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Geneva

TECHNICAL COMMITTEE

Forty-Eighth Session
Geneva, March 26 to 28, 2012

DUS EXAMINATION OF SEED-PROPAGATED VARIETIES OF PAPAYA

Document prepared by the Office of the Union
(containing proposal prepared by an expert from Mexico)

1. The purpose of this document is to consider a proposal by the Leading Expert for the Test Guidelines for Papaya, Mr. Alejandro Barrientos-Priego (Mexico), for the DUS examination of seed-propagated varieties of Papaya, with a view to revising the Test Guidelines for Papaya to include seed-propagated varieties.

2. The following abbreviations are used in this document:

CAJ:	Administrative and Legal Committee
TC:	Technical Committee
TC-EDC:	Enlarged Editorial Committee
TWA:	Technical Working Party for Agricultural Crops
TWC:	Technical Working Party on Automation and Computer Programs
TWF:	Technical Working Party for Fruit Crops
TWO:	Technical Working Party for Ornamental Plants and Forest Trees
TWV:	Technical Working Party for Vegetables
TWPs:	Technical Working Parties

3. The structure of the document is as follows:

CONSIDERATION OF THE TEST GUIDELINES FOR PAPAYA BY THE TECHNICAL COMMITTEE IN 2010

4. At its forty-sixth session held in Geneva from March 22 to 24, 2010, the TC considered document TG/PAPAYA(proj.6), which covers all varieties of *Carica papaya* L.of the family *Caricaceae.*

5. The TC agreed to amend Chapter 1 to read "These Test Guidelines apply to vegetatively propagated varieties of *Carica papaya* L." and to make the necessary amendments in Chapters 2, 3, 4 and TQ 4. To invite the TC to consider how to address seed-propagated varieties. As explained in paragraph 1, the TC also agreed that the TWPs should be invited to consider how to address the DUS examination of seed-propagated varieties of Papaya on the basis of a document to be prepared by the Leading Expert, Mr. Alejandro Barrientos-Priego (Mexico), and the Office of the Union with a view to revising the Test Guidelines for Papaya to include seed-propagated varieties at the earliest opportunity. It also agreed that the Administrative and Legal Committee (CAJ) should be invited to consider that matter.

BACKGROUND INFORMATION

Situation in other Test Guidelines

6. In their consideration of seed-propagated varieties of papaya, the TWPs were invited to reflect on situations in other Test Guidelines where observations for characteristics are only made on certain plants within a variety. The following examples were provided:

Annex I: Test Guidelines for Hemp (document TG/CAN_SAT(proj.3))[1]

Annex II: Test Guidelines for Carrot (document TG/49/8)

7. At the suggestion of the Technical Working Party for Agricultural Crops (TWA) and the Technical Working Party for Vegetables (TWV), the following examples have also been included in this document:

Annex III: Test Guidelines for Spinach (document TG/55/7)

Annex IV: Test Guidelines for Asparagus (document TG/130/4)

Explanation of seed-propagated varieties of Papaya

8. The Leading Expert for the Test Guidelines for Papaya, Mr. Alejandro Barrientos-Priego (Mexico) provided the following explanation concerning seed-propagated varieties of Papaya:

9. The Technical Working Party for Fruit Crops, at its thirty-sixth session, held in Kôfu, Japan, from September 5 to 9, 2005, considered document TG/PAPAYA(proj.1) and agreed the use of only hermaphrodite plants.

10. The proposal in document TG/PAPAYA(proj.6) was that, for seed-propagated varieties, the description of the variety would be based only on hermaphrodite plants, although protection would be granted for the variety as a whole.

11. In general, there are three sex types in papaya seedlings: male, female and hermaphrodite. Those types cannot be distinguished at the seedling and vegetative stages of growth. In papaya, a selection of the appropriate sex type of the progeny is made for commercial planting because, in general, hermaphrodite plants are grown for fruit, due to their better size and elongated shape. In addition, the use of hermaphrodite plants is essential for seed production.

[1] Annex I contains document TG/CAN_SAT(proj.6), which will be considered for adoption by the TC at its forty-eighth session.

12. Papaya is grown in many countries as an annual crop because of papaya ringspot virus (PRSV), which is not transmitted by seed.

13. The sex homologues are designated as:

M	male
MH	hermaphrodite
m	female

14. All combinations of dominant alleles, such as MM, MHMH and MHM, are lethal to the zygote. This makes all males and hermaphrodites into enforced sex heterozygotes. Twenty-five percent of the seeds in their fruits are non-viable.

15. The genotypes for sex are:

Mm	male
MHm	hermaphrodite
mm	female

Recently, other lethal genes have been detected and the plants are only hermaphrodite.

PROPOSAL BY THE LEADING EXPERT FOR THE DUS EXAMINATION OF SEED-PROPAGATED VARIETIES OF PAPAYA

16. On the basis that the male, hermaphrodite and female plants cannot be distinguished at the vegetative stage, the Leading Expert for the Test Guidelines for Papaya, Mr. Barrientos-Priego (Mexico) proposed that the vegetative characteristics could be recorded on all those types of plants. However, on the basis that the expression of inflorescence and fruit characteristics differs greatly between female and hermaphrodite plants, it is proposed that the observations for inflorescence and fruit characteristics be made only on hermaphrodite plants.

COMMENTS OF THE TECHNICAL WORKING PARTIES IN 2010

Technical Working Party for Agricultural Crops

17. At its thirty-ninth session, held in Osijek, Croatia, from May 24 to 28, 2010, the Technical Working Party for Agricultural Crops (TWA) considered document TWA/39/25 (see document TWA/39/27 “Report”, paragraphs 79 to 81).

18. The TWA agreed with the approach proposed by the Leading Expert for the Test Guidelines for Papaya, as set out in document TWA/39/25, paragraph 11 (paragraph 16 of this document). In that regard, it agreed that, in Chapter 3.4, it would be important to specify the number of plants that would need to be sown in order to achieve 25 hermaphrodite plants. It also agreed that it might be appropriate to consider the addition of a characteristic for the proportion of male plants, female plants and hermaphrodite plants in the variety, if that characteristic would fulfill the requirements for a characteristic set out in the General Introduction.

19. In order to assist other experts in their consideration of the proposal, the TWA agreed that it would be useful to provide information on the method of propagation of varieties of papaya. It was also agreed that reference might be made to the Test Guidelines for Spinach (document TG/55/7) (see Annex IV to this document), with particular regard to the following characteristics:

Proportion of monoecious plants (characteristic 12)
Proportion of female plants (characteristic 13)
Proportion of male plants (characteristic 14)

Technical Working Party for Vegetables

20. The Technical Working Party for Vegetables (TWV), at its forty-fourth session, held in Veliko Tarnovo, Bulgaria, from July 5 to 9, 2010, considered document TWV/44/25 (see document TWV/44/34 “Report”, paragraphs 88 to 90).

21. The TWV noted that the situation in Carrot (Annex II to this document) was not quite the same as that with Papaya, because the characteristic “Plants: proportion of male sterile plants” was examined in a special test and all other characteristics were examined on all plants of the variety. However, it agreed that the situation for Asparagus and Spinach was similar to that for Papaya. In that regard, it noted that all the plants of those varieties were observed and a description was made to cover all plants. The TWV agreed that the approach proposed for Papaya by the Leading Expert, as set out in document TWV/44/25, paragraph 11 (paragraph 16 of this document), might be interesting for crops such as Asparagus and Spinach. The TWV noted that a similar situation existed in varieties of *Matthiola incana*, where there were single- and double-flowered plants within a variety.

22. An expert from the International Seed Federation (ISF) requested clarification on what was protected if only certain plants of a variety were described and wondered whether the female plants in such a seed-propagated Papaya variety could be vegetatively propagated and protected as a new variety. In that regard, it was noted that such a vegetatively propagated variety could probably be considered as a new variety (e.g. on the basis of a characteristic for the proportion of male plants, female plants and hermaphrodite plants in the variety), irrespective of whether all the plants in the seed-propagated variety were described, or only the hermaphrodite plants. The TWV also noted that the vegetative characteristics could be recorded on all plants and it was only the inflorescence and fruit characteristics that were proposed to be observed only on hermaphrodite plants.

Technical Working Party for Ornamental Plants and Forest Trees

23. The TWO, at its forty-third session, held in Cuernavaca, Morelos State, Mexico, from September 20 to 24, 2010, agreed with the approach proposed by the Leading Expert for the Test Guidelines for Papaya, as set out in document TWO/43/27, paragraph 11 (paragraph 16 of this document). It noted that there would be no obstacle to develop additional characteristics for male plants, for example, if that would be useful (see document TWO/43/29 Rev. “Report”, paragraph 88).

Technical Working Party for Fruit Crops

24. The TWF considered document TWF/41/27, as presented by Mr. Alejandro Barrientos-Priego (Mexico). The TWF agreed with the approach proposed by the Leading Expert for the Test Guidelines for Papaya, as set out in document TWF/41/27, paragraph 11 (paragraph 16 of this document) and also agreed with the TWA that, in Chapter 3.4, it would be important to specify the number of plants that would need to be sown in order to achieve 25 hermaphrodite plants. It also agreed with the TWA that it might be appropriate to consider the addition of a characteristic for the proportion of male plants, female plants and hermaphrodite plants in the variety, if that characteristic would fulfill the requirements for a characteristic set out in the General Introduction.. It also noted that there would be no obstacle to develop additional characteristics for male plants and female plants if that would be useful (see document TWF/41/30 Rev. “Report”, paragraphs 60 and 61).

FURTHER PROPOSAL AND COMMENTS BY THE LEADING EXPERT FOR THE DUS EXAMINATION OF SEED-PROPAGATED VARIETIES OF PAPAYA

25. On the basis that the male, hermaphrodite and female plants cannot be distinguished at the vegetative stage, the Leading Expert for the Test Guidelines for Papaya, Mr. Barrientos-Priego (Mexico), proposed that the vegetative characteristics could be recorded on all those types of plants. However, on the basis that the expression of inflorescence and fruit characteristics differs greatly between female and hermaphrodite plants, it was proposed that the observations for inflorescence and fruit characteristics be made only on hermaphrodite plants.

26. At the meeting of the Enlarged Editorial Committee (TC-EDC), held in Geneva on January 6, 2011, Mr. Barrientos-Priego reported that, with regard to the suggestion of the TWA, it was not intended to add a characteristic for the proportion of male plants, female plants and hermaphrodite plants.

CONSIDERATION BY THE TECHNICAL COMMITTEE IN 2011

27. The TC, at its forty-seventh session, held in Geneva from April 4 to 6, 2011, considered document TC/47/15 "DUS Examination of seed-propagated varieties of Papaya" and agreed that a proposed revision of the Test Guidelines should be considered by the TWF at its forty-second session to be held in Hiroshima, Japan, from November 14 to 18, 2011 (see document TC/47/26 "Report on the Conclusions").

CONSIDERATION BY THE ADMINISTRATIVE AND LEGAL COMMITTEE IN 2011

28. The CAJ, at its sixty-second session, held in Geneva on October 18 and 19, 2010, noted that the TC, at its forty-sixth session, held in Geneva from March 22 to 24, 2010, had agreed that the Test Guidelines for Papaya should be adopted on the basis that they would apply to vegetatively propagated varieties. The CAJ noted that the TC had agreed that the TWPs should be invited to consider how to address the DUS examination of seed-propagated varieties of Papaya on the basis of a document to be prepared by the Leading Expert, Mr. Alejandro Barrientos-Priego (Mexico), and the Office of the Union with a view to revising the Test Guidelines for Papaya to include seed-propagated varieties at the earliest opportunity. The CAJ also noted that the TC had further agreed that the CAJ should be invited to consider that matter (see document TC/46/15 "Report on the Conclusions", paragraph 99). The CAJ agreed to consider that matter at its sixty-fourth session to be held in Geneva in October 2011 (see document CAJ/62/8 "Report on the Conclusions", paragraph 25).

29. The CAJ at its sixty-fourth session held in Geneva on October 17, 2011, noted the conclusion of the TC concerning the DUS examination of seed-propagated varieties of Papaya, at its forty-seventh session, held in Geneva from April 4 to 6, 2011, as set out in paragraph 30 of document CAJ/64/10. The CAJ agreed that the matter should be considered further by the CAJ at its sixty-fifth session, on the basis of the conclusions of the TC at its forty-eighth session, in March 2012.

CONSIDERATION BY THE TECHNICAL WORKING PARTY FOR FRUIT CROPS

30. At the forty-second session held in Hiroshima, Japan, from November 14 to 18, 2011, the TWF discussed document TG/264/2(proj.1) draft Test Guidelines for Papaya and agreed that the draft Test Guidelines should be sent to the TC for adoption at its forty-eighth session, to be held in Geneva from March 26 to 28, 2012, on the basis of document TG/264/2(proj.1) and comments of the TWF.

31. The revisions to the Test Guidelines for Papaya (document TG/264/1), agreed by the TWF at the forty-second session, are set out in Annex V.

CONSIDERATION BY THE ENLARGED EDITORIAL COMMITTEE

32. The TC-EDC, at its session held in Geneva, on January 11 and 12, 2012, considered documents TG/264/2(proj.2) and TC-EDC/Jan12/7 "DUS Examination of Seed-Propagated Varieties of Papaya" and noted the progress in the development of the draft of the Test Guidelines. It noted that it would be difficult to assess the proportion of male plants, hermaphrodite plants and female plants (Chars. 17-19) on the basis of the proposed sample sizes: 5 plants and 20 plants. Therefore, the TC-EDC recommended that the draft Test Guidelines for Papaya be referred back to the TWF for further consideration in that regard.

33. The TC is invited to consider the proposed revision of the Test Guidelines for Papaya, as set out in document TG/264/2(proj.3) and summarized in Annex V to this document, in conjunction with the consideration of the TWF and the recommendation of the TC-EDC, as set out in paragraphs 30 to 32 of this document.

[Annexes follow]

ANNEX I

Extract from

TEST GUIDELINES FOR HEMP (DOCUMENT TG/CAN_SAT(PROJ.6))

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

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
11. (*) (+)	**MG**	**Time of male flowering**	**Époque de floraison mâle**	**Zeitpunkt der männlichen Blüte**	**Época de floración masculina**		
QN		very early	très précoce	sehr früh	muy temprana	Finola	1
		early	précoce	früh	temprana	Santhica 27	3
		medium	moyenne	mittel	media	Dioica 88	5
		late	tardive	spät	tardía	Futura 75	7
		very late	très tardive	sehr spät	muy tardía	Kompolti	9
12.	**2102 2304 VG**	**Inflorescence: anthocyanin coloration of male flowers**	**Inflorescence : pigmentation anthocyanique des fleurs mâles**	**Blütenstand: Anthocyanfärbung der männlichen Blüten**	**Inflorescencia: pigmentación antociánica de las flores masculinas**		
QN		absent or very weak	nulle ou très faible	fehlend oder sehr gering	ausente o muy débil	Kompolti	1
		weak	faible	gering	débil	Beniko	3
		medium	moyenne	mittel	media	Uso 31	5
		strong	forte	stark	fuerte	Ermes	7
		very strong	très forte	sehr stark	muy fuerte	Finola	9
13. (*) (+)	**MG**	**Inflorescence: THC content**	**Inflorescence : teneur en THC**	**Blütenstand: THC-Gehalt**	**Inflorescencia: contenido en THC**		
QN		absent or very low	nulle ou très faible	fehlend oder sehr gering	ausente o muy bajo	Santhica 23	1
		medium	moyenne	mittel	medio	Uso 31	3
		very high	très élevée	sehr hoch	muy alto	Medisins	5
14. (*) (+)	**2102 2202 2302 2304 MS/ VG**	**Plant: proportion of hermaphrodite plants**	**Plante : proportion de plantes hermaphrodites**	**Planze: Anteil zwittriger Pflanzen**	**Planta: proporción de plantas hermafroditas**		
QN		low	faible	gering	baja		1
		medium	moyenne	mittel	media		3
		high	élevée	hoch	alta		5

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
15. (*) (+)	**2102 2202 2302 2304 MS/ VG**	**Plant: proportion of female plants**	**Plante : proportion de plantes femelles**	**Planze: Anteil weiblicher Pflanzen**	**Planta: proporción de plantas femeninas**		
QN		low	faible	gering	baja		1
		medium	moyenne	mittel	media		3
		high	élevée	hoch	alta		5
16. (*) (+)	**2102 2202 2302 2304 MS/ VG**	**Plant: proportion of male plants**	**Plante : proportion de plantes mâles**	**Planze: Anteil männlicher Pflanzen**	**Planta: proporción de plantas masculinas**		
QN		low	faible	gering	baja		1
		medium	moyenne	mittel	media		3
		high	élevée	hoch	alta		5
17. (*) (+)	**2202 2302 VG/ MG**	**Plant: natural height**	**Plante : hauteur naturelle**	**Pflanze: natürliche Höhe**	**Planta: altura natural**		
QN		short	basse	niedrig	baja	Finola	3
		medium	moyenne	mittel	media	Uso 31	5
		long	haute	hoch	alta	Ferimon	7
18. (*)	**2202 2302 VG**	**Main stem: color**	**Tige principale : couleur**	**Haupttrieb: Farbe**	**Tallo principal: color**		
PQ	**(c)**	yellow	jaune	gelb	amarillo	Chamaeleon	1
		medium green	vert moyen	mittelgrün	verde medio	Epsilon 68	2
		dark green	vert foncé	dunkelgrün	verde oscuro	Kompolti	3
		purple	pourpre	purpurn	púrpura	Fibranova	4
19.	**2202 2302 MS**	**Main stem: length of internode**	**Tige principale : longueur de l'entre-nœud**	**Haupttrieb: Internodienlänge**	**Tallo: longitud del entrenudo**		
QN	**(c)**	short	court	kurz	corto	Ferimon	3
		medium	moyen	mittel	medio	Uso 31	5
		long	long	lang	largo	KC Dora	7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
20.	**2202 2302 MS/ VG**	**Main stem: thickness**	**Tige principale : épaisseur**	**Haupttrieb: Dicke**	**Tallo principal: grosor**		
QN	**(c)**	thin	mince	dünn	delgado	Finola	1
		medium	moyenne	mittel	medio	Epsilon 68	2
		thick	épaisse	dick	grueso	Kompolti	3
21.	**2202 2302 VG**	**Main stem: depth of grooves**	**Tige principale : profondeur des cannelures**	**Haupttrieb: Tiefe der Furchen**	**Tallo principal: profundidad de los surcos**		
QN	**(c)**	shallow	peu profondes	flach	poco profundos	Finola	1
		medium	moyennes	mittel	medios	Ferimon	2
		deep	profondes	tief	profundos	Dioica 88	3
22. **(+)**	**2204 2306 VG**	**Main stem: pith in cross-section**	**Tige principale : moelle en section transversale**	**Haupttrieb: Füllung im Querschnitt**	**Tallo principal: médula en sección transversal**		
QN	**(c)**	absent or thin	absente ou fine	fehlend oder dünn	ausente o delgada	Ermes	1
		medium	moyenne	mittel	media	Santhica 27	2
		thick	épaisse	dick	gruesa	Chamaeleon	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:

[…]

(c) Observations should be done on the internode below the last opposite leaves of female and/or hermaphrodite plants only.

8.2 Explanations for individual characteristics

Ad. 11: Time of male flowering

Monoecious varieties: 50 % of all plants with first male flower open.
Other varieties: 50 % of all male plants with first male flower open.

First male flowers mostly appear from the axils of the leaves on the main stem. Male flowers usually appear about 2 weeks before the styles of female flowers are visible.

Ad. 13: Inflorescence: THC content

The method to determine the THC content is based on a quantitative determination of Δ^9-tetrahydrocannabinol by gas chromatography after extraction with a suitable solvent.

Sampling

The sample (mixture of 20 plants) should be taken from the upper 30 cm of the main stem, containing the female inflorescence. Sampling should be carried out in the period from 20 days after the beginning of female flowering up to the end of flowering. The sample should be dried as soon as possible (within 48 hours) at a temperature below 60º C. Samples should be dried to a constant weight and to a moisture content of 8 – 13 %. After drying samples can be stored (without crushing) at below 25º C in a dark place.

[…]

Ad. 14, 15 and 16: Plant: proportion of hermaphrodite plants, female plants and male plants resp.

Cannabis sativa L. is dioecious by nature, containing approximately equal proportions of male and female plants. Hermaphrodite plants (male and female flowers on one plant) occasionally occur naturally but are specially created by breeding activity (Bócsa, 1998). Several intersexual forms exist and sex expression can be modified by environmental factors.

Hermaphrodite plants: plants with both male and female flowers
Female plants: plants with female flowers only
Male plants: plants with male flowers only

Proportion	Note	Ranges (percentage)
low	1	<= 5 %
low to medium	2	6-35 %
medium	3	36-65 %
medium to high	4	66-95 %
high	5	>= 96 %

Proportion should be based on at least 200 plants for seed propagated varieties and at least 40 plants for vegetatively propagated varieties (numbers are rounded to whole numbers).

Ad. 17: Plant: natural height

Natural height should be observed on female and/or hermaphrodite plants including inflorescence.

[Annex II follows]

ANNEX II

Extract from

TEST GUIDELINES FOR CARROT (DOCUMENT TG/49/8)

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

		English	français	Deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
31. (*) (+)	**VS**	**Plants: proportion of male sterile plants**	**Plantes: proportion de plantes mâles stériles**	**Pflanzen: Anteil männlich steriler Pflanzen**	**Plantas: proporción de plantas androestériles**		
QN	**(c)**	absent or very low	nulle ou très faible	fehlend oder sehr gering	ausente o muy baja	Nantaise améliorée 2, Touchon	1
		intermediate	intermédiaire	mittel	intermedio		2
		high	forte	hoch	alta	Nanco, Tino	3
32. (*) (+)	**VS**	**Plant: type of male sterility**	**Plante: type de stérilité mâle**	**Pflanze: Typ der männlichen Sterilität**	**Planta: tipo de androestérilidad**		
QL	**(c)**	brown anther	anthères brunes	braune Antheren	antera marrón	Nanco	1
		petaloid anther	anthères pétaloïdes	petaloide Antheren	antera petaloide	Tino	2

8. Explanations on the Table of Characteristics

8.2 Explanations for individual characteristics

Ad. 31: Plants: proportion of male sterile plants
Ad. 32: Plant: type of male sterility

Type of male sterility:

Brown anther type: rudimentary brown anthers;
Petaloid anther type: anthers transformed into petals with different shapes (e.g. bract-like, spoon-like)

[Annex III follows]

ANNEX III

Extracts from

TEST GUIDELINES FOR SPINACH (DOCUMENT TG/55/7)

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

		English	français	Deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
12. (*) (+)	**VS**	**Proportion of monoecious plants**	**Proportion de plantes monoïques**	**Anteil monözischer Pflanzen**	**Proporción de plantas monoicas**		
QN		absent or very low	absente ou très faible	fehlend oder sehr gering	ausente o muy baja	Medania	1
		low	faible	gering	baja	Matador	3
		medium	moyenne	mittel	media	Figo	5
		high	grande	hoch	alta	Giraffe, Lazio	7
		very high	très grande	sehr hoch	muy alta	Monnopa	9
13. (*) (+)	**VS**	**Proportion of female plants**	**Proportion de plantes femelles**	**Anteil weiblicher Pflanzen**	**Proporción de plantas femeninas**		
QN		absent or very low	absente ou très faible	fehlend oder sehr gering	ausente o muy baja	Monnopa	1
		low	faible	gering	baja	Giraffe	3
		medium	moyenne	mittel	media	Figo, Medania	5
		high	grande	hoch	alta	Parrot	7
		very high	très grande	sehr hoch	muy alta		9
14. (*) (+)	**VS**	**Proportion of male plants**	**Proportion de plantes mâles**	**Anteil männlicher Pflanzen**	**Proporción de plantas masculinas**		
QN		absent or very low	absente ou très faible	fehlend oder sehr gering	ausente o muy baja	Monnopa, Parrot	1
		low	faible	gering	baja		3
		medium	moyenne	mittel	media	Medania	5
		high	grande	hoch	alta		7
		very high	très grande	sehr hoch	muy alta		9

8. Explanations on the Table of Characteristics

8.2 Explanations for individual characteristics

Ad. 12: Proportion of monoecious plants
Ad. 13: Proportion of female plants
Ad. 14: Proportion of male plants

Observations on the proportion of monoecious, female or male plants should be made at the beginning of seed setting. The three groups are defined as follows:

Monoecious plants: plants which have both male flowers and female flowers (seeds clearly visible);

Female plants: plants which have only female flowers (seeds clearly visible);

Male plants: plants which have only male flowers.

	Note	Approximate percentage
absent or very low	1	< 10%
	2	20%
low	3	30%
	4	40%
medium	5	50%
	6	60%
high	7	70%
	8	80%
very high	9	> 90%

[Annex IV follows]

ANNEX IV

Extracts from

TEST GUIDELINES FOR ASPARAGUS (DOCUMENT TG/130/4)

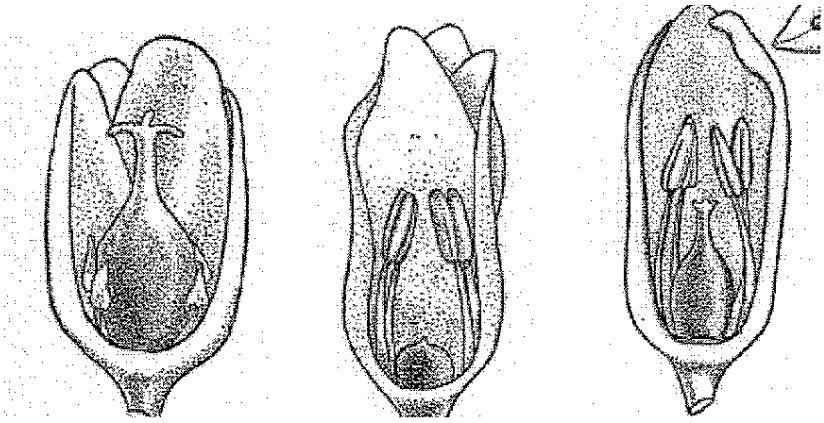
7. Table of Characteristics/Tableau des caractères/Merkmalstabelle/Tabla de caracteres

		English	français	Deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
16. (+) (*)	**VG**	**Type of flowering**	**Type de floraison**	**Blühtyp**	**Tipo de floración**		
QL		plants with male flowers and plants with female flowers	plantes avec des fleurs mâles et plantes avec des fleurs femelles	Pflanzen mit männlichen Blüten und Pflanzen mit weiblichen Blüten	plantas con flores masculinas y plantas con flores femeninas	Andreas	1
		plants with male and female flowers	plantes avec des fleurs mâles et des fleurs femelles	Pflanzen mit männlichen und weiblichen Blüten	plantas con flores masculinas y femeninas	Argenteuil, Desto	2
		plants with androhermaphrodite flowers and plants with male flowers with style rudiments	plantes avec des fleurs androhermaphrodites et plantes avec des fleurs mâles avec rudiments de style	Pflanzen mit männlich-zwittrigen Blüten und Pflanzen mit männlichen Blüten mit Griffelrudimenten	plantas con flores hermafroditas masculinas y plantas con flores masculinas con estilo	Backlim, Gijnlim	3

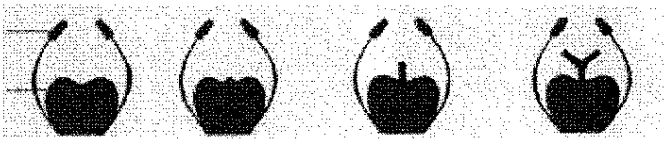
8. Explanations on the Table of Characteristics

8.2 Explanations for individual characteristics

Ad. 16: Type of flowering



Female male androhermaphrodite



Type of male flowers: the flowers always have fully developed anthers; the style can be from absent to fully developed, but the stigmas are always rudimentary or absent. Even when two of the three stigmas are present, the flower is considered to be male. The male flower will not produce seeds.

The androhermaphrodite flower has three stigmas and anthers which produce pollen. The flower has the possibility, when self-pollinated, to produce a berry with some seeds.

[Annex V follows]

ANNEX V

REVISIONS TO THE TEST FOR GUIDELINES PAPAYA (DOCUMENT TG/264/1)

"1. Subject of these Test Guidelines

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

"2. Material Required

[…]

"2.2 The material is to be supplied in the form of ~~hermaphrodite~~ seeds or plants.

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

~~6 hermaphrodite~~ 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 durations of a single growing season, beginning with vegetative growth, followed by flowering and fruit harvest~~. 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.

[…]

"3.3 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. In particular, it is essential that the trees produce a satisfactory crop of fruit in each of the two growing cycles.

~~"3.3.2 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 ~~6~~ 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 Number of Plants / Parts of Plants to be Examined*~~

~~"Unless otherwise indicated, all observations should be made on 6 plants or plant parts.~~

[…]

"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'.

[…]

"4.1.4 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 plants and 5 plants or parts taken from each of 5 plants in the case of vegetatively propagated plants, in both types of propagation disregarding any off-type plants.

"4.1.5 Method of Observation

[…]

"4.2 *Uniformity*

[…]

"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 ~~6~~ 5 plants, ~~one off-type is allowed~~ 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.

"4.2.4 Hybrid varieties: the assessment of uniformity for hybrid varieties depends on the type of hybrid and should be according to the recommendations for hybrid 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 ~~tested, either by growing a~~ further ~~generation, or~~ examined by testing a new seed or plant stock to ensure that it exhibits the same characteristics as those shown by the ~~previous~~ initial material supplied.

[…]

"*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:

[…]"

Extract from

TEST GUIDELINES FOR PAPAYA (DOCUMENT TG/264/2 (PROJ.2))

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

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
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 Nº 1	5
		high	haute	hoch	alta	Cera	7
11. (*) (+)	**VG**	**Leaf: presence of flag leaflet**	**Limbe : 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	9
12. (*)	**VG/ MG**	**Time of flowering**	**Époque de floraison**	**Blütezeit**	**Época de floración**		
QN		early	précoce	früh	temparana	Arum, Carisya, Sinta	3
		medium	moyenne	mittel	media	Callina, Sunrise	5
		late	tardive	spät	tardía	Cavite Special, Wulung	7
17. (+)	**VG/ 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. **(+)**	**VG/ 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. **(+)**	**VG/ 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
22. **(+)**	**VG/ MS**	**Flower: length of corolla**	**Fleur : longueur de la corolle**	**Blüte: Länge der Krone**	**Flor: longitud de la corola**		
QN	**(d)**	short	courte	kurz	corta		3
		medium	moyenne	mittel	media	Sunrise,	5
		long	longue	lang	larga	Tainung Nº 1	7
23. **(+)**	**VG**	**Flower: color of corolla**	**Fleur : couleur de la corolle**	**Blüte: Farbe der Krone**	**Flor: color de la corola**		
PQ	**(d)**	white	blanche	weiß	blanca		1
		cream	crème	cremefarben	crema	Sunrise, Tainung N 1	2
		yellow	jaune	gelb	amarilla		3
		green	verte	grün	verde		4
		purple	pourpre	purpurn	púrpura		5

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
28. (*) (+)	**VG**	**Fruit: shape**	**Fruit : forme**	**Frucht: Form**	**Fruto: forma**		
PQ	**(e)**	ovate	ovale	eiförmig	oval		1
		elliptic	elliptique	elliptisch	elíptico	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	5
		obovate waisted	obovale étranglée	verkehrt eiförmig tailliert	oboval entallado	BT-1	6
33.	**VG**	**Fruit: surface**	**Fruit : surface**	**Frucht: Oberfläche**	**Fruto: superficie**		
QN		smooth	lisse	glatt	lisa	Callina, Paris	1
		medium	moyenne	mittel	media	Carisya	2
		rough	rugueuse	rauh	rugosa	Sukma	3
37. (+)	**VG/ MS**	**Fruit: sweetness of flesh**	**Fruit : goût sucré de la chair**	**Frucht: Süße des Fleisches**	**Fruto: dulzura de la pulpa**		
QN	**(f)**	low	faible	niedrig	baja	Cera, Sari Gading	3
		medium	moyen	mittel	media	Maradol, Tainung Nº 1	5
		high	fort	hoch	alta	Ishigaki Sango, Sunrise	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	**(f)**	circular	circulaire	rund	circular		1
		angular	angulaire	winklig	angular	Tainung N 1	2
		star-shaped	en forme d'étoile	sternförmig		Du Roi Solo, Ishigaki Sango, Sunrise	3
		stellate	étoilée	sternförmig	estrellada	BT-2	4
		irregular	irrégulière	unregelmäßig	irregular	Simangko	~~4~~ 5

General remark: in the document TG/264/2(proj.2) the indications of method of observation for all of the characteristics were added and some examples varieties were added/changed.

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 ~~fruit has reached harvest maturity~~ 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 ~~fruit has reached its full size.~~ 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. Observations must be made only on hermaphrodite or female plants, according to the type of variety that will be tested.

(d) Flower: Observations on the flower should be made during the first flower opening, at the start of anther dehiscence in hermaphrodite ~~flowers~~ varieties, and in the case of female varieties at midday.

(e) 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. Observations must be made only on the type of variety that will be tested: hermaphrodite or female plants.

(f) Ripe: Observations on the 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, t~~T~~he 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. 11: Leaf: presence of flag leaf

1
absent

9
present

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.

Ad. 23: Flower: color of corolla

This characteristic applies to all types of plants, regardless of the sex.

Ad. 28: Fruit: shape

< lateral outline >	< broadest part >		
	(below middle)	at middle	(above middle)
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. 37: Fruit: sweetness of flesh

To be ~~determined~~ measured by ~~tasting the fruit~~ refractometer as total soluble solids content.

Ad. 41: Fruit: shape of central cavity

1
circular

2
angular

3
star-shaped

4
irregular

5
stellate

[End of annex V and of document]