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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

DRAFT

COCONUT

UPOV Code: COCOS_NUC

Cocos nucifera L.

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by experts from Brazil

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:*

Botanical name	*English*	*French*	*German*	*Spanish*
Cocos nucifera L.	Coconut	Cocotier	Kokosnuß	Cocotero

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 *Cocos nucifera* 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 (fruits) or seedlings.

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

20 fruits
12 seedlings (at age 6 months)

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. In particular, it is essential that the trees produce a satisfactory crop of fruit in each of the two 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 12 trees, which should be divided between at least 3 replicates.

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 purposes of distinctness, all observations on single plants should be made on 12 plants or parts taken from each of 12 plants and any other observations made on all plants in the test, disregarding any off-type plants. In the case of observations of parts taken from single plants, the number of parts to be taken from each of the plants should be 2.

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:

4.2.1.1 The assessment of uniformity for cross-pollinated varieties, in the case of giant varieties, should be according to the recommendations for cross-pollinated varieties in the General Introduction.”

4.2.1.2 For the assessment of uniformity of self-pollinated varieties, in the case of dwarf 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 12 plants, 1 off-type is allowed.

4.3 Stability

4.3.1 In practice, it is not usual to perform tests of stability that produce results as certain as those of the testing of distinctness and uniformity. However, experience has demonstrated that, for many types of variety, when a variety has been shown to be uniform, it can also be considered to be stable.

4.3.2 Where appropriate, or in cases of doubt, stability may be 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) Stem: diameter (characteristic 8)
(b) Inflorescence: pollination behavior (characteristic 30)
(c) Fruit: weight (characteristic 33)
(d) Fruit: shape (polar view) (characteristic 37)
(e) Fruit: color of husk (characteristic 41)
(f) Nut: shape (characteristic 43)

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)-{d}	See Explanations on the Table of Characteristics in Chapter 8.1	
(+)	See Explanations on the Table of Characteristics in Chapter 8.2.	

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

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1. **(+)**	**VG**	**Young plant: color of sprout:**					
PQ		yellow				GKN	1
		green				GSK	2
		red				DMT	3
		brown				GRA	4
2. **(+)**	**VG/ MS**	**Young plant: number of leaves at age 6 months**					
QN		few					3
		medium					5
		many					7
3. **(*)**	**VG**	**Young plant: time of leaflets splitting**					
QN		early					3
		medium					5
		late					7
4. **(+)**	**VG**	**Tree: shape of crown**					
PQ	**(a)**	spherical					1
		semi-spherical					2
		x-shaped ‘silhouette’					3
		v-shaped					4
5. **(*)** **(+)**	**VG**	**Stem: bottom**	**Or bole/boll**				
QL	**(a)**	absent				GKN	1
		present					9
6. **(*)**	**VG/ MS**	**Stem: size of bottom**					
QN	**(a)**	small				KHINA-1	3
		medium					5
		large				DMT	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
7. **(*)** **(+)**	**VG**	**Stem: length**					
QN	**(a)**	short					3
		medium					5
		long					7
8. **(*)** **(+)**	**VG**	**Stem: diameter**					
QN	**(a)**	small					3
		medium					5
		large					7
9. **(*)** **(+)**	**VG**	**Stem: height between 11 leaf scars (ten internodes)**					
	(a)	small					3
		medium					5
		high					7
10. **(+)**	**VG**	**Stem: height of 10 leaf scars**					
	(a)	low					3
		medium					5
		high					7
11. **(+)**	**VG/ MS**	**Petiole: length**					
QN	**(b)**	short				GKN	3
		medium				KHINA-1	5
		long				DTA	7
12.) **(+)**	**VG/ MS**	**Petiole: thickness**					
QN	**(b)**	thin				GKN	3
		medium				KHINA-2	5
		thick				DBI	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
13. **(+)**	**VG/ MS**	**Petiole: width**					
QN	**(b)**	narrow					3
		medium					5
		broad					7
14.	**VG**	**Petiole: color**					
QN	**(b)**	yellow				GKN	1
		yellowish green					2
		yellowish red					3
		green				GSK	4
		greenish yellow					5
		greenish red					6
		red				DMT	7
		reddish yellow					8
		reddish green					9
		brown				GRA	10
15. **(*)** **(+)**	**VG/ MS**	**Leaf: length of rachis**					
QN	**(b)**	short				GKN	3
		medium				KHINA-3	5
		long				DPU	7
16.	**VG/ MS**	**Leaf: number of leaflets**					
QN	**(b)**	few					3
		medium					5
		many					7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
17.	**VG/ MS**	**Leaf: leaflet length**					
QN	**(b)**	short					3
		medium					5
		long					7
18.	**VG/ MS**	**Leaf: leaflet width**					
QN	**(b)**	narrow					3
		medium					5
		broad					7
19.	**VG/ MS**	**Leaf: green color**					
QN	**(b)**	light green					3
		medium green					5
		dark green					7
20.	**VG**	**Time of beginning of flowering**					
	(a)	early					3
		medium					5
		late					7
21. **(+)**	**VG/ MS**	**Inflorescence: peduncle length**					
QN	**(c)**	short				GRA	3
		medium				KHINA-4	5
		long				DMT	7
22. **(+)**	**VG/ MS**	**Inflorescence: peduncle diameter**					
QN	**(c)**	small				GRA	3
		medium				KHINA-4	5
		large				DMT	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
23. **(+)**	**VG/ MS**	**Inflorescence: central axis length**					
QN	**(c)**	short				GRA	3
		medium				KHINA-4	5
		long				DMT	7
24. **(+)**	**VG/ MS**	**Inflorescence: number of spikelets**					
QN	**(c)**	few					7
		medium					5
		many					7
25. **(+)**	**VG/ MS**	**Inflorescence: number of female flowers**					
QN	**(c)**	few				DSA	3
		medium				GRA	5
		many				DTE	7
26. **(*)**	**VG/ MS**	**Inflorescence: number of spikelets with female flowers**					
QN	**(c)**	few				GOS	3
		medium				DMT	5
		many				GRA	7
27. **(*)**	**VG/ MS**	**Inflorescence: number of spikelets without female flowers**					
QN	**(c)**	few					3
		medium					5
		many					7
28.	**VG/ MS**	**Inflorescence: length of first spikelet bearing female flower**					
QN	**(c)**	short				GRA	3
		medium				KHINA-4	5
		long				DMT	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
29. **(+)**	**VG/ MS**	**Inflorescence: diameter of female flower**					
QN	**(c)**	small					3
		medium					5
		large					7
30. **(*)** **(+)**	**VG/ MS**	**Inflorescence: pollination behavior**					
QL	**(c)**	predominantly self-pollinated					1
		intermediate					2
		predominantly out-crossing					3
31.	**VG/ MS**	**Bunch: number of fruits per bunch**					
QN	**(d)**	few				DSA	3
		medium				DMT	5
		many				DTE	7
32.	**VG/ MS**	**Bunch: peduncle length**					
QN	**(d)**	short					3
		medium					5
		long					7
33. **(*)**		**Fruit: weight**					
QN	**(d)**	low				GOS	3
		medium				GTT	5
		high				DBI	7
34.	**VG/ MS**	**Fruit: length**					
	(d)	short					3
		medium					5
		long					7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
35.	**VG/ MS**	**Fruit: diameter**					
	(d)	small					3
		medium					5
		large					7
36.	**VG/ MS**	**Fruit: ratio length/diameter**					
	(d)	small					3
		medium					5
		large					7
37. **(*)** **(+)**	**VG/ MS**	**Fruit: shape (polar view)**					
PQ	**(d)**	round					1
		ovate					2
		angled (pear shaped)					3
		oblong (elliptic)					4
38. **(+)**	**VG/ MS**	**Fruit: shape (equatorial view)**					
PQ	**(d)**	round					1
		angular					2
		flat					3
39. **(+)**	**VG/ MS**	**Fruit: ratio fruit/ husk**					
	(d)	small					3
		medium					5
		high					7
40. **(+)**	**VG/ MS**	**Fruit: ratio fruit/ shell(endocarp)**					
	(d)	small					3
		medium					5
		high					7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
41. (*) (+)	**VG**	**Fruit: color of husk**					
	(d)	yellow				GKB	1
		yellowish green					2
		yellowish red					3
		green				GHN	4
		greenish yellow					5
		greenish red					6
		red				GMW	7
		reddish yellow					8
		reddish green					9
		brown				GRA	10
42. (*) (+)	**VG/ MS**	**Fruit: water content**					
QN	**(d)**	few				DTE	3
		medium				DMT	5
		many				DBI	7
43. (*) (+)	**VG/ MS**	**Nut: shape**					
PQ	**(d)**	flat or oblate					1
		pointed					2
		ovoid					3
		almost round					4
44.	**VG/ MS**	**Nut: size**					
QN	**(d)**	small				GOS	3
		medium				GRA	5
		large				DPU	7
45.	**VG/ MS**	**Nut: length**					
	(d)	short					3
		medium					5
		large					7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
46.	**VG/ MS**	**Nut: diameter**					
	(d)	small					3
		medium					5
		large					7
47. **(+)**	**VG/ MS**	**Shell (endocarp): thickness**					
QN	**(d)**	thin				GKN	3
		medium				KHINA-1	5
		thick				DTA	7
48. **(*)** **(+)**	**VG/ MS**	**Meat (endosperm or solid albumen): weight**					
QN	**(d)**	low				GOS	3
		medium				DTA	5
		high				DBI	7
49. **(*)**	**VG/ MS**	**Meat: endosperm thickness**					
QN	**(d)**	thin				GKJ	3
		medium				DSA	5
		thick				DMT	7
50. **(+)**	**VG/ MS**	**Nut : weight of copra**					
QN	**(d)**	light				GKN	3
		medium				DTA	5
		heavy				DBI	7
51.	**VG/ MS**	**Nut: oil content**					
QN	**(d)**	low				GRA	3
		medium				DSA	5
		high				PB121	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
52.	**VG/ MS**	**Seednuts: germination rate**					
QN		early					3
		medium					5
		late					7

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) Tree and stem: Observations on the tree and stem should be made at age 5 years on dwarf varieties and 7 years on giant varieties and hybrids between dwarf and giant varieties.

(b) Leaf and petiole: Observations on the tree and stem should be made at 14ª leaf on maturity leaf, at age 5 years on dwarf varieties and 7 years on giant varieties and hybrids between dwarf and giant varieties.

(c) Inflorescence: Observations on inflorescence should be taken after the first inflorescence has appeared, at age 5 years on dwarf varieties and 7 years on giant varieties and hybrids between dwarf and giant varieties (at 3º years appears inflorescence, but only with male flowers).

(d) Bunch, peduncle, fruit, nut, shell and meat: Observations on the bunch, peduncle, fruit shell and meat should be made at harvest maturity, at 11-12 months age fruit. In the case of fruits and seeds, the observations should be done on 3 typical fruits, taken from the middle part of the fruiting region.

8.2 Explanations for individual characteristics

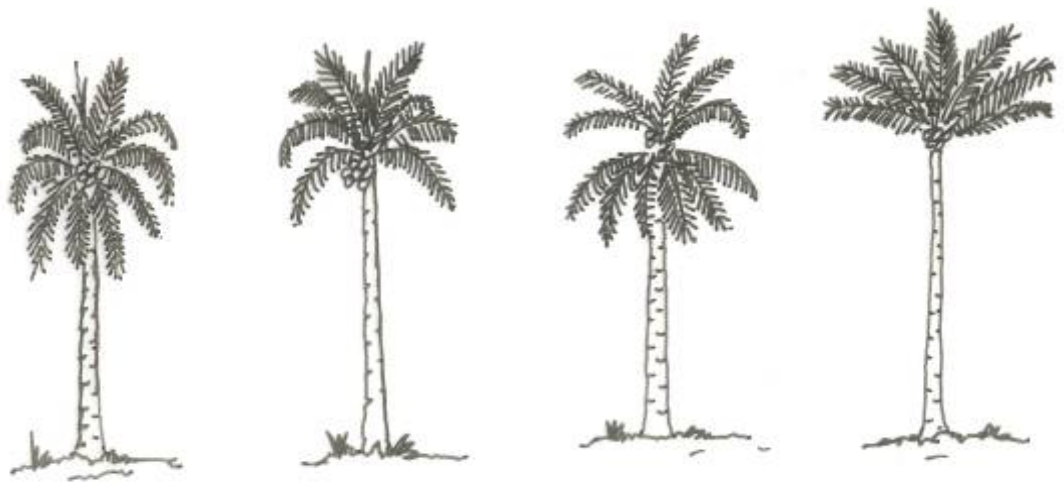
Ad. 1: Young plant: color of sprout
Ad. 2: Young plant: number of leaves at age 6 months

Should be observed at age 6 months after the germination.

Ad. 3: Young plant: time of leaflets splitting

Ad. 4: Tree: shape of crown

Figure 1 - Indonesian



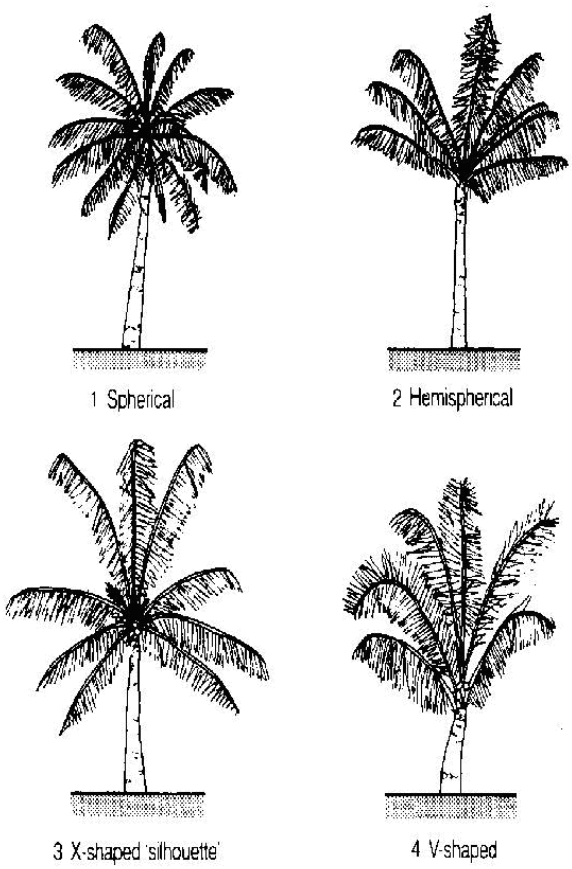
1
spherical

2
semi -spherical

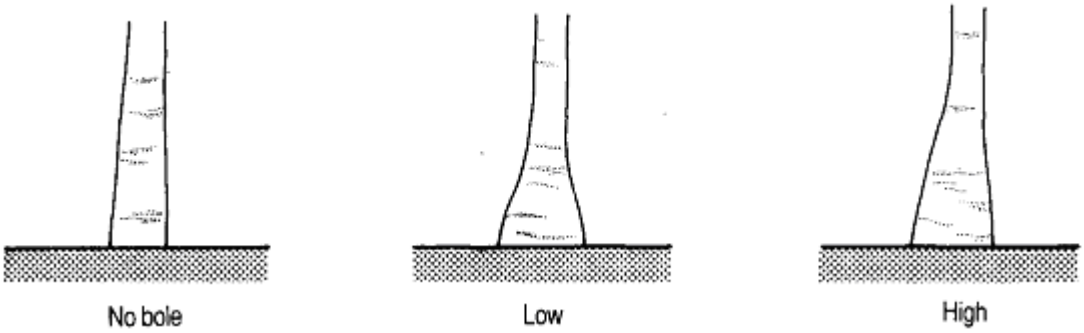
3
x-shaped 'silhouette'

4
v-shaped

Figure 2 – IPGRI – Brazil prefers IPGRI



Ad. 5: Stem bottom
Ad. 6: Stem: size of bottom *(OR BOLE??)*



Ad. 7: Stem: length measure

In dwarf varieties, measure at age 5 years; in tall varieties, at age 7 years.

Ad. 8: Stem: diameter

Measure from ground to 1.5 meters

Ad. 10: Stem: height of 10 leaf scars

Measure from ground to 1.5 meters.

Ad. 9: Stem: height between 11 leaf scars (ten internodes)

Measure starting from 1.5 m from ground surface.

Ad. 11: Petiole: length

Measure from base to the most proximal leaflet.

Ad. 12: Petiole: thickness

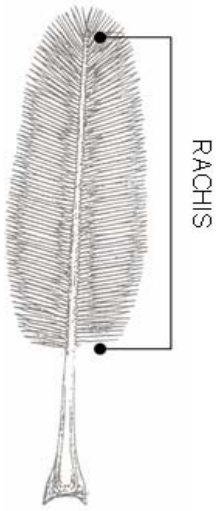
Measure at insertion of the first leaflet.

Ad. 13: Petiole: width

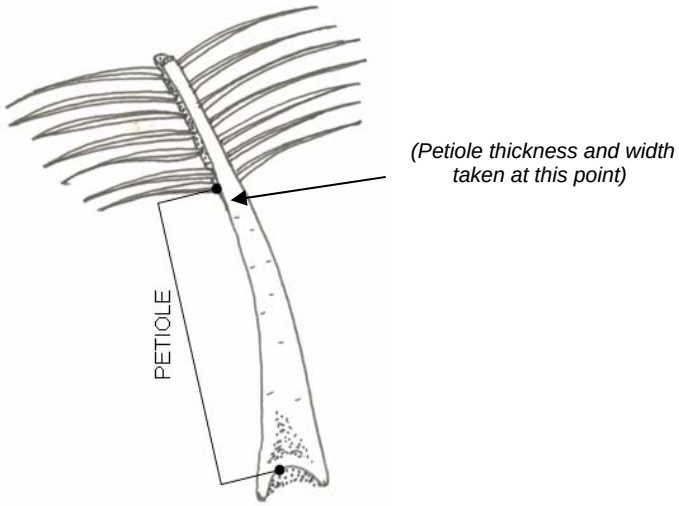
Measure at insertion of the first leaflet.

Ad. 15: Leaf: length of rachis

Measure from the base of the petiole to the tip.



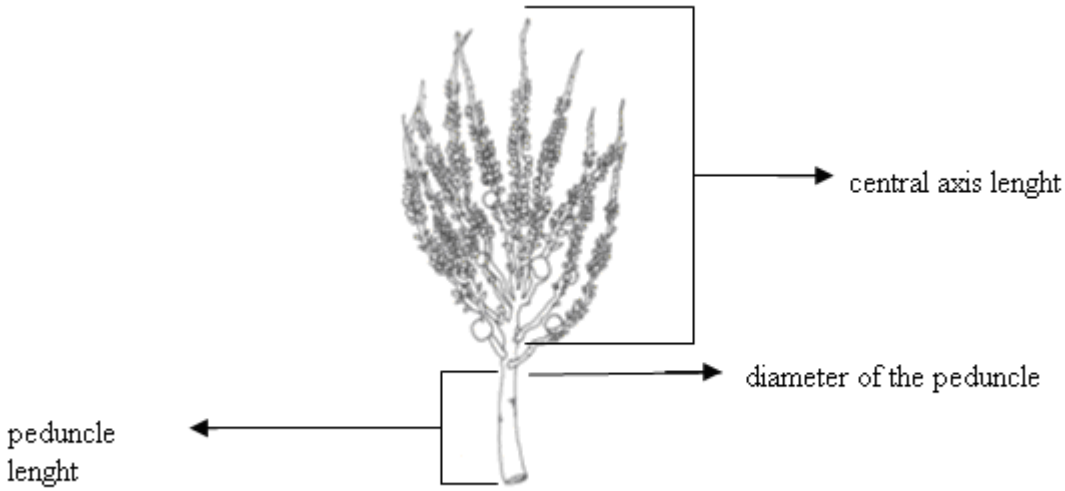
(Coconut leaf)



(Petiole of coconut leaf showing first leaflet insertion)

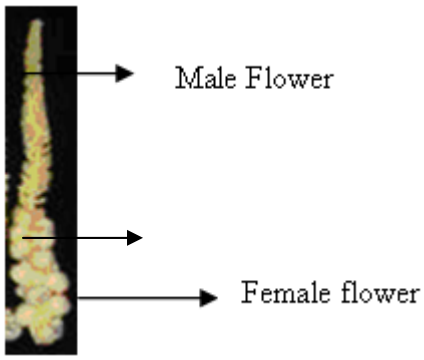
Ad. 21: Inflorescence: peduncle length
Ad. 22: Inflorescence: peduncle diameter
Ad. 23: Inflorescence: central axis length

coconut inflorescence



(Coconut inflorescence)

Ad. 24: Inflorescence: number of spikelets
Ad. 25: Inflorescence: number of female flowers



Ad. 29: Inflorescence: diameter of female flower

Ad. 30: Inflorescence: pollination behavior

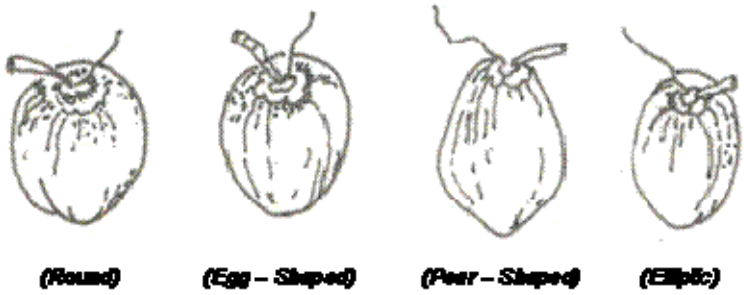
The inflorescence pollination behavior is predominantly self-pollinated generally observed in dwarf varieties and is predominantly out-crossing generally observed in tall varieties.

Ad. 32: Bunch: peduncle length

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

Ad. 37: Fruit: shape (polar view)

Indonesian



(Shape of fruit, polar view)

IPGRI

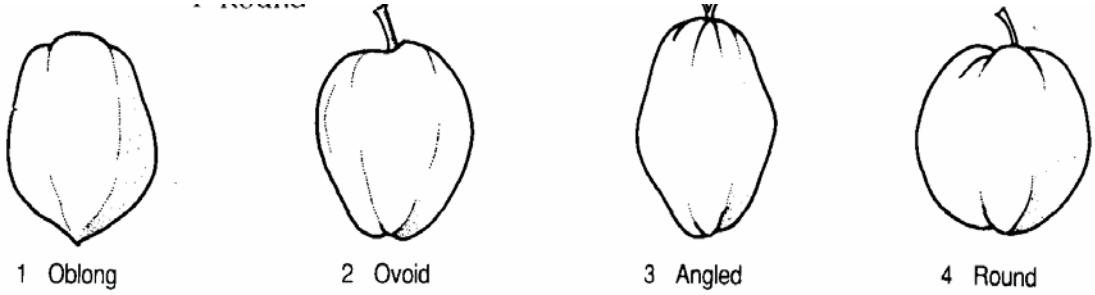
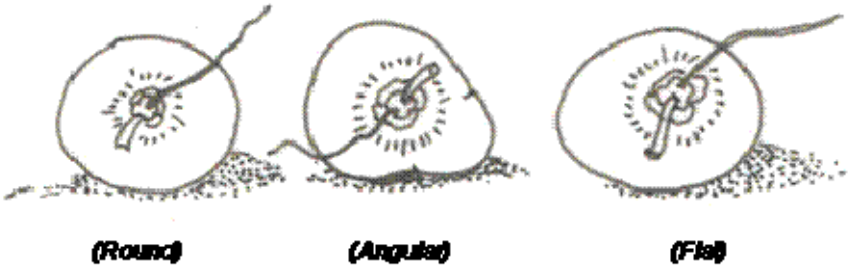


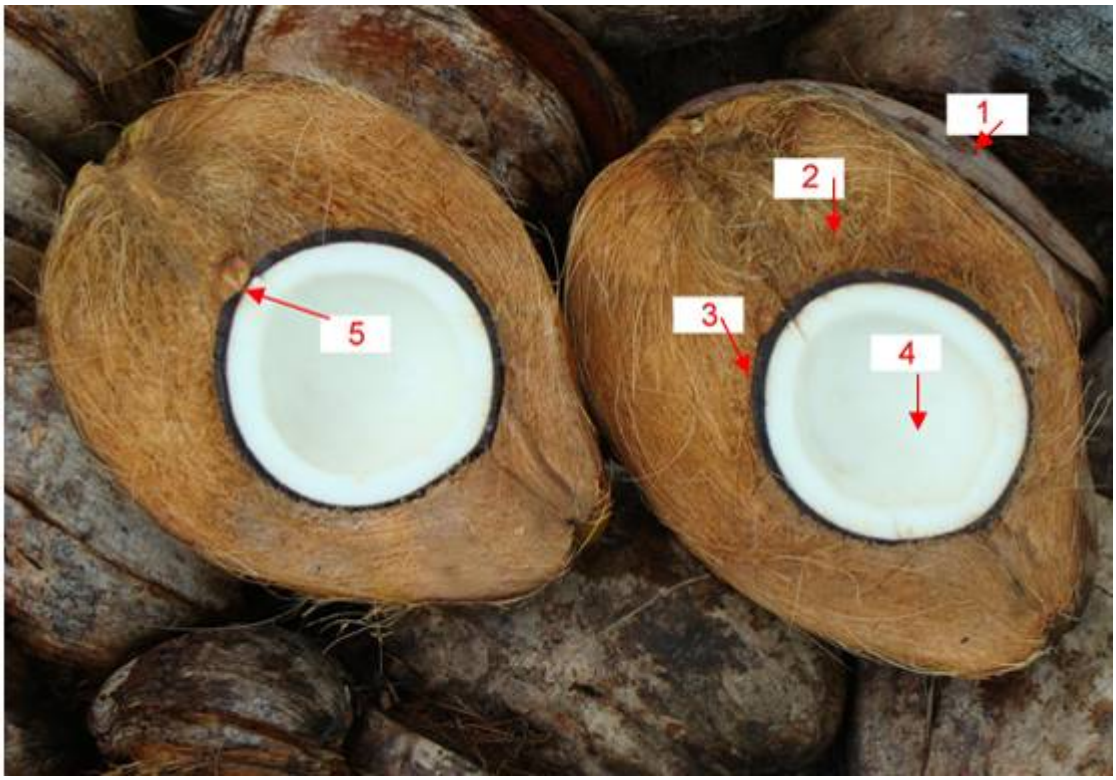
Fig. 4 Fruit appearance/shape

Ad. 38: Fruit: shape (equatorial view)



(Equatorial view of fruit)

Ad. 39: Fruit: ratio fruit/husk
Ad. 40: Fruit: ratio fruit/shell (endocarp)
Ad. 41: Fruit: color of husk
Ad. 43: Nut: shape
Ad. 47: Shell (endocarp): thickness
Ad. 48: Meat (endosperm or solid albumen): weight



1.	exocarp	**husk** = exocarp + mesocarp
2.	mesocarp	
3.	endocarp (shell)	**nut** = endocarp + endosperm
4.	endosperm (meat)	
5.	embryo	

Ad. 43: Nut: shape

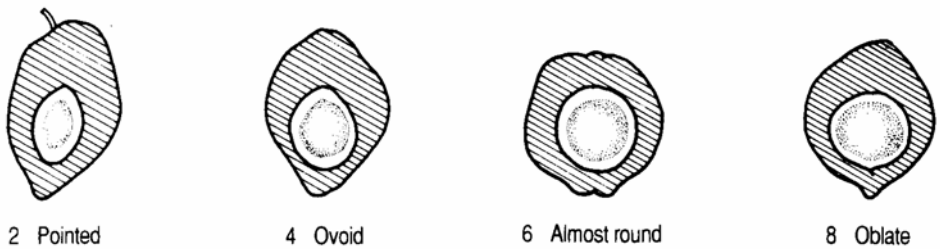
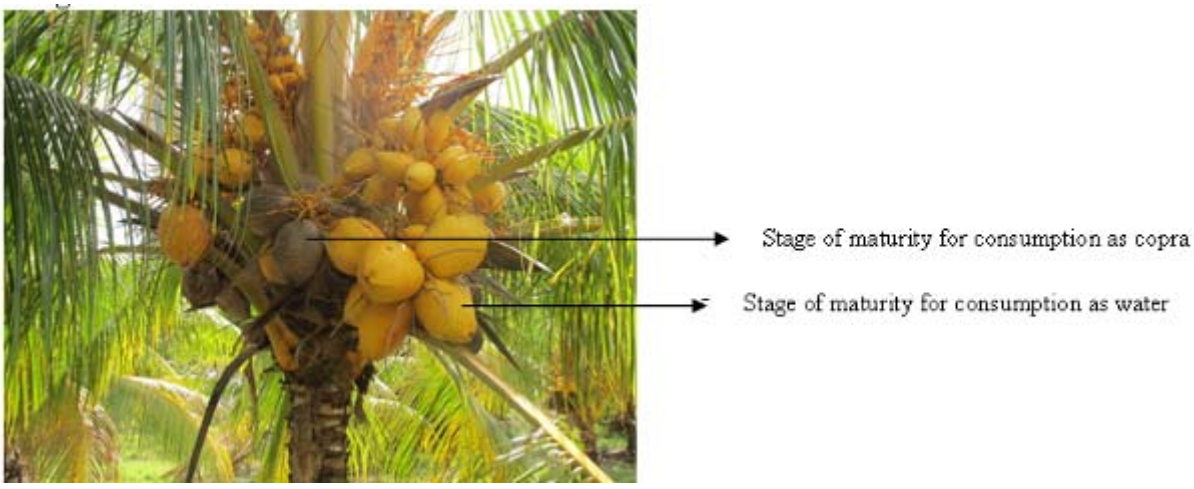


Fig. 5 Nut appearance/shape

Ad. 41: Fruit: color of husk

Should be evaluated at the stage of maturity as water.



Ad. 42: Fruit: water content

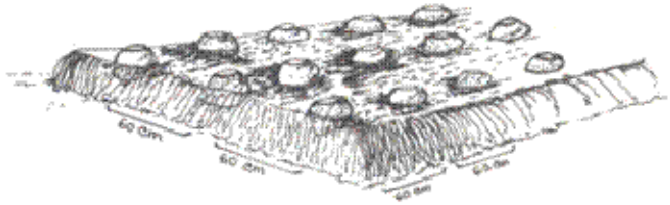
The water content should be evaluated at age fruit 7 months.

Ad. 50: Nut: weight of copra

The observation for copra characteristics should be done at 6% water contain of copra. **Copra** is the dried meat. The weight of copra should be evaluated according to Ribeiro, F.E., de Ribeiro, M.M.J., 2011: Caracterização de populações de coqueiro gigante no Nordeste do Brasil. Aracaju: Embrapa Tabuleiros Costeiros, 16p. (Embrapa-Tabuleiros Costeiros. Boletim de Pesquisa e Desenvolvimento, 59).

Ad. 52: Seednuts: germination rate

Germinating seednut ready for transplanting. PHOTO: C. ELEVITCH



(Sowing of seednuts in a germination bed)

9. Literature

IPGRI, 1995: Descriptors for Coconut (*Cocus nucifera* L.). International Plant Genetic Resources Institute. Rome, IT, 61 pp.

Ribeiro, F.E., de Siqueira, E.R., Aragão, W.M., Tupinambá, E.A., 1999: O coqueiro anão no Brasil. Aracaju: Embrapa Tabuleiros Costeiros, 23p. (Embrapa-Tabuleiros Costeiros. Documentos, 8).

Ribeiro, F.E., de Siqueira, E.R., Aragão, W.M., Tupinambá, E.A., 2000: Ecótipos de coqueiro gigante no Brasil. Aracaju: Embrapa Tabuleiros Costeiros,. 25p. (Embrapa-Tabuleiros Costeiros. Documentos, 17).

Ribeiro, F.E., de J. Ribeiro, M.M., 2011: Caracterização de populações de coqueiro gigante no Nordeste do Brasil. Aracaju: Embrapa Tabuleiros Costeiros,. 16p. (Embrapa-Tabuleiros Costeiros. Boletim de Pesquisa e Desenvolvimento, 59).

Aragão, W.M., Ribeiro, F.E., Tupinambá, E.A., de Siqueira, E.R., 2003: Variedades e híbridos. In: Fontes, H.R., Ribeiro, F.E., Fernandes, M.F., (Ed.). Coco produção: Aspectos técnicos. Aracaju: Embrapa Tabuleiros Costeiros, p. 21.

de Siqueira, E.R., Ribeiro, F.E., Aragão, W.M., Tupinambá, E.A., 1998: Melhoramento genético do coqueiro. In: Ferreira, J.M.S.; Warwick, D.R.N.; Siqueira, L.A. (Ed.). A cultura do coqueiro no Brasil. 2. Ed. rev. Amp. Brasília: Embrapa-SPI,. 292p.

Aragão, W.M., Ribeiro, F.E., de V. Melo, M.F. 2009: Cultivares de coqueiro para produção de coco seco: coqueiro gigante vs híbridos. In: Cintra, F.L.D., Fontes, H.R., Passos, E.E.M., Ferreira, J.M.S., (Ed.). Fundamentos tecnológicos para a revitalização das áreas cultivadas com coqueiro gigante do Brasil. Aracaju: Embrapa Tabuleiros Costeiros,. 232p.

Wuidart, W., Rognon, F., 1978: L'analysis de composant de la noix de cocotier: Méthode de determination du coprah. Oléagineux, **33**(5):225-33.

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	*Cocos nucifera* L.
1.2 Common name	Coconut

2. Applicant

Name	
Address	
Telephone No.	
Fax No.	
E-mail address	
Breeder (if different from applicant)	

3. Proposed denomination and breeder's reference

Proposed denomination (if available)	
Breeder's reference	

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

[#]4. Information on the breeding scheme and propagation of the variety

4.1 Breeding scheme

Variety resulting from:

4.1.1 Crossing

(a) controlled cross [ ]
(please state parent varieties)

(……..……..) 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.

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

4.2 Method of propagating the variety

4.2.1 Seed-propagated varieties

(a) Self-pollination [ ]
(b) Cross-pollination
(i) population [ ]
(ii) synthetic variety [ ]
(c) Hybrid [ ]
(d) Other [ ]
(please provide details)

4.2.2 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:

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 (8)	**Stem: diameter**		
	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[ ]
5.2 (30)	**Inflorescence: pollination behavior**		
	predominantly self pollinated		1[ ]
	Intermediate		2[ ]
	predominantly out crossing		3[ ]
5.3 (33)	**Fruit: weight**		
	very low		1[ ]
	very low to low		2[ ]
	low	GOS	3[ ]
	low to medium		4[ ]
	medium	GTT	5[ ]
	medium to large		6[ ]
	high	DBI	7[ ]
	high to very high		8[ ])
	very high		9[ ]

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

	Characteristics	Example Varieties	Note
5.4 (37)	**Fruit: shape (polar view)**		
	round		1[ ]
	ovate		2[ ]
	angled (pear shaped)		3[ ]
	oblong (elliptic)		4[ ]
5.5 (41)	**Fruit: color of husk**		
	yellow	GKB	1[ ]
	yellowish green		2[ ]
	yellowish red		3[ ]
	green	GHN	4[ ]
	greenish yellow		5[ ]
	greenish red		6[ ]
	red	GMW	7[ ]
	reddish yellow		8[ ]
	reddish green		9[ ]
	brown	GRA	10[ ]
5.6 (43)	**Nut: shape**		
	flat or oblate		1[ ]
	pointed		2[ ]
	ovoid		3[ ]
	almost round		4[ ]

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

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
GHN	*Fruit: color of husk*	*green*	*yellow*

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

Main use of the variety:

(a) pot plant [ ]

(b) garden plant [ ]

(c) other [ ]

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:

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

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

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

(a)	Microorganisms (e.g. virus, bacteria, phytoplasma)	Yes [ ]	No [ ]
(b)	Chemical treatment (e.g. growth retardant, pesticide)	Yes [ ]	No [ ]
(c)	Tissue culture	Yes [ ]	No [ ]
(d)	Other factors	Yes [ ]	No [ ]

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

…….

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

Applicant’s name

Signature Date

[End of document]