

UPOV

TG/264/2(proj.4)
ORIGINAL: English
DATE: 2012-06-18

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

DRAFT

PAPAYA

UPOV Code: CARIC_PAP

Carica papaya L.

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by an expert from Mexico

to be considered by the

*Technical Working Party for Fruit Crops at its forty-third session,
to be held in Beijing, from July 30 to August 3, 2012*

Alternative Names:^{*}

<i>Botanical name</i>	<i>English</i>	<i>French</i>	<i>German</i>	<i>Spanish</i>
<i>Carica papaya</i> L.	Papaya, Papaw	Papayer	Melonenbaum, Papaya	Papayo, Lechosa, Fruta bomba

The purpose of these guidelines ("Test Guidelines") is to elaborate the principles contained in the General Introduction (document TG/1/3), and its associated TGP documents, into detailed practical guidance for the harmonized examination of distinctness, uniformity and stability (DUS) and, in particular, to identify appropriate characteristics for the examination of DUS and production of harmonized variety descriptions.

ASSOCIATED DOCUMENTS

These Test Guidelines should be read in conjunction with the General Introduction and its associated TGP documents.

^{*} These names were correct at the time of the introduction of these Test Guidelines but may be revised or updated. [Readers are advised to consult the UPOV Code, which can be found on the UPOV Website (www.upov.int), for the latest information.]

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1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Carica papaya* L..

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 seeds or plants.

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

200 seeds in the case of seed-propagated varieties,
or 5 plants in the case of vegetatively propagated varieties.

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*

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

3.1.2 The growing cycle is considered to be the period ranging from the beginning of active vegetative growth or flowering, continuing through active vegetative growth or flowering and fruit development and concluding with the harvesting of fruit.

3.2 *Testing Place*

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

3.3 *Conditions for Conducting the Examination*

The tests should be carried out under conditions ensuring satisfactory growth for the expression of the relevant characteristics of the variety and for the conduct of the examination. In particular, it is essential that the trees produce a satisfactory crop of fruit in each of the two growing cycles.

3.4 *Test Design*

3.4.1 Each test should be designed to result in a total of at least 20 plants in the case of seed-propagated plants or, in the case of vegetatively propagated varieties, in a total of at least 5 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 *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.

Further guidance is provided in documents TGP/9 “Examining Distinctness” and TGP/8 “Trial Design and Techniques Used in the Examination of Distinctness, Uniformity and Stability”.

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.

4.1.4 Number of Plants / Parts of Plants to be Examined

Unless otherwise indicated, for the purpose of distinctness, all observations on single plants should be made on 20 plants or parts taken from each of 20 plants in the case of seed-propagated varieties disregarding any off-type plants. In the case of vegetatively propagated varieties all observations on single plants should be made on 5 plants or parts taken from each of 5 plants.

4.1.5 Method of Observation

The recommended method of observing the characteristic for the purposes of distinctness is indicated by the following key in the second column of the Table of Characteristics (see document TGP/9 “Examining Distinctness”, Section 4 “Observation of characteristics”):

MG: single measurement of a group of plants or parts of plants

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

VG: visual assessment by a single observation of a group of plants or parts of plants

VS: visual assessment by observation of individual plants or parts of plants

Type of observation: visual (V) or measurement (M)

“Visual” observation (V) is an observation made on the basis of the expert’s judgment. For the purposes of this document, “visual” observation refers to the sensory observations of the experts and, therefore, also includes smell, taste and touch. Visual observation includes observations where the expert uses reference points (e.g. diagrams, example varieties, side-by-side comparison) or non-linear charts (e.g. color charts). Measurement (M) is an objective observation against a calibrated, linear scale e.g. using a ruler, weighing scales, colorimeter, dates, counts, etc.

Type of record: for a group of plants (G) or for single, individual plants (S)

For the purposes of distinctness, observations may be recorded as a single record for a group of plants or parts of plants (G), or may be recorded as records for a number of single, individual plants or parts of plants (S). In most cases, “G” provides a single record per variety and it is not

possible or necessary to apply statistical methods in a plant-by-plant analysis for the assessment of distinctness.

In cases where more than one method of observing the characteristic is indicated in the Table of Characteristics (e.g. VG/MG), guidance on selecting an appropriate method is provided in document TGP/9, Section 4.2.

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 Vegetatively propagated varieties: for the assessment of uniformity of vegetatively propagated varieties, a population standard of 1% and an acceptance probability of 95% should be applied. In the case of a sample size of 5 plants, no off-type is allowed.

4.2.3 Seed-propagated varieties: the assessment of uniformity for seed-propagated varieties should be according to the recommendations for cross-pollinated varieties in the General Introduction.

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 further examined by testing a new seed or plant stock to ensure that it exhibits the same characteristics as those shown by the initial 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:

- (a) Plant: height of attachment of first inflorescence or flower (characteristic 2)
- (b) Leaf blade: ratio length/width (characteristic 9)
- (c) Fruit: ratio length/diameter (characteristic 27)
- (d) Fruit: shape (characteristic 28)

5.4 Guidance for the use of grouping characteristics, in the process of examining distinctness, is provided through the General Introduction and document TGP/9 "Examining Distinctness".

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

6.2.1 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.

6.2.2 In the case of qualitative and pseudo-qualitative characteristics (see Chapter 6.3), all relevant states of expression are presented in the characteristic. However, in the case of quantitative characteristics with 5 or more states, an abbreviated scale may be used to minimize the size of the Table of Characteristics. For example, in the case of a quantitative characteristic with 9 states, the presentation of states of expression in the Test Guidelines may be abbreviated as follows:

State	Note
small	3
medium	5
large	7

However, it should be noted that all of the following 9 states of expression exist to describe varieties and should be used as appropriate:

State	Note
very small	1
very small to small	2
small	3
small to medium	4
medium	5
medium to large	6
large	7
large to very large	8
very large	9

6.2.3 Further explanation of the presentation of states of expression and notes is provided in document TGP/7 "Development of Test Guidelines".

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

- MG, MS, VG, VS – see Chapter 4.1.5

- (a)-(e) 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. VG (+)	Young plant: color of stem	Jeune plante : couleur de la tige	Junge Pflanze: Farbe des Triebs	Planta joven: color del tallo		
PQ	only green	seulement verte	nur grün	sólo verde	Ishigaki Sango	1
	yellowish green	vert jaunâtre	gelblich grün	verde amarillento	Tainung N° 1	2
	brown	brune	braun	marrón	Tangkai hitam	3
	green and purple	verte et pourpre	grün und purpurn	verde y púrpura	Sunrise	4
	only purple	seulement pourpre	nur purpurn	sólo púrpura		5
2. VG/MS (*) (+)	Plant: height of attachment of first inflorescence or flower	Plante: hauteur de l'attache de la première inflorescence ou fleur	Pflanze: Höhe der Ansatzstelle des ersten Blütenstandes oder der ersten Blüte	Planta: altura de la inserción de la primera inflorescencia		
QN (a)	low	basse	niedrig	baja	Ishigaki Sango	3
	medium	moyenne	mittel	media	Sunrise, Tainung N° 1	5
	high	haute	hoch	alta	Cera, Dampit, Simangko	7
3. VG (*) (+)	Plant: branching	Plante: ramification	Pflanze: Verzweigung	Planta: ramificación		
QL	absent	absente	fehlend	ausente	Ishigaki Sango, Maradol, Sunrise	1
	present	présente	vorhanden	presente		9
4. VG/MS (*) (+)	Stem: diameter	Tige : diamètre	Stängel: Durchmesser	Tallo: diámetro		
QN (a)	small	petit	klein	pequeño		3
	medium	moyen	mittel	medio	Ishigaki Sango, Sunrise, Tainung N° 1	5
	large	large	groß	grande	Klangdong	7
5. VG/MS (*) (+)	Stem: number of nodes	Tige : nombre de nœuds	Stängel: Anzahl Knoten	Tallo: número de nudos		
QN (a)	few	petit	gering	bajo	Ishigaki Sango	3
	medium	moyen	mittel	medio	Sunrise, Tainung N° 1	5
	many	grand	groß	alto	Simangko	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota	
6.	VG/ MS	Stem: length of internode	Tige : longueur de l'entreœud	Stängel: Länge der Internodien	Tallo: longitud del entrenudo		
(*)							
(+)							
QN	(a)	short	courte	kurz	corto	Ishigaki Sango	3
		medium	moyenne	mittel	medio	Sunrise, Tainung N° 1	5
		long	longue	lang	largo	Simangko	7
7.	VG/ MS	Leaf blade: length	Limbe : longueur	Blattspreite: Länge	Limbo: longitud		
(*)							
(+)							
QN	(b)	short	court	kurz	corta	BT-K, Eksotika	3
		medium	moyen	mittel	media	Ishigaki Sango, Sunrise, Tainung N° 1	5
		long	long	lang	larga	Dampit	7
8.	VG/ MS	Leaf blade: width	Limbe : largeur	Blattspreite: Breite	Limbo: anchura		
(*)							
(+)							
QN	(b)	narrow	étroit	schmal	estrecha	BT-K	3
		medium	moyen	mittel	media	Sunrise, Tainung N° 1	5
		broad	large	breit	amplia	Dampit	7
9.	VG/ MS	Leaf blade: ratio length/width	Limbe : rapport longueur/largeur	Blattspreite: Verhältnis Länge/Breite	Limbo: relación longitud/anchura		
(*)							
(+)							
QN	(b)	very elongated	très allongé	sehr langgezogen	muy alargado	Johor	1
		moderately elongated	modérément allongé	mäßig langgezogen	moderadamente alargado	Ishigaki Sango, Sunrise, Tainung N° 1	2
		slightly elongated	légèrement allongé	leicht langgezogen	ligeramente alargado	Golden	3
10.	VG	Leaf blade: presence of tertiary lobes	Limbe : présence de lobes tertiaires	Blattspreite: Vorhandensein von Lappen dritter Ordnung	Limbo: presencia de lóbulos terciarios		
(*)							
(+)							
QL	(b)	absent	absents	fehlend	ausencia		1
		present	présents	vorhanden	presencia	Ishigaki Sango, Sunrise, Tainung N° 1	9
11.	VG	Leaf: presence of flag leaflet	Feuille : présence d'une dernière foliole	Blatt: Vorhandensein eines Fahnenfiederblattes	Hoja: presencia de folíolos		
(*)							
(+)							
QL		absent	absente	fehlend	ausentes	Cera, Maradol, Sunrise	1
		present	présente	vorhanden	presentes	Callina, Plugmailai, Sekaki	9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota	
12.	VG	Leaf blade: pubescence on lower side	Limbe : pubescence sur la face inférieure	Blattspreite: Behaarung der Unterseite	Limbo: pubescencia en el envés		
(+)							
QL	(b)	absent	absente	fehlend	ausente	Ishigaki Sango, Sunrise, Tainung N° 1	1
		present	présente	vorhanden	presente		9
13.	VG/ MS	Petiole: length	Pétiole : longueur	Blattstiel: Länge	Pecíolo: longitud		
QN	(b)	short	court	kurz	bajo	BT-K	3
		medium	moyen	mittel	medio	Ishigaki Sango, Sunrise, Tainung N° 1	5
		long	long	lang	alto	Dampit	7
14.	VG	Petiole: anthocyanin coloration	Pétiole : pigmentation anthocyanique	Blattstiel: Anthocyanfärbung	Pecíolo: coloración antocianica		
QN	(b)	absent or very weak	absente ou très faible	fehlend oder sehr schwach	corta	Ishigaki Sango	1
		medium	moyenne	mittel	media	Sunrise, Tainung N° 1	3
		very strong	très forte	sehr stark	larga		5
15.	MG	Time of flowering	Époque de floraison	Blütezeit	Época de floración		
QN	(a)	early	précoce	früh	temparana	Arum, Carisya, Sinta	3
		medium	moyenne	mittel	media	Callina, Sunrise	5
		late	tardive	spät	tardía	Cavite Special, Wulung	7
16.	VG	Inflorescence: number of flowers	Inflorescence : nombre de fleurs	Blütenstand: Anzahl der Blüten	Inflorescencia: número de flores		
QN	(c)	few	petit	wenige	escasass	Ishigaki Sango	3
		medium	moyen	mittel	media	Eksoitika, Sunrise	5
		many	élevé	viele	abundantes	Tainung N° 1	7
17.	MG	Proportion of male plants	Proportion de plantes mâles	Anteil männlicher Pflanzen	Proporción de plantas masculinas		
(+)							
QN		absent or very low	nulle ou très faible	fehlend oder sehr gering	ausente o muy baja		1
		low	faible	gering	baja		3
		medium	moyenne	mittel	media		5
		high	élevée	hoch	alta		7
		very high	très élevée	sehr hoch	muy alta		9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
18. MG (+)	Proportion of hermaphrodite plants	Proportion de plantes hermaphrodites	Anteil zwittriger Pflanzen	Proporción de plantas hermafroditas		
QN	absent or very low	nulle ou très faible	fehlend oder sehr gering	ausente o muy baja		1
	low	faible	gering	baja		3
	medium	moyenne	mittel	media		5
	high	élevée	hoch	alta		7
	very high	très élevée	sehr hoch	muy alta		9
19. MG (+)	Proportion of female plants	Proportion de plantes femelles	Anteil weiblicher Pflanzen	Proporción de plantas femeninas		
QN	absent or very low	nulle ou très faible	fehlend oder sehr gering	ausente o muy baja		1
	low	faible	gering	baja		3
	medium	moyenne	mittel	media		5
	high	élevée	hoch	alta		7
	very high	très élevée	sehr hoch	muy alta		9
20. VG/ MS	Inflorescence: length of main axis	Inflorescence : longueur de l'axe central	Blütenstand: Länge der Hauptachse	Inflorescencia: longitud del eje central		
QN (c)	short	court	kurz	corta	Ishigaki Sango, Sunrise	3
	medium	moyen	mittel	media	BT-1	5
	long	long	lang	larga	Dampit	7
21. VG	Inflorescence: anthocyanin coloration of axis	Inflorescence : pigmentation anthocyanique de l'axe	Blütenstand: Anthocyanfärbung der Achse	Inflorescencia: pigmentación antocianica del eje		
QN (c)	absent or weak	absente ou faible	fehlend oder schwach	ausente o débil	Ishigaki Sango, Sunrise, Tainung N° 1	1
	medium	moyenne	mittel	media		2
	strong	forte	stark	fuerte	Tangkai hitam	3
22. VG/ MS (+)	Flower: length of corolla	Fleur : longueur de la corolle	Blüte: Länge der Krone	Flor: longitud de la corola		
QN	short	courte	kurz	corta	BT-3	3
	medium	moyenne	mittel	media	BT-1	5
	long	longue	lang	larga	Dampit	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
23. VG (+)	Flower: color of corolla	Fleur : couleur de la corolle	Blüte: Farbe der Krone	Flor: color de la corola		
PQ	white	blanche	weiß	blanca	Morib	1
	cream	crème	cremefarben	crema	Eksotika, Sunrise	2
	yellow	jaune	gelb	amarilla		3
	green	verte	grün	verde		4
	purple	pourpre	purpurn	púrpura	Sabah Yellow	5
24. VG/MS (*)	Peduncle: length	Pédoncule : longueur	Stiel: Länge	Pedúnculo: longitud		
QN (d)	short	court	kurz	corta	Ishigaki Sango, Sunrise	3
	medium	moyen	mittel	media	Sekaki	5
	long	long	lang	larga	Dampit, Semangko	7
25. VG/MS (*)	Fruit: length	Fruit : longueur	Frucht: Länge	Fruto: longitud		
QN (d)	short	petit	kurz	corta	Du Roi Solo, Sunrise	3
	medium	moyen	mittel	media	Ishigaki Sango	5
	long	long	lang	larga	Cera	7
26. VG/MS (*)	Fruit: diameter	Fruit : diamètre	Frucht: Durchmesser	Fruto: diámetro		
QN (d)	small	petit	klein	pequeño	Du Roi Solo, Sunrise	3
	medium	moyen	mittel	medio	Ishigaki Sango	5
	large	large	groß	grande	Cera	7
27. VG/MS (*)	Fruit: ratio length/diameter	Fruit : rapport longueur/diamètre	Frucht: Verhältnis Länge/Durchmesser	Fruto: relación longitud/diámetro		
QN (d)	very elongated	très allongé	sehr langgezogen	muy alargado	Cera, Dampit	3
	moderately elongated	modérément allongé	mäßig langgezogen	moderadamente alargado	Ishigaki Sango, Sekaki	5
	slightly elongated	légèrement allongé	leicht langgezogen	ligeramente alargado	Eksotika, Sunrise	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
28.	VG Fruit: shape	Fruit : forme	Frucht: Form	Fruto: forma		
(*)						
(+)						
PQ	(d) ovate	ovale	eiförmig	oval	Cariflora	1
	elliptic	elliptique	elliptisch	elíptico	Eksitika, Ishigaki Sango	2
	obovate	obovale	verkehrt eiförmig	oboval	Du Roi Solo, Red Lady	3
	pyriform	pyriforme	birnenförmig	piriforme	Kapoho, Rainbow	4
	oblong	oblong	rechteckig	oblongo	Amarela, Sekaki	5
	obovate waisted	obovale étranglée	verkehrt eiförmig tailliert	oboval entallado	BT-1	6
29.	VG Fruit: shape of stalk end	Fruit : forme de l'extrémité pédonculaire	Frucht: Form des Stielendes	Fruto: forma del extremo peduncular		
(+)						
PQ	(d) pointed	pointue	spitz	en punta	BT-1	1
	rounded	arrondie	abgerundet	redondeado	Simangko	2
	truncate	tronquée	stumpf	truncado	Sunrise	3
	depressed	déprimée	ingesunken	deprimido	Du Roi Solo, Ishigaki Sango	4
30.	VG Fruit: shape at distal end	Fruit : forme à l'extrémité distale	Frucht: Form am distalen Ende	Fruto: forma en el extremo distal		
QN	(d) rounded	arrondi	abgerundet	redondeado	Tainung N° 1	1
	weakly pointed	pointu	leicht spitz	ligeramente puntiagudo	Ishigaki Sango, Sunrise	2
	strongly pointed	fortement pointu	stark spitz	muy puntiagudo	Du Roi Solo	3
31.	VG Fruit: main color	Fruit : couleur principale	Frucht: Hauptfarbe	Fruto: color principal		
(*)						
PQ	(e) green	verte	grün	verde	Sari Gading	1
	yellow green	vert jaune	gelbgrün	verde amarillento	BT-K, Sabah Yellow	2
	yellow	jaune	gelb	amarillo	Amarela, Kapoho, Tainung N° 1	3
	medium orange	orange moyen	mittelorange	anaranjado medio	Ishigaki Sango, Maradol, Mulata	4
	dark orange	orange foncé	dunkelorange	anaranjado oscuro	Dampit, Mamey	5

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
32.	VG Fruit: ridges	Fruit : cannelures	Frucht: Rippen	Fruto: aristas		
	(+)					
QN	(e) absent or very weak	absentes ou très faibles	fehlend oder sehr schwach	ausentes o muy débiles	Ishigaki Sango, Tainung N° 1	1
	weak	faibles	schwach	débiles	BT-4	2
	moderate	modérées	mittel	moderadas	Simangko	3
	strong	fortes	stark	fuertes	Dampit	4
33.	VG Fruit: surface	Fruit : surface	Frucht: Oberfläche	Fruto: superficie		
QN	(e) smooth	lisse	glatt	lisa	Callina, Paris	1
	medium	moyenne	mittel	media	Carisya	2
	rough	rugueuse	rauh	rugosa	Sukma	3
34.	VG Fruit: thickness of skin	Fruit : épaisseur de l'épiderme	Frucht: Dicke der Schale	Fruto: grosor de la piel		
	(*)					
	(+)					
QN	(e) thin	mince	dünn	delgada	BT-3	1
	medium	moyenne	mittel	media	Ekstotika, Sunrise	2
	thick	épaisse	dick	gruesa	Dampit, Tainung N° 1	3
35.	VG Fruit: color of flesh	Fruit : couleur de la chair	Frucht: Fleischfarbe	Fruto: color de la pulpa		
	(*)					
PQ	(e) yellow	jaune	gelb	amarillo	Amarela, Cera, Kapoho	1
	orange	orange	orange	anaranjado	Sunrise, Tainung N 1	2
	red orange	rouge orangé	rotorange	anaranjado rojizo	Ishigaki Sango, Maradol	3
36.	VG Fruit: firmness of flesh	Fruit : fermeté de la chair	Frucht: Festigkeit des Fleisches	Fruto: firmeza de la pulpa		
QN	(e) soft	molle	weich	blanda	Cera, Mamey	3
	medium	moyenne	mittel	media	Maradol	5
	firm	ferme	fest	firme	Sekaki, Sunrise	7
37.	MS Fruit: sweetness of flesh	Fruit : goût sucré de la chair	Frucht: Süße des Fleisches	Fruto: dulzura de la pulpa		
	(+)					
QN	(e) low	faible	niedrig	baja	Cera, Sari Gading	3
	medium	moyen	mittel	media	Maradol, Tainung N° 1	5
	high	fort	hoch	alta	Ishigaki Sango, Sunrise	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota	
38.	VG	Fruit: aroma of flesh	Fruit : arôme de la chair	Frucht: Aroma des Fleisches	Fruto: aroma de la pulpa		
QN	(e)	weak	faible	schwach	débil	Callina, Sekaki	1
		moderate	modéré	mittel	moderado	Ishigaki Sango, Sunrise	2
		strong	fort	stark	fuerte	Eksotika	3
39.	VG	Fruit: abundance of placental tissue	Fruit : abondance de tissu placentaire	Frucht: Menge des plazentalen Gewebes	Fruto: abundancia de tejido placentario		
QN	(e)	scarce	rare	gering	escaso	BT-1, Mamey	3
		moderate	moyen	mittel	moderado	Eksotika, Sunrise	5
		abundant	abondant	groß	abundante	BT-3, Cera	7
40.	VG/ MS (+)	Fruit: width of central cavity	Fruit : largeur de la cavité centrale	Frucht: Breite der zentralen Höhlung	Fruto: anchura de la cavidad central		
QN	(e)	narrow	étroite	eng	estrecha	Sekaki, Sunrise	3
		medium	moyenne	mittel	media	Ishigaki Sango, Tainung N° 1	5
		broad	large	breit	amplia	Dampit, Semangko	7
41	VG (* (+)	Fruit: shape of central cavity	Fruit : forme de la cavité centrale	Frucht: Form der zentralen Höhlung	Fruto: forma de la cavidad central		
PQ	(e)	circular	circulaire	rund	circular	Niensee	1
		angular	angulaire	winklig	angular	BT-K, Tainung N° 1	2
		star-shaped	en forme d'étoile	sternförmig	forma de estrella	Du Roi Solo, Ishigaki Sango, Sunrise	3
		stellate	étoilée	sternförmig	estrellada	BT-2	4
		irregular	irrégulière	unregelmäßig	irregular	Simangko	5
42.	VG/ MS (* (+)	Fruit: number of seeds	Fruit : nombre de graines	Frucht: Anzahl Samen	Fruto: número de semillas		
QN	(d)	absent or very few	nul ou très faible	fehlend oder sehr wenige	ninguna o muy pocas	Ishigaki Sango	1
		few	petit	wenige	pocas	Du Roi Solo	3
		medium	moyen	mittel	medio		5
		many	grand	viele	numerosas	Sunrise	7
		very many	très grand	sehr viele	muy numerosas	Cera, Tainung N° 1	9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
43. VG	Seed: color	Graine : couleur	Samen: Farbe	Semilla: color		
PQ	(d) grey yellow	jaune gris	graugelb	amarillo grisáceo	BT-K	1
	grey	grise	grau	gris	Dampit	2
	medium brown	brun moyen	mittelbraun	marrón medio	Ekstotika	3
	dark brown	brun foncé	dunkelbraun	marrón oscuro	BT-1, Sekaki	4
	black	noire	schwarz	negro	Maradol, Morib	5
44. VG/MS	Seed: length	Graine : longueur	Samen: Länge	Semilla: longitud		
QN	(d) short	courte	kurz	corta	BT-K	3
	medium	moyenne	mittel	media	BT-1	5
	long	longue	lang	larga	Cera, Dampit	7
45. VG/MS	Seed: width	Graine : largeur	Samen: Breite	Semilla: anchura		
QN	(d) narrow	étroite	schmal	estrecha	BT-2	3
	medium	moyenne	mittel	media	Sunrise, Tainung N 1	5
	broad	large	breit	amplia	Dampit	7
46. VG/MS	Seed: ratio length/width	Graine : rapport longueur/largeur	Samen: Verhältnis Länge/Breite	Semilla: relación longitud/anchura		
QN	(d) elongated	allongé	langgezogen	alargada		1
	circular	circulaire	kreisförmig	circular	Sunrise, Tainung N° 1	2
	compressed	comprimé	zusammengedrückt	comprimida	BT-1	3
47. VG (+)	Seed: position of broadest part	Graine : position de la partie la plus large	Samen: Position der breitesten Stelle	Semilla: posición de la parte más ancha		
QN	(d) at middle	au milieu	in der Mitte	en el medio	Sunrise	1
	slightly towards base	légèrement vers la base	leicht zur Basis hin	ligeramente hacia la base	Tainung N° 1	2
	strongly towards base	nettement vers la base	stark zur Basis hin	claramente hacia la base		3
48. VG	Seed: amount of mucilage	Graine : quantité de mucilage	Samen: Menge Schleim	Semilla: cantidad de mucilago		
QN	(d) small	petite	gering	pequeña	BT-3	1
	moderate	modérée	mittel	moderada	Sunrise, Tainung N 1	2
	large	grande	groß	grande	BT-3Cera	3

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:

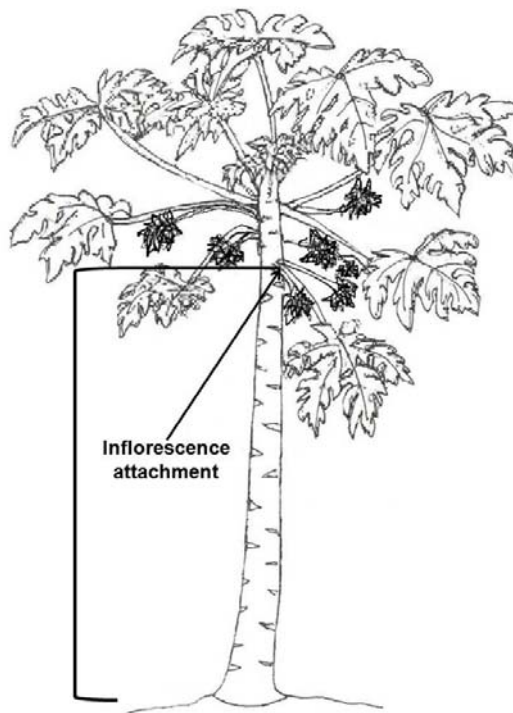
- (a) Plant and stem: Observations on the plant and stem should be made when the first inflorescence or single flower has appeared.
- (b) Leaf blade and petiole: Observations on the leaf blade and petiole should be made on mature leaves. Leaves should be taken from the middle third of the current season's growth when the first inflorescence or single flower fruit has appeared.
- (c) Inflorescence: Observations on inflorescence should be taken after the fourth one has appeared, when it has reached its full length. Single flowers should be excluded from all observations. In seed-propagated varieties observations must be made only on hermaphrodite or female plants, according to the type of variety that will be tested.
- (d) Peduncle, fruit and seed: Observations on the peduncle, fruit and seed should be made on 5 typical fruits, taken from the middle part of the fruiting region at the time of harvest maturity. Seed characteristics should only be observed on fully-developed seeds. In seed-propagated varieties observations must be made only on the type of variety that will be tested: hermaphrodite or female plants.
- (e) Ripe fruit: Observations on the ripe fruit should be made when the color change is complete

8.2 *Explanations for individual characteristics*

Ad. 1: Young plant: color of stem

In the case of seed propagated varieties, the color of stem should be observed when the first node is formed. In the case of vegetatively propagated varieties, the color of stem should be observed when the first node is formed of new growth.

Ad. 2: Plant: height of attachment of first inflorescence or flower



Ad. 3: Plant: branching

The branching should be observed at the beginning of flowering.

Ad. 4: Stem: diameter

The diameter should be observed half-way up the stem, at the beginning of flowering.

Ad. 5: Stem: number of nodes

The number of nodes should be observed from the ground up to the first flower.

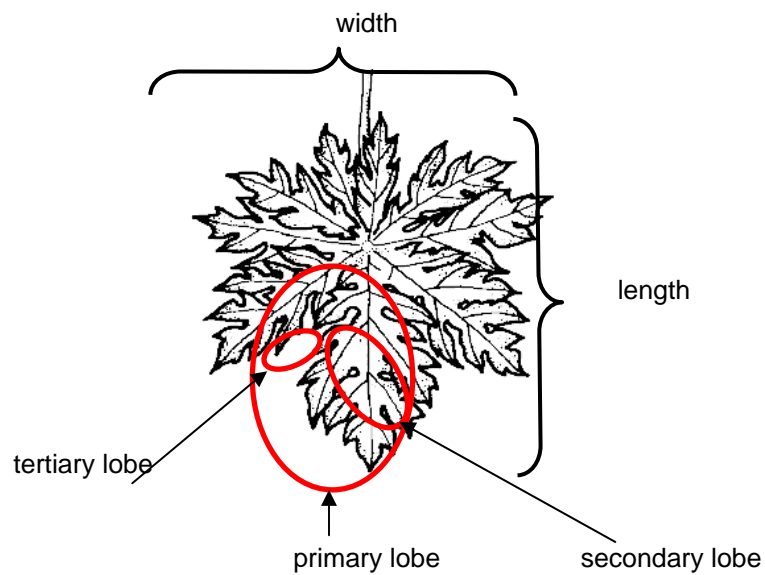
Ad. 6: Stem: length of internode

The length of internode should be observed midway between the ground and the first inflorescence.

Ad. 7: Leaf blade: length

Ad. 8: Leaf blade: width

Ad. 10: Leaf blade: presence of tertiary lobes



Ad. 11: Leaf: presence of flag leaflet



1
absent



9
present

Ad. 12: Leaf blade: pubescence on lower side

Observations on pubescence should be made with the aid of a magnifying glass.

Ad. 17: Proportion of male plants

Ad. 18: Proportion of hermaphrodite plants

Ad. 19: Proportion of female plants

The observations on proportion of male, hermaphrodite and female, must be observed when the plant is in full bloom, only in seed-propagated varieties.

Male, hermaphrodite, female plants	Note	Approximate percentage
absent or very low	1	< 10%
	2	11 to 20%
low	3	21 to 30%
	4	31 to 40%
medium	5	41 to 50%
	6	51 to 60%
high	7	61 to 70%
	8	71 to 80%
very high	9	> 90%







Ad. 22: Flower: length of corolla

This characteristic only applies to hermaphrodite or female varieties. Observations on flower length should be made during the first flower opening, at the start of anther dehiscence in hermaphrodite varieties, and in the case of female varieties at midday.

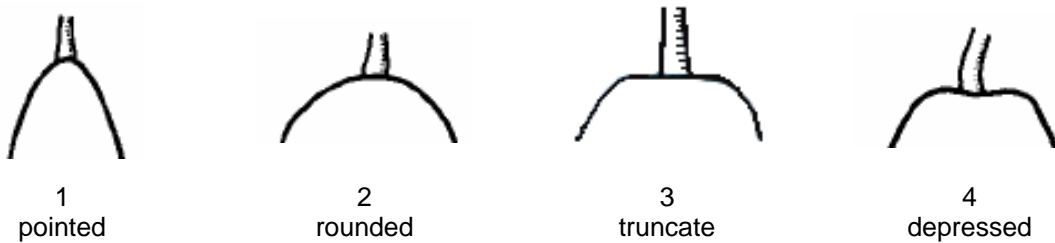
Ad. 23: Flower: color of corolla

This characteristic applies to all types of plants, regardless of the sex. Observations on flower color should be made during the first flower opening

Ad. 28: Fruit: shape

		< broadest part >		
		(below middle)	at middle	(above middle)
< lateral outline >	flat parallel sides		 5 oblong	
	rounded	 1 ovate	 2 elliptic	 3 obovate
	rounded with neck			 4 pyriform
	Rounded with central constriction			 6 obovate waisted

Ad. 29: Fruit: shape of stalk end

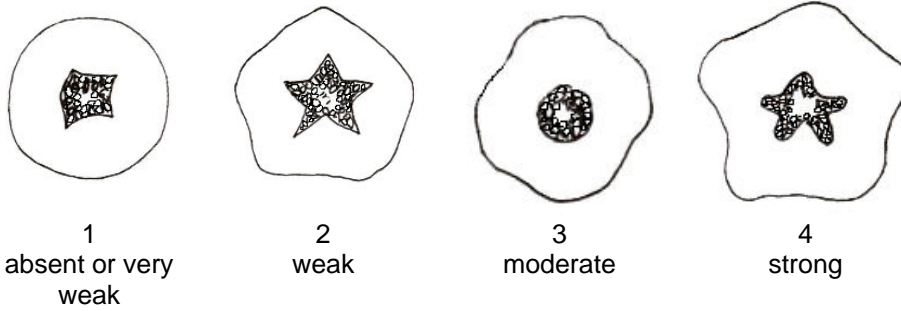


Ad. 32: Fruit: ridges

To be observed in transverse section.

Ad. 34: Fruit: thickness of skin

The thickness of the skin is observed in transverse section.

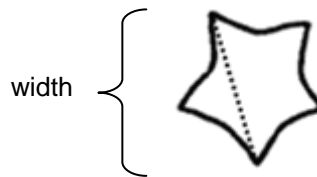


Ad. 37: Fruit: sweetness of flesh

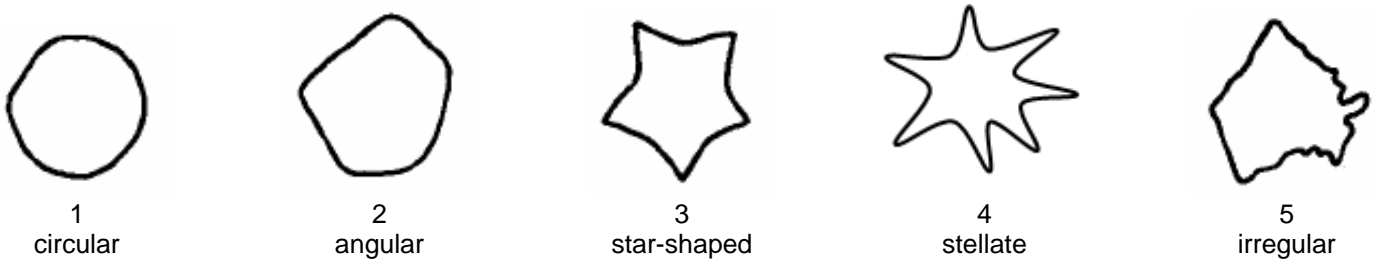
To be measured by refractometer as total soluble solids content.

Ad. 40: Fruit: width of central cavity

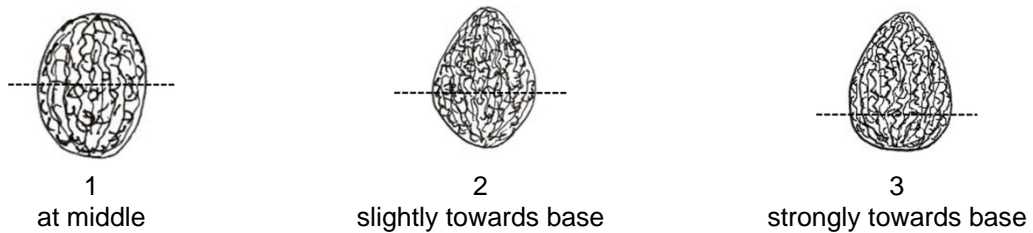
The width of the central cavity should be observed at the broadest part.



Ad. 41: Fruit: shape of central cavity



Ad. 47: Seed: position of broadest part



9. Literature

IBPGR, 1988: Descriptors for Papaya. International Board for Plant Genetic Resources. Rome, IT, 34 pp.

Loyola, J.L.D., Pinto, R.M. de S., Lima, J.F. de, Ferreira, F.R. 2000: Catálogo de germoplasma de mamão (*Carica papaya* L.). Embrapa Mandioca e Fruticultura, Cruz das Almas, Bahia, BR, 40 pp.

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="Carica papaya L."/>	
1.2 Common name	<input type="text" value="Papaya"/>	
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"/>	

#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)

(.....) x (.....)
female parent male parent

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

(.....) x (.....)
female parent male parent

(c) unknown cross []

4.1.2 Mutation []
(please state parent variety)

.....

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

.....

4.1.4 Other []
(please provide details)

.....

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

4.2 Method of propagating the variety

4.2.1 Seed-propagated varieties

(a) Cross-pollination

(b) Hybrid []

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

[]

4.2.1 Vegetative propagation

(a) cuttings []

(b) *in vitro* propagation []

(c) other (state method) []

4.2.3 Other []
(please provide details)"

[]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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5. Characteristics of the variety to be indicated (the number in brackets refers to the corresponding characteristic in Test Guidelines; please mark the note which best corresponds).

Characteristics	Example Varieties	Note
5.1 Plant: height of attachment of first inflorescence or flower (2)		
very low		1[]
very low to low		2[]
low	Ishigaki Sango	3[]
low to medium		4[]
medium	Sunrise, Tainung N° 1	5[]
medium to high		6[]
high	Cera	7[]
high to very high		8[]
very high		9[]
5.2 Leaf blade: ratio length/width (9)		
slightly elongated	Johor	1[]
moderately elongated	Ishigaki Sango, Sunrise, Tainung N° 1	2[]
very elongated	Golden	3[]
5.3 Fruit: ratio length/diameter (27)		
very slightly elongated		1[]
very slightly elongated to slightly elongated		2[]
slightly elongated	Eksoitika, Sunrise	3[]
slightly elongated to moderately elongated		4[]
moderately elongated	Ishigaki Sang, Sekaki	5[]
moderately elongated to very elongated		6[]
very elongated	Cera, Dampit	7[]
very elongated to extremely elongated		8[]
extremely elongated		9[]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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Characteristics	Example Varieties	Note
5.4 Fruit: shape (28)		
ovate	Cariflora	1[]
elliptic	Eksitika, Ishigaki Sango	2[]
obovate	Du Roi Solo, Red Lady	3[]
pyriform	Kapoho, Rainbow	4[]
oblong	Amarela, Sekaki	5[]
obovate waisted	BT-1	6[]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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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>Fruit: shape</i>	<i>ovate</i>	<i>elliptic</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 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 image 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:
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9. Information on plant material to be examined or submitted for examination.

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

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

- | | | |
|---|---------|--------|
| (a) Microorganisms (e.g. virus, bacteria, phytoplasma) | Yes [] | No [] |
| (b) Chemical treatment (e.g. growth retardant, 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

[Annex follows]

ANNEX

OBSERVATIONS AND COMMENTS TO DOCUMENT TG/264/2(PROJ.4)

Comments

In the case of these characteristics:

Char. 17: Proportion of male plants

Char. 18: Proportion of hermaphrodite plants

Char. 19: Proportion of female plants

The TC considered that the number of seedlings to be considered is too low to have good discrimination and probably it will be variation between years will be large.

Brazil proposal

(a) The proportion of female and hermaphrodite plants is totally dependent on environmental conditions, and therefore cannot ensure stability.

(b) So, what we propose is to "delete" the characteristics: 17) proportion of male plants, 18) proportion of hermaphrodite plants and 19) proportion of female plants

[End of Annex and of document]