum Wachstumsring	Nudo: posición del ápice de la yema en relación con el anillo de crecimiento		
(a) clearly below	nettement en-dessous	deutlich unterhalb	claramente por debajo		1
intermediate	intermédiaire	in der Mitte	intermedio	RB72-454, Q179	2
clearly above	nettement en-dessus	deutlich oberhalb	claramente por encima	Q121	3
27. Node: pubescence on the bud (+)	Nœud: pilosité sur le bourgeon	Nodium: Behaarung an der Knospe	Nudo: pubescencia en la yema		
(a) absent	absente	fehlend	ausente		1
present	présente	vorhanden	presente		9
28. Node: position of the pubescence on the bud (+)	Nœud: position des poils sur le bourgeon	Nodium: Lage der Behaarung an der Knospe	Nudo: posición de la pubescencia en la yema		
(a) basal	basale	an der Basis	basal		1
apical	apicale	an der Spitze	apical		2
lateral	latérale	seitlich	lateral		3
29. Node: bud cushion (space between base of bud and leaf scar) (+)	Nœud: coussinet du bourgeon (espace entre la base du bourgeon et la cicatrice foliaire)	Nodium: Knospenswulst (Abstand zwischen der Knospensbasis und der Blattnarbe)	Nudo: cojín de la yema (espacio entre la base de la yema y la cicatriz foliar)		
(a) absent or very narrow	absent ou très étroit	fehlend oder sehr schmal	ausente o muy estrecho	Q121, Q186	1
narrow	étroit	schmal	estrecho	Q96	3
medium	moyen	mittel	mediano	RB72-454, Q181	5
wide	large	breit	ancho	Q170	7

English	français	deutsch	español	Example Exemples Beispielssorten Variedades ejemplo	Varieties Note/ Nota
30. Node: width of bud wing (+)	Nœud: largeur de l'aile du bourgeon	Nodium: Breite des Knospenflügels	Nudo: anchura del ala de la yema		
(a) narrow	étroite	schmal	estrecha	RB72-454	3
medium	moyenne	mittel	mediana	Q121	5
wide	large	breit	ancha	BN81-1394	7
31. Leaf sheath: length (+) MS	Gaine de la feuille: longueur	Blattscheide: Länge	Vaina: longitud		
(b) short	courte	kurz	corta	Q117	3
medium	moyenne	mittel	mediana	Q136, Q170	5
long	longue	lang	larga	Q121, Q124	7
32. Leaf sheath: number of hairs (groups 57 and 60) (+)	Gaine de la feuille: nombre de poils (groupes 57 et 60)	Blattscheide: Anzahl Haare (Gruppen 57 und 60)	Vaina: número de pelos (grupos 57 y 60)		
(b) absent or very few	absent ou très petit	fehlend oder sehr gering	ausente o muy pocos	RB72-454, Q186	1
few	petit	gering	pocos	Q170	3
medium	moyen	mittel	medio	Q117, Q179	5
many	grand	groß	numerosos	Q124	7
very many	très grand	sehr groß	muy numerosos	Q169	9
33. Leaf sheath: length of hairs (groups 57 and 60) (+)	Gaine de la feuille: longueur des poils (groupes 57 et 60)	Blattscheide: Länge der Haare (Gruppen 57 und 60)	Vaina: longitud de los pelos (grupos 57 y 60)		
(b) short	courts	kurz	cortos	Q186	3
medium	moyens	mittel	medianos	Q117, Q179, Q138	5
long	longs	lang	largos	Q121	7
34. Leaf sheath: distribution of hairs (+)	Gaine de la feuille: distribution des poils	Blattscheide: Verteilung der Haare	Vaina: distribución de los pelos		
(b) only dorsal	uniquement dorsale	dorsal	únicamente dorsal	Q138, Q170	1
lateral and dorsal	latérale et dorsale	lateral und dorsal	lateral y dorsal		2

English	français	deutsch	español	Example Exemples Beispielssorten Variedades ejemplo	Varieties Note/ Nota
35. Leaf sheath: shape of ligule (+)	Gaine de la feuille: forme de la ligule	Blattscheide: Form der Ligula	Vaina: forma de la lígula		
(b) strap-shaped	en forme de bande	bandförmig	en forma de correa		1
deltoid	deltoïde	deltaförmig	deltoïde	H56-752, Q170	2
crescent-shaped	en forme de croissant	halbmondförmig	en forma de cuarto creciente	Q121, Q96, Q179	3
bow-shaped	en forme d'arceau	bogenförmig	arqueada		4
asymmetrical, steeply sloping	asymétrique, fortement inclinée	asymmetrisch steil abfallend	asimétrica con una inclinación pronunciada		5
assymmetrical, horizontal	asymétrique, horizontale	asymmetrisch waagrecht	asimétrica horizontal		6
36. Leaf sheath: ligule width (+)	Gaine de la feuille: largeur de la ligule	Blattscheide: Breite der Ligula	Vaina: anchura de la lígula		
(b) narrow	étroite	schmal	estrecha		1
medium	moyenne	mittel	mediana	Q186, Q115, Q179	2
wide	large	breit	ancha	H56-752, Q170	3
37. Leaf sheath: length of ligule hairs (group 61) (+)	Gaine de la feuille: longueur des poils de la ligule (groupe 61)	Blattscheide: Länge der Ligulahaare (Gruppe 61)	Vaina: longitud de los pelos de la lígula (grupo 61)		
(b) short	courts	kurz	cortos	Q96, Q170, Q152	3
medium	moyens	mittel	medianos	RB72-454, Q179	5
long	longs	lang	largos	BN81-1394, Q124	7
38. Leaf sheath: density of ligule hairs (group 61) (+)	Gaine de la feuille: densité des poils de la ligule (groupe 61)	Blattscheide: Dichte der Ligulahaare (Gruppe 61)	Vaina: densidad de los pelos de la lígula (grupo 61)		
(b) absent or very sparse	nulle ou très lâche	fehlend oder sehr locker	ausente o muy laxa		1
sparse	lâche	locker	laxa		3
medium	moyenne	mittel	mediana	Q152	5
dense	dense	dicht	densa	Q121, RB72-454	7
very dense	très dense	sehr dicht	muy densa	Q179	9

English	français	deutsch	español	Example Exemples Beispielssorten Variedades ejemplo	Varieties Note/ Nota
39. Leaf sheath: shape of underlapping auricle (+)	Gaine de la feuille: forme de l'auricule sous-jacente	Blattscheide: Form des unterlappenden Blattöhrchens	Vaina: forma de la aurícula subyacente		
(b) transitional	transitoire	durchgehend	transicional	Q121	1
deltoid	deltoïde	deltaförmig	deltoïde	Q186	2
dentoid	en forme de dent	zahnförmig	dentoïde		3
unciform	unciforme	hakenförmig	unciforme		4
calcarifom	en forme d'éperon	spornförmig	calcariforme		5
lanceolate	lancéolée	lanzettlich	lanceolada	RB72-454, H56-752	6
falcate	falciforme	sichelförmig	falcada		7
40. Leaf sheath: size of underlapping auricle (+)	Gaine de la feuille: taille de l'auricule sous-jacente	Blattscheide: Größe des unterlappenden Blattöhrchens	Vaina: tamaño de la aurícula subyacente		
(b) small	petite	klein	pequeña	Q96	3
medium	moyenne	mittel	mediana	Q201	5
large	grande	groß	grande	Q135	7
41. Leaf sheath: shape of overlapping auricle (+)	Gaine de la feuille: forme de l'auricule de chevauchement	Blattscheide: Form des überlappenden Blattöhrchens	Vaina: forma de la aurícula superpuesta		
(b) transitional	transitoire	durchgehend	transicional	Q121, Q152	1
deltoid	deltoïde	deltaförmig	deltoïde	RB72-454, Q117	2
dentoid	en forme de dent	zahnförmig	dentoïde		3
unciform	unciforme	hakenförmig	unciforme		4
calcariform	en forme d'éperon	spornförmig	calcariforme		5
lanceolate	lancéolée	lanzettlich	lanceolada	Q138	6
falcate	falciforme	sichelförmig	falcada		7

English	français	deutsch	español	Example Exemples Beispielssorten Variedades ejemplo	Varieties Note/ Nota
42. Leaf sheath: size of overlapping auricle (+)	Gaine de la feuille: taille de l'auricule de chevauchement	Blattscheide: Größe des überlappenden Blattöhrchens	Vaina: tamaño de la aurícula superpuesta		
(b) small	petite	klein	pequeña		3
medium	moyenne	mittel	mediana		5
large	grande	groß	grande		7
43. Leaf sheath: color of dewlap (*) (+)	Gaine de la feuille: couleur de l'ochréa	Blattscheide: Farbe des Lappens	Vaina: color del collar		
(b) RHS Color chart (indicate reference number)	code RHS des couleurs (indiquer le numéro de référence)	RHS-Farbkarte (Nummer angeben)	Carta de colores RHS (indíquese el número de referencia)		
44. Leaf blade: curvature	Limbe: courbure	Blattspreite: Biegung	Limbo: curvado		
(b) straight	droit	gerade	recto	Q138	1
curved tips	sommets incurvés	gebogene Spitzen	ápices curvados	H56-752, Q115, Q124	2
arched	arqué	gebogen	arqueado		3
curved at base	incurvé à la base	an der Basis gebogen	curvado a la base		4
45. Leaf blade: width at the longitudinal mid-point (*) MS	Limbe: largeur à mi-longueur	Blattspreite: Breite in der Mitte der Länge	Limbo: anchura en el punto medio de la longitud		
(b) narrow	étroit	schmal	estrecho	Q113, Q186	3
medium	moyen	mittel	mediano	Q121, Q124	5
broad	large	breit	ancho	Q138, Q179	7

English	français	deutsch	español	Example Exemples Beispielssorten Variedades ejemplo	Varieties Note/ Nota
46. Leaf: midrib width (as for 46)	Feuille: largeur de la nervure principale (comme pour 46)	Blatt: Breite der Mittelrippe (wie für 46)	Hoja: anchura de la nervadura principal (como para 46)		
MS					
(b) very narrow	très étroite	sehr schmal	muy estrecha		1
narrow	étroite	schmal	estrecha	Q121	3
medium	moyenne	mittel	mediana	Q124, Q170	5
wide	large	breit	ancha		7
very wide	très large	sehr breit	muy ancha	Q138	9
47. Leaf: ratio leaf blade width/midrib width	Feuille: rapport épaisseur du limbe/épaisseur de la nervure principale	Blatt: Verhältnis der Breite der Blattspreite/Breite der Mittelrippe	Hoja: relación entre la anchura del limbo y la anchura de la nervadura principal		
(b) low	faible	niedrig	baja		3
medium	moyen	mittel	media	Q124, H56-752	5
high	important	hoch	alta		7
48. Leaf blade: length	Limbe: longueur	Blattspreite: Länge	Limbo: longitud		
(+) MS					
(b) short	court	kurz	corta	Q124	3
medium	moyen	mittel	mediana	Q136	5
long	long	lang	larga	Q170	7
49. Leaf blade: pubescence on (+) margin	Limbe: pilosité sur le bord	Blattspreite: Behaarung am Rand	Limbo: pubescencia en el borde		
(b) absent or very sparse	absente ou très faible	fehlend oder sehr locker	ausente o muy rala	Q121, Q170, Q117	1
sparse	faible	locker	rala	H56-752	3
medium	moyenne	mittel	media	Q152	5
dense	forte	dicht	densa	Q169	7

English	français	deutsch	español	Example Exemples Beispielssorten Variedades ejemplo	Varieties	Note/ Nota
50. Leaf blade: serration of margin (+)	Limbe: dentelure du bord	Blattspreite: Randzählung	Limbo: aserrado del borde			
(b) absent	absente	fehlend	ausente			1
present	présente	vorhanden	presente	Q121, Q170, H56-752		2
51. Cane top: length (c)	Sommet de la canne: longueur	Rohrspitze: Länge	Parte superior de la caña: longitud			
short	courte	kurz	corta			3
medium	moyenne	mittel	mediana			5
long	longue	lang	larga			7
52. Cane top: shape of cross-section (c)	Sommet de la canne: forme de la section transversale	Rohrspitze: Form des Querschnitts	Parta superior de la caña: forma de la sección transversal			
circular	circulaire	rund	circular			1
ovate	ovoïde	eiförmig	ovada			2
53. Cane top: color (c)	Sommet de la canne: couleur	Rohrspitze: Farbe	Parte superior de la caña: color			
RHS Color chart (indicate reference number)	code RHS des couleurs (indiquer le numéro de référence)	RHS-Farbkarte (Nummer angeben)	Carta de colores RHS (indíquese el número de referencia)			
54. Cane top: waxiness (c)	Sommet de la canne: pruine	Rohrspitze: Wachsschicht	Parte superior de la caña: cerosidad			
absent or very weak	absente ou très faible	fehlend oder sehr gering	ausente o muy débil			1
weak	faible	gering	débil			3
medium	moyenne	mittel	media			5
strong	forte	stark	fuerte			7

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) Observation on the node and internode to be made on the largest internode of a representative culm.
- (b) Observation on the leaf blade and leaf sheath to be made on the top visible dewlap (TVD) leaf.
- (c) The cane top is the region between the youngest exposed visible dewlap and the insertion of the fourth youngest fully extended leaf (leaf + 4) in the culm.

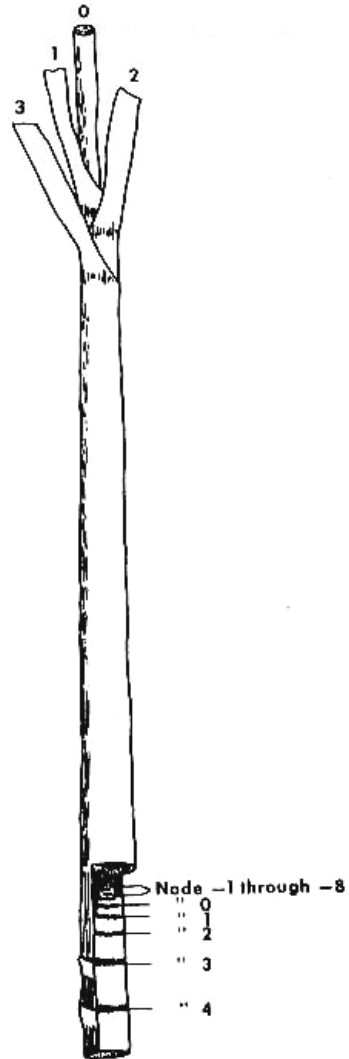
8.2 *Explanations for individual characteristics*

Ad. 2: Plant: adherence of leaf sheath

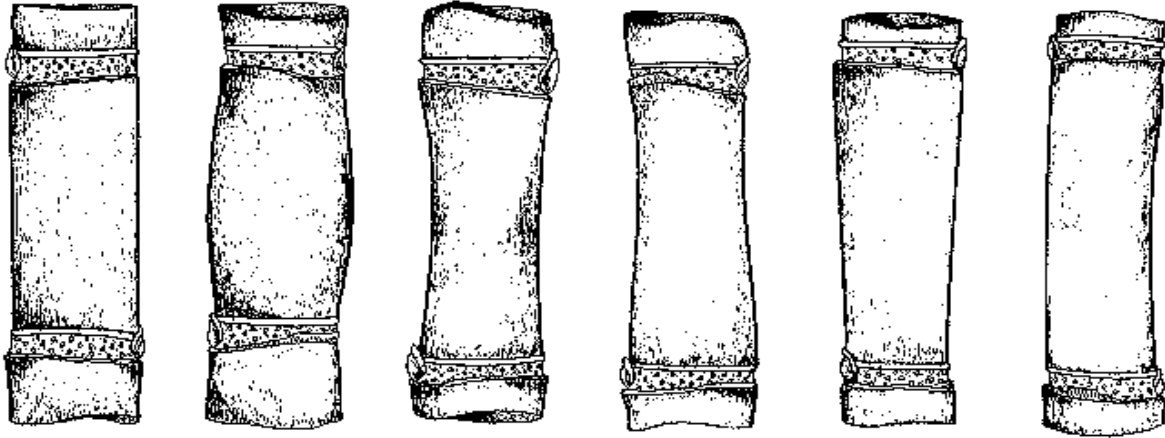
To be observed on the lower half of the stool on the senescing leaves.

Ad. 7: Culm: height (from the base to the TVD leaf)

Based on quantitative measurements of 24 culms.
TVD = top visible dewlap = 1



Ad. 10: Internode shape



1 cylindrical 2 tumescent 3 bobbin-shaped 4 conoidal 5 obconoidal 6 concave-convex

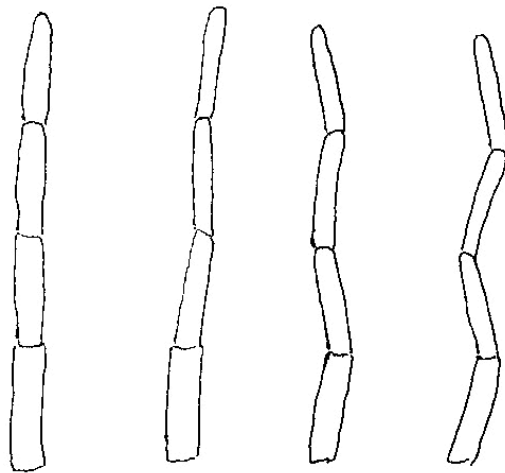
Ad. 12: Internode: color where exposed to sun

After three days of exposure to the sun on a culm on which the wax has been removed.

Ad. 13: Internode: color where not exposed to sun

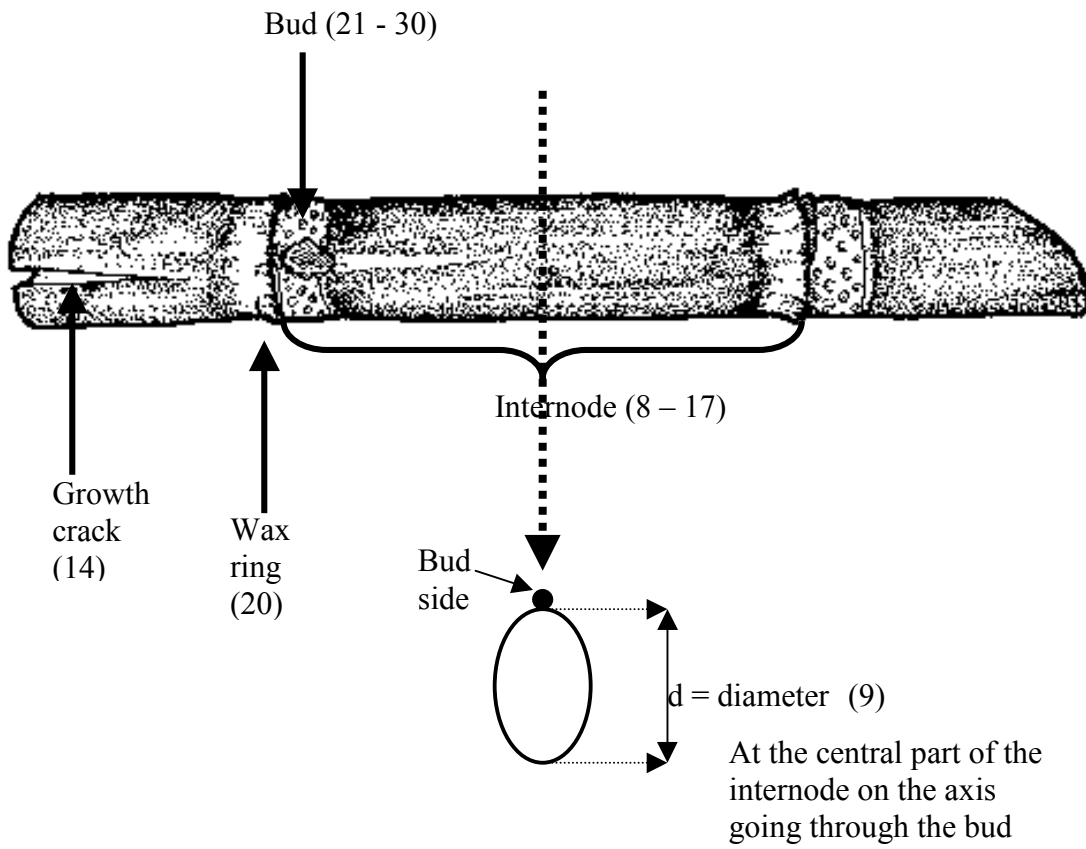
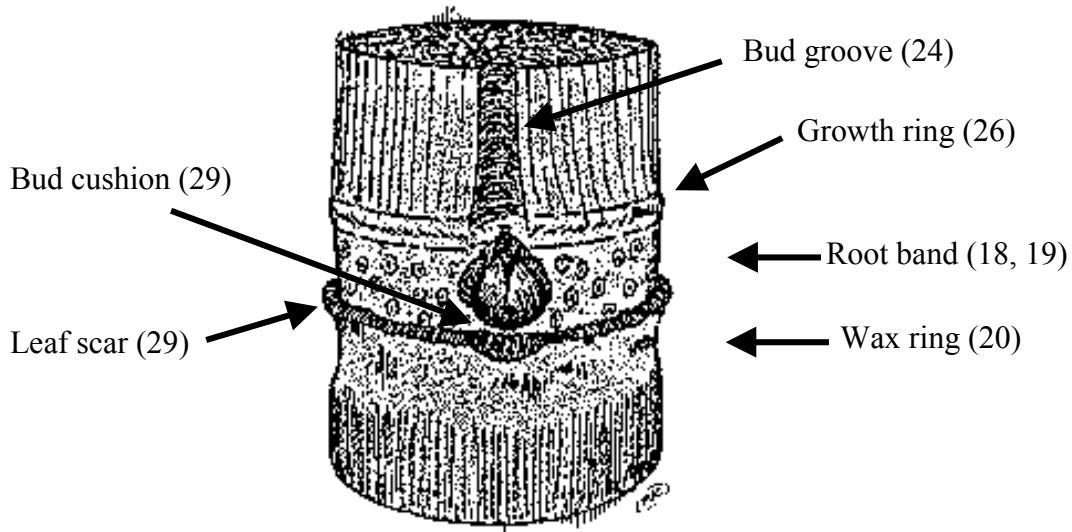
On a culm protected from the sun, on which the wax has been removed.

Ad. 15: Internode: expression of zigzag alignment

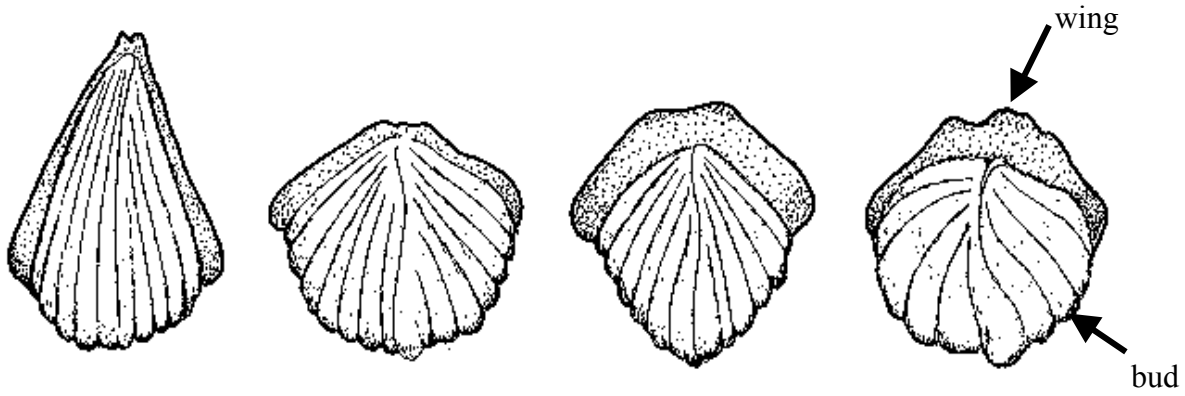


1 absent or very weak 3 weak 5 moderate 7 strong

Ad. 8 to 17: Internode and 18 to 30: Node



Ad. 21: Node: shape of bud, excluding wings

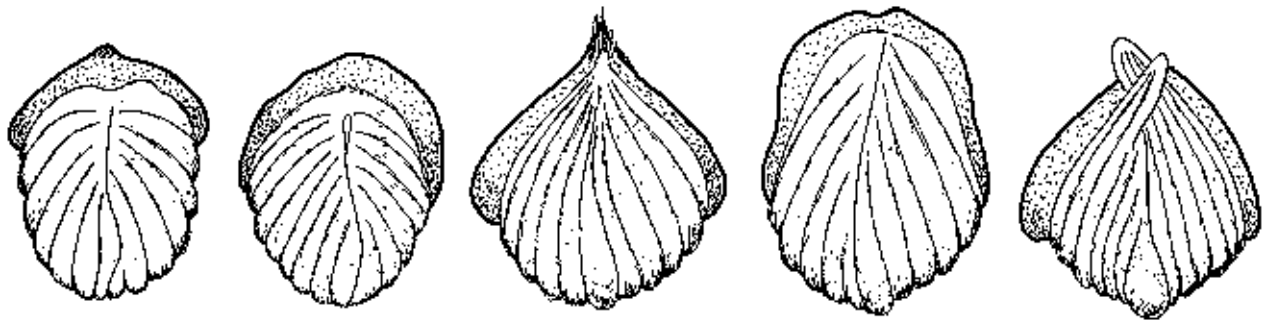


1
triangular pointed

2
oval

3
obovate

4
pentagonal



5
rhomboid

6
round

7
ovate

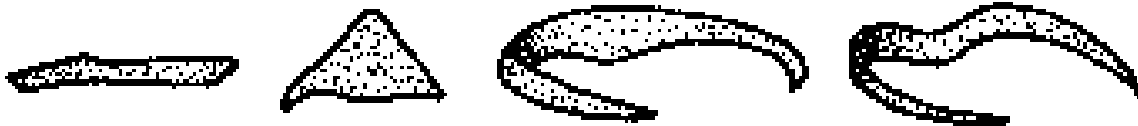
8
rectangular

9
beaked

Ad. 31: Leaf sheath: length

The leaf sheath is measured from the sheath base (point of attachment to the culm) to the dewlap (the junction between the leaf blade and the leaf sheath).

Ad. 35 and 36: Leaf sheath: shape of ligule (35) and ligule width (36)

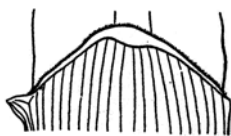


1
strap-shaped

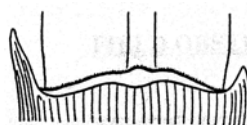
2
deltoid

3
crescent-shaped

4
bow-shaped



5
asymmetrical,
steeply sloping



6
asymmetrical,
horizontal

States strap-shaped (1) and deltoid (2) do not curl round the sheath.

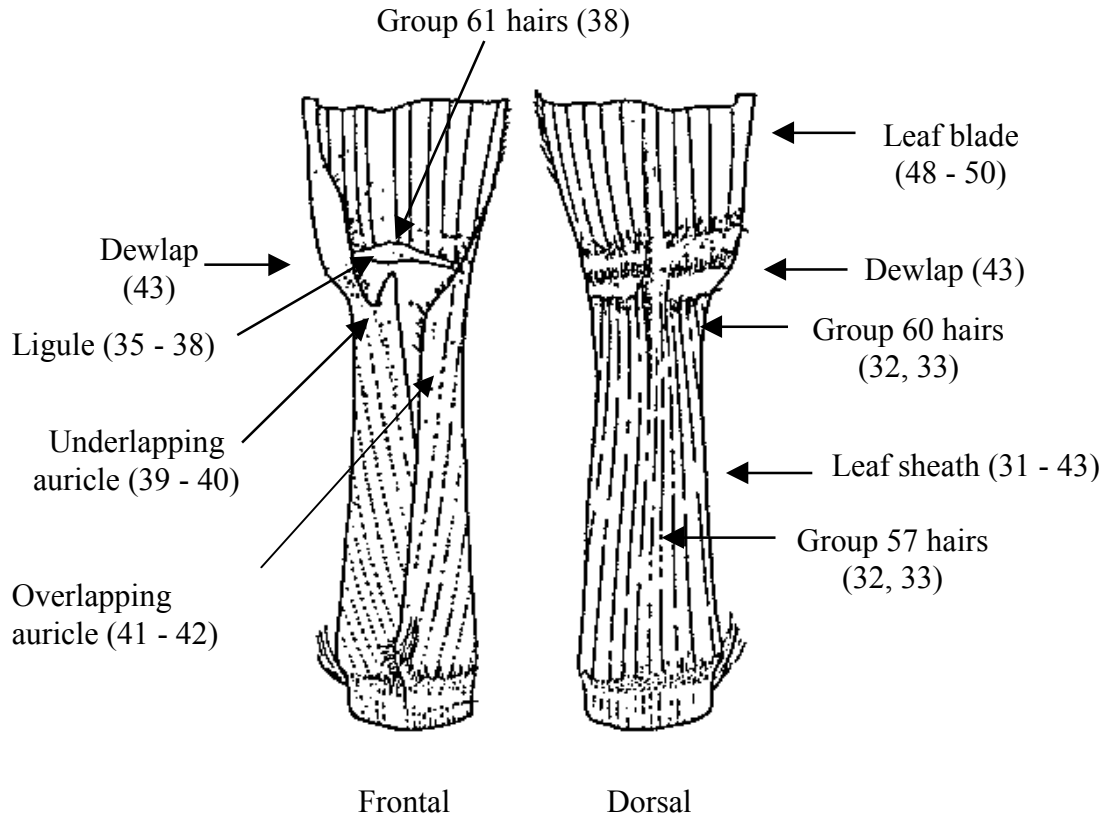
Ligule width is the distance from the point of attachment at the junction of the leaf blade and leaf sheath at the widest point (middle of ligule).

narrow < 3 mm

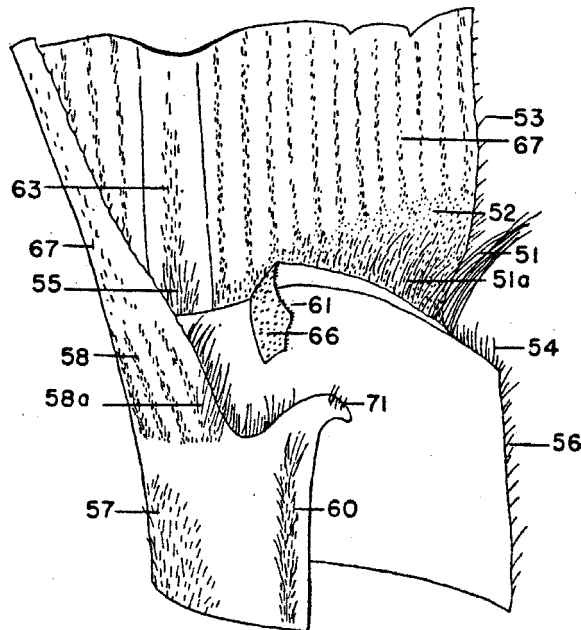
medium 3 – 5 mm

wide > 5 mm

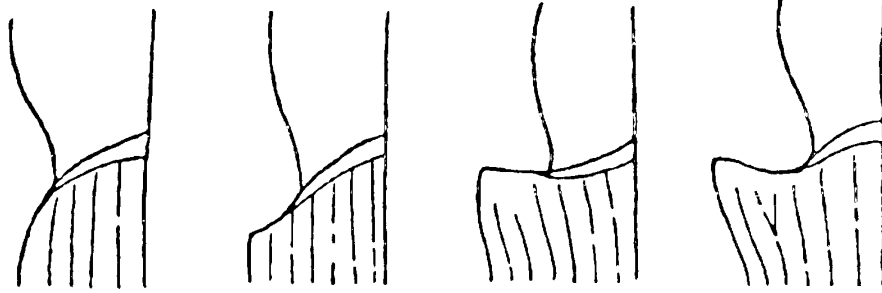
Ad. 31 to 43: Leaf sheath and 48 to 50: Leaf blade



Ad. 32 and 33: Leaf sheath: number of hairs (32) (groups 57 and 60) and length of hairs (33) (groups 57 and 60)



Ad. 39 and 41: Leaf sheath: shape of auricle

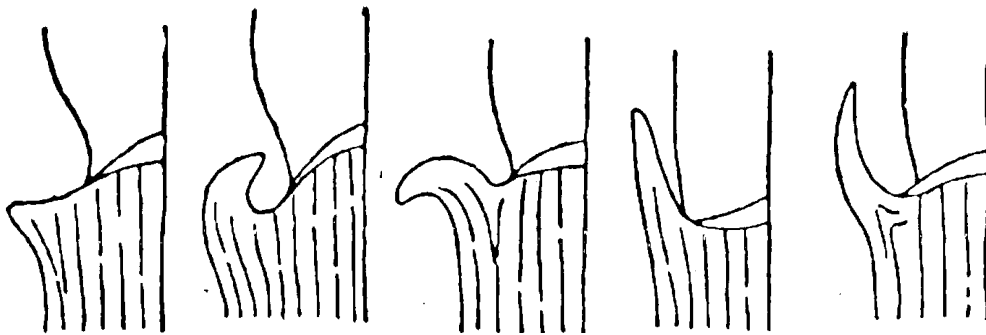


1
transitional

1
transitional

1
transitional

2
deltoid



3
dentoid

4
unciform

5
calcariform

6
lanceolate

7
falcate

9. Literature

Artschwager, E., 1940: Journal of Agricultural Research, v. 60, n. 8, pp. 503-508.

Gallacher, D.J., 1994: Development of a minimum descriptor set for individuals of *Saccharum* spp. Hybrid germplasm. Thesis submitted for Ph.D., Department of Botany and Tropical Agriculture, James Cook University of North Queensland, AU.

Gallacher, D.J. and Berding, N. 1997: Purpose selection and application of descriptors for sugarcane germplasm. *Aust. J. Agric. Res* 48: 759-67.

Gallacher, D.J., 1997: Evaluation of sugarcane morphological descriptors using variance components analysis. *Aust. J. Agric. Res* 48: 769-73.

Gallacher, D.J., 1997: Optimised descriptors recommended for Australian sugarcane germplasm (*Saccharum* spp. hybrid) *Aust. J. Agric. Res* 48: 775-79.

10. Technical Questionnaire

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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	Application date: (not to be filled in by the applicant)
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TECHNICAL QUESTIONNAIRE
to be completed in connection with an application for plant breeders' rights

1. Subject of the Technical Questionnaire

1.1 Botanical name

1.2 Common name

2. Applicant

Name

Address

Telephone No.

Fax No.

E-mail address

Breeder (if different from applicant)

3. Proposed denomination and breeder's reference

Proposed denomination
(if available)

Breeder's reference

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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#4. Information on the breeding scheme and propagation of the variety

4.1 Breeding scheme

Variety resulting from:

4.1.1 Crossing

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

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

(c) unknown cross []

4.1.2 Mutation []
(please state parent variety)

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

4.1.4 Other []
(please provide details)

4.2 Method of propagating the variety

4.2.1 Vegetative propagation []

4.2.2 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:
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5. Characteristics of the variety to be indicated (the number in brackets refers to the corresponding characteristic in Test Guidelines; please mark the note which best corresponds).

Characteristics	Example Varieties	Note
5.1 Plant: adherence of leaf sheath (2)		
weak	H56-752, Q96	3 []
medium	Q124, Q186	5 []
strong	Q120, NC ₀ 310, Q201	7 []
5.2 Internode: shape (10)		
cylindrical	Q169, RB72-454	1 []
tumescient		2 []
bobbin-shaped	H56-752	3 []
conoidal		4 []
obconoidal	H60-3802	5 []
concave-convex	Q115	6 []
5.3 Internode: color where <u>exposed</u> to sun (12)		
RHS Color chart (indicate reference number)		
.....		
5.4 Internode: color where <u>not exposed</u> to sun (13)		
RHS Color chart (indicate reference number)		
.....		

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:	
Characteristics	Example Varieties	Note	
5.5 Internode: expression of zigzag alignment (15)			
absent or very weak	Q124	1 []	
weak	Q135, Q152	3 []	
moderate	Q117	5 []	
strong	H56-752	7 []	
5.6 Node: shape of bud, excluding wings (21)			
triangular-pointed	RB72-454	1 []	
oval	Q138	2 []	
obovate		3 []	
pentagonal		4 []	
rhomboid		5 []	
round	Q179, Q124	6 []	
ovate	Q170, Q115, Q186	7 []	
rectangular		8 []	
beaked		9 []	
5.7 Leaf sheath: color of dewlap (43)			
RHS Color chart (indicate reference number)		
5.8 Leaf blade: width at the longitudinal mid-point (45)			
narrow	Q113, Q186	3 []	
medium	Q121, Q124	5 []	
broad	Q138, Q179	7 []	

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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6. Similar varieties and differences from these varieties

Please use the table, and space provided for comments, below to provide information on how your candidate variety differs from the variety (or varieties) which, to the best of your knowledge, is (or are) most similar. This information may help the examination authority to conduct its examination of distinctness in a more efficient way.

Denomination(s) of variety(ies) similar to your candidate variety	Characteristic(s) in which your candidate variety differs from the similar variety(ies)	Describe the expression of the characteristic(s) for the similar variety(ies)	Describe the expression of the characteristic(s) for your candidate variety
<i>Example</i>	<i>Internode: shape</i>	<i>cylindrical</i>	<i>tumescant</i>

Comments:

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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#7. Additional information which may help in the examination of the variety

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

Yes [] No []

(If yes, please provide details)

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

Yes [] No []

(If yes, please provide details)

7.3 Other information

8. Authorization for release

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

Yes [] No []

(b) Has such authorization been obtained?

Yes [] No []

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

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

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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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 or pesticide) | Yes [] | No [] |
| (c) Tissue culture | Yes [] | No [] |
| (d) Other factors | Yes [] | No [] |

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

.....

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

Applicant's name

Signature

Date

[End of document]