

UPOV

TG/123/4(proj.2)

ORIGINAL: English

DATE: 2004-06-24

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

DRAFT

BANANA

UPOV code: MUSAA_ACU
MUSAA_BAL*Musa acuminata* Colla and intraspecific
hybrids of *M. acuminata* Colla and
M. balbisiana Colla (Musaceae)

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

*prepared by an expert from Brazil**to be considered by the
Technical Working Party for Fruit Crops at its thirty-fifth session,
to be held in Marquardt (Potsdam), Germany, from July 19 to 23, 2004*

Alternative Names:*

<i>Latin</i>	<i>English</i>	<i>French</i>	<i>German</i>	<i>Spanish</i>
<i>Musa</i> spp.	Banana	Bananier	Banane	Banano, Plátano

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 guidelines (“Test Guidelines”) should be read in conjunction with document TG/1/3, “General Introduction to the Examination of Distinctness, Uniformity and Stability and the Development of Harmonized Descriptions of New Varieties of Plants” (hereinafter referred to as 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.]

<u>TABLE OF CONTENTS</u>	<u>PAGE</u>
1. SUBJECT OF THESE TEST GUIDELINES	3
2. MATERIAL REQUIRED.....	3
3. METHOD OF EXAMINATION	3
3.1 Number of Growing Cycles.....	3
3.2 Testing Place	3
3.3 Conditions for Conducting the Examination	4
3.4 Test Design.....	4
3.5 Number of Plants / Parts of Plants to be Examined.....	4
3.6 Additional Tests.....	4
4. ASSESSMENT OF DISTINCTNESS, UNIFORMITY AND STABILITY	4
4.1 Distinctness.....	4
4.1.1 <i>General Recommendations</i>	4
4.1.2 <i>Consistent Differences</i>	4
4.1.3 <i>Clear Differences</i>	4
4.2 Uniformity	5
4.3 Stability	5
5. GROUPING OF VARIETIES AND ORGANIZATION OF THE GROWING TRIAL	5
6. INTRODUCTION TO THE TABLE OF CHARACTERISTICS	6
6.1 Categories of Characteristics	6
6.1.1 <i>Standard Test Guidelines Characteristics</i>	6
6.1.2 <i>Asterisked Characteristics</i>	6
6.2 States of Expression and Corresponding Notes	7
6.3 Types of Expression	7
6.4 Example Varieties	7
6.5 Legend.....	7
7. TABLE OF CHARACTERISTICS/TABLEAU DES CARACTÈRES/MERKMALSTABELLE/TABLA DE CARACTERES	8
8. EXPLANATIONS ON THE TABLE OF CHARACTERISTICS.....	22
8.1 Explanations covering several characteristics	22
8.2 Explanations for individual characteristics.....	23
9. LITERATURE.....	27
10. TECHNICAL QUESTIONNAIRE.....	28

1. Subject of these Test Guidelines

1.1 These Test Guidelines apply to all varieties of *Musa acuminata* Colla and intraspecific hybrids of *M. acuminata* Colla and *M. balbisiana* Colla (*Musaceae*), doesn't matter its genetic composition.

1.2 It is admitted 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 due to its genome combination. The main groups founded in the edible bananas, natural varieties or hybrids, are AA, AAA, AAB, ABB, AAAA, AAAB and AABB.

1.3 Each application should include a declaration of variety 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 {xx}

2.3 The minimum quantity of plant material, to be supplied by the applicant, should be:
10 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:

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 All observations should be made on the second ratoon or later in the plantation life.

3.4 *Test Design*

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

3.4.2 The spacing of the plants should be specified. (TG 123/3, 1989).

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

Unless otherwise indicated, all observations should be made on 10 plants or parts taken from each of 10 plants. In the case of parts of plants, the number to be taken from each of the plants should be 2.

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 The assessment of uniformity for cross-pollinated varieties should be according to the recommendations for cross-pollinated varieties in the General Introduction. (to review)

4.2.3 For the assessment of uniformity, a population standard of 1% and an acceptance probability of at least 95% should be applied for varieties resulting from crossing, and a population standard of 2% with the same acceptance probability. In the case of a sample size of 5 plants, no off-type are allowed. In the case of a sample size of 10 plants, 1 off-type is allowed. (to review)

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 triploid varieties (the AAA group) of *Musa acuminata* into subgroups and types which can be identified by the following characteristics:

1. Gros Michel

- | | | |
|-----|--|---------------|
| (a) | Bunch: ratio length/diameter (characteristic 30) | large |
| (b) | Fruit: shape of apex (characteristic 51) | bottle-necked |
| (c) | Fruit: color of skin (characteristic 53) | deep yellow |

2. Cavendish

- | | | |
|-----|--|------------------------|
| (a) | Bunch: ratio length/diameter (characteristic 30) | medium |
| (b) | Fruit: shape of apex (characteristic 50) | blunt |
| (c) | Fruit: color of skin (characteristic 52) | yellow-green to yellow |

(i) Dwarf Cavendish

Pseudostem: length (characteristic 1) very short

(ii) Giant Cavendish

Pseudostem: length (characteristic 1) short

(iii) Robusta

Pseudostem: length (characteristic 1) medium

(iv) Pisang Masak Hijau

Pseudostem: length (characteristic 1) long

3. Red and Green Red

- | | | |
|-----|--|--------------|
| (a) | Bunch: ratio length/diameter (characteristic 30) | small |
| (b) | Fruit: shape of apex (characteristic 50) | blunt |
| (c) | Fruit: color of skin (characteristic 52) | green or red |

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 Section 6.1.2

(QL) Qualitative characteristic – see Section 6.3

(QN) Quantitative characteristic – see Section 6.3

(PQ) Pseudo-qualitative characteristic – see Section 6.3

(a)–(d) See Explanations on the Table of Characteristics in Chapter 8, Section 8.1

(+) See Explanations on the Table of Characteristics in Chapter 8, Section 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.	Level of ploidy					
	diploid					2
	triploid					3
	tetraploid					4
2.	Rhizome: outcropping					
QN	few				Pacovan	3
	medium				Nanicão, Giant Cavendish	5
	many				Terra	7
3.	Rhizome: sprout					
QN	few				Ouro	3
	medium				Nanicão	5
	many				Prata Anã	7
4. (* (+)	Pseudostem: length					
QN	very short				Salta-do-Cacho	1
	short				Nanica	3
	medium				Nanicão	5
	long				Prata comum	7
	very long				Pacovan	9
5. (+)	Pseudostem: diameter					
QN	small				Caipira	3
	medium				Nanicão	5
	large				Prata Anã	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
6.	Pseudostem: shape					
PQ	conical				Caru Verde	1
	conical to cylindrical				Nanicão	2
	cylindrical				Grande Naine	3
7.	Pseudostem: color					
PQ	yellow					1
	greenish yellow				Prata Anã	2
	medium green					3
	green				D'Angola	4
	dark green					5
	redish green				Pacovan	6
	red					7
	purple/violet				Grande Naine	8
	blue					9
8.	Pseudostem: dark spots					
QL	absent				Figo	1
	present				Grande Naine	9
9.	Pseudostem: inner color of the sheath					
PQ	yellowish green				Ouro	1
	green				D'Angola, Prata Anã	2
	red				Figue Rose Naine	3
	rose				Grande Naine	4

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
10. Leaf: development of crook					
QN (a)	very weak			Pacovan	1
	weak			Grande Naine	3
	medium			<i>Prata Anã</i>	5
	strong			Figo Anão	7
	very strong			Figue Pome Naine	9
11. Leaf: attitude					
(*)					
(+)					
PQ (a)	upright			Branca	1
	intermediate			Nanicão	2
	drooping			Maçã	3
12. Leaf: base of petiole					
(*)					
(+)					
PQ (a)	open with open margins				1
	open with erect margins				2
	narrow with erect margins				3
	curved margins to the interior				4
	overlapping margins				5
13. Leaf: length of petiole					
QN (a)	short			Nanica	3
	medium			Nanicão	5
	long			Maçã	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
14.	Leaf: diameter of petiole					
QN	(a) small					3
	medium					5
	large					7
15.	Leaf: color of lower side of the midrib					
PQ	(a) green				Prata Anã	1
	rose				Caipira	2
	purple				Thap Maeo	3
16.	Leaf: symmetry between the sides of blade					
?	(a) absent				Maçã	1
	present				Figo Anão	9
17.	Leaf: shape of the sides of the blade base					
(*) (+)						
?	(a) both round				Figo Anão	1
	one round and the other tapering				Maçã	2
	both tapering				Grande Naine	3
18.	Leaf: wax (iness) intensity at abaxial surface of the (lower) blade					
(+)						
QN	absent or very weak					1
	weak (or low ?)					3
	medium					5
	high (or strong)					7
	very high					9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
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) low					3
	medium					5
	high					7
22.	Leaf blade: color of lower side of the young leaf					
(+)						
	green					1
	purple					2
23.	Leaf blade: shape of apex					
PQ	(a) acute					1
	slightly obtuse					2
	moderately obtuse					3
	obtuse to rounded					4
	rounded					5

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
24.	Leaf: symmetry among sides of the blade					
	(a) right side					1
	symmetric				Nanica	2
	left side					3
25.	Leaf: aspect of secondary nervure					
QN	(a) slightly prominent					3
	moderately prominent					5
	strongly prominent					7
26.	Leaf: appearance of upper side blade					
?	(a) opaque					1
	bright					2
27.	Leaf blade: intensity of green of lower side					
QN	(a) light				Ouro, Maçã	3
	medium				Pacovan	5
	dark				Figo Anão	7
28.	Bunch: length					
(*)						
(+)						
QN	(b) short				Ouro	3
	medium				Prata Anã	5
	long				Grande Naine	7

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota	
29.	Bunch: diameter					
(*)						
(+)						
QN	(b)	small		Ouro	3	
		medium		Prata	5	
		large		Pacovan, D'Angola	7	
30.	Bunch: ratio length/diameter					
(*)						
(+)						
QN	(b)	small		D'Angola	3	
		medium		Prata	5	
		large		Grande Naine	7	
31.	Bunch stalk: length					
(+)						
QN	(b)	short		Ouro, Nanica	3	
		medium		Pacovan, Grande Naine	5	
		long		Maçã, São Domingos	7	
32.	Bunch stalk: diameter					
QN	(b)	small		Ouro	3	
		medium		Pacovan, Prata	5	
		large		Grande Naine	7	
33.	Bunch stalk: pilosity					
QL	(b)	absent			1	
		present			9	

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
34. Bunch: attitude					
? (b) parallel to pseudostem					1
slightly angulate					2
hanging up to 45°					3
hanging past 45°					4
35. Bunch: shape					
(+)					
PQ (b) cylindric				Grande Naine	1
slightly conical				Nanica	2
clearly conical				Prata Anã	3
36. Bunch: uniformity					
QN (b) low				Prata Anã	3
medium				Nanicão	5
high				Grande Naine, Caipira	7
37. Bunch: insertion of the bunches					
(b) turned up hands				Terra	1
turned up and horizontal				Nanicão	3
horizontal				Pacovan, São Tomé	5
38. Bunch: distribution					
QN (b) sparse				Figo	3
medium				Nanicão	5
compact				Thap Maeo	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
39. (*)	Bunch: number					
QN	(b) low				D'Angola	3
	medium				Prata comum	5
	high				Thap Maeo, Grande Naine	7
40. (*)	Bunch: number of fruits per hand					
QN	(b) low				D'Angola	3
	medium				Prata comum	5
	high				Thap Maeo, Grande Naine	7
41. (*)	Bunch: attitude of the rachis					
?	(b) vertical				Branca	1
	(d) inclined				Prata	3
	curved				Maçã	5
	recurved or "s" shaped				Gros Michel	7
42.	Bunch: prominence of the scars of the rachis					
QN	(b) small				Prata Zulu, Ouro	3
	(d) medium				Nanica	5
	large				Ouro-da-Mata	7
43. (+)	Bunch: dehiscence of the bracts of the rachis					
?	(b) persistent				Prata Anã	1
	(d) partially persistent				Grande Naine	3
	not persistent				Maçã	5

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
44.	Bunch: persistence of pistil of the rachis					
?	(b)				Terra	1
	(d)				Grande Naine	3
					Maçã	5
45.	Bunch: persistence of male flowers of the rachis					
?	(b)				Prata Anã	1
	(d)				Grande Naine	3
					Ouro	5
46.	Fruit: curvature					
					absent or very weak	
QN	(c)				Figo, Pacovan	3
					Nanicão	5
					Nanica	7
					very strong	
47.	Fruit: shape in cross section					
?	(c)				Figo	1
					Terra, Prata Anã	3
					Ouro, Caipira	5
48.	Fruit: length					
(*)						
(+)						
					Ouro	1
(QN)	(c)				Prata	3
					Nanicão	5
					Terra	7
					D Angola	9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
49. (*)	Fruit: diameter (excluding sharp edges)					
QN	(c) small				Ouro	3
	medium				Grande Naine	5
	large				Figo, D'Angola	7
50.	Fruit: length of pedicel					
QN	(c) short				Ouro, Caipira	3
	medium				Prata	5
	long				Terra	7
51. (*) (+)	Fruit: shape of apex					
PQ	(c) rounded				Prata Ponta Aparada, Ouro	1
	pointed				Terra	2
	bottle-neck				Prata	3
52.	Fruit: thickness of skin					
QN	(c) thin				Ouro, Maçã	3
	medium				Nanica	5
	thick				Terra, Pacovan	7
53. (*)	Fruit: color of skin					
PQ	(c) green				São Tomé	1
	pale yellow				Cavendish	2
	weak yellow				Maça	3
	medium yellow				Prata comum	4
	dark yellow				Ouro	5
	reddish				Caru Roxa	6
	brown					7

English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
54.	Fruit: adherence of skin				
QN	(c) weak			Pacovan, Prata	3
	medium			Grande Naine	5
	strong			Ouro	7
55.	Fruit: detachment resistance				
QN	(c) low			Maçã	3
	medium			Nanicão	5
	high			Ouro, Caipira	7
56.	Fruit: color of pulp				
PQ	(c) white			Maçã	1
	dull white			Prata	2
	cream			Caru Roxa e Verde	3
	yellow			Nanicão	4
	orange			Terra	5
	rose			São Domingos	6
57.	Fruit: consistency of pulp				
QN	(c) very soft			Grande Naine	1
	soft			Maçã	3
	hard			Terra	5

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
58.	Bunch: shape of male bud					
(+)						
PQ	slim					1
	lanceolate				Pacovan	2
	oval					3
	wide oval (elliptic)				Prata	4
	truncate					5
59.	Bunch: overlap of bracts of male bud					
QN	absent or very weak				Prata Anã	1
	weak					3
	medium				Pacovan	5
	strong				Nanicão	7
	very strong					9
60.	Reaction to yellow Sigatoka					
(+)	(Mycosphaerella musicola)					
QN	susceptible					1
	resistant					9
61.	Reaction to black Sigatoka					
(+)	(Mycosphaerella figiensis)					
QN	susceptible					1
	resistant					9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
62.	Reaction to Fusariosis					
(+)	<i>(Fusarium oxysporium f. sp. cubense Sn. e Hansen)</i>					
QN	susceptible				Maçã	1
	resistant				Ouro	9
63.	Reaction to Nematoid					
	<i>(Radopholus similis)</i>					
QN	susceptible					1
	resistant					9
64.	Reaction to Nematoid					
	<i>(Meloydogine spp)</i>					
QN	susceptible					1
	resistant					9
65.	Reaction to Nematoid					
	<i>(Prathylencus cofee)</i>					
QN	susceptible					1
	resistant					9
66.	Reaction to Borer					
	<i>(Cosmopolites sordidus)</i>					
QL?	susceptible				Nanicão	1
	tolerant					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:

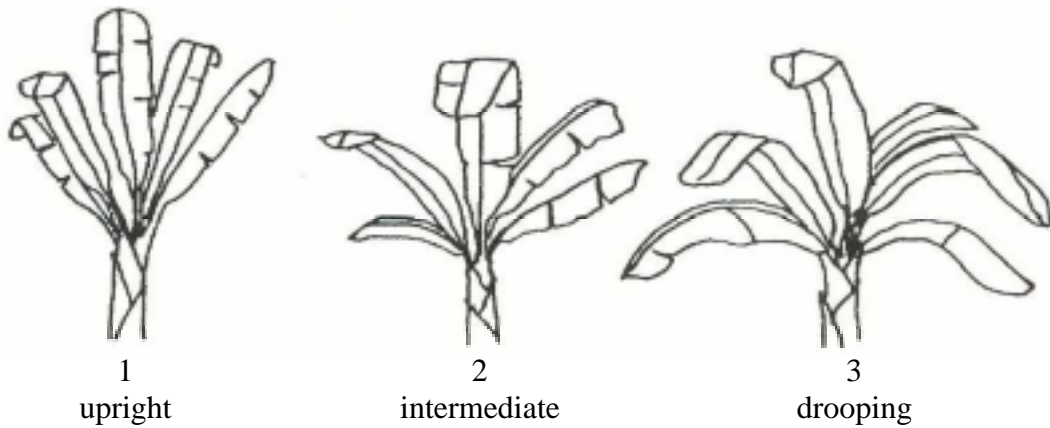
- (a) All observations on the leaf should be made on the third leaf from the apex at [harvest time] (TG 123/3, 1989) the moment of inflorescence emerging of those fruit bunches which were originally marked for observation.
- (b) All observations on the fruit bunch should be done at fruit maturity (harvest time) [on those bunches which were originally marked for flower observations.] (TG 123/3, 1989).
- (c) All observations on the fruit should be made on the ripe fruit at the optimum edible stage and on the third cluster.
- (d) All observations on inflorescence and flower should be made at the time of full flowering. (TG 123/3, 1989)

8.2 *Explanations for individual characteristics*

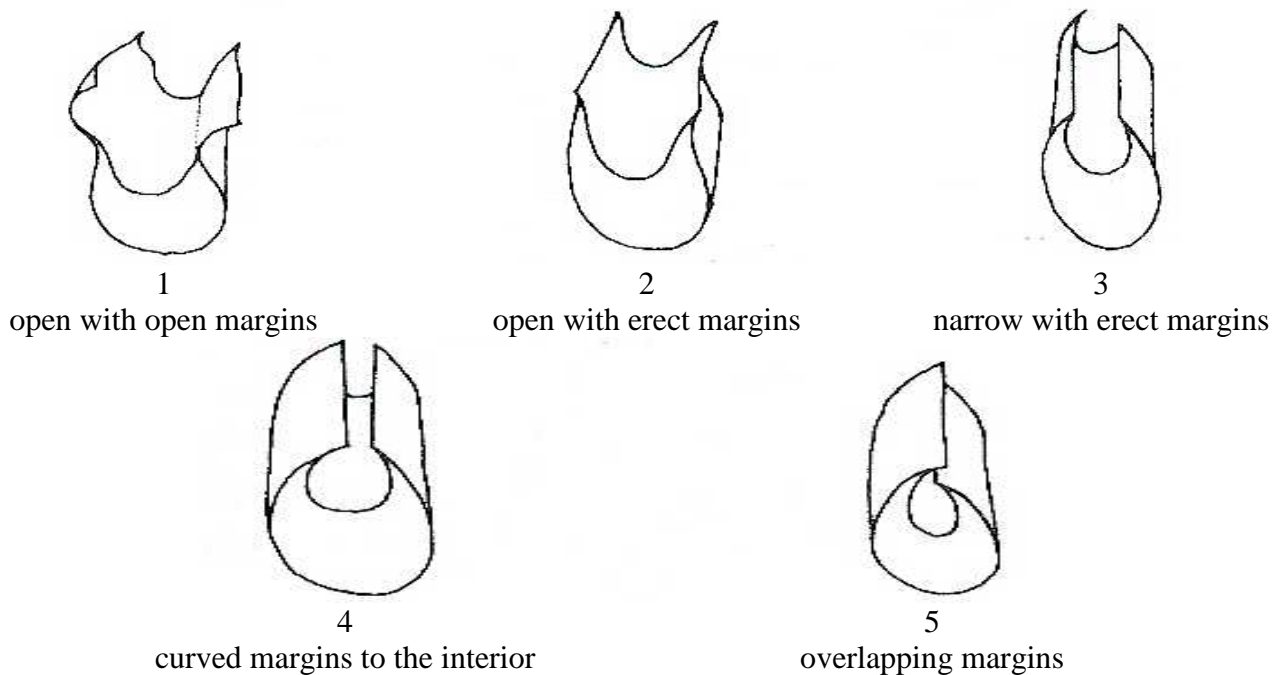
Ad. 4: Pseudostem: length: The length of the pseudostem should be measured from the ground level to the crook of the stalk at the beginning of flowering.

Ad. 5: Pseudostem: diameter: The diameter of the pseudostem should be measured at a height of 30 cm from ground level at the beginning of flowering.

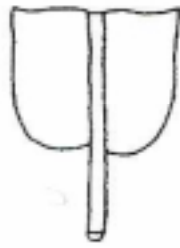
Ad. 11: Leaf: attitude: The leaf attitude should be observed at [harvest time] (TG 123/3, 1989) at the moment of inflorescence emerging of those fruit bunches which were originally marked for observation.



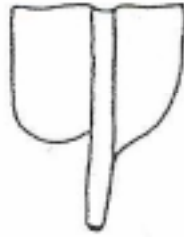
Ad. 12: Leaf: base of petiole



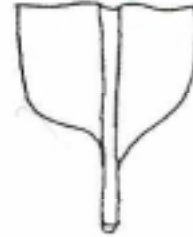
Ad. 17: Leaf: shape of the sides of the blade base



1
both round



2
one round and the other tapering



3
both tapering

Ad. 18: Leaf: wax (iness) intensity at abaxial surface of the of the (lower) blade

EXPLANATION TO BE PROVIDED

Ad. 22: Leaf blade: color of lower side of the young leaf

The color of the leaf blade of lower side of the young leaf should be determined from the first leaf before flowering

Ad. 28: Bunch: length

The length of the fruit bunch should be determined from the attachment of the proximal fruit cluster to that of the distal well developed fruit cluster.

Ad. 29: Bunch: diameter

The diameter of the fruit bunch should be determined at its middle.

Ad. 30: Bunch: ratio length/diameter

EXPLANATION TO BE PROVIDED

Ad. XX: Bunch: length of the internodes between the fruit clusters

The length of the internodes between the fruit clusters on the fruit bunch should be determined between the second, third and fourth cluster from the proximal end of the fruit bunch.] (TG 123/3, 1989).

Ad. 31: Bunch stalk: length

The length of the stalk of the fruit bunch should be determined from the crook of the stalk to the point of attachment of the proximal fruit cluster (hand).

Ad. 35: Bunch: shape

EXPLANATION TO BE PROVIDED

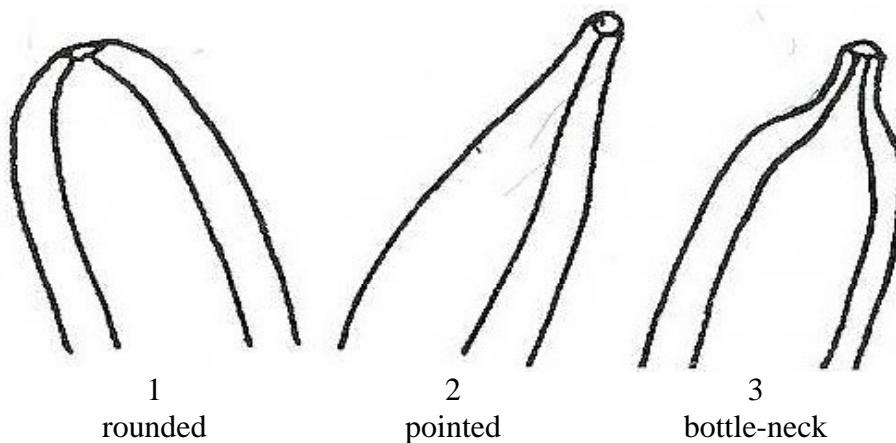
Ad. 43: Bunch: dehiscence of the bracts of the rachis

All observations on the female bract should be made [at the time of flowering] (TG/123/3, 1989) on the third bract from the proximal end of the bunch.

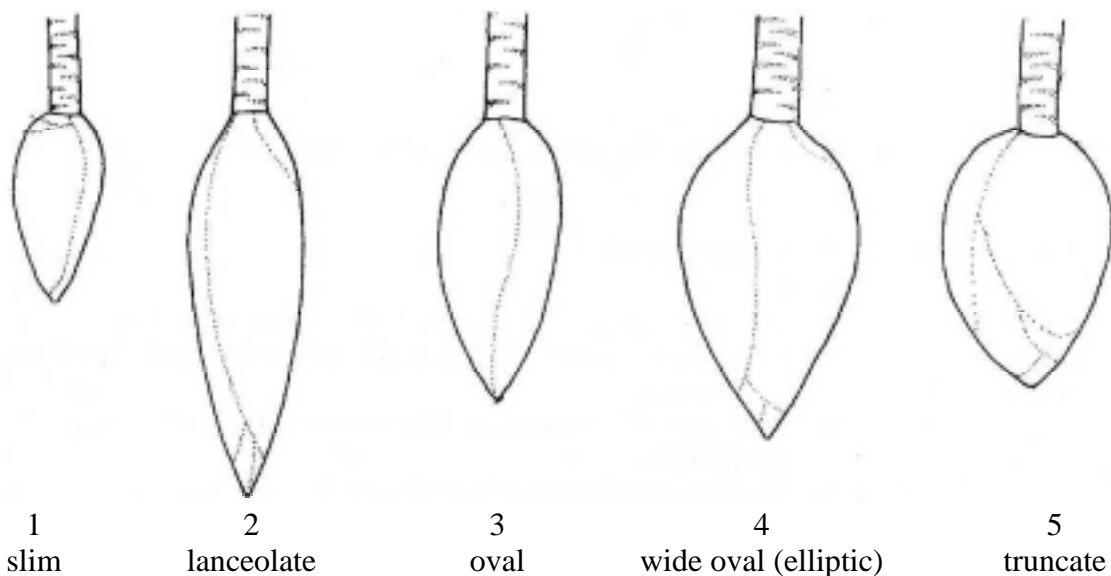
Ad. 48: Fruit: length

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. 51: Fruit: shape of apex.



Ad. 58: Bunch: shape of male bud



Ad. 60: Reaction to yellow Sigatoka (*Mycosphaerella musicola*)

Ad. 61: Reaction to black Sigatoka (*Mycosphaerella figiensis*)

Ad. 62: Reaction to Fusariosis (*Fusarium oxysporium* f. sp. cubense Sn. e Hansen)

EXPLANATION TO BE PROVIDED

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

IPGRI

10. Technical Questionnaire

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
		Application date: (not to be filled in by the applicant)
TECHNICAL QUESTIONNAIRE to be completed in connection with an application for plant breeders' rights		
1. Subject of the Technical Questionnaire		
1.1 Botanical name	<input type="text" value="Musa spp.*"/>	
1.2 Common name	<input type="text" value="BANANA"/>	
2. Applicant		
Name	<input type="text"/>	
Address	<input type="text"/>	
Telephone No.	<input type="text"/>	
Fax No.	<input type="text"/>	
E-mail address	<input type="text"/>	
Breeder (if different from applicant)	<input type="text"/>	
3. Proposed denomination and breeder's reference		
Proposed denomination (if available)	<input type="text"/>	
Breeder's reference	<input type="text"/>	

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

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 Bunch: ratio length/diameter (30)		
small	D'Angola	3[]
medium	Prata	5[]
large	Grande Naine	7[]

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:
-------------------------	-----------------	-------------------

	Characteristics	Example Varieties	Note
5.2	Fruit: shape of apex		
(51)			
	rounded	Prata Ponta Aparada, Ouro	1[]
	pointed	Terra	2[]
	bottle-neck	Prata	3[]
5.3	Fruit: color of skin		
(53)			
	green	São Tomé	1[]
	pale yellow	Cavendish	2[]
	weak yellow	Maça	3[]
	medium yellow	Prata comum	4[]
	dark yellow	Ouro	5[]
	reddish	Caru Roxa	6[]
	brown		7[]

6. Similar varieties and differences from these varieties

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

Denomination(s) of variety(ies) similar to your candidate variety	Characteristic(s) in which your candidate variety differs from the similar variety(ies)	Describe the expression of the characteristic(s) for the similar variety(ies)	Describe the expression of the characteristic(s) for your candidate variety
<i>Example</i>			
<i>(example to be inserted) (example to be inserted)</i>			

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 Special conditions for the examination of the variety

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

Yes [] No []

7.2.2 If yes, please give 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.

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]