

UPOV

TG/COFFEE(proj.3)

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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 x *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-sixth session,
to be held in Kôfu, Japan, from September 5 to 9, 2005*

Alternative Names:*

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

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 *Coffea arabica* L. (Arabica type), *Coffea canephora* Pierre ex A. Froehner (Robusta type) and their 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.

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

(a) *Coffea arabica* L.:

20 seedling plants;

(b) *Coffea canephora* Pierre ex A. Froehner:

i) Vegetatively propagated varieties: 5 one-year-old plants,

ii) Seed-propagated varieties: 30 one-year-old plants;

(c) Interspecific hybrids:

i) Vegetatively propagated varieties: 5 one-year-old plants,

ii) Seed-propagated varieties: 20 one-year-old plants.

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. Observations should be made after the third year of planting **on a representative harvest cycle.**

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.

3.3.3 Because daylight varies, color determinations made against a color chart should be made either in a suitable cabinet providing artificial daylight or in the middle of the day in a room without direct sunlight. The spectral distribution of the illuminant for artificial daylight should conform with the CIE Standard of Preferred Daylight D 6500 and should fall within the tolerances set out in the British Standard 950, Part I. These determinations should be made with the plant part placed against a white background.

3.4 *Test Design*

3.4.1 Each test should be designed **to result in a total of at least [...] plants.**

3.4.2 The design of the tests should be such that plants or parts of plants may be removed for measurement or counting without prejudice to the observations which must be made up to the end of the growing cycle.

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

Varieties resulting from crossing: unless otherwise indicated, all observations should be made on 5 plants or parts taken from each of 5 plants.

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 *Coffea arabica* L.: For the assessment of uniformity for varieties of *Coffea arabica* L. a population standard of 5% with an acceptance probability of at least 95% should be applied. In the case of a sample size of 20 plants, 3 off-types are allowed.

4.2.3 *Coffea canephora* Pierre ex A. Froehner: For the assessment of uniformity for varieties of *Coffea canephora* Pierre ex A. Froehner a population standard of 10% with an acceptance probability of at least 95% should be applied. In the case of a sample size of 5 plants (check: if this standard for uniformity applies to vegetatively propagated varieties too), 2 off-types are allowed. In the case of a sample size of 30 plants, 6 off-types are allowed.

4.2.4 Interspecific hybrids: For the assessment of uniformity for interspecific hybrids varieties, a population standard of { x }% and an acceptance probability of at least { y }% should be applied. In the case of a sample size of { a } plants, [{ b } off-types are] / [1 off-type is] allowed.. To add uniformity standards for interspecific hybrids.

4.3 Stability

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.

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 20).

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*

6.4.1 Where appropriate, example varieties are provided to clarify the states of expression of each characteristic.

6.4.2 Example varieties are provided for varieties of *Coffea arabica* L. only.

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

Char. No.	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
1.	Plant: shape					
(+)		Brazil will prepare illustrations for 2006				
PQ	(a) cylindrical				Catuaí, Mundo Novo	1
	narrow conical				Laurina	2
	conical				Vila Lobos, Garnica	3
	ellipsoidal				Bourbon	4
	cylindrical-conical				Acaiá	5
	inverted conical					6
2.	Plant: height					
(*)						
QN	(a) very short				Vila Lobos, San Ramón	1
	short				IAPAR 59, Caturra	3
	medium				Catuaí, Rubi, Topázio	5
	tall				Acaiá	7
	very tall				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				Acaiá	7
	very large				Mundo Novo	9
4.	Plant: number of inflorescences per axil					
QN	low				Típica	3
	medium				Bourbon	5
	high				Catuaí, Rubi, Topázio	7

Char. No.	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
5.	Stem (main and lateral): length of internodes					
(+)						
QN	short				IAPAR 59	3
	medium				Catuaí, Rubi, Topázio	5
	long				Mundo Novo	7
6.	Plagiotropic branch: ramification					
QN	weak				Acaia	3
	medium				Mundo Novo	5
	strong				Catuaí, Rubi, Topázio	7
7.	Leaf: length					
QN (b)	short				Bourbon, San Ramón	3
	medium				Mundo Novo, Caturra	5
	long				Obatã	7
8.	Leaf: width					
QN (b)	narrow				Bourbon	3
	medium				Mundo Novo, Caturra	5
	long				Obatã	7
9.	Leaf: shape					
(+)						
PQ (b)	elliptic				San Ramón	1
	ovate					2
	lanceolate					3

Char. No.	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
10.	Leaf: young leaf color					
PQ	green				Catuaí, Caturra	1
	green and bronze					2
	bronze				Rubi, Topázio	3
	purple					4
11.	Leaf: undulation of margin					
QL (b)	absent				Laurina	1
	present				Mundo Novo	9
12.	Leaf: degree of margin undulation					
QN (b)	slight					3
	medium				Mundo Novo, Catuaí, Caturra	5
	strong				Typica	7
13.	Leaf: depth of secondary veins					
QN (b)	shallow					3
	medium					5
	deep					7
14.	Leaf: domatia					
QL (b)	absent					1
	partially developed					2
	fully developed				Typica, Costa Rica	3
15.	Leaf: domatia pilosity					
QL (b)	absent					1
	present					9

Char. No.	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
16.	Inflorescence: number of flowers					
QN	low				Típica	3
	medium				Bourbon, Caturra	5
	high				Catuaí, Rubi, Topázio	7
17.	Flower: crossing compatibility					
(+)						
QL	(c) self-compatible				Typica	1
	partially compatible					2
	self-incompatible					3
18.	Fruit: size					
QN	(d) very small				Mokka	1
	small				Bourbon Amarelo	3
	medium				Mundo Novo	5
	large				Acaiaí	7
	very large				Maragogipe	9
19.	Fruit: shape					
(+)						
PQ	(d) round				Mokka	1
	elliptic					2
	oblong				Mundo Novo	3
20.	Fruit: color					
(*)						
PQ	(d) yellow				Bourbon, Topázio, Caturra Amarillo	1
	orange red					2
	light red				Mundo Novo, Rubi, Oro Azteca	3
	dark red					4

Char. No.	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
21.	Fruit: sepal					
QL (d)	dehiscent				Bourbon Amarelo	1
	non-dehiscent					2
22.	Fruit: adherence level					
(+)						
QN (d)	very low					1
	low				Bourbon	3
	medium				Mundo Novo, Catuaí	5
	high				Icatu, Obatã	7
	very high				Apoatã	9
23.	Seed: length					
(+)						
		Brazil will prepare illustrations for 2006 and will check if width (Ad. 24) is needed				
QN (e)	very short				Ibairi	1
	short				Bourbon	3
	medium				Mundo Novo, Catuaí, Caturra	5
	long				Acaiá, Typica	7
	very long				Maragogipe	9
24.	Seed: width					
(+)						
QN (e)	narrow				Acaiá	3
	medium				Mundo Novo	5
	wide				Catuaí	7
25.	Seed: thickness					
(+)						
QN (e)	thin				Mokka, Ibara	3
	medium				Mundo Novo	5
	thick				Maragogipe	7

Char. No.	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
26. (+)	Seed: shade of silver skin					
	light					1
	dark					2
27. (+) QN	Seed: degree of silver skin adherence					
	weak					3
	medium					5
	strong					7
28. QN	Time of maturity (at 80% of mature fruits)					
	very early				IAPAR 59	1
	early				Bourbon	3
	medium				Mundo Novo, Rubi	5
	late				Catuaí	7
	very late				Obatã	9
29. QN	First flowering					
	early				Catuaí, Rubi, Topázio	3
	medium				Bourbon	5
	late				Mundo Novo	7
30. (+) QN	Only varieties of <i>Coffea canephora</i> L.: Fruit: juiciness of the mesocarp					
	dry				Conilon	3
	medium					5
	juicy				Apoatã	7

Char. No.	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
31.	Seed: caffeine content					
(+)		Brazil will prepare an explanation for 2006				
QN	low				Laurina	3
	medium				Mundo Novo, Catuaí	5
	high					7
32.	Seed: weight of 100 seeds (11% moisture)					
(+)						
QN	low				Ibairi	3
	medium				Catuaí	5
	high				Acaiaá	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.
- (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

Illustrations to be provided.

Ad. 3: Plant: diameter of canopy

The measurement should correspond to the maximum diameter.

Ad. 5: Stem (main and lateral): length of internodes

The length of the internodes should be observed in the middle of the shoot.

Ad. 9: Leaf: shape



1
elliptic



2
ovate

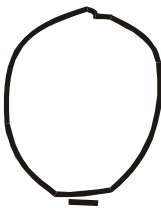


3
lanceolate

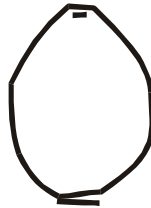
Ad. 17: Flower: crossing compatibility

Evaluated by means of bagging or isolating the flowers buds.

Ad. 19: Fruit: shape



1
round



2
elliptic



3
oblong

Ad. 22: Fruit: adherence level

Illustrations to be provided.

Ad. 23: Seed: length

Ad. 24: Seed: width

Illustrations to be provided.

Ad. 25: Seed: thickness

The measurement must be taken on flat-type seeds.

Ad. 26: Seed: shade of silver skin

Illustrations to be provided.

Ad. 27: Seed: degree of silver skin adherence

Explanation to be provided.

Ad. 30: Only varieties of *Coffea canephora* L.: Fruit: juiciness of the mesocarp

Explanation to be provided.

Ad. 31: Seed: caffeine content

Explanation to be provided.

Ad. 32: Seed: weight of 100 seeds (11% moisture)

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

9. Literature

TO ADD LITERATURE

Brazil is preparing for 2006

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"/>	
<hr/>		
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"/>	
<hr/>		
1.3.1 Botanical name	<input type="text" value="Coffea arabica x C. canephora"/>	<input type="checkbox"/>
1.3.2 Common name	<input type="text" value="INTERSPECIFIC HYBRID"/>	
<hr/>		
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"/>	
<hr/>		
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

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 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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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
TO ADD CHARACTERISTICS		

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:

TECHNICAL QUESTIONNAIRE	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

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:
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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]