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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 fortieth session, to be held in Angers, France, from September 21 to 25, 2009

Alternative Names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Musa acuminata Colla	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.]

TABLE OF CONTENTS PAGE

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 corms (whole), rhizomes or *in vitro* plants.

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

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 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:
See the table SYNONYM AND SUBGROUPS at the end of the section (Example Varieties) to be checked by all interested experts.

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 26)
(b) Bunch: diameter (characteristic 27)
(c) Fruit: shape of apex (characteristic 42) bottle-necked ver com janay
(d) Fruit: color of skin (before maturity) (characteristic 44) dark yellow

2) Cavendish

(a) Bunch: length (characteristic 26)
(b) Bunch: diameter (characteristic 27)
(c) Fruit: shape of apex (characteristic 42) blunt ???? ver com janay
(d) Fruit: color of skin (before maturity) (characteristic 44) greenish yellow
(e) Pseudostem: length (characteristic 3) short e no Gros Michel?????

3) Red and Green Red

(a) Bunch: length (characteristic 26)
(b) Bunch: diameter (characteristic 27)
(c) Fruit: shape of apex (characteristic 42) blunt ???? ver com janay
(d) Fruit: color of skin (before maturity) (characteristic 44??) yellow-green to yellow
(e) Pseudostem: length (characteristic 3) short e no Gros Michel???and Red???

4) Ibota – Yamgambi km5

(a) Bunch: length (characteristic 26)
(b) Bunch: diameter (characteristic 27)
(c) Fruit: shape of apex (characteristic 42) blunt ???? ver com janay
(d) Fruit: color of skin (characteristic 44) (before maturity??) yellow-green to yellow
(e) Pseudostem: length (characteristic 3) long
(f) Plant: growth habit (characteristic 12) 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 42) 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 38) weakly expressed
(b) Fruit: length (characteristic 39) long
(c) Fruit: shape of apex (characteristic 42) pointed
(d) Fruit: thickness of skin (characteristic 43) thick
(e) Fruit: color of flesh (stage 6 for ripe fruit) (characteristic 49) orange
(f) Fruit: firmness of flesh (stage 6 for ripe fruit) (characteristic 49) firm

7) Silk

(a) Fruit: longitudinal ridges (characteristic 40) absent
(b) Fruit: length (characteristic 41) short
(c) Fruit: shape of apex (characteristic 42) pointed ??????
(d) Fruit: thickness of skin (characteristic 43) thin
(e) Fruit: color of flesh (stage 6 for ripe fruit) (characteristic 49) white
(f) Fruit: firmness of flesh (stage 6 for ripe fruit) (characteristic 49) dull white

8) Pacovan

(a) Fruit: longitudinal ridges (characteristic 40) strongly expressed
(b) Fruit: length (characteristic 41) long ????
(c) Fruit: shape of apex (characteristic 42) pointed ?????
(d) Fruit: thickness of skin (characteristic 43) thick
(e) Fruit: color of flesh (stage 6 for ripe fruit) (characteristic 49) dull white
(f) Fruit: firmness of flesh (stage 6 for ripe fruit) (characteristic 49) 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-group Bluggoe or Figo (isn't the same of Figue)
Caract 23
(b) Fruit: length (characteristic 41) long 3 quinas
Pseudostem: spots (characteristic 8) absent

SYNONYM AND SUBGROUPS (Example Varieties) to be checked by all interested experts

Group	**Subgroup**	**Variety Name**	**Synonyms**	**Synonyms and varieties in Brazil**
AA	-	Pisang Mas	Bocadillo (Orito, Pera, Sucrier, Sugar fig banana)	Ouro (Bananinha, Inaja, Pera)
AAA	-	Sao Tome	Criolo	São Tome (Banana Curta)
	-	Morado Verde (Dacca)	Tafetan Verde (Platano Macho, Platano Harton, Harton, Morado Verde, Green Red)	Caru Verde (Banana-verde, Cobre)
	-	Morato	Red (Claret, Green, Tafetan Morado, Morado, Kulli, Injerto)	Caru Roxa (Vinagre Ferro, Banana Roxa, Prata Roxa)
	Cavendish	Giant Cavendish	Willians (Nanicao, Valery)	Willians Monte Cristo IAC 2001
		Grand Nain	Grand Nain (Pineo Gigante, Johnson)	Grande Naine (Nanica Alta, Johnson)
		Dwarf Cavendish	Pigmeo (Enano,Petite naine,Govenor)	Nanica (Bae, Banana de italiano, Casca verde, Caturra, Banana D'água)
		Poyo	Robusta	Robusta
		Lacatan	Lacatan	Lacatan

				Giant fig Mestica
		Salta-do-cacho	Salta-do-cacho	Salta-do-cacho
	Gros Michel	Gros Michel	Platano Roatan (Seda, Banano, Habano, Guineo Patriota)	Gros Michel
	Ibota	Yangambi km 5		Caipira
AAAA		Golden Beauty	IC-2	IC-2
AAAB		FHIA 18		FHIA 18
AAB	Prata	Preciosa		Preciosa
		Platina		Platina
		Pioneira		Pioneira
		Ouro da Mata		Ouro da Mata (Prata maca)
		Prata ponta aparada		Prata ponta aparada
		Pacovan		Pacovan
		Prata (Canary banana)	Commom Banana (Banano de mesa)	Prata
		Prata ana	Prata ana	Prata ana (Enxerto, Prata Rio, Santa Catarina)
		Branca	Branca	Branca
		Thap Maeo	Thap Maeo	Thap Maeo
	Plantain (Terra)	Horn Plantain	Cuerno	D'Angola
		French Plantain	Maqueño	Terra Terra Maranhão
			Maranhao	Maranhao (Terra comprida)
			Maranhao caturra	Maranhao caturra
			Pacova (Harton, Harton velhaco)	Pacova (Farta velhaco, Chifre-de-bode, Banana comprida)
	Silk	Silk	Manzana (Apple banana, Figue pomme)	Maca (Branca leite)
ABB	Bluggoe	Bluggoe	Figo Cinza (Ice cream)	Figo (Zinco, Cinco quinas)
			Figo vermelha	Figo vermelha (Cacau, Pao, Sapo, Coruda, Marmelo)
		Gia Hui	Pisang awak	Prata Zulu
		Figo anao	Figo anao	Figo anao

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	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
1.	**Ploidy**		
(+)			
QL	diploid	Pisong Mas	2
	triploid	Grand Nain, Prata ana	3
	tetraploid	Golden Beauty	4
2.	**Rhizome: number of suckers above**		
(+)	**ground**		
QN	few	Sucrier	3
	medium	Nanicão	5
	many	Prata Anã	7
3.	**Pseudostem: length**		
(*)			
(+)			
QN	very short	Salta-do-Cacho, Dwarf Cavendish	1
	short	Grand Nain, Willians	3
	medium	Poyo	5
	long	Prata	7
	very long	Gros Michel, Pacovan	9
4.	**Pseudostem: diameter**		
(*)			
(+)			
QN	small	Yangambi Km 5	3
	medium	Willians	5
	large	Prata Ana	7

	English		Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
5. **(+)**	**Pseudostem: overlapping of leaf sheaths**	**FR povide an ilustration or to delete – to BR is only important the charc. 13. Petiole: atitude of wings at base**	SA SUPPORTS BR	
	weak			1
	medium			2
	strong			3
6. **(+)**	**Pseudostem: tapering along length**			
QN	absent or weak		Grand Nain	1
	medium		Nanicão	2
	strong		Mysore	3
7.	**Pseudostem: color**			
PQ	greenish yellow		Prata Anã	1
	light green			2
	medium green		D'Angola	3
	dark green			4
	reddish green		Pacovan	5
	red			6
	purple		Grand Nain	7
8. **(*)**	**Pseudostem: presence of anthocyanin**			
QN	absent		Bluggoe, Figo	1
	present		Caipira, Figue Pomme Nain, Peti Nain	9

		English	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
9. **(+)**		**Pseudostem: intensity of anthocyanin coloration**		
QN		weak	Gross Michel	3
		medium		5
		strong	Yangambi km 5	7
10.		**Pseudostem: color of the inner side of sheath base**		
PQ		yellowish green	Sucrier	1
		green	D'Angola, Prata Ana	2
		red	Figue Rose Naine	3
		purple	Grand Nain	4
11. **(+)**		**Plant: compactness of crown**		
QN	**(a)**	loose	Grand Nain	3
		medium	Prata Ana	5
		compact	Figo Anão (Bluggoe)	7
12. **(*)** **(+)**		**Plant: growth habit**		
QN	**(a)**	upright	Branca	1
		spreading	Nanicão	2
		drooping	Silk	3

		English	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
13. **(+)**		**Petiole: attitude of wings at base**		
QN		curved outwards		1
		straight		2
		slightly curved inwards		3
		moderately curved inwards		4
		overlapping		5
14. **(+)**		**Petiole: length**		
QN	**(a)**	short	Nanica	3
		medium	Nanicão	5
		long	Silk	7
15.		**Leaf blade: color of midrib on lower side**		
PQ	**(a)**	yellow		1
		green	Prata Ana, Dwarf Cavendish	2
		pink	Yangambi Km 5	3
		purple	Green Red	4
		black purple		5
16. **(*)** **(+)**		**Leaf blade: shape of base**		
PQ	**(a)**	both sides rounded	Bluggoe	1
		one side rounded and one side acute	Silk	2
		both sides acute	Grand Nain	3

		English	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
17.		**Leaf blade: waxiness on lower side**		
QN	**(a)**	absent or very weak		1
		weak		3
		medium		5
		strong	Figo	7
18.		**Leaf blade: length**		
QN	**(a)**	short	Nanica	3
		medium	Nanicão	5
		long	Branca, Pacovan	7
19.		**Leaf blade: width**		
QN	**(a)**	narrow	Grand Nain	3
		medium		5
		broad	Gros Michel	7
20.		**Leaf blade: ratio length/width**		
QN	**(a)**	small	Dwarf Cavendish	3
		medium	Poyo	5
		large		7
21.		**Leaf blade: glossiness of upper side**		
QL	**(a)**	absent	Grand Nain, Prata	1
		present	Bluggoe	9
22.		**Peduncle: length**		
(+)				
QN	**(b)**	short	Sucrier	3
		medium	Pacovan, Prata	5
		long	Grand Nain	7

		English	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
23.		**Peduncle: diameter**		
(+)				
QN	**(b)**	small	Sucrier	3
		medium	Pacovan, Prata	5
		large	Grand Nain	7
24.		**Peduncle: pubescence**		
QL	**(b)**	absent	Prata Anã	1
		present	Nanicão	9
25.		**Peduncle: curvature**		
(+)				
QN	**(b)**	absent or very weak		1
		weak	Grand Nain	3
		medium	Figue Pomme	5
		strong	Yangambi Km 5	7
26. **(*)** **(+)**		**Bunch: length**		
QN	**(b)**	short	Sucrier, Dwarf Cavendish	3
		medium	Pacovan	5
		long	Grand Nain	7
27. (*) **(+)**		**Bunch: diameter**		
QN		narrow	Sucrier	3
		medium	Prata	5
		broad	D'Angola	7

		English	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
28.		**Bunch: shape**		
(+)				
	(b)	cylindrical	Grand Nain, Willians	1
		irregular		2
PQ		conical	Dwarf Cavendish, Prata Ana	3
29.		**Bunch: attitude of fruits**		
(+)				
QN	**(b)**	horizontal to slightly turned up	Pacovan	1
		moderately turned up	Nanicão	2
		strongly turned up	Terra	3
30.		**Bunch: compactness**		
QN	**(b)**	loose	Bluggoe	1
		medium	Willians	5
		compact	Dwarf Cavendish	7
31. **(*)**		**Bunch: number of hands**		
QN	**(b)**	few	D'Angola	3
		medium	Prata	5
		many	Grand Nain, Thap Maeo	7
32. **(*)** **(+)**		**Rachis: attitude of male part**		
PQ		vertical	Branca	1
		inclined	Silk	2
		curved with vertical end		3
		horizontal with inclined end		4

		English	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
33.		**Rachis: prominence of scars**		
QN	**(c)**	weak	Gia Hui, Sucrier	1
		moderate	Nanica	2
		strong	Ouro-da-Mata	3
34.		**Rachis: persistence of bracts**		
QN	**(c)**	absent or weak	Silk	1
		moderately persistent	Prata	2
		strongly persistent	Prata Ana	3
35.		**Rachis: persistence of hermaphrodite flowers**		
QL	**(c)**	absent	Nanicão, Silk	1
		present	Terra	9
36. **(+)**		**Fruit: longitudinal curvature**		
PQ	**(c)**	straight	Bluggoe, Pacovan	1
		slightly curved in distal part	Nanicão	2
		evenly curved		3
		S-shaped	Nanica	4
37. **(+)**		**Fruit: position in relation to rachis**	BR to delete SA SUPPORTS BR	
QN	**(c)**	parallel	Grand Nine, Nanicão	1
		intermediate	Prata anã	3
		perpendicular	Pacovan	5

		English	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
38. (*) (+)		**Fruit: longitudinal ridges**		
QN	**(c)**	absent	Silk, Sucrier, Yangambi Km 5	1
		weakly expressed	Terra, Prata	2
		strongly expressed	Bluggoe, Pacovan, Terra	3
39. (*) (+)		**Fruit: length**		
QN	**(d)**	short	Figue Pomme, Silk, Sucrier	3
		medium	Nanicao	5
		long	Terra	7
40. (*) (+)		**Fruit: width (excluding sharp edges)**		
QN	**(d)**	narrow	Sucrier	3
		medium	Grand Nain	5
		broad	Bluggoe, D'Angola	7
41.		**Fruit: length of pedicel**		
QN	**(d)**	short	Sucrier, Yangambi Km 5	3
		medium	Prata	5
		long	Figue Pomme, Terra	7

		English		Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
42. (*) (+)		**Fruit: shape of apex**			
PQ	**(d)**	rounded			1
		truncate	FR draw or delete truncate	SA SUPPORTS FR	2
		blunt-tipped	BR wants to maintain blunt tipped		3
		bottle-necked			4
		pointed			5
43. (+)		**Fruit: thickness of skin (stage 6 for ripe fruit)**			
QN	**(d)**	thin		Silk, Sucrier	3
		medium		Nanica	5
		thick		Pacovan, Terra+	7
44. (*)		**Fruit: color of skin (before maturity)**	**BR: stage 5**	**SA: BEFORE STAGE 6**	
PQ	**(d)**	light yellow		Plantain	1
		medium yellow		Prata comum	2
		dark yellow		Sucrier, São Domingos	3
		greenish yellow		Cavendish	4
		light green		Silk	5
		medium green		Gros Michel	6
		dark green		Sao Tome, Mysore	7
		pink			8
		red		Caru Roxa	9
		purple			10
		brown			11

		English	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
45. (*)		**Fruit: color of skin (stage 6 for ripe fruit)**		
PQ	**(d)**	light yellow	Gros Michel, Branca, Pacovan	1
		medium yellow	Prata comum, Plantain	2
		greenish yellow	Cavendish	3
		green	São Tomé	4
		dark yellow	Sucrier, Mysoure, São Domingo	5
		orange	Bluggoe	6
		red orange	Morado Verde	7
		reddish	Morato	8
		brown		9
		black	Black French Plantain	10
46.		**Fruit skin adherence (stage 6 for ripe fruit)**		
QN	**(d)**	weak	Silk	3
		medium	Grand Nain	5
		strong	Sucrier	7
47.		**Fruit: persistence of floral organs**		
QL	**(d)**	absent	Figue rose	1
		present	Yangambi km 5	9

		English	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
48. (*)		**Fruit: color of flesh (stage 6 for ripe fruit)**		
PQ	**(d)**	white	Silk	1
		ivory/whitish	Pacovan, Prata	2
		cream	Red, Morado Verde	3
		yellow	Nanicão	4
		orange	Terra	5
		pinkish cream	São Domingos	6
49.		**Fruit: firmness of flesh (stage 6 for ripe fruit)**		
QN	**(c)**	soft	Grand Nain, Silk	1
		medium	Pacovan, Prata	3
		firm	Terra	5
50. (+)		**Male inflorescence: persistence**		
QL		absent		1
		present		9
51. (+)		**Male inflorescence: shape (in cross section)**		
QN		lanceolate	Pacovan	1
		narrow ovate		2
		medium ovate		3
		broad ovate	Prata	4

	English		Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
52. **(+)**	**Male inflorescence: overlap of bracts**			
QN	weak			3
	medium		Pacovan	5
	strong		Nanicão	7
53.	**Bract: color of inner side**			
PQ	whitish			1
	yellow			2
	yellow green			3
	green			4
	pink			5
	orange red			6
	red			7
	purple			8
54.	**Bract: yellow hue of apex (upper side)**	*to add (+) and provide explanation by France*	France keep Br delete	
QL	absent		SA TO DELETE	1
	present			9
55.	**Male inflorescence: separation of bract**	*to add (+) and provide explanation by France*	France keep Br delete SA TO DELETE	
	never separate		Plantain French	1
	separate one-by-one		Gros Michel	2
	several separate		Figue Rose	3

	English		Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
56. **(+)**	**Male inflorescence: shape of apex of bract**	(*to BR ok, be checked by France*)	SA SUPORTS BR	
	acute			1
	slightly acute			2
	intermediate			3
	obtuse			4
	obtuse and split			5
57.	**<u>Only obtuse apex bract varieties</u>: Male inflorescence: shape of apex of bract**	*to add (+) and provide explanation by France, to check wording and states*	France keep Br delete	
	absent		SA WAIT FOR EXPLANAITON	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 third hand on a median standard fruit of the inner cluster, at stage 6 for ripe fruit. (See Ad: 44 –stage 5)

Color stages according to the following scheme:

Taken from: “Stage for ripe fruit: according Inipab Technical Guidelines – Routine Post-Harvest Screening of Banana Plantain Hybrids: Criteria and Methods, B. K. Dadzie et J. E. Orchard.”

8.2 Explanations for individual characteristics

Ad. 1: Ploidy

Used for musa:

African Crop Science Journal, Vol. 11. No. 2, 2003, pp. 119-124

Short Communication

ESTABLISHING THE GENOME OF *'SUKALI NDIZI'*

M. Pillay, J. Hartman*, C. Dimkpa and D. Makumbi
International Institute of Tropical Agriculture, Eastern and Southern Africa Regional Center, P. O. Box 7878 Kampala, Uganda

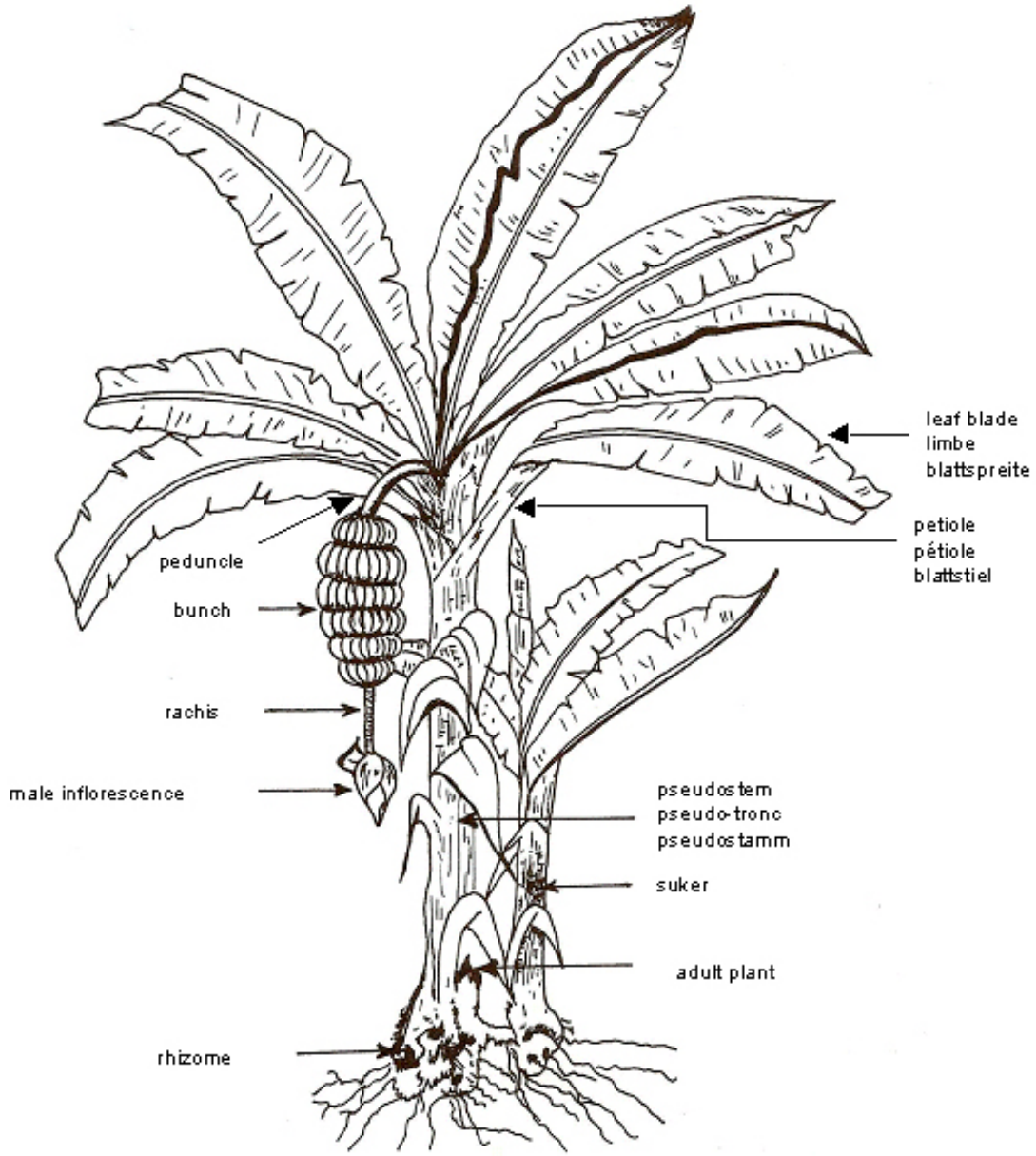
(Received 22 February, 2002; accepted 8 April, 2003)

Chromosome counts from root tips of plants. Briefly, fresh root tips were pretreated for 2 h in 0.036% 8-hydroxyquinoline and then fixed in 3:1 ethanol-acetic acid. The meristematic zones were digested at 37° C in an enzyme mixture consisting of 5% cellulase (Sigma Chemicals), 1% pectinase and 1% pectolyase Y23 (Karlan Research, Santa Rosa, Calif) made in a citrate buffer, pH 4.5.The enzyme solution was removed and the meristems were washed with water several times. A single meristem was placed on a glass slide, the excess water removed with a paper towel and 1 or 2 drops of freshly prepared 3:1 ethanol-acetic acid placed over it. The meristem was macerated and the cells smeared over the slide with a fine forceps. The slide was observed in a phase contrast microscope. When the cells began to adhere to the slide, several drops of the 3:1 was placed over one end of the slide and allowed to flow over the cells. The slide was air-dried and stained with Leishman's stain as described by Singh (1993).

Singh, R.J. 1993. Plant Cytogenetics. CRC Press, Inc., Boca Raton. 391 pp.

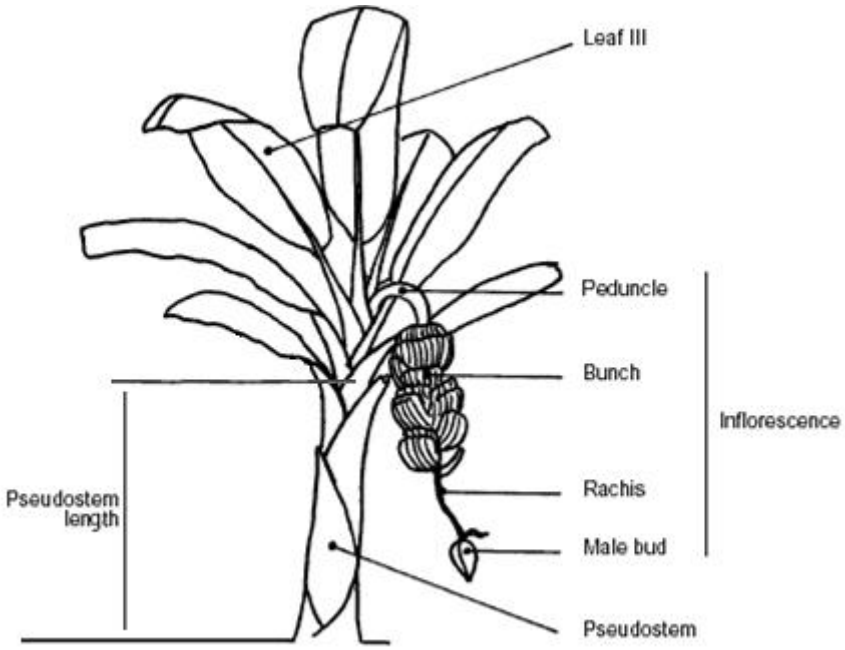
Ad. 2: Rhizome: number of suckers above ground

Assessed at harvest time with visible suckers.



Ad. 3: Pseudostem: length

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



Ad. 4: Pseudostem: diameter

Brazil wants to maintain this proposal:

The diameter of the pseudostem should be observed at the height of 0,3 meter from ground level, at the beginning of flowering.

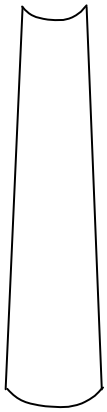
France proposal: SA SUPPORTS FR PROPOSAL REGARDING THE HEIGHT AT WHICH DIM IS TO BE MEASURED

The diameter of the pseudostem should be observed at the height of one meter from ground level at flowering time

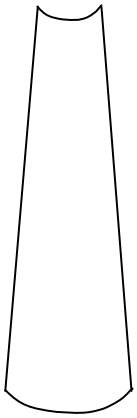
Ad. 5: Pseudostem: overlapping of leaf sheaths

[to be provided by France or delete charact.]

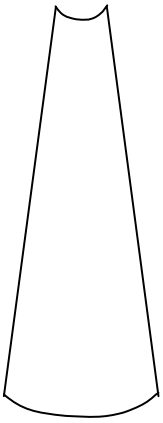
Ad. 6: Pseudostem: tapering along length



1
absent or weak



2
medium



3
strong

Ad. 9: Pseudostem: intensity of anthocyanin coloration

3
weak

5
medium

7
strong

Ad. 11: Plant: compactness of crown

3
loose

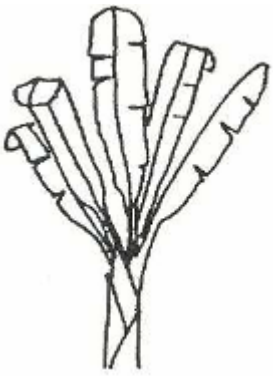
[to be provided]

5
medium

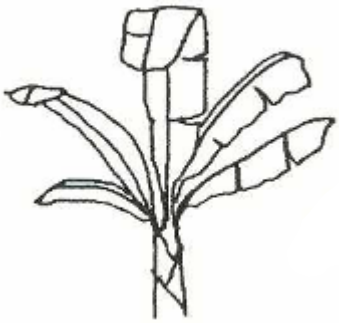
7
compact

Ad. 12: Plant: growth habit

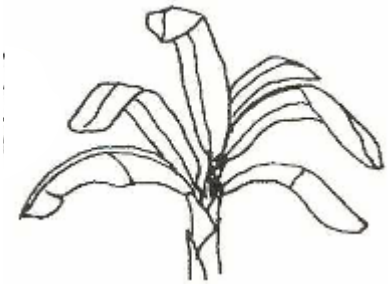
The growth habit should be observed at harvest time, at the moment of inflorescence emerging of those fruit bunches which were originally marked for observation.



1
upright

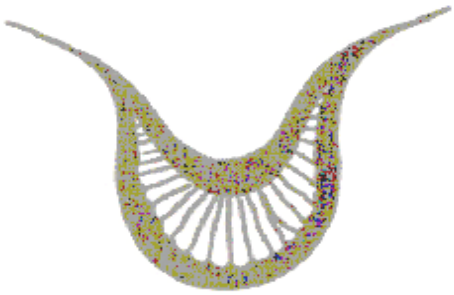


2
spreading



3
drooping

Ad. 13: Petiole: attitude of wings at base



1
curved outwards

2
straight

3
slightly curved inwards

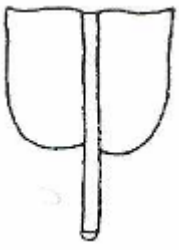
4
moderately curved inward

5
overlapping

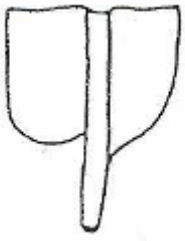
Ad. 14: Petiole: length

Measured from the pseudostem to the base of the leaf blade.

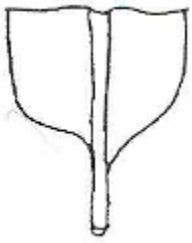
Ad. 16: Leaf blade: shape of base



1
both sides rounded



2
one side rounded and one side acute



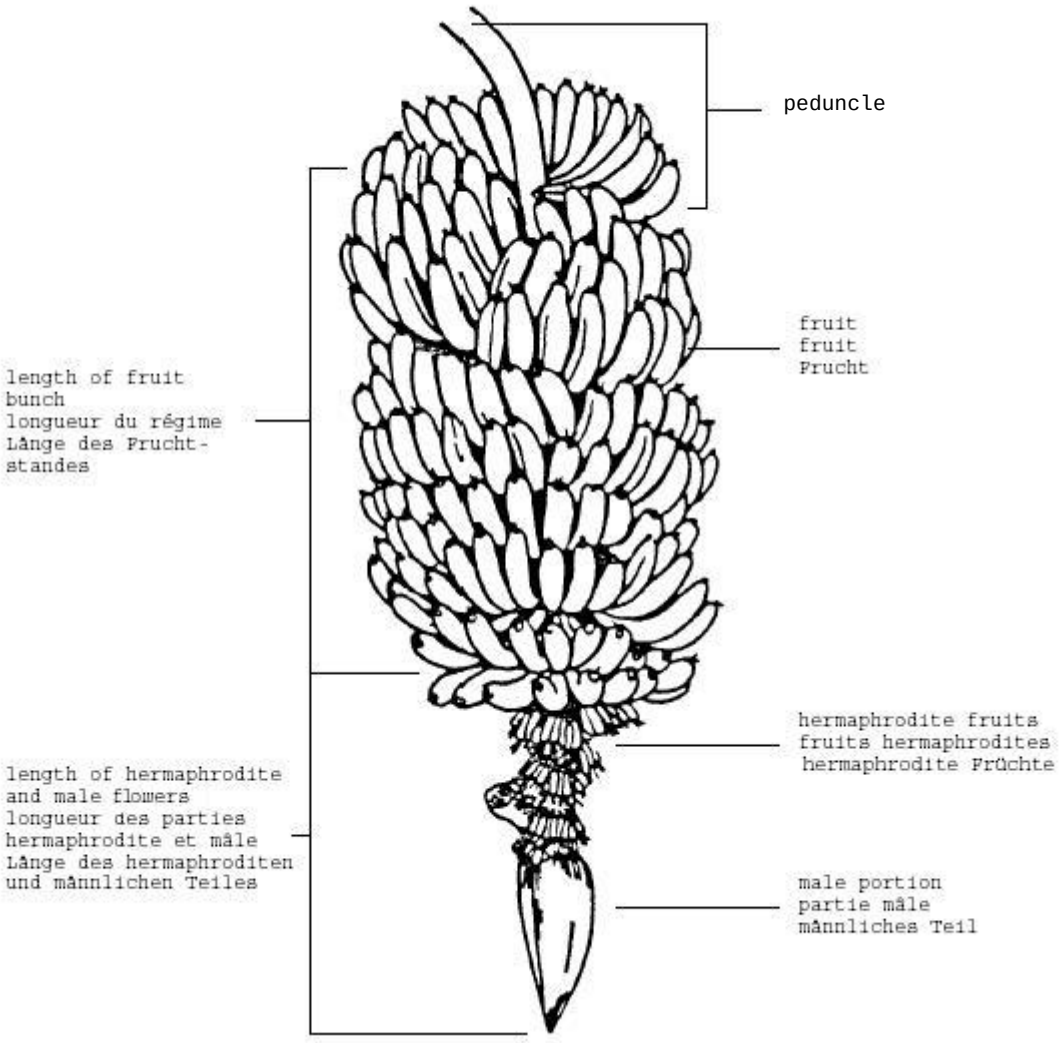
3
both sides acute

Ad. 22: Peduncle: length

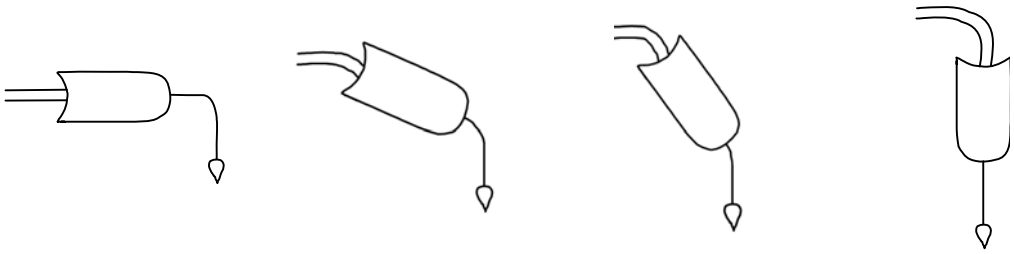
The length of the peduncle should be determined from the attachment point of the bunch to the first hand.

Ad. 23: 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: curvature



1	3	5	7
absent or very weak	weak	medium	strong

Ad. 26: Bunch: length

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

Ad. 27: Bunch: diameter

The diameter of the bunch should be measured at the middle the attachment of the first hand to the last hand.

Ad. 28: Bunch: shape

[to be provided]

1	2	3
cylindrical	irregular	conical

Ad. 29: Bunch: attitude of fruits

1

horizontal to slightly turned up

2

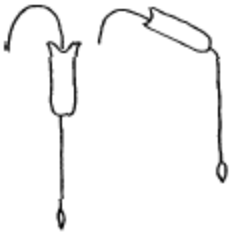
moderately turned up

3

strongly turned up

Ad. 32: Rachis: attitude of male part

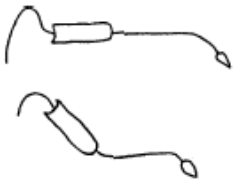
Assessed just before harvest time.



1
vertical

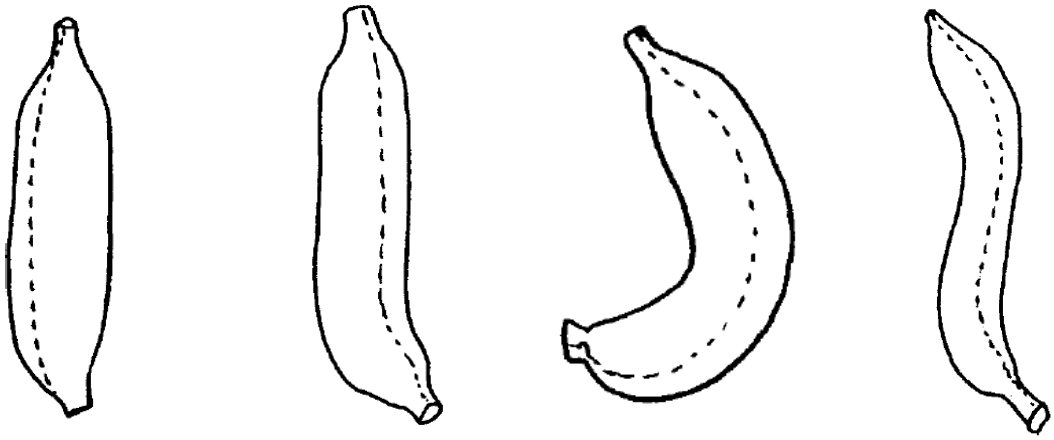
2
inclined

3
curved with vertical end



4
horizontal with inclined end

Ad. 36: Fruit: longitudinal curvature



1	2	3	4
straight	slightly curved in distal part	evenly curved	S-shaped

Ad. 37: Fruit: position in relation to rachis

TO BE PROVIDED

Ad. 38: Fruit: longitudinal ridges

To observe at the middle external fruit of the third hand.
SA: WORDING –EG. TO BE OBSERVED ON THE OUTER CLUSTER OF THE THIRD HAND ON THE MIDDLE FRUIT. SA observation

1	2	3
absent	weakly expressed	strongly expressed

Ad. 39: 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.

Ad. 40: Fruit: width (excluding sharp edges)

TO BE PROVIDED

Ad. 42: Fruit: shape of apex

To observe from narrowest to widest.

1	2	3	4	5	6
rounded	truncate	blunt-tipped	bottle-necked	pointed	lenghtly pointed

truncate: [TO BE PROVIDED BY FRANCE OR DELETE]

Ad. 43: Fruit: thickness of skin (stage 6 for ripe fruit)

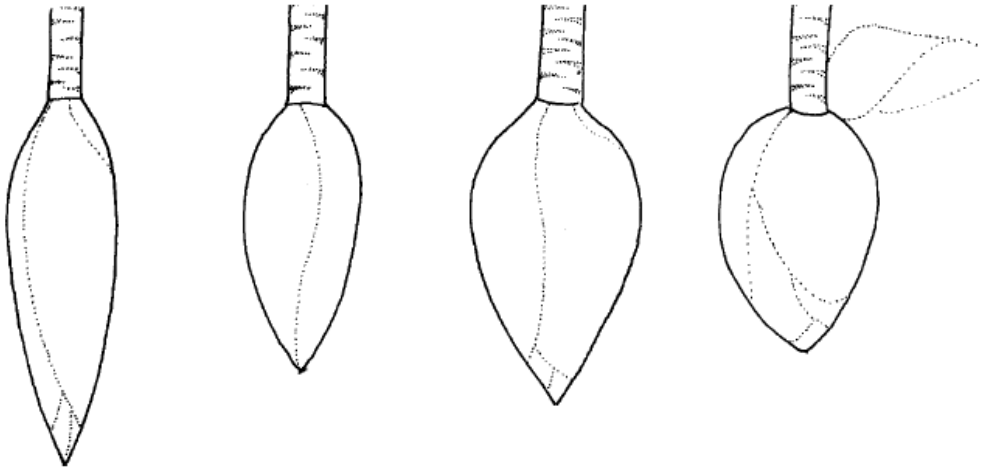
TO BE PROVIDED

Ad. 50: Male inflorescence: persistence

[to be provided by Brazil]

Ad. 51: Male inflorescence: shape (in cross section)

Should be assessed at harvest time.



1	2	3	4
lanceolate	narrow ovate	medium ovate	broad ovate

Ad. 52: Male inflorescence: overlap of bracts

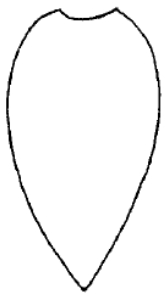
3
weak

5
medium

7
strong

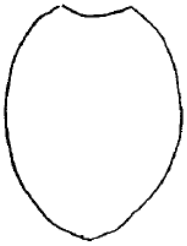
Ad. 56: Male inflorescence: shape of apex of bract

1
acute

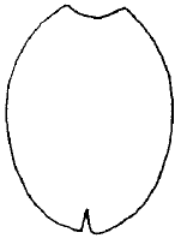


2
slightly acute

3
intermediate



4
obtuse



5
obtuse and split

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.

Purseglove, J.W., 1972: Tropical Crops: Monocotyledons. Longman. London, GB, pp. 351-355

Samson, J.A., 1980: Tropical Fruits. Longman. London, GB. pp. 133-138.

Simmonds, N.W., 1966: Bananas. 2nd ed., Longmans Green. London, GB, pp. 44-128.

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.

Stover, R.H., 1988: Variation and Cultivar Nomenclature in Musa, AAA Group, Cavendish Subgroup. Fruits d'Outre-mer, Vol. 43, No. 6, pp. 353-357, FR.

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. pp. 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

[#] 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:

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			
TO ADD EXAMPLES			

Comments:

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

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

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

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

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

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

7.3 Other information

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

8. Authorization for release

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

Yes [ ] No [ ]

(b) Has such authorization been obtained?

Yes [ ] No [ ]

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

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

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

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

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

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

(a) Microorganisms (e.g. virus, bacteria, phytoplasma) Yes [ ] No [ ]

(b) Chemical treatment (e.g. growth retardant, pesticide) Yes [ ] No [ ]

(c) Tissue culture Yes [ ] No [ ]

(d) Other factors Yes [ ] No [ ]

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

……

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

Applicant’s name:

Signature Date:

[End of document]