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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

TECHNICAL WORKING PARTY FOR AGRICULTURAL CROPS

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DUS EXAMINATION OF SEED-PROPAGATED VARIETIES OF PAPAYA

Document prepared by Mexico and by the Office of the Union

INTRODUCTION

1. The Technical Committee, at its forty-sixth session, held in Geneva from March 22 to 24, 2010, agreed that the Test Guidelines for Papaya should be adopted on the basis that they would apply to vegetatively propagated varieties. It agreed that the Technical Working Parties (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.

CONSIDERATION BY THE TECHNICAL COMMITTEE

2. At its forty-sixth session, the TC considered document TG/PAPAYA(proj.6), which contained the following references to seed-propagated varieties:

"Subject of these Test Guidelines

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

"2. Material Required

[..]

"2.2 The material is to be supplied in the form of seed 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 6 hermaphrodite plants in the case of vegetatively propagated varieties.

In the case of seed, the seed should meet the minimum requirements for germination, species and analytical purity, health and moisture content, specified by the competent authority.

[…]

"3.4 Test Design

"3.4.1 Each test should be designed to result in a total of at least 25 hermaphrodite plants in the case of seed-propagated plants or, in the case of vegetatively propagated varieties, in a total of at least 6 hermaphrodite plants or plant parts.

"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 25 hermaphrodite plants parts in the case of seed-propagated varieties or, in the case of vegetatively propagated varieties, on 6 hermaphrodite plants or plant parts.

"4.2 Uniformity

"4.2.2 For the assessment of uniformity for seed-propagated varieties, a population standard of 1% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 25 hermaphrodite plants, one off-type is allowed.

[…]"

3. 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 CAJ should be invited to consider that matter.

BACKGROUND INFORMATION

Explanation by Leading Expert (Alejandro Barrientos-Priego (Mexico))

4. 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.

5. 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.

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

7. The sex homologues are designated as:

M	male
MH	hermaphrodite
m	female

8. 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.

9. The genotypes for sex are:

Mm	male
MHm	hermaphrodite
mm	female

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

10. 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. Therefore, it is proposed that the matter be considered in particular, in relation to this specific case.

PROPOSAL BY THE LEADING EXPERT

11. On the basis that the male, hermaphrodite and female plants cannot be distinguished at the vegetative stage, it is 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.

SITUATION IN OTHER TEST GUIDELINES

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

Annex I: Test Guidelines for Hemp (document TG/CAN_SAT(proj.3))
Annex II: Test Guidelines for Carrot (document TG/49/8)

[Annexes follow]

ANNEX I

Extract from

TEST GUIDELINES FOR HEMP (DOCUMENT TG/CAN_SAT(PROJ.3))

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
12. (*) (+)	**2101 2304 MG**	**Time of male flowering**					
QN		very early				Finola	1
		early				Ruby	3
		medium				Tiborszállási	5
		late				Kompolti	7
		very late					9
13.	**2102 2304 VG**	**Inflorescence: anthocyanin coloration of male flowers**					
QN		absent or very weak				Kompolti	1
		weak				Carmen	3
		medium				Lovrin 110	5
		strong					7
		very strong					9
14. (*) (+)	**2202 2203 2302 2305 MG**	**Inflorescence: THC content**					
QN	**(b)**	absent or very low				Santhica 23, Hlera, Glukhovskaya 33	1
		low to medium				Férimon, Carmen, Uso 31	2
		medium to very high				Krasnodarskaya, Medisins, Grace	3

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
15. **(*)** **(+)**	**2102 2202 2302 2304 VS**	**Plant: proportion of monoecious plants**					
QN		absent or very low					1
		low					3
		medium					5
		high					7
		very high					9
16. **(*)** **(+)**	**2102 2202 2302 2304 VS**	**Plant: proportion of female plants**					
QN		absent or very low					1
		low					3
		medium					5
		high					7
		very high					9
17. **(*)** **(+)**	**2102 2202 2302 2304 VS**	**Plant: proportion of male plants**					
QN		absent or very low					1
		low					3
		medium					5
		high					7
		very high					9

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
18. (*) (+)	**2202 2302 VG/ MG**	**Plant: natural height**					
QN	**(b)**	short				Carmen, Uso 31, Finola	3
		medium				Glukhovskaya 33	5
		long				Dneprovskaya 11	7
19. (*)	**2202 2302 VG**	**Main stem: color**					
PQ	**(b) (c)**	yellow				Chamaeleon, Glukhovskaya 10	1
		medium green				Tiborszállási, Hlera	2
		dark green				Kompolti, Zolotonoshskaya 11	3
		purple				Fibranova	4
20.	**2202 2302 MS**	**Main stem: length of internodes**					
QN	**(b) (c)**	short				Finola, Fasamo	3
		medium				Ruby, Sinelnikovskaya 3	5
		long				Dneprovskaya 11	7
21.	**2202 2302 MS/ VG**	**Main stem: thickness**					
QN	**(b) (c)**	thin				Carmen	1
		medium				Dneprovskaya 11	2
		thick				Carmagnola, Deni	3

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
22.	**2202 2302**	**Main stem: number of grooves**					
(+)	**VG**						
QN	**(b) (c)**	few					1
		medium				Fedora 17, FibreGem	2
		many				Uso 31, Ruby	3
23.	**2204 2306**	**Main stem: pith in cross-section**					
(+)	**VG**						
QN	**(b)**	absent or very thin					1
		medium					2
		thick				Deni	3

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) Observations should be done on the last opposite, fully expanded leaves
(b) Male plants should be excluded from the observation
(c) Observations should be done on the middle third part of the plant.

[Annex II follows]

ANNEX II

Extract from

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

		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

[End of Annex II and of document]