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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

DRAFT

BANANA

UPOV Codes: MUSAA_ACU; MUSAA_PAR

Musa acuminata Colla; *Musa* x*paradisiaca* L.

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by experts from Brazil and France

to be considered by the
Technical Working Party for Fruit Crops
at its thirty-ninth session, to be held in Lisbon, Portugal, from June 2 to 6, 2008

Alternative Names:*

Latin	*English*	*French*	*German*	*Spanish*
Musa acuminata Colla, *Musa cavendishii* Lamb.	Banana, Cavendish banana, Chinese banana, Dwarf banana	Bananier, Bananier nain	Banane, Zwergbanane	Bananera, Banano, Platanera, Plátano
Musa x*paradisiaca* L., *M. acuminata* Colla × *M. balbisiana* Colla	Plantain, Pomme banana, Silk banana, Banana sucrier			

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

1.1 These Test Guidelines apply to all varieties of *Musa acuminata* Colla and *Musa* ×*paradisiaca* L. (*M. acuminata* Colla x *M. balbisiana* Colla) of the family *Musaceae*.

1.2 It is noted that cultivated bananas have been derived from wild species *Musa acuminata* (A) and *Musa balbisiana* (B) either alone or in combinations. The cultivated bananas are classified into botanical groups according to their genome combination. The main groups found in the edible bananas, natural varieties or hybrids, are AA, AB, AAA, AAB, ABB, AAAA, AAAB and AABB.

1.3 Each application should include a declaration of botanical group according to the genetic combination that could be checked if necessary.

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 corm (whole), rhizome or *in vitro* plant.

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

20 corms, rhizomes or *in vitro* plants.

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

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

3. Method of Examination

3.1 Number of Growing Cycles

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

3.2 Testing Place

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

3.3 Conditions for Conducting the Examination

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

3.3.2 In particular, it is essential that the plants produce a satisfactory crop of fruit in each of the two growing cycles. In particular, observations should not be made on the first crop of fruit.

3.4 Test Design

3.4.1 Each test should be designed to result in a total of at least 15 plants.

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

3.5 Number of Plants / Parts of Plants to be Examined

Unless otherwise indicated, all observations should be made on 15 plants or parts taken from each of 15 plants.

3.6 Additional Tests

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

4. Assessment of Distinctness, Uniformity and Stability

4.1 Distinctness

4.1.1 General Recommendations

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

4.1.2 Consistent Differences

The 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, a population standard of 1% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 15 plants, 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 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 review)

It is recommended that the competent authorities divide the varieties on the AAA group of *Musa acuminata* into subgroups and types which can be identified by the following characteristics:

1) Gros Michel

(a) Bunch: length (characteristic 27)
(b) Bunch: diameter (characteristic 28)
(c) Fruit: shape of apex (characteristic 44) bottle-necked ver com janay
(d) Fruit: color of skin (before maturity) (characteristic 46) dark yellow

2) Cavendish

(a) Bunch: length (characteristic 27)
(b) Bunch: diameter (characteristic 28)
(c) Fruit: shape of apex (characteristic 44) blunt ???? ver com janay
(d) Fruit: color of skin (before maturity) (characteristic 46) greenish yellow
(e) Pseudostem: length (characteristic 3) short e no Gros Michel?????

3) Red and Green Red

(a) Bunch: length (characteristic 27)
(b) Bunch: diameter (characteristic 28)
(c) Fruit: shape of apex (characteristic 44) blunt ???? ver com janay
(d) Fruit: color of skin (before maturity) (characteristic 46??) yellow-green to yellow
(e) Pseudostem: length (characteristic 3) short e no Gros Michel???and Red???

4) Ibota – Yamgambi km5

(a) Bunch: length (characteristic 27)
(b) Bunch: diameter (characteristic 28)
(c) Fruit: shape of apex (characteristic 44) blunt ???? ver com janay
(d) Fruit: color of skin (characteristic 46 before maturity??) yellow-green to yellow
(e) Pseudostem: length (characteristic 3) long
(f) Plant: growth habit (characteristic 13) upright

Also, it is recommended that the competent authorities divide the triploid varieties of the AAB group (*Musa acuminata* x *M. Balbisiana*) into subgroups and types which can be identified by the following characteristics:

5) Prata or Pomme

(a) Fruit: longitudinal ridges (characteristic 40) weakly expressed
(b) Fruit: length (characteristic 41) medium
(c) Fruit: shape of apex (characteristic 44) pointed
(d) Fruit: thickness of skin (characteristic 45) medium
(e) Pseudostem: length (characteristic 3)
(f) Pseudostem: diameter (characteristic 4)
(g) Male inflorescence ???????

6) Plantain Horn or Terra

(a) Fruit: longitudinal ridges (characteristic 40) weakly expressed
(b) Fruit: length (characteristic 41) long
(c) Fruit: shape of apex (characteristic 44) pointed
(d) Fruit: thickness of skin (characteristic 45) thick
(e) Fruit: color of flesh (characteristic 50) orange
(f) Fruit: firmness of flesh (characteristic 51) firm

7) Silk

(a)	Fruit: longitudinal ridges (characteristic 40)	absent
(b)	Fruit: length (characteristic 41)	short
(c)	Fruit: shape of apex (characteristic 44)	pointed ??????
(d)	Fruit: thickness of skin (characteristic 45)	thin
(e)	Fruit: color of flesh (characteristic 50)	white
(f)	Fruit: firmness of flesh (characteristic 51)	dull white

8) Pacovan

(a)	Fruit: longitudinal ridges (characteristic 40)	strongly expressed
(b)	Fruit: length (characteristic 41)	long ????
(c)	Fruit: shape of apex (characteristic 44)	pointed ?????
(d)	Fruit: thickness of skin (characteristic 45)	thick
(e)	Fruit: color of flesh (characteristic 50)	dull white
(f)	Fruit: firmness of flesh (characteristic 51)	moderately soft

Also, it is recommended that the competent authorities divide the triploid varieties of the ABB group (*Musa acuminata* x *M. Balbisiana*) into subgroups and types which can be identified by the following characteristics:

9) Sub-grup Bluggoe or Figo (isn't the same of Figue)
Caract 23

(b)	Fruit: length (characteristic 41)	long

3 quinas
Pseudstem: spots (characteristic 8) absent

For tetraploid varieties grouping into triploids parents??????

SYNONYM AND SUBGROUPS (Example Varieties)

International	Americ	Brazil	Group
Bluggoe	Figo cinza, Ice cream	Figo	ABB
Dwarf Cavendish	Pigmeo, Enano, Petite Naine, Govenor	Nanica, Caturra	AAA
Figo Anão		Figo Anão	
Figue Pomme			AAB
Figue Pomme Nain			AAB
Figue Rose		São Domingos, Pacuvi	AAA
Figue Rose Nain			AAA
French Plantain	Maqueño	Terra, Terra Maranhão	AAB
French Plantain			
Gia Hui		Prata Zulu	ABB
Golden Beauty			AAAA
Grand Nain	Grand Nain, Pineo gigante	Grande Naine	AAA

Gros Michel	Platano roatan, Seda, Banano, Habano, Guineo patriota	Gros Michel	AAA
Horn Plantain		D'Angola	AAB
IDN 110			AA e AAAA
Morato	Claret, Green, Tafetan Morado, Morado, Kulli, Injerto	Caru roxa, Vinagre, Ferro, Banana Roxa, Prata roxa	AAA
Morato verde, Dacca	Tafetan verde, Plátano macho, Plátano harton, Harton, Harton velhaco, Morado verde	Caru Verde, Banana verde; Cobre	AAA
Mysore		Mysore	AAB
Nanicão		Nanicão ???	AAA
Nzumoheli			AAA
Ouro da Mata		Ouro da Mata, Prata Maçã	AAAB
Pacovan			AAB
Pioneira		Pioneira	AAAB
Pisang Mas	Bocadillo, Pera	Sucrier, Ouro	AA
Platina		Platina	AAAB
Poyo		Prata, Robusta	AAB
Prata anã		Prata Anã, Enxerto	AAB
Prata comum		Prata comum	AAB
Prata Ponta Aparada		Prata Ponta Aparada	AAB
Prata, Canary banana	Commom banana, Banano de mesa	Prata	AAB
Preciosa		Preciosa	AAAB
Rajahpuri	Rajah, Pisang Raja, King banana		AAB
Salta-do-cacho		Salta-do-cacho	AAA
São Tomé		São Tomé	AAA
Silk	Manzana, Apple Banana, Figue Pomme	Maçã, Branca	AAB
Thap Maeo		Thap Maeo	AAB
Valery	Giant Cavendish	Congo, Anã do Alto	AAA
Willians	Giant Cavendish		AAA
Yangambi km 5		Caipira	AAA

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

(a)–(d) See Explanations on the Table of Characteristics in Chapter 8.1
(+) See Explanations on the Table of Characteristics in Chapter 8.2

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

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
1.		**Ploidy**	*to use standard explanation*				
(+)							
QL		diploid				Pisong Mas, Sucrier (AA)	2
		triploid				Grande Nine, Prata, Silk	3
		tetraploid				Golden Beauty (AAAA), Ouro-da-Mata (AAAB)	4
2.	**VG**	**Rhizome: number of suckers above ground**					
(+)							
QN		few				Sucrier (Ouro)	3
		medium				Nanicão	5
		many				Prata Anã	7
3.	**VG/ MS**	**Pseudostem: length**					
(*)							
(+)							
QN		very short				Fig Pomme Naine, Rajapuri, Salta-do-Cacho	1
		short				Dwarf Cavendish, Nanica	3
		medium				Nanicão, Poyo Grand nain, Valery	5
		long				Locatan, Prata comum	7
		very long				Pacovan	9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
4. **(*)** **(+)**	**Pseudostem: diameter**					
QN	small				Ouro (Bocadillo), Yangambi Km 5 (Caipira)	3
	medium				Nanicão, Valery, Willians	5
	large				Prata Anã	7
5. **(+)**	**Pseudostem: overlapping of leaf sheaths**		*BR to delete. It"s important to see charact. 13: Petiole: attitude of wings at base*			
	weak					3
	medium					5
	strong					7
6. **(+)**	**Pseudostem: tapering along length**					
PQ	absent or weak				Grand Nain	1
	medium				Nanicão	2
	strong				Mysore	3
7.	**Pseudostem: color**					
PQ	greenish yellow				Prata Anã	2
	light green					3
	medium green				D'Angola	4
	dark green					5
	reddish green				Pacovan	6
	red					7
	purple				Gran Nain	8

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
8. (*)		**Pseudostem: spots**					
QL		absent				Bluggoe, Figo	1
		present				Caipira, Figue Pomme Nain, Peti Nain	9
9.		**Pseudostem: color of spots**					
PQ		red				Gran Nain, Thap Maeo	2
		medium purple				Caipira	3
		dark purple				Preciosa	4
10. (+)		**Pseudostem: size of spots**					
		small				Gross Michel	3
		medium					5
		large				Yangambi km 5	7
11.		**Pseudostem: color of the inner side of sheath base**					
PQ		yellowish green				Sucrier (Ouro)	1
		green				D'Angola, Prata Anã	2
		red				Figue Rose Naine	3
		purple				Gran Nain	4
12. (+)		**Plant: compactness of crown**					
QN	**(a)**	loose				Gran Nain	3
		medium				Prata Anã	5
		compact				Figo Anão (Bluggoe)	7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
13. (*) (+)		**Plant: growth habit**	*BR: ATTITUD OF LEAVES*				
PQ	**(a)**	upright				Branca, Nzumoheli	1
		spreading				Nanicão	2
		drooping				Silk (Maçã)	3
14. (+)		**Petiole: attitude of wings at base**	*BR: to delete 5 and replace:*				
		curved outwards	weak 3			Pacovan	3
		straight	medium 5			Prata anã	5
		slightly curved inwards	strong 7			Dwarf Cavendish	7
		moderately curved inwards					
		overlapping					
15.		**Petiole: length**					
(+)							
QN	**(a)**	short				Nanica	3
		medium				Nanicão	5
		long				Silk (Maçã)	7
16.		**Leaf blade: color of midrib on lower side**	*ok for ornamentals in Brasil*				
PQ	**(a)**	yellow	*to be checked colors by CIRAD*				
		green				Prata Anã	1
		pink				Yangambi Km 5 (Caipira)	2
		purple				Thap Maeo	3
		black purple	*to be checked*				

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
17. (*) (+)		**Leaf blade: shape of base**					
PQ	**(a)**	both sides rounded				Figo Anão (Bluggoe)	1
		one side rounded and one side acute				Silk (Maçã)	2
		both sides acute				Gran Nain	3
18.		**Leaf blade: waxiness on lower side**					
QN	**(a)**	weak					3
		medium					5
		strong					7
19.		**Leaf blade: length**					
QN	**(a)**	short				Nanica	3
		medium				Nanicão	5
		long				Branca, Pacovan	7
20.		**Leaf blade: width**					
QN	**(a)**	narrow					3
		medium					5
		broad					7
21.		**Leaf blade: ratio length/width**					
QN	**(a)**	small					3
		medium					5
		large					7
22.		**Leaf blade: glossiness of upper side**					
QL	**(a)**	absent	*to check whether truly qualitative*		*BR: it's qualitative*	Gran Nain, Prata	1
		present				Bluggoe	9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
23.		**Peduncle: length**					
(+)							
QN	**(b)**	short				Nanica, Sucrier (Ouro)	3
		medium				Gran Nain, Pacovan	5
		long				São Domingos, Silk (Maçã),	7
24.		**Peduncle: diameter**					
(+)							
QN	**(b)**	small				Sucrier (Ouro)	3
		medium				Pacovan, Prata	5
		large				Grand Nine (international literature)	7
25.		**Peduncle: pubescence**	*to delete illustration*				
(+)							
QL	**(b)**	absent				Prata Anã	1
		present				Nanicão	9
26.		**Peduncle: curvature**					
(+)							
QN	**(b)**	absent or weak					1
		weak				Gran Nain	3
		medium				Figue Pomme	5
		strong				Yangambi Km 5 (Caipira)	7
27. **(*)** **(+)**		**Bunch: length**					
PQ	**(b)**	short				Sucrier (Ouro)	3
		medium				Pacovan	5
		long				Gran Nain	7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
28. (*) **(+)**		**Bunch: diameter**					
		narrow				Ouro	3
		medium				Nanicão	5
		broad				Gran Nain, D'Angola	7
29. **(+)**		**Bunch: shape**	*Janay rever fotos ou desenho*				
QN	**(b)**	cylindrical				Gran Nain, Gros Michel, Terra	1
		cylindrical to conical					2
		conical				Cavendish, Dwarf, Prata Anã	3
30. **(+)**		**Bunch: attitude of fruits**					
	(b)	all turned up				Terra	1
		turned up to horizontal				Nanicão	2
		horizontal				Pacovan, São Tomé	3
31.		**Bunch: compactness**					
QN	**(b)**	loose				Bluggoe	3
		medium				Nanicão	5
		compact				Thap Maeo	7
32. **(*)**		**Bunch: number of hands**					
QN	**(b)**	few			*example varieties to be checked*	D'Angola	3
		medium				Prata comum	5
		many				Gran Nain, Thap Maeo	7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
33. (*)		**Bunch: number of fruits per hand**					
QN	**(b)**	few			*example varieties to be checked*	D'Angola	3
		medium				Prata comum	5
		many				Gran Nain, Thap Maeo	7
34. (*) (+)		**Rachis: attitude of male part**					
PQ		vertical					1
		inclined					2
		curved with vertical end				Branca, Gran Nain	3
		horizontal with inclined end				Prata	4
35.		**Rachis prominence of scars**					
QN	**(c)**	weak				Gia Hui, Sucrier	3
		moderate				Nanica	5
		strong				Ouro-da-Mata	7
36.		**Rachis: persistence of the bracts**					
	(c)	absent or very weak				Gran Nain, Silk (Maçã)	1
		moderately persistent				Prata	2
		strongly persistent				Prata Anã	3
37.		**Rachis: persistence of hermaphrodite flowers**					
QL	**(c)**	absent				Nanicão, Silk (Maçã)	1
		present				Terra	2

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
38. **(+)**		**Fruit: longitudinal curvature**					
QN	**(c)**	weak				Bluggoe, Pacovan	3
		medium				Nanicão	5
		strong				Nanica	7
39. **(+)**		**Fruit: position compared to rachis or in relation to rachis**	*It's important for Brazil*		angulo entre fruto e rachis		
QN	**(c)**	parallel				Grand Nine, Nanicão	1
		intermediate				Prata anã	3
		perpendicular				Pacovan	5
40. **(*)** **(+)**		**Fruit: longitudinal ridges**					
	(c)	absent				Silk (Maçã), Sucrier (Ouro), Yangambi Km 5 (Caipira)	
		weakly expressed				Terra, Prata	
		strongly expressed				Bluggoe, Pacovan, Terra	
41. **(*)** **(+)**		**Fruit: length**					
QN	**(d)**	short				Figue Pomme, Silk, Sucrier	3
		medium				Nanicão	5
		long				Terra	7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
42. (*) (+)		**Fruit: width (excluding sharp edges)**					
QN	**(d)**	narrow				Sucrier (Ouro)	3
		medium				Gran Nain	5
		broad				Bluggoe, D'Angola	7
43.		**Fruit: length of pedicel**					
QN	**(d)**	short				Sucrier (Ouro), Yangambi Km 5 (Caipira)	3
		medium				Prata	5
		long				Figue Pomme, Terra	7
44. (*) (+)		**Fruit: shape of apex**		*BR: to delete truncate*			
PQ	**(d)**	rounded				Prata Ponta Aparada, Sucrier (Ouro)	3
		pointed				Terra	1
		bottle-necked				Prata	2
		truncate				Gran Nain	4
45.		**Fruit: thickness of skin (stage 6 for ripe fruit)**					
QN	**(d)**	thin				Silk, Sucrier	3
		medium				Nanica	5
		thick				Pacovan, Terra+	7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
46. (*)		**Fruit: color of skin (before maturity)**	*CIRAD CHECK COLORS*				
PQ	**(d)**	light yellow				Silk	1
		medium yellow				Prata comum	2
		dark yellow				Sucrier	3
		greenish yellow				Cavendish	4
		light green				São Tomé	5
		medium green					6
		dark green					7
		pink					8
		red				Caru Roxa	9
		purple					10
		brown					11
47. (*)		**Fruit: color of skin (stage 6 for ripe fruit)**	*CIRAD CHECK COLORS*				
PQ	**(d)**	green				São Tomé	1
		greenish yellow				Cavendish	2
		yellow					2
		light yellow				Silk (Maçã)	1
		medium yellow				Prata comum	4
		green yellow					4
		dark yellow				Sucrier (Ouro)	3
		orange					~~5~~
		red orange					6
		reddish				Caru Roxa	7
		brown					8
		black					9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
48.		**Fruit skin adherence (stage 6 for ripe fruit)**					
QN	**(d)**	weak				Silk (Maçã)	3
		medium				Nanicao	5
		strong				Sucrier (Ouro), Yangambi Km 5 (Caipira)	7
49.		**Fruit: persistence of floral organs**					
		absent				Figue rose	1
		present				IDN 110, Yangambi km 5	9
50. **(*)**		**Fruit: color of flesh (stage 6 for ripe fruit)**					
PQ	**(d)**	white				Silk (Maçã)	1
		off white				Pacovan, Prata	2
		cream				Caru Roxa e Caru Verde	3
		yellow				Nanicão	4
		orange				Terra	5
		pinkish cream				São Domingos	6
51. **(*)**		**Fruit: firmness of flesh (stage 6)**					
QN	**(c)**	soft				Gran Nain, Silk (Maçã)	1
		medium				Pacovan, Prata	3
		firm				Terra	5
52. **(+)**		**Male inflorescence: presence**	*BR better persistence*				
		absent					1
		present					9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
53. **(+)**	**Male inflorescence: shape (in cross section)**					
PQ	lanceolate					1
	ovate				Pacovan, Yangambi Km 5	2
	triangular					3
	rounded					4
54. **(+)**	**Male: inflorescence overlap of bracts**					
QN	absent or very weak				Prata Anã	1
	weak					3
	medium				Pacovan	5
	strong				Nanicão	7
	very strong					9
55.	**Bract: color of the inner side**					
	whitish					1
	yellow					2
	yellow green					3
	green					
	pink					
	orange red					
	red					
	purple					
56.	**Bract: yellow hue of the apex (upper side)**	*BR TO DELETE*				
	absent					1
	present					2

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
57.	**Male inflorescence: separate on of the bract**	*BR TO DELETE*				
	never separate				Plantain Frech	1
	separate one by one				Gros Michel	2
	several separate				Figue Rose	3
58. **(+)**	**Male inflorescence: shape of apex of bract** (*to be checked by France*)	*BR: 4 states of expression are enough*				
	acute				Gros Michel	1
	pointed					2
	slightly acute					3
	intermediate					4
	obtuse				Yangambi Km 5	5
	obtuse and split				Figue Pomme	6
59.	**Only obtuse apex bract varieties: Male inflorescence: shape of apex of bract** (*to be checked by France)*					
	absent					1
	present					9

8. Explanations on the Table of Characteristics

8.1 Explanations covering several characteristics

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

(a) Unless otherwise stated, all observations on the leaf should be made on the third leaf from the apex at the moment of inflorescence emerging of those fruit bunches which were originally marked for observation.

(b) All observations on the fruit bunch should be done at fruit maturity (harvest time) [on those bunches which were originally marked for flower observations]. (TG/123/3, 1989).

(c) All observations on inflorescence and flower should be made at the time of full flowering.

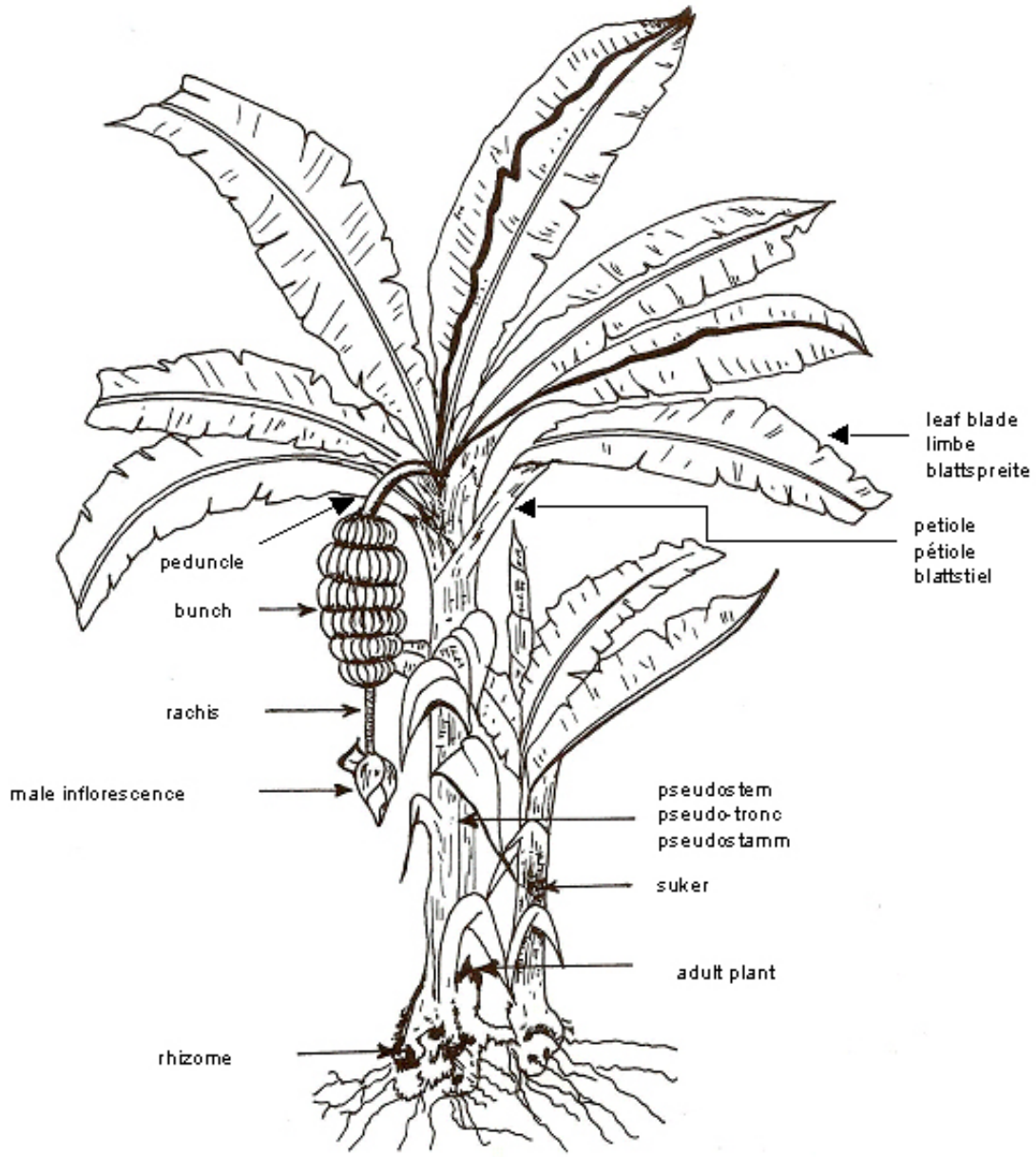
(d) All observations on the fruit should be made on the second hand (or third??), on a median standard fruit of the inner cluster.

8.2 Explanations for individual characteristics

Ad. 1: Ploidy

to use standard explanation

Ad. 2: Rhizome: number of suckers above ground
Ad. 3: Pseudostem: length
Ad. 4: Pseudostem: diameter



Ad. 2: Rhizome: number of suckers above ground

Assessed from the beginning of the suckers emission until harvest OR at the harvest time???
Assessed (France suggest delete: from the beginning of the suckers emission until harvest) at harvest with visible suckers
Assessed at harvest time and only visible suckers above ground
or should be assessed

Ad. 3: Pseudostem: length

The length of the pseudostem should be measured from the ground level to the crown of the peduncle, at the beginning of flowering.
or should be assessed

Ad. 4: Pseudostem: diameter

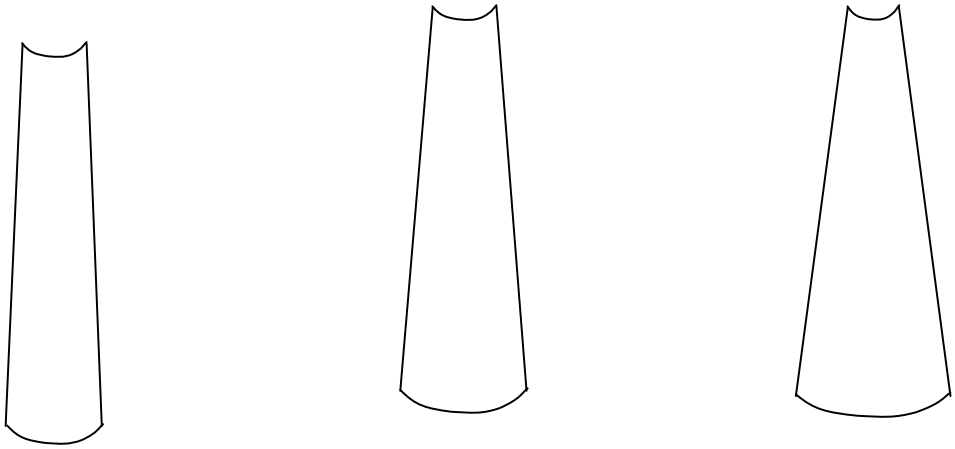
The diameter of the pseudostem should be observed at the height of one meter from ground level, at the beginning of flowering.
or should be assessed

France suggest:
The diameter of the pseudostem should be observed at the height of one meter from ground level at flowering time
or should be assessed

Ad. 5: Pseudostem: overlapping of leaf sheaths

[to be provided]

Ad. 6: Pseudostem: tapering along length



1	2	3
absent or weak	medium	strong

Ad. 10: Pseudostem: size of spots

3
small

5
medium

7
large

Ad. 12: Plant: compactness of crown

[to be provided]

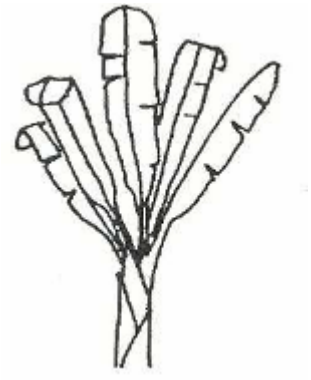
3
loose

5
medium

7
compact

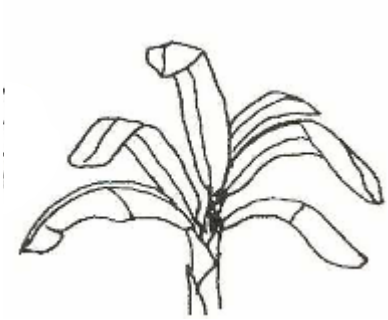
Ad. 13: Plant: growth habit

The growth habit should be observed at harvest time, at the moment of inflorescence emerging of those fruit bunches which were originally marked for observation.
or should be assessed



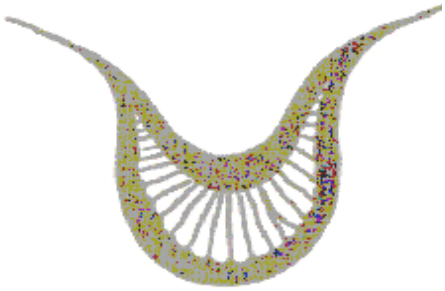
1
upright

2
spreading



3
drooping

Ad. 14: Petiole: attitude of wings at base



3
curved outwards
or:
weak

5
straight
or:
medium

7
slightly curved inwards
or:
strong

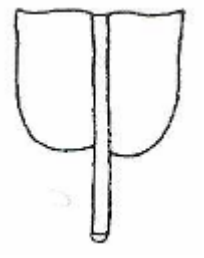
moderately curved inward

overlapping

Ad. 15: Petiole: length

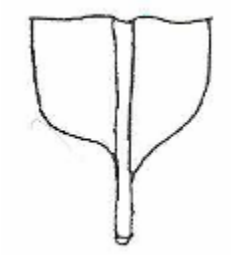
Measured from the pseudostem to the base of the leaf blade
or should be assessed

Ad. 17: Leaf blade: shape of base



1
both sides rounded

2
one side rounded and one side acute



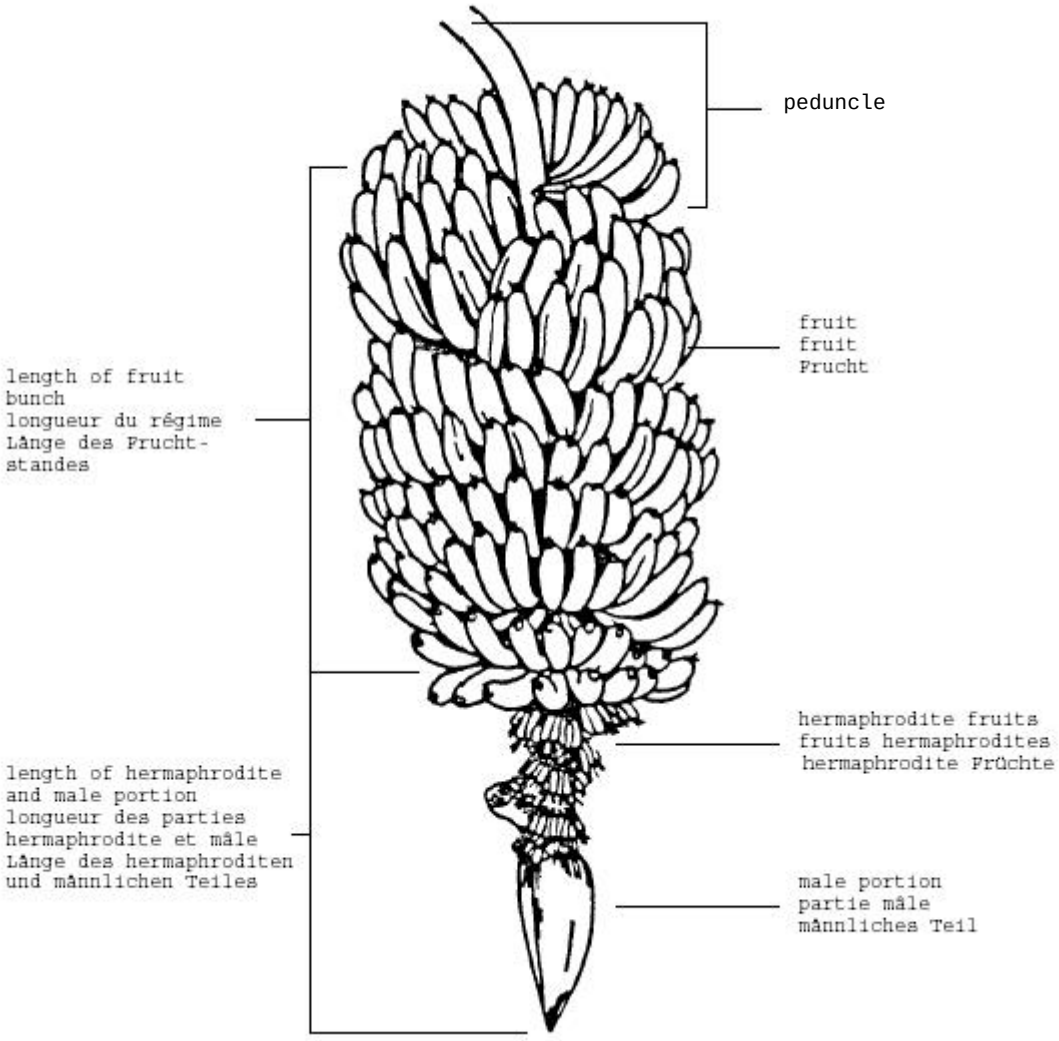
3
both sides acutes

Ad. 23: Peduncle: length

The length of the peduncle should be determined from the attachment point of the bunch to the first hand.
or should be assessed

Ad. 24: Peduncle: diameter

The diameter of the peduncle should be assessed in the middle point between the attachment point of the bunch and the first hand.

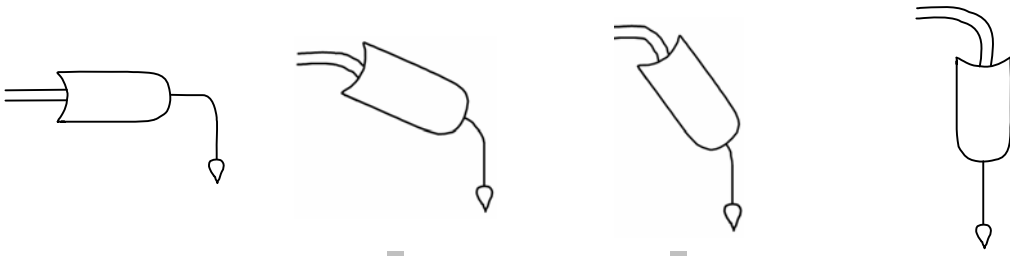


Ad. 25: Peduncle: pubescence (*for Brazil, to delete the illustration*)

1
absent

9
present

Ad. 26: Peduncle: curvature



1	3	5	7
absent or weak	weak	medium	strong

Ad. 27: Bunch: length

The length of the bunch should be measured from the attachment point of the first hand to the last hand.
or should be assessed

Ad. 28: Bunch: diameter

The diameter of the bunch should be measured at the middle the attachment of the first hand to the last hand. (*translation ??)*
or should be assessed

Ad. 29: Bunch: shape

[to be provided]

1	2	3
cylindrical	cylindrical to conical	conical

Ad. 30: Bunch: attitude of fruits

1

all turned up

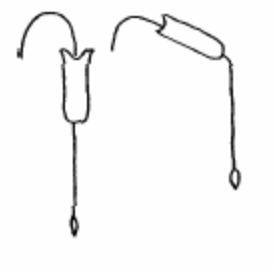
2

turned up to horizontal

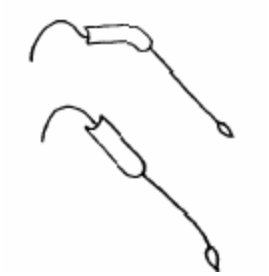
3

horizontal

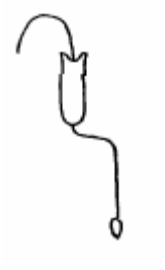
Ad. 34: Rachis: attitude of male part
Assessed just before harvest time.
or should be assessed



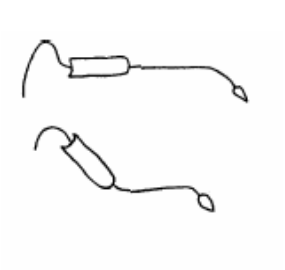
1
vertical



2
inclined



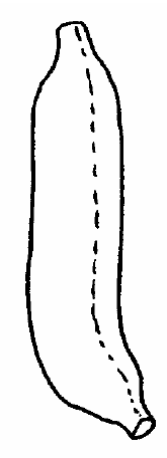
3
curved with vertical end



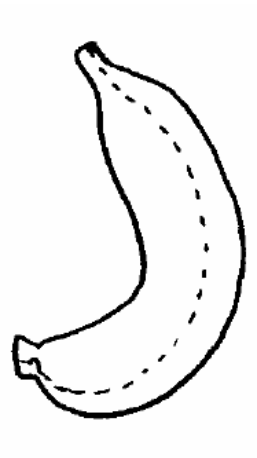
4
horizontal with inclined end

Ad. 38: Fruit: longitudinal curvature

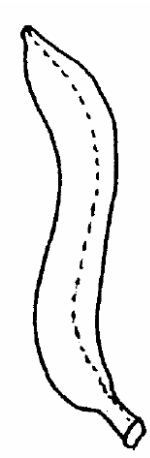
3
weak



5
weak



7
medium



5
strong

Ad. 39: Fruit: position compared to rachis or in relation to rachis

[TO BE PROVIDED]

Ad. 40: Fruit: longitudinal ridges
To observe at the middle external fruit of the third hand
or should be assessed

1
absent

3
weakly expressed

5
strongly expressed

Ad. 41: Fruit: length

The length of the fruit should be determined on the outer (convex) side from where the fruit widens at the stalk end to the apical point.
or should be assessed

Ad. 42: Fruit: width (excluding sharp edges)

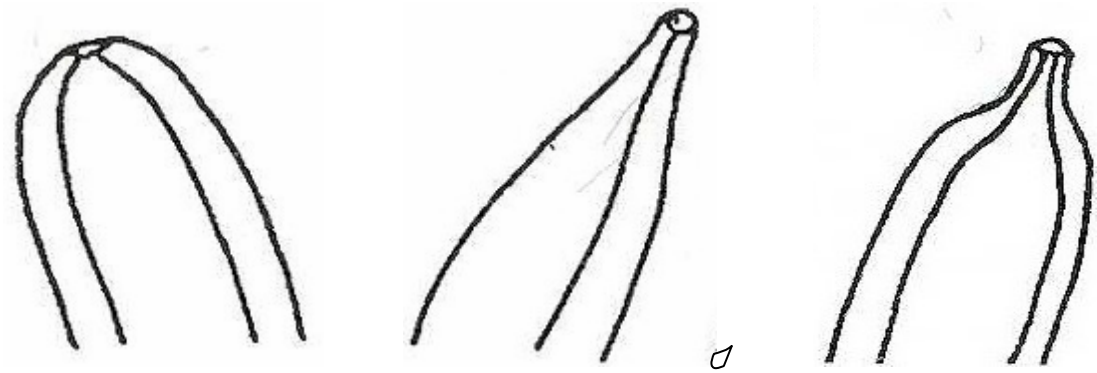
Characteristic 41 and 42 – to observe at harvest time E 41 e 42????

Ad. 44: Fruit: shape of apex.

To observe from narrowest to widest
or should be assessed

1 pointed | 2 lengthily pointed | 3 blunt-tipped | 4 bottle-necked | 5 rounded

or



1 rounded | 2 pointed | 3 bottle-neck

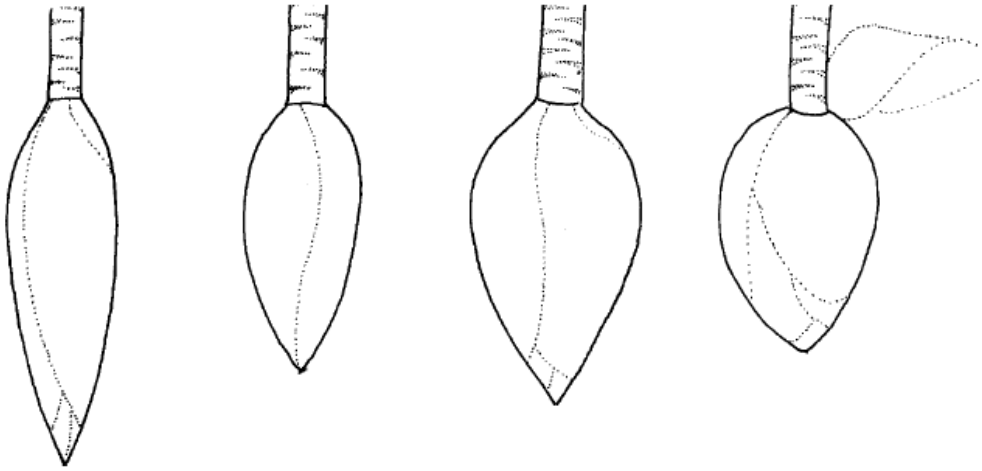
truncate: [TO BE PROVIDED]

Ad. 52: Male inflorescence: presence

[to be provided]

Ad. 53: Male inflorescence: shape (in cross section)

Should be assessed at harvest time



1
lanceolate

2
ovate

3
triangular

4
rounded

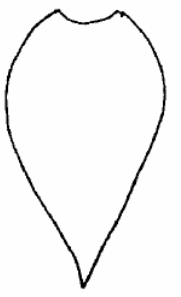
Ad. 54: Male inflorescence: overlap of bracts

3
weak

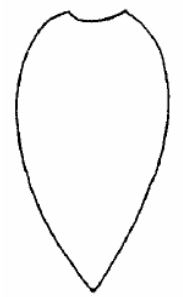
5
medium

7
strong

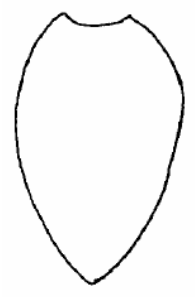
Ad. 58: Male inflorescence: shape of apex of bract



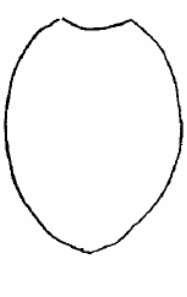
1
pointed



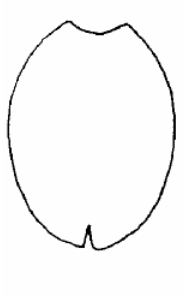
2
slightly pointed



3
intermediate



4
obtuse



5
obtuse and split

or

1
obtuse

2
acute

3
rounded

9. Literature

Daniels, J.W., March-April 1986: Banana cultivars in Australia. Queensland Agriculture Journal, AU, pp. 75-84

De Langhe, E., 1969: Bananas, Outlines of perennial crop breeding in the tropics. Miscellaneous papers 4, Landbouwhogeschool, Wageningen, NL. pp. 53-78.

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Turner, D.W. and Hunt, N., 1984: Growth, yield and leaf nutrient composition of 30 banana varieties in subtropical New South Wales. Dept. of Agriculture New South Wales, AU, Technical Bulletin 31, pp. 1-36

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Silva, S.S.; Shepherd, K.; Dantas, J.L.L.; Souza, A.S.; Carneiro, M.S. Germoplasma. In: Alves, E.J. (org.). A cultura da banana. 2. ed., rev. - Brasília-DF: Embrapa-SPI / Cruz das Almas: Embrapa-CNPMF, 1999. p.61-84.

Descriptors for Banana [*Musa spp*](revised). IBPGR/ICRISAT, Rome, 1984.

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

1.1.1	Botanical name	*Musa acuminata* Colla ❑
1.1.2	Common name	Banana
1.1.3	Botanical group (please complete e.g. AA, AAA)	
1.2.1	Botanical name	*Musa* ×*paradisiaca* L. (*M. acuminata* Colla × *M. balbisiana* Colla) ❑
1.2.2	Botanical group (please complete e.g. AAB, ABB)	

2. Applicant

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

3. Proposed denomination and breeder's reference

Proposed denomination (if available)	
Breeder's reference	

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

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

4.1 Breeding scheme

Variety resulting from:

4.1.1 Crossing

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

[#] Aurhorities 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:

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
TO ADD CHARACTERISTICS		

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

6. Similar varieties and differences from these varieties

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

Denomination(s) of variety(ies) similar to your candidate variety	Characteristic(s) in which your candidate variety differs from the similar variety(ies)	Describe the expression of the characteristic(s) for the **similar** variety(ies)	Describe the expression of the characteristic(s) for **your** candidate variety
Example		*(example to be inserted)*	*(example to be inserted)*
TO ADD EXAMPLES			

Comments:

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

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

Yes [ ] No [ ]
(If yes, please provide details)

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

Yes [ ] No [ ]
(If yes, please provide details)

7.3 Other information

A representative color 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.

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”.

……

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

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]