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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

DRAFT

CORIANDER

UPOV Code: CORIA_SAT

Coriandrum sativum L.

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by experts from Brazil

to be considered by the

Technical Committee at its forty-ninth session,
to be held in Geneva from March 18 to 20, 2013

Alternative Names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Coriandrum sativum L.	Coriander,Cilantro, Collender, Chinese parsley	Coriandre, Persil arabe	Koriander	Coriandro, Cilantro, Cilandrio, Culantro

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 *Coriandrum sativum* 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 seed.

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

50g or 5,000 seeds.

The seed should meet the minimum requirements for germination, species and analytical purity, health and moisture content, specified by the competent authority. In cases where the seed is to be stored, the germination capacity should be as high as possible and should, be stated by the applicant.

2.4 The plant material supplied should be visibly healthy, not lacking in vigor, nor affected by any important pest or disease.

2.5 The plant material should not have undergone any treatment which would affect the expression of the characteristics of the variety, unless the competent authorities allow or request such treatment. If it has been treated, full details of the treatment must be given.

3. Method of Examination

3.1 Number of Growing Cycles

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

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.

3.4 Test Design

3.4.1 Each test should be designed to result in a total of at least 60 plants, which should be divided between two or more 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.

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 40 plants or parts taken from each of 40 plants and any other observations made on all plants in the test, disregarding any off-type 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 The assessment of uniformity for cross-pollinated 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 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) Seedling: anthocyanin coloration of hypocotyl (characteristic 1)
(b) Plant: number of basal leaves (characteristic 4)
(c) Basal leaf: degree of lobing (characteristic 8)
(d) Time of beginning of flowering (characteristic 13)

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)–(c) 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**	**Seedling: anthocyanin coloration of hypocotyl**	**Plantule : pigmentation anthocyanique de l'hypocotyle**	**Keimpflanze: Anthocyanfärbung des Hypokotyls**	**Plántula: pigmentación antociánica del hipocótilo**		
QN	**(a)**	absent or weak	absente ou faible	fehlend oder sehr gering	ausente o débil	Americano	1
		medium	moyenne	mittel	media	Palmeira	2
		strong	forte	stark	fuerte	HTV-9299, Tabocas	3
2.	**VG**	**Cotyledon: shape**	**Cotylédon : forme**	**Keimblatt: Form**	**Cotiledón: forma**		
(+)							
QN	**(a)**	narrow elliptic	elliptique étroit	schmal elliptisch	elíptica estrecha	Asteca, Santo	1
		medium elliptic	elliptique moyen	mittel elliptisch	elíptica media	Palmeira, Tapacurá	2
		broad elliptic	elliptique large	breit elliptisch	elíptica ancha	Verdão	3
3. **(+)**	**VG/ MG**	**Plant: height**	**Plante : hauteur**	**Pflanze: Höhe**	**Planta: altura**		
QN	**(b)**	short	basse	niedrig	baja	Tabocas	1
		medium	moyenne	mittel	media	Português, Tapacurá, Thüringer	2
		tall	haute	hoch	alta	Asteca	3
4. (*) (+)	**VS**	**Plant: number of basal leaves**	**Plante : nombre de feuilles basales**	**Pflanze: Anzahl Basalblätter**	**Planta: número de hojas basales**		
QN	**(b)**	few	petit	gering	bajo	Palmeira	3
		medium	moyen	mittel	medio	Asteca	5
		many	grand	groß	alto	Santo	7
5.	**VG**	**Plant: density of foliage**	**Plante : densité du feuillage**	**Pflanze: Dichte des Laubes**	**Planta: densidad del follaje**		
QN	**(b)**	sparse	lâche	locker	escaso	Tapacurá	1
		medium	moyenne	mittel	medio	Americano, Asteca, Supéria, Verdão	3
		dense	dense	dicht	denso	HTV-9299, Santo	5
6.	**VG**	**Foliage: intensity of green color**	**Feuillage : intensité de la couleur verte**	**Laub: Intensität der Grünfärbung**	**Follaje: intensidad del color verde**		
QN	**(b)**	light	faible	hell	claro		1
		medium	moyenne	mittel	medio	Palmeira, Santo	3
		dark	forte	dunkel	oscuro	Tapacurá	5
7. **(+)**	**MS**	**Basal leaf: length**	**Feuille basale : longueur**	**Basalblatt: Länge**	**Hoja basal: longitud**		
QN	**(b)**	short	courte	kurz	corta	Tabocas	1
		medium	moyenne	mittel	media	Palmeira	2
		long	longue	lang	larga	Santo	3

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
8. (*) (+)	**VG**	**Basal leaf: degree of lobing**	**Feuille basale : degré de la découpure du bord**	**Basalblatt: Stärke der Lappung**	**Hoja basal: grado de lobulado**		
QN	**(b)**	weak	faible	gering	débil	Santo, Supéria	1
		medium	moyenne	mittel	medio	HTV9299, Tabocas, Tapacurá, Verdão	2
		strong	forte	stark	fuerte	Delfino	3
9. (+)	**VG**	**Leaf: size of terminal leaflet**	**Feuille : taille de la foliole terminale**	**Blatt: Größe der Endblattfieder**	**Hoja: tamaño del folíolo terminal**		
QN	**(b)**	small	petite	klein	pequeño	Português	1
		medium	moyenne	mittel	medio	Asteca	2
		large	grande	groß	grande	HTV-9299	3
10. (*)	**VG**	**Fruit: size**	**Fruit : taille**	**Frucht: Größe**	**Fruto: tamaño**		
QN	**(c)**	small	petite	klein	pequeño	Americano	1
		medium	moyenne	mittel	medio	HTV-9299, Tapacurá	2
		large	grande	groß	grande	Palmeira, Verdão	3
11.	**VG**	**Fruit: intensity of brown color**	**Fruit : intensité de la couleur brune**	**Frucht: Intensität der Braunfärbung**	**Fruto: intensidad del color marrón**		
QN	**(c)**	light	claire	hell	claro	Asteca, Superia	3
		medium	moyenne	mittel	medio	Palmeira, Tabocas, Verdão	5
		dark	foncée	dunkel	oscuro	Português	7
12. (*) (+)	**VG**	**Fruit: shape**	**Fruit : forme**	**Frucht: Form**	**Fruto: forma**		
QN	**(c)**	medium elliptic	elliptique moyenne	mittel elliptisch	elíptica media	Tabocas, Verdão	1
		broad elliptic	elliptique large	breit elliptisch	elíptica ancha	Americano, Asteca, HTV-9299, Palmeira, Santo, Superia, Tapacurá	2
		circular	circulaire	kreisförmig	circular	Português	3
13. (*) (+)	**MG**	**Time of beginning of flowering**	**Époque de début de floraison**	**Zeitpunkt des Blühbeginns**	**Época de inicio de la floración**		
QN		early	précoce	früh	temprana		3
		medium	moyenne	mittel	media	Tabocas, Tapacurá	5
		late	tardive	spät	tardía	Americano, Santo, Supera	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) Observations on the seedling should be done on plants with three leaves.

(b) Observations on the plant, foliage and leaf should be done at the beginning of flowering.

(c) Observations on fruits should be made at the stage of dry seeds, collected in the first and second order umbells.

8.2 Explanations for individual characteristics

Ad. 2: Cotyledon: shape

1
narrow elliptic

2
medium elliptic

3
broad elliptic

Ad. 3: Plant: height

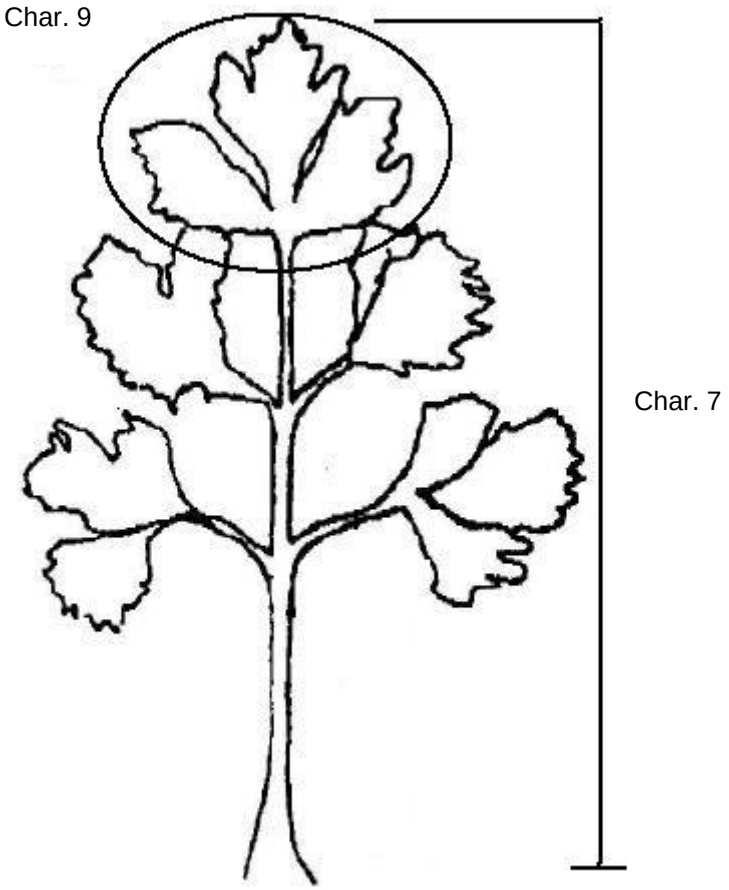
The assessment of the height of the plant should be made from the cotyledon node to the top of the highest leaf.

Ad. 4: Plant: number of basal leaves

Basal leaves are the leaves around the stem forming a rosette, excluding the cotyledon leaves. The observations on the basal leaf should be done on the longest basal leaf.

Ad. 7: Basal leaf: length
Ad. 9: Leaf: size of terminal leaflet

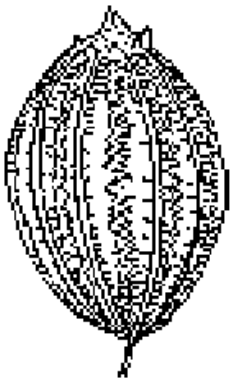
The observation on leaves and leaflets should be done in the leave on the third node from the bottom to the top.



Ad. 8: Basal leaf: degree of lobing

1	2	3
weak	medium	strong

Ad. 12: Fruit: shape



1
medium elliptic

2
broad elliptic

3
circular

Ad. 13: Time of beginning of flowering

The time of beginning of flowering is when 50% of plants have at least one open flower.

9. Literature

Diederichsen, A., 1996: *Coriander (Coriandrum sativum* L.*). Promoting the conservation and use of underutilized and neglected crops*. 3. Rome: Institute of Plant Genetics and Crop Plant Research, Gatersleben/International Plant Genetic Resources Institute, 82 pp., IT.

Melo, P.C.T de ; Shirahige, F . H.; Negrini, A.C.A.; Wanderley Júnior, L. J. da G. Caracterização morfológica de estruturas vegetais de coentro *(Coriandrum sativum* L.*)*.

Melo, P.C.T de ; Shirahige, F . H.; Negrini, A.C.A.; Wanderley Júnior, L. J. da G. Caracterização morfológica de estruturas reprodutivas e caracteres fenológicos de coentro *(Coriandrum sativum* L.*)*.

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	*Coriandrum sativum* L.
1.2 Common name	Coriander

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) Cross-pollination

(i) population [ ]

(ii) synthetic variety [ ]

(b) Other [ ]
(please provide details)

4.2.2 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 (1)	**Seedling: anthocyanin coloration of hypocotyl**		
	absent or weak	Americano	1[ ]
	medium	Palmeira	2[ ]
	strong	HTV-9299, Tabocas	3[ ]
5.2 (4)	**Plant: number of basal leaves**		
	very few		1[ ]
	very few to few		2[ ]
	few	Palmeira	3[ ]
	few to medium		4[ ]
	medium	Asteca	5[ ]
	medium to many		6[ ]
	many	Santo	7[ ]
	many to very many		8[ ]
	very many		9[ ]
5.3 (8)	**Basal leaf: degree of lobing**		
	weak	Santo, Supéria	1[ ]
	medium	HTV9299, Tabocas, Tapacurá, Verdão	2[ ]
	strong	Delfino	3[ ]
5.4 (13)	**Time of beginning of flowering**		
	very early		1[ ]
	very early to early		2[ ]
	early		3[ ]
	early to medium		4[ ]
	medium	Tabocas, Tapacurá	5[ ]
	medium		6[ ]
	late	Americano, Santo, Supera	7[ ]
	late to very late		8[ ]
	very late		9[ ]

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
Example	*Basal leaf: length*	*short*	*medium*

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

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]