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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

DRAFT

CHESTNUT *

UPOV Codes: CASTA_SAT; CASTA_CRE; CASTA_MOL

Castanea sativa Mill.;
Castanea crenata Sieold & Zucc.;
Castanea mollissima Blume

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by an expert from Japan

to be considered by the

Technical Working Party for Fruit Crops
at its forty-fifth session, to be held in Marrakesh, Morocco, from May 26 to 30, 2014

Alternative Names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Castanea sativa Mill.	Chestnut	Chataignier	Kastanie	
Castanea crenata Sieold & Zucc.	Japanese chestnut	Châtaignier du Japon	castaño del Japón; Japanische Kastanie	
Castanea mollissima Blume	Chinese Chestnut	Châtaignier de Chine	Chinesische Kastanie	Castaño chino

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 vegetatively propagated varieties of *Castanea sativa* Mill., ~~and~~ *Castanea crenata* Siebold & Zucc.,~~and~~ *Castanea mollissima* Bl and their hybrids among these species.

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 dormant shoots grafted on a rootstock selected by the testing authority or two-year-old trees grafted on a rootstock selected by the testing authority.

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

- 6 dormant shoots or
- 6 two-year-old trees.

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 duration of a single growing season, beginning with bud burst, flowering and fruit harvest and concluding when the following dormant period ends with the swelling of new season buds.

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. Trees should only be pruned in the year of planting to ensure good branch formation.

3.4 Test Design

3.4.1 Each test should be designed to result in a total of at least 5 trees.

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 5 plants or parts taken from each of 5 plants and any other observations made on all plants in the test. 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:

4.2.2 For the assessment of uniformity, 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 further examined by testing a new 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) Fruit: time of maturity for consumption (characteristic 29)
(b) Fruit: shape (characteristic 36)
(c) Fruit: color of skin (characteristic 42)
(d) Fruit: size (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. Example varieties are separated into four groups:

Group A: *Castanea sativa* Mill.
Group B: *Castanea crenata* Siebold & Zucc.
Group C: *Castanea mollissima* Bl.
Group D: Hybrids among above three species.

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)-(g) See Explanations on the Table of Characteristics in Chapter 8.1

~~(A) The characteristic only applies to varieties in Group A~~
~~(B) The characteristic only applies to varieties in Group B~~
~~(C) The characteristic only applies to varieties in Group C~~
~~See Chapter 6.4 and 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.~~	~~MG~~	~~**Tree: diameter of trunk (after first growing season, below first branch)**~~	Delete				
~~QL~~	~~(b)~~	~~very small~~				~~Rousse de Nay(A)~~	~~1~~
		~~small~~				~~Comballe(A)~~	~~3~~
		~~medium~~				~~Maraval(A)~~	~~5~~
		~~large~~				~~Belle Epine(A)~~	~~7~~
		~~very large~~				~~Marigoule(A)~~	~~9~~
1. (New)	**VG**	**Tree: vigor**					
QN	**(b)**	weak				Hong Mao Zao (C), Toyotamawase (B)	3
		medium				Ibuki (B), Ishizuchi (B), Zhong Chi Li (C)	5
		strong				Da Hong Pao (C), Ganne (B), Tsukuba (B)	7
2. (*) (+)	**VG**	**Tree: growth habit**					
QN	**(b)**	erect				Akatyu (B), Arima (B), Bouche rouge (A), Song Jia Zao (C), Tsukuba (B)	1
		semi erect				Maraval (A), Otomune (B), Rihei (B), Yan Hong (C)	2
		spreading				Belle Epine (A), Ibuki (B), Zhong Chi Li (C)	3
3. (*)	**MS/ VG**	**Current season's ~~lateral~~ shoot: thickness**					
QN	**(c)**	thin				Arima (B), Ginrei (B), Marsol (A)	3
		medium				Ginyose (B), Isizuchi (B) Marron de Chevanceaux (A), Tanzawa (B)	5
		thick				Belle Epine (A), Ibuki (B), Tsukuba (B)	7
4. (*)	**MS/ VG**	**Current season's ~~lateral~~ shoot: length of internodes**					
QN	**(c)**	short				Marigoule (A), Ibuki (B), Isizuchi (B), Yanshan Duan Zhi (C)	3
		medium				Ganne (B), Kui Li (C), Maraval (A), Shihou (B)	5
		long				Jiu Yue Han (C), Marsol (A), Rihei (B), Syogatsu (B)	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
5. (*)	**MS/ VG**	**Current season's ~~lateral~~ shoot: phyllotaxis**					
QN	**(c)**	one half				Marsol (A)	1
		two fifths				Belle Epine (A)	2
6. (*)	**MS/ VG**	**Current season's ~~lateral~~ shoot: anthocyanin coloration of distal part**					
QN	**(c)**	absent				Belle Epine (A)	1
		present				Marigoule (A)	9
7. (New) (*)	**VG**	**Current season's shoot: color of upper side**					
PQ	**(c)**	yellow brown				Ganne (B), Isizuchi (B), Okkwang (B), Shen Ci Da Ban Li (C)	1
		brown				Ginyose (B), Tsukuba (B)	2
		red brown				Arima (B), Hong Guang You Li (C), Imakita (B), Tamazukuri (B)	3
8. (old 7) (*)	**VG**	**Current season's ~~lateral~~ shoot: density of lenticels**					
QN	**(c)**	sparse				Marsol (A), Yan Kui (B)	3
		medium				Da Ban Hong (C), Ginyose (B), Ibuki (B), Rousse de Nay (A), Tanzawa (B), Tukuba (B)	5
		dense				Bournette (A), Ginrin (B), Tamazukuri (B), Taziriginyose (B), Yin Feng (C)	7
9. (old 8) (*) (+)	**MS/ VG**	**Time of leaf bud burst**					
QN		very early				Maraval (A), Shen Ci Da Ban Li (C)	1
		early				Ginyose (B), Précoce de Vans (A), Toyotamawase (B), Zao Li Zi (C)	3
		medium				Dorée de Lyon (A), Er Huang Zao (C), Ganne (B), Tanzawa (B), Tukuba (B)	5
		late				Arima (B), Ishizuchi (B), Marron Dauphine (A), Rihei (B), Yan Chang (C)	7
		very late				Banseki (B), Marron Comballe (A), Syougatu (B), Yin Feng (C)	9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
10. (old 9) (*)	**MS/ VG**	**Male flower: length of filament**					
QN	**(d)**	very short				Bouche rouge (A)	1
		short				Marron d'Olargues (A)	3
		medium				Marron de Redon (A)	5
		long				Belle Epine (A)	7
		very long					9
11. (old 10) (*) (+)	**MS**	**Unisexual catkin: length**					
QN	**(e)**	short				Belle Epine (A), Ganne (B), Ishizuchi (B), Jiu Jia Zhong (C), Toyotamawase (B)	3
		medium				Akatyu (B), Da Di Qing (C), Ginyose (B), Izumo (B), Marron de Goujounac (A)	5
		long				Arima (B), Chu Shu Hong (C), Ibuki (B), Marron de Chevanceau (A), Tanzawa (B), Tsukuba (B)	7
12. (old 11) (*) (+)	**MS/ VG**	**Time of ~~beginning of~~ male flowering**					
QN		very early				Moriwase (B), Shandong Lai Xi Da You Li (C), Soulage Première (A)	1
		early				Akatyu (B), Marigoule (A), Qing Mao Zao (C), Tamazukuri (B), Toyotamawase (B)	3
		medium				Chu Shu Hong (C), Ginyose (B), Ibuki (B), Marron de Chevanceaux (A), Tanzawa (B)	5
		late				Belle Epine (A), Ganne (B), Ishizuchi(B), Jiu Jia Zhong (C), Tsukuba (B)	7
		very late				Banseki (B), Jiu Hua 2 (C), Marron de Goujounac (A), Syogatu (B)	9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
13. (old 12) (*) (+)	**MS/ VG**	**Time of ~~beginning of~~ female flowering**					
QN		very early				Chu Shu Hong (C), Moriwase (B), Soulage Première (A)	1
		early				Akatyu (B), Jiu Jia Zhong (C), Marigoule (A), Tamazukuri (B)	3
		medium				Arima (B), Bouche rouge (A), Hong Guang (C), Ibuki (B)	5
		late				Belle Epine (A), Ishizuchi (B), Zha Shui 11 (C)	7
		very late				Banseki (B), Marron de Goujounac (A), Qian Ci Hong Mao Zao (C)	9
14. (old 13) (*)	**MS/ VG**	**Young leaf: bronze coloration (distal part of lateral)**					
QN	**(c)**	absent				Bouche rouge (A)	1
		present				Belle Epine (A)	9
15. (old 14) (*)	**MS/ VG**	**~~Full developed~~ Leaf: size**					
QN	**(d)**	small				Maraval (A), Moriwase (B), Toyotamawase (B), Wu Hua Li (C)	3
		medium				Bournette (A), Ginyose (B), Ibuki (B), Kui Li (C), Tanzawa (B)	5
		large				Marsol (A), Qian Ci Da Ban Li (C), Rihei (B), Tsukuba (B)	7
16. (old 15) (*)	**VG**	**~~Full developed~~ Leaf: cross section**					
PQ	**(d)**	straight				Belle Epine (A)	1
		slightly concave					2
		clearly concave				Comballe (A)	3
17. (old 16) (*)	**VG**	**~~Full developed~~ Leaf: symmetry**					
PQ	**(d)**	symmetric				Marsol (A)	1
		slightly asymmetric					2
		clearly asymmetric				Bournette (A)	3
18. (old 17) (*)	**MS/ VG**	**~~Full developed~~ Leaf: length/width ratio**					
QN	**(e)**	small				Marsol (A)	3
		medium				Marron de Chevanceaux (A)	5
		large				Bournette (A)	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
19. (old 18) (*)	**MS/ VG**	**~~Full developed~~ Leaf: attitude compared to shoot**					
QN	**(e)**	erect				Bouche rouge (A)	3
		horizontal				Belle Epine (A)	5
		drooping				Marron de Chevan- ceaux (A)	7
20. (old 19) (*)	**MS/ VG**	**~~Full developed~~ Leaf: green color of upper side**					
QN	**(d)**	light				Belle Epine (A), Da Di Qing (C)	1
		medium				Er Xin Zao (C), Ganne (B), Ginyose (B), Rousse de Nay (A), Tsukuba (B)	3
		dark				Bouche rouge (A), Dabufen Pinzhong (C)	5
21. (old 20) (*)	**MS/ VG**	**~~Full developed~~ Leaf: color of lower side**					
QN	**(c)**	whitish				Banseki (B), Marsol (A)	1
		light green				Bouche rouge (A), Ginyose (B)	2
22. (New) (*) (+)	**VG**	**Leaf: shape of blade**					
PQ	**(d)**	lanceolate				Jiu Yue Han (C)	1
		narrow elliptic				Daehan (B), Ganne (B), Ginyose (B), Mipung (B), Qian Ci Da Ban Li (C), Tsukuba (B)	2
		elliptic				Daebo (D), Zhong Chi Li (C)	3
23. (NEW) (*) (+)	**VG**	**Leaf: shape of apex**					
PQ	**(d)**	attenuate-acuminate				Ishizuchi (B), Qian Ci Da Ban Li (C), Tanzawa (B), Tsukuba (B)	1
		acuminate				Ginyose (B), Ibuki (B), Jian Ding You Li (C)	2
		acute				Ginrei (B), Imakita (B)	3
24. (old 21) (*) (+)	**VG**	**~~Full developed~~ Leaf: shape of base**					
PQ	**(d)**	acute				Bournette (A), Ginyose (B), Ibuki (B), Jiu Yue Han (C), Tanzawa (B)	1
		obtuse				Qian Ci Da Ban Li (C), Verdale (A)	2
		cordate				Comballe (A), Hui Huang You Li (C)	3

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
25. (old 22) (*) (+)	**MS/ VG**	**~~Full developed~~ Leaf: incisions of margin**					
PQ	**(d)**	mucronate				Bournette (A), Ginyose (B), Ibuki (B), Tanzawa (B), Tsukuba (B),	1
		dentate				Akatyu (B), Daebo (D), Izumo (B), Marsol (A)	2
26. (old 23) (*)	**VG**	**~~Full developed~~ Leaf: symmetry of petiole**					
PQ	**(d)**	symmetric or slightly asymmetric				Belle Epine (A)	1
		moderately asymmetric					2
		strongly asymmetric				Marsol (A)	3
27. (old 24) (*)	**MS/ VG**	**~~Full developed~~ Leaf: color of petiole**					
QN	**(c)**	yellow				Marsol (A)	1
		green				Belle Epine (A)	2
28. (old 25) (*) (+)	**MS/ VG**	**~~Full developed~~ Leaf: ratio length of blade/length of petiole**					
QN	**(d)**	small				Arima (B), Marava l (A), Rihei (B), Tsukuba (B)	1 ~~3~~
		medium				Ginyose (B), Ishizuchi (B), Marsol (A), Tanzawa (B)	3 ~~5~~
		large				Ganne (B), Ibuki (B), Toyotamawase (B), Verdale (A)	5 ~~7~~
29. (old 26) (*) (+)	**MS/ VG**	**~~Time of beginning of fruit ripening~~ Fruit: time of maturity for consumption**					
QN		very early				Bouche de Betizac (A), E Li 1 (C), Moriwase (B), Toyotamawase (B)	1
		early				Izumo (B), Précoce Migoule (A), Song Jia Zao (C), Tamazukuri (B), Tanzawa (B)	3
		medium				Arima (B), Hua Guang (C), Marigoule (A), Tsukuba (B)	5
		late				Bouche rouge (A), Ganne (B), Ishizuchi (B), Qing Mao Ruan Ci (C)	7
		very late				Banseki (B), Syogatsu (B), Verdale (A)	9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
30. (New) (*) (+)	**VG**	**Bur: shape in combination of front view and lateral view**					
QL	**(f)**	circular				Ganne (B), Ibuki (B), Jiao Ci (C)	1
		oblate				Arima (B), Ishizuchi (B), Jiu Jia Zhong (C), Tanzawa (B), Tsukuba (B)	2
		oblong				Ginyose (B), Imakita (B)	3
31. (New) (*) (+)	**VG**	**Bur: density of spines**					
QN	**(f)**	sparse				Duan Ci You Li (C), Tanzawa (B), Tsukuba (B)	1
		medium				Cha Wan Li (C), Moriwase (B)	3
		dense				Arima (B), Ganne (B), Ginnyose (B), Ishizuchi (B), Shen Ci Da Ban Li (C)	5
32. (old 27) (*)	**MS/ VG**	**Fruit: embryony**					
QN	**(c)**	mono-embryonic				Belle Epine (A)	1
		poly-embryonic				Laguepie (A)	2
33. (old 28) (*)	**VG**	**Poly-embryonic varieties only: Fruit: coherence of embryos**					
QN	**(d)**	weak				Maraval (A)	3
		medium				Précoce Migoule (A)	5
		strong				Laguepie (A)	7
34. (old 29) (*)	**MS/ VG**	**Fruit: penetration of seed coat into embryo**					
QN	**(c)**	absent				Marigoule (A)	1
		present				Laguepie (A)	9
35. (old 30) (*)	**VG**	**Fruit: degree of penetration of seed coat into embryo**					
QN	**(d)**	weak				Maraval (A)	3
		medium				Bournette (A)	5
		strong				Laguepie (A)	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
36. (old 31) (*) (+)	**MS/ VG**	**Fruit: shape**					
QN	**(g)**	ovoid				Jian Ding You Li (C), Marki (A)	1
		broad ovoid				Marsol (A)	2
		globose				Arima (B), Da Hong Pao (C), Isiduchi (B), Marron de Chevanceaux (A)	3
		transverse elliptic				Izumo (B), Marigoule (A), Qian Ci Da Ban Li (C), Rihei (B)	4
		transverse broad elliptic				Laguepie (A)	5
37. (New) (*) (+)	**VG**	**Fruit: distribution of pubescence**					
QN	**(g)**	narrow				Ginyose (B), Tamazukuri (B), Tsukuba (B), You Li (C)	1
		medium				Ibuki(B), Isizuchi(B), Tanzawa (B)	3
		broad				Ganne (B), Rihei (B), Yang Mao Li (C)	5
38. (old 32) (*) (+)	**MS/ VG**	**Fruit: size of hilum**					
QN	**(g)**	small				Comballe (A), Da Ban Hong (C), Isizuchi (B), Rihei (B), Toyotamawase (B)	1
		medium				Ibuki (B), Marron d'Olargues (A), Tanzawa (B), Tsukuba (B), Yanshan Zao Feng (C)	3
		large				Arima (B), Da Di Qing (C), Ganne (B), Ginrei (B), Marigoule (A)	5
39. (New) (*) (+)	**VG**	**Fruit: shape of border line of hilum and pericarp**					
QN	**(g)**	straight				Arima (B), Cui Jia Bao Zi 2399 (C), Imakita (B), Syogatsu (B)	1
		curve				Hong Li (C), Ibuki (B), Tanzawa (B), Tsukuba (B)	2
		wave				Ganne (B), Otomune (B), Rihei (B), Xinyang Da Ban Li (C)	3
40. (old 33) (*)	**MS/ VG**	**Fruit: contrast of hilum to pericarp**					
QN	**(c)**	inconspicuous				Rousse de Nay (A)	1
		conspicuous				Marigoule (A)	2

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
41. (old 34) (*)	**MS/ VG**	**Fruit: glossiness (immediately after opening of involucre)**					
QN	**(c)**	absent				Marigoule (A)	1
		present				Belle Epine (A)	9
42. (old 35) (*)	**MS/ VG**	**Fruit: color of skin**					
PQ	**(g)**	light brown				Comballe (A), Daebo (D), Hangawii (B), Hong Guang (C), Otomune (B), Tanzawa (B)	1
		brown				Arima (B), Belle Epine (A), Mipung (B), Okkwang (B), Taziriginrei (B), Zhong Chi Li (C)	2
		dark brown				Akatyu (B), Ishizuchi (B), Jiao Zha (C), Tsukuba (B)	3
		reddish brown				Daekwang (B), Ganne (B), Ginyose (B), Ibuki (B), Liu Yue Pu (C), Marron du Var (A)	4
		blackish brown				Marigoule (A), Rihei (B), Wu Ke Li (C)	5
43. (old 36) (*)	**MS/ VG**	**Fruit: size**					
QN	**(g)**	small				Hangan Tie Dan Li (C), Imakita (B), Roussette de Montpazier (A), Toyotamawase (B)	3
		medium				Arima (B), Ibuki (B), Laguepie (A), Tannzawa (B), Yan Hong (C)	5
		large				Ganne (B), Ginyose (B), Marigoule (A), Tsukuba (B), Xinyang Da Ban Li (C)	7
44. (old 37) (*) (+)	**MS/ VG**	**Seed coat: adherence to kernel (fresh fruit)**					
QN	**(g)**	weak ~~absent~~				Marigoule (A), Rihei (B)	1
		medium				Akatyu (B), Isiduchi (B), Tanzawa (B)	3
		strong ~~present~~				Ginyose (B), Ibuki (B), Laguepie (A), Tsukuba (B)	5 ~~9~~

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
45. (old 38) (*)	**MS/ VG**	**Kernel: color of flesh**					
PQ	**(g)**	white				Akatyu (B), Ginrei (B), Hubei You Li (C), Imakita (B), Marigoule (A)	1
		light yellow ~~creme~~				Arima (B), Belle Epine (A), Ginyose (B), Hangawii (B), Ishizuchi (B), Okkwang (B), Yu Luo Hong (C)	2
		yellow				Daebo (D), Ibuki (B), Mipung (B), Rihei (B), Tanzawa (B), Tsukuba(B), Zhong Chi Ban Li (C)	3
46. (old 39) (*)	**MS/ VG**	**Mono-embryonic varieties only: Kernel: inner cavity**					
QN	**(c)**	absent				Belle Epine (A)	1
		present				Bouche rouge (A)	9

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) Applies to Group A type varieties only~~
~~(B) Applies to Group B type varieties only~~
~~(C) Applies to Group C type varieties only~~

(a) Observations should be made at physiological ripeness.

(b) Plant: Observations on the plant should be made in the dormant season.

(c) Current season's shoot: Observations on the current season's shoot should be made on middle third shoots in the dormant season.

(d) Leaf: Observations on the leaf should be made on fully developed leaves. Leaves should be taken from the middle third of bearing shoots.

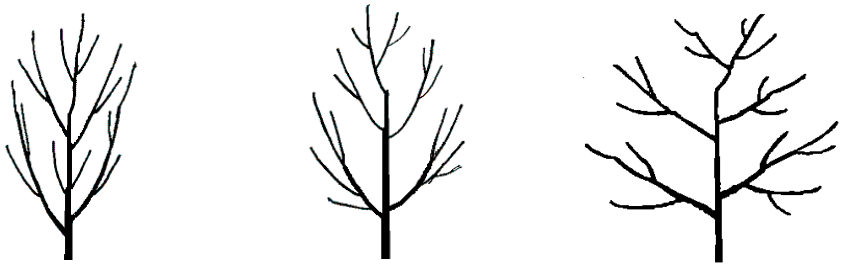
(e) Flower: Observations on the flower should be made at full flowering time.

(f) Bur: Observations on the bur should be made just before dehiscence.

(g) Fruit: Observations on the fruit should be made on mature fruits for consumption which are at outside in a bur in case of~~. If there are~~ three fruits in it ~~the bur, fruit of the center don't surveyed~~.

8.2 Explanations for individual characteristics

Ad. 2: Tree: growth habit



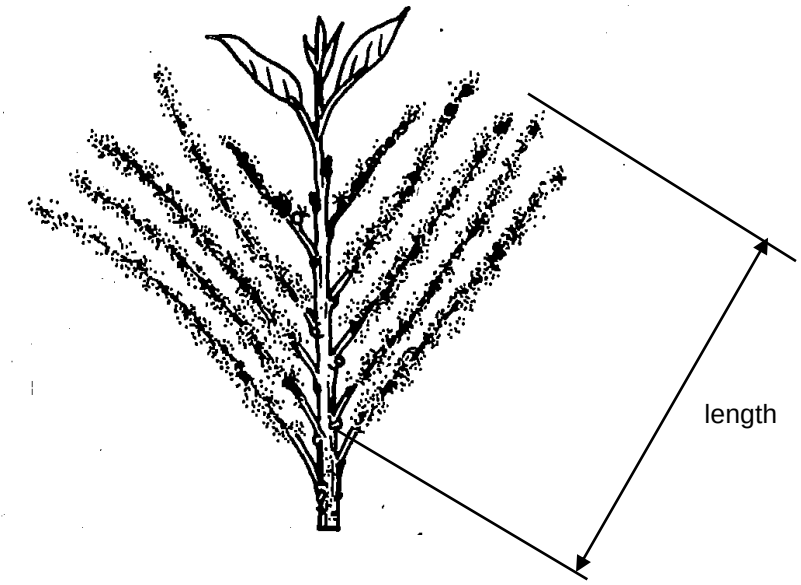
1 erect | 2 semi erect | 3 spreading

Ad. 9: Time of leaf bud burst

The time of leaf bud burst is considered as the time when 20% of buds show green color at the top of bud.

Ad. 11: Unisexual catkin: length

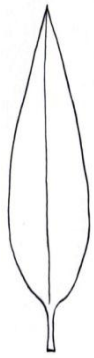
The length of catkin should be measured to the longest catkin at the full flowering time.



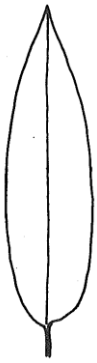
Ad. 12: Time of male flowering
Ad. 13: Time of female flowering

The time of male and female flowering is considered as the middle day between the day when 20% of the flower are fully open and the day when 80% of the flower are fully open.

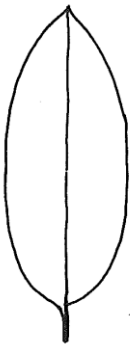
Ad. 22: Leaf: shape of blade



1
lanceolate

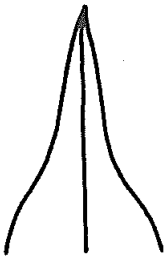


2
narrow elliptic

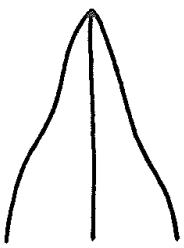


3
elliptic

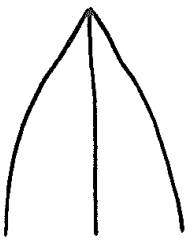
Ad. 23: Leaf: shape of apex



1
attenuate-acuminate

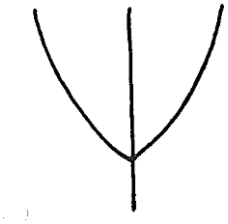


2
acuminate

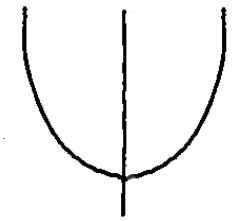


3
acute

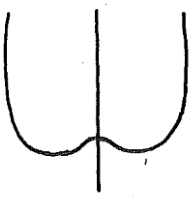
Ad. 24: Leaf: shape of base



1
acute



2
obtuse



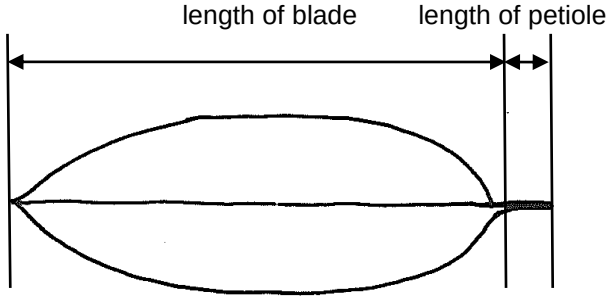
3
cordate

Ad. 25: Leaf: incisions of margin

1
mucronate

2
dentate

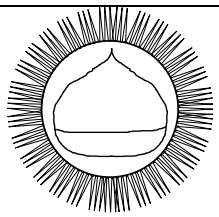
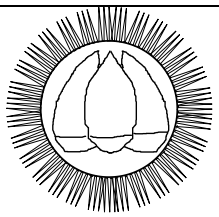
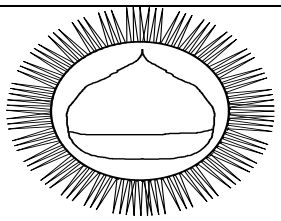
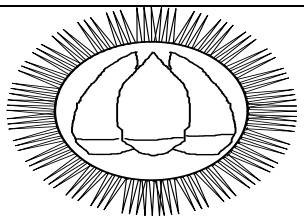
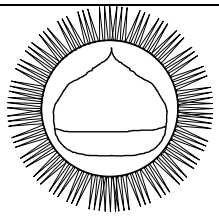
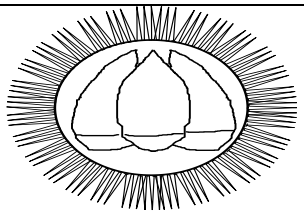
Ad. 28: Leaf: ratio length of blade/length of petiole



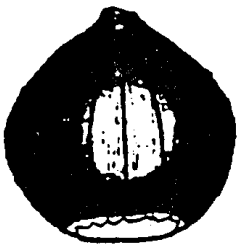
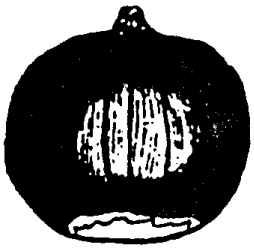
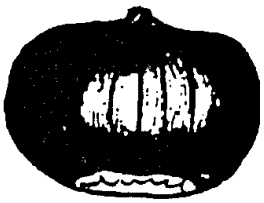
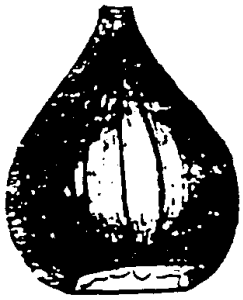
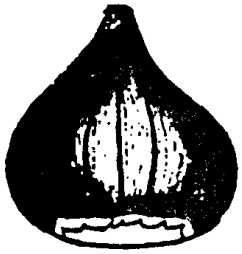
Ad. 29: Fruit: time of maturity for consumption

The time of maturity for consumption is considered as the middle day between the day when 20% of fruit is harvested and the day when 100% of fruits is harvested.

Ad. 30: Bur: shape in combination of front view and lateral view

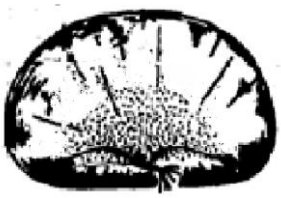
front view	lateral view
	
1 circular	
	
2 oblate	
	
3 oblong	

Ad. 36: Fruit: shape

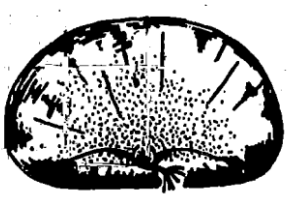
The position of the broadest point	The ratio width/height			
	long	medium	broad	very broad
middle→		 3 globose	 5 transverse broad elliptic	 4 transverse elliptic
	 1 ovoid			
←base	 2 broad ovoid			

Ad. 37: Fruit: distribution of pubescence

1
narrow

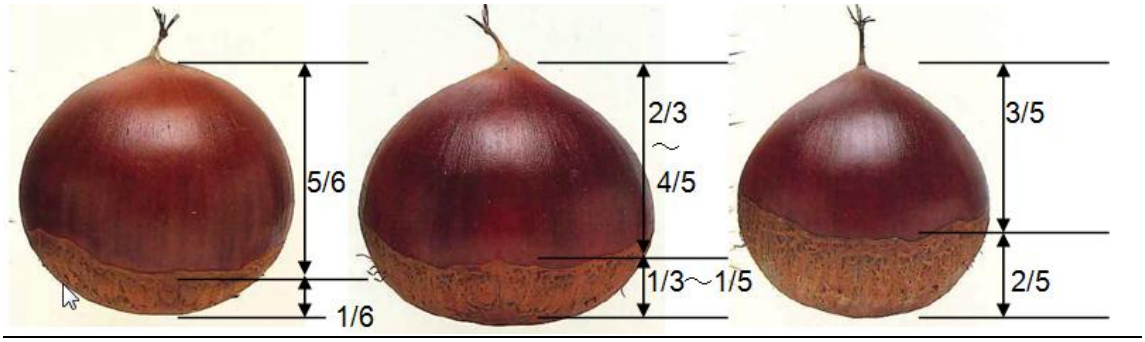


3
medium



5
broad

Ad. 38: Fruit: size of hilum



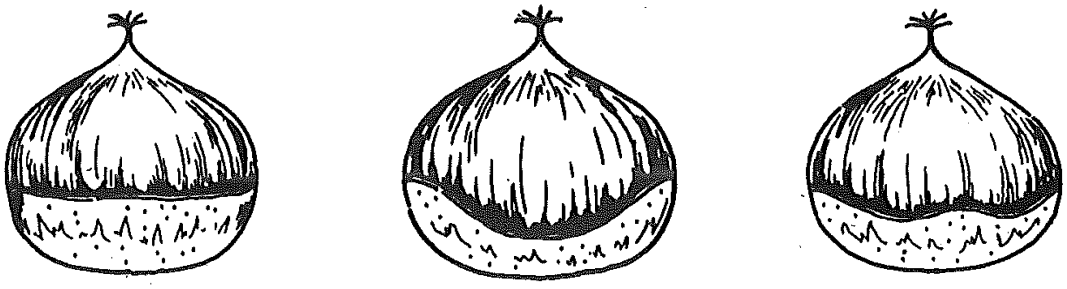
1
small

3
medium

5
large

← observation from this side

Ad. 39: Fruit: shape of border line of hilum and pericarp



1
straight

2
curve

3
wave

Ad. 44: Seed coat: adherence to kernel (fresh fruit)

The adherence to kernel should be determined by observation of easiness of peeling seed coat by hand after just harvested fruits are steamed for fifty minutes.

9. Literature

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Iwahori, S. et al.. 1999: The introduction to Citrus, Yokendo Ltd., JP, pp. 708, pp197- 199

Iwamasa, M. 1976: The varieties of Citrus, Sizuoka prefecture Citrus Agricultural cooperative, JP, pp. 255, pp243- 245

Kawase, K. 2007: Kumquat, Nosangyoson Bunka Kyokai, JP, pp. 204

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 (please complete)

1.1 Botanical name	
1.2 Common name	Chestnut

with the boxes left blank for completion by the applicant.

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 Vegetative propagation

(a) cuttings [ ]

(b) layering and grafting

(c) *in vitro* propagation [ ]

(d) other (state method) [ ]

4.2.2 Seed [ ]

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 (29)	**Time of maturity for consumption**		
	very early	Bouche de Betizac (A), E Li 1 (C), Moriwase (B), Toyotamawase (B)	1[ ]
	very early to early		2[ ]
	early		3[ ]
	early to medium	Izumo (B), Précoce Migoule (A), Song Jia Zao (C), Tamazukuri (B), Tanzawa (B)	4[ ]
	medium	Arima (B), Hua Guang (C), Marigoule (A), Tsukuba (B)	5[ ]
	medium to late		6[ ]
	late	Bouche rouge (A), Ganne (B), Ishizuchi (B), Qing Mao Ruan Ci (C)	7[ ]
	late to very late		8[ ]
	very late	Banseki (B), Syogatsu (B), Verdale (A)	9[ ]
5.2 (36)	**Fruit: shape**		
	ovoid	Jian Ding You Li (C), Marki (A)	1[ ]
	broad ovoid	Marsol (A)	2[ ]
	globose	Arima (B), Da Hong Pao (C), Isiduchi (B), Marron de Chevanceaux (A)	3[ ]
	transverse elliptic	Izumo (B), Marigoule (A), Qian Ci Da Ban Li (C), Rihei (B)	4[ ]
	transverse broad elliptic	Laguepie (A)	5[ ]
5.3 (42)	**Fruit: color of skin**		
	light brown	Comballe (A), Daebo (D), Hangawii (B), Hong Guang (C), Otomune (B), Tanzawa (B)	1[ ]
	brown	Arima (B), Belle Epine (A), Mipung (B), Okkwang (B), Taziriginrei (B), Zhong Chi Li (C)	2[ ]
	dark brown	Akatyu (B), Ishizuchi (B), Jiao Zha (C), Tsukuba (B)	3[ ]
	reddish brown	Daekwang (B), Ganne (B), Ginyose (B), Ibuki (B), Liu Yue Pu (C), Marron du Var (A)	4[ ]
	blackish brown	Marigoule (A), Rihei (B), Wu Ke Li (C)	5[ ]

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

	Characteristics	Example Varieties	Note
5.4 (43)	**Fruit: size**		
	very small		1[ ]
	very small to small		2[ ]
	small	Hangan Tie Dan Li (C), Imakita (B), Roussette de Montpazier (A), Toyotamawase (B)	3[ ]
	small to medium		4[ ]
	medium	Arima (B), Ibuki (B), Laguepie (A), Tannzawa (B), Yan Hong (C)	5[ ]
	medium to large		6[ ]
	large	Ganne (B), Ginyose (B), Marigoule (A), Tsukuba (B), Xinyang Da Ban Li (C)	7[ ]
	large to very large		8[ ]
	very large		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	*Fruit color*	*brown*	*dark brown*

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 What is this variety used for?

Fruit [ ] Ornamental [ ]

7.4 Other information

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.

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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]