

UPOV

TG/COFFEE(proj.6)

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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

DRAFT

COFFEE

UPOV Codes:

COFFE_ARA; COFFE_CAN; COFFE_ACA

Coffea arabica L.; *C. canephora* Pierre ex A. Froehner;
C. arabica × *C. canephora* hybrids

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by an expert from Brazil

*to be considered by the Technical Working Party for Fruit Crops
at its thirty-eighth session, to be held in Jeju, Republic of Korea, from July 9 to 13, 2007*

Alternative Names: *

<i>Botanical name</i>	<i>English</i>	<i>French</i>	<i>German</i>	<i>Spanish</i>
<i>Coffea arabica</i> L.	Coffee	Caféier	Kaffee	Cafeto
<i>Coffea canephora</i> Pierre ex A. Froehner	Coffee	Caféier	Kaffee	Cafeto

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.]

<u>TABLE OF CONTENTS</u>	<u>PAGE</u>
1. SUBJECT OF THESE TEST GUIDELINES.....	3
2. MATERIAL REQUIRED	3
3. METHOD OF EXAMINATION.....	3
3.1 Number of Growing Cycles	3
3.2 Testing Place	3
3.3 Conditions for Conducting the Examination.....	3
3.4 Test Design	4
3.5 Number of Plants / Parts of Plants to be Examined.....	4
3.6 Additional Tests	4
4. ASSESSMENT OF DISTINCTNESS, UNIFORMITY AND STABILITY	4
4.1 Distinctness	4
4.2 Uniformity.....	5
4.3 Stability	5
5. GROUPING OF VARIETIES AND ORGANIZATION OF THE GROWING TRIAL.....	5
6. INTRODUCTION TO THE TABLE OF CHARACTERISTICS	6
6.1 Categories of Characteristics.....	6
6.2 States of Expression and Corresponding Notes.....	6
6.3 Types of Expression.....	6
6.4 Example Varieties	6
6.5 Legend.....	6
7. TABLE OF CHARACTERISTICS/TABLEAU DES CARACTÈRES/MERKMALSTABELLE/TABLA DE CARACTERES.....	7
8. EXPLANATIONS ON THE TABLE OF CHARACTERISTICS	14
8.1 Explanations covering several characteristics	14
8.2 Explanations for individual characteristics	14
9. LITERATURE	18
10. TECHNICAL QUESTIONNAIRE	19

1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Coffea arabica* L. (Arabica type), *Coffea canephora* Pierre ex A. Froehner (Robusta type) and hybrids between *C. arabica* and *C. canephora*.

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 one-year-old plants or seed.

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

Vegetatively propagated varieties: 8 one-year-old plants,
Seed-propagated varieties: 50 seeds

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*

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 plants produce a satisfactory crop of fruit in each of the two growing cycles.

3.3.2 The recommended method of observing the characteristic is indicated by the following key in the second column of the Table of Characteristics:

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

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

3.4 *Test Design*

3.4.1 For seed-propagated varieties: each test should be designed to result in a total of at least 20 plants.

3.4.2 For vegetatively propagated varieties: each test should be designed to result in a total of at least 5 plants.

3.5 *Number of Plants / Parts of Plants to be Examined*

Unless otherwise indicated, all observations should be made on 5 plants or parts taken from each of 5 plants for vegetatively propagated varieties and 20 plants or parts taken from each of 5 plants for seed-propagated varieties.

3.6 *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.

4.2 *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 seed-propagated varieties should be according to the recommendations for cross-pollinated varieties in the General Introduction..

4.2.3 For the assessment of uniformity of vegetatively 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 5 plants, no off-types are 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 tested, either by growing a further generation, or by testing a new seed or plant stock to ensure that it exhibits the same characteristics as those shown by the previous material supplied.

5. Grouping of Varieties and Organization of the Growing Trial

5.1 The selection of varieties of common knowledge to be grown in the trial with the candidate varieties and the way in which these varieties are divided into groups to facilitate the assessment of distinctness are aided by the use of grouping characteristics.

5.2 Grouping characteristics are those in which the documented states of expression, even where produced at different locations, can be used, either individually or in combination with other such characteristics: (a) to select varieties of common knowledge that can be excluded from the growing trial used for examination of distinctness; and (b) to organize the growing trial so that similar varieties are grouped together.

5.3 The following have been agreed as useful grouping characteristics:

- (a) Plant: height (characteristic 2)
- (b) Fruit: color (characteristic 16).

5.4 Guidance for the use of grouping characteristics, in the process of examining distinctness, is provided through the General Introduction.

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*

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.

6.3 *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

VG-MG: see Section 3.3.1

(a)–(e) See Explanations on the Table of Characteristics in Chapter 8.1

(+) See Explanations on the Table of Characteristics in Chapter 8.2

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

General: To indicate type of observation (VG or MG) and to indicate () for suitable characteristics. Mex and Fr to provide example varieties of C. canephora for all characteristics.*

Char. No.	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
1. (+)	Plant: shape		Mexico: to provide example varieties for "elliptic"			
PQ	(a) conical				Acaiá, Laurina	1
	elliptic					2
	cylindrical				Catuaí	3
2. (*)	Plant: height					
QN	(a) very short				San Ramón, Vila Lobos	1
	short				IAPAR 59, Caturra	3
	medium				Catuaí, Rubi, Topázio	5
	tall				Bourbon	7
	very tall				Acaiá, Mundo Novo	9
3. (+)	Plant: diameter of canopy					
QN	(a) very small				Vila Lobos	1
	small				IAPAR 59	3
	medium				Catuaí, Rubi, Topázio	5
	large				Obatã	7
	very large				Mundo Novo IAC 388-17	9
4. (+)	Plagiotropic primary branch: length of internode					
QN	short				IAPAR 59, Caturra, Típica	3
	medium				Catuaí, Rubi, Topázio	5
	long				Mundo Novo	

Char. No.	English	français	deutsch	español	Example Varieties/ Exemplos/ Beispielssorten/ Variedades ejemplo	Note/ Nota
5.	Plagiotropic primary branch: intensity of ramification					
QN	very weak				Bourbon	1
	weak				Acaia	3
	medium				Mundo Novo	5
	strong				Catuaí, Rubi, Topázio	7
	very strong				San Ramón	9
6.	Leaf: length					
QN (b)	very short				Laurina	1
	short				Bourbon, San Ramón	3
	medium				Caturra, Mundo Novo	5
	long				Obatã	7
	very long				Maragogipe	9
7.	Leaf: width					
	very narrow				Laurina	1
QN (b)	narrow				Bourbon	3
	medium				Caturra, Mundo Novo	5
	wide				Obatã	7
	very wide				Maragogipe	9
8.	Leaf: shape					
(+)						
PQ (b)	lanceolate					1
	ovate				Maragogipe	2
	elliptic				San Ramón, Típica	3

Char. No.	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
9.	Young leaf: color	Brazil to provide photographs to enable TWF to consider whether this characteristic is anthocyanin coloration				
PQ	(b) green				Catuaí, Caturra	1
	brown				Mundo Novo IAC 379-19	2
	purple					3
10.	Leaf: undulation of margin					
QN	(b) very weak					1
	weak				Laurina	3
	medium				Catuaí, Caturra, Mundo Novo	5
	strong				Típica	7
11.	Leaf: depth of secondary veins					
QN	(b) shallow				Laurina	3
	medium				Catuaí, Mundo Novo	5
	deep					7
12.	Leaf: domatia					
(+)						
QL	(b) absent					1
	present				Típica	2
13.	Inflorescence: number of flowers					
(+)						
QN	few				Típica	3
	medium				Bourbon, Caturra	5
	many				Catuaí, Rubi, Topázio	7

Char. No.	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
14.	Fruit: size	MX/FR to provide example varieties of <i>C. canephora</i>				
QN	(d) very small				Ibairi	1
	small				Bourbon Amarelo	3
	medium				Mundo Novo	5
	large				Acaiaá	7
	very large				Maragogipe	9
15.	Fruit: shape	MX/FR to provide example varieties of <i>C. canephora</i>				
(+)						
PQ	(d) elliptic					1
	circular				Ibairi	2
	oblong				Mundo Novo	3
16.	Fruit: color					
(*)						
PQ	(d) yellow				Bourbon Amarelo, Caturra Amarelo, Topázio	1
	orange					
	light red				Mundo Novo, Oro Azteca, Rubi,	2
17.	Fruit: adherence to the branch	To check if DUS/to check if this characteristic is necessary for distinctness				
(+)						
QN	(d) weak				Mundo Novo	3
	medium				Catuaí	5
	strong				Icatu Amarelo IAC 29-44	7

Char. No.	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
18.	Fruit: dry weight of 100 fruits					
(+)						
QN	(d)				Ibairi	3
					Catuaí	5
					Maragogipe	7
19.	Seed: length					
(+)						
QN	(e)				Ibairi	1
					Bourbon	3
					Catuaí, Caturra, Mundo Novo	5
					Acaiaá, Típica	7
					Maragogipe	9
20.	Seed: width					
(+)						
QN	(e)				Acaiaá	3
					Mundo Novo	5
					Catuaí	7
21.	Seed: length/width ratio					
(+)						
QN	(e)				Ibairi	
					Bourbon, Típica	
					Maragogipe, Laurina	
22.	Seed: thickness					
(+)						
QN	(e)				Ibairi	3
					Mundo Novo	5
					Maragogipe	7

Char. No.	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
23.	Seed: weight of 100 seeds (12% moisture)					
(+)						
QN	very low				Ibairi	1
	low				Laurina	3
	medium				Catuaí	5
	high				Acaíá	7
	very high				Maragogipe	9
24.	Period between flowering and harvesting	To define the precise time of harvesting or maturity				
(+)						
QN	very short				IAPAR 59	1
	short				Bourbon	3
	medium				Mundo Novo	5
	long				Catuaí	7
	very long				Obatã	9
25.	<u>Only varieties of Coffea canephora L.:</u> Fruit: juiciness of the mesocarp	to check the most appropriate number of states (1-3 or 1-5)				
(+)						
QN	dry				Conilon	3
	medium					5
	juicy				Apoatã	7
26.	Seed: caffeine content	To delete/to check if this characteristic is necessary for distinctness				
(+)						
QN	low				Laurina	3
	medium				Catuaí, Mundo Novo	5
	high					7

Char. No.	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
27.	Seed: sucrose content	To delete/to check if this characteristic is necessary for distinctness				
(+)						
QN	low					3
	medium					5
	high					7
28.	Seed: total chlorogenic acid content	To delete/to check if this characteristic is necessary for distinctness				
(+)						
QN	low					3
	medium					5
	high					7
29.	Seed: diterpene content	To delete/to check if this characteristic is necessary for distinctness				
(+)						
QN	low					3
	medium					5
	high					7

8. Explanations on the Table of Characteristics

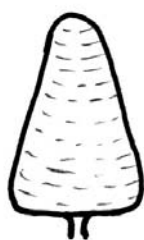
8.1 *Explanations covering several characteristics*

Characteristics containing the following key in the second column of the Table of Characteristics should be examined as indicated below:

- (a) After the second yield from the third harvest on, assessed on one main stem.
- (b) Observations should be made in summer on fully developed leaves from the middle third of a well-developed current season shoot.
- (c) Observations should be made on fully developed flowers at the beginning of anther dehiscence.
- (d) Observations should be made at the time of harvest on ripen fruits unless otherwise stated.
- (e) Must be measured from a sample of 20 seeds.

8.2 *Explanations for individual characteristics*

Ad. 1: Plant: shape



1
conical



2
elliptic



3
cylindrical

Ad. 3: Plant: diameter of canopy

The measurement (observation?) should correspond to the maximum diameter.

Ad. 5: Plagiotropic primary branch: length of internode

The length of the internodes should be observed in the middle third of the branch.

Ad. 10: Leaf: shape



1
lanceolate

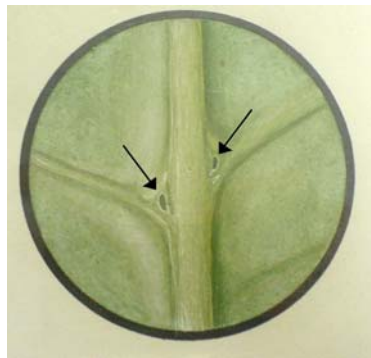


2
ovate



3
elliptic

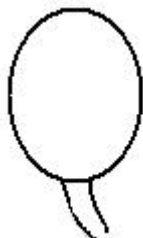
Ad. 15: Leaf: domatia



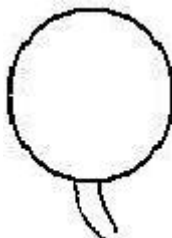
Ad. 16: Inflorescence: number of flowers

To be observed on one axil on the middle third of a plagiotropic branch.

Ad. 18: Fruit: shape



1
elliptic



2
circular



3
oblong

Ad. 20: Fruit: adherence to the branch

To describe method of assessment/to check if DUS characteristic/to check if this characteristic is necessary for distinctness

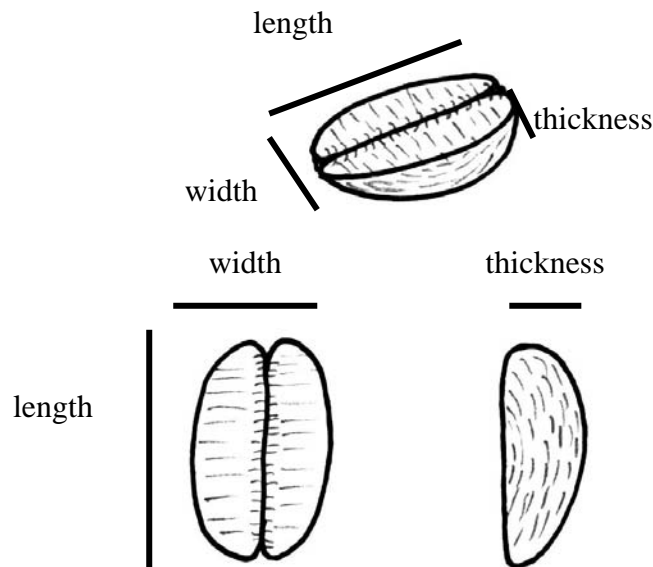
Ad 21: Fruit: dry weight of 100 fruits

Only non-floating fruits at 12% of moisture content shall be used for mensuration of this characteristic.

Ad. 23: Seed length

Ad. 24: Seed width

Ad. 25: Seed length/width ratio



Ad. 26: Seed: thickness

The measurement must be taken on flat-type seeds.

Ad. 28: Seed: weight of 100 seeds (11% moisture)

Only flat-type seeds should be used for this evaluation.

Ad. 29: Period between flowering and harvesting

To define the precise time of harvesting or maturity

Ad. 31: Only varieties of *Coffea canephora* L.: Fruit: juiciness of the mesocarp

To be provide explanation for “juiciness”.

Ad. 32: Seed: caffeine content

Ad. 33: Seed: sucrose content

Ad. 34: Seed: total chlorogenic acid content

Ad. 35: Seed: diterpene content

Methods of assessment to be provided by France/ To delete or to check if these characteristics are necessary for distinctness

9. Literature

TO ADD LITERATURE

Brazil is preparing for 2007

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		
1.1.1 Botanical name	<input type="text" value="Coffea arabica L."/>	<input type="checkbox"/>
1.1.2 Common name	<input type="text" value="Arabica Type Coffee"/>	
1.2.1 Botanical name	<input type="text" value="Coffea canephora Pierre ex A. Froehner"/>	<input type="checkbox"/>
1.2.2 Common name	<input type="text" value="Robusta Type Coffee"/>	
1.3.1 Botanical name	<input type="text" value="Coffea arabica × C. canephora"/>	<input type="checkbox"/>
1.3.2 Common name	<input type="text" value="Interspecific Hybrid"/>	
2. Applicant		
Name	<input type="text"/>	
Address	<input type="text"/>	
Telephone No.	<input type="text"/>	
Fax No.	<input type="text"/>	
E-mail address	<input type="text"/>	
Breeder (if different from applicant)	<input type="text"/>	
3. Proposed denomination and breeder's reference		
Proposed denomination (if available)	<input type="text"/>	
Breeder's reference	<input type="text"/>	

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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#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)
- (b) partially known cross []
 (please state known parent variety(ies))
- (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)

4.2 Method of propagating of the variety

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

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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Characteristics	Example Varieties	Note
TO ADD CHARACTERISTICS		

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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6. Similar varieties and differences from these varieties

Please use the table, and space provided for comments, below to provide information on how your candidate variety differs from the variety (or varieties) which, to the best of your knowledge, is (or are) most similar. This information may help the examination authority to conduct its examination of distinctness in a more efficient way.

Denomination(s) of variety(ies) similar to your candidate variety	Characteristic(s) in which your candidate variety differs from the similar variety(ies)	Describe the expression of the characteristic(s) for the similar variety(ies)	Describe the expression of the characteristic(s) for your candidate variety
<i>Example</i>		<i>(example to be inserted)</i>	<i>(example to be inserted)</i>
TO ADD EXAMPLES			
Comments:			

	Page {x} of {y}	Reference Number:
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#7. Additional information which may help in the examination of the variety

7.1 In addition to the information provided in sections 5 and 6, are there any additional characteristics, which may help to distinguish the variety?

Yes [] No []

(If yes, please provide details)

7.2 Are there any special conditions for growing the variety or conducting the examination?

Yes [] No []

(If yes, please provide details)

7.3 Other information

A representative color photograph of the variety should accompany the Technical Questionnaire

Brazil suggest not to delete

	Page {x} of {y}	Reference Number:
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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.

	Page {x} of {y}	Reference Number:
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9. Information on plant material to be examined or submitted for examination.

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

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

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

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

.....

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

Applicant's name:

Signature

Date:

[End of document]