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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

DRAFT

CHESTNUT

UPOV Code(s): CASTA_CRE; CASTA_MOL; CASTA_SAT

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

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by experts from Japan
to be considered by the
Technical Working Party for Fruit Crops
at its forty-seventh session, to be held in Angers, France,
from 2016-11-14 to 2016-11-18

Disclaimer: this document does not represent UPOV policies or guidance

Alternative names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Castanea crenata Sieold & Zucc.	Japanese chestnut	Châtaignier du Japon	Japanische Kastanie	Castaño del Japón
Castanea mollissima Blume	Chinese Chestnut	Châtaignier de Chine	Chinesische Kastanie	Castaño chino
Castanea sativa Mill., *Castanea vesca* Gaertn., *Castanea vulgaris*, *Fagus castanea* L.	Chestnut	Chataignier	Kastanie	

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.

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1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Castanea crenata* Sieold & Zucc., *Castanea mollissima* Blum and *Castanea sativa* Mill. and hybrids between 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 for grafting 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:

- 10 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.

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.

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 or 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 of plants taken from each of 5 plants and any other observations made on all plants in the test, disregarding any off-type plants.

4.1.5 Method of Observation

The recommended method of observing the characteristic for the purposes of distinctness is indicated by the following key in the second column of the Table of Characteristics (see document TGP/9 “Examining Distinctness”, Section 4 “Observation of characteristics”):

MG: single measurement of a group of plants or parts of plants
MS: measurement of a number of individual plants or parts of plants
VG: visual assessment by a single observation of a group of plants or parts of plants
VS: visual assessment by observation of individual plants or parts of plants

Type of observation: visual (V) or measurement (M)

“Visual” observation (V) is an observation made on the basis of the expert’s judgment. For the purposes of this document, “visual” observation refers to the sensory observations of the experts and, therefore, also includes smell, taste and touch. Visual observation includes observations where the expert uses reference points (e.g. diagrams, example varieties, side-by-side comparison) or non-linear charts (e.g. color charts). Measurement (M) is an objective observation against a calibrated, linear scale e.g. using a ruler, weighing scales, colorimeter, dates, counts, etc.

Type of record: for a group of plants (G) or for single, individual plants (S)

For the purposes of distinctness, observations may be recorded as a single record for a group of plants or parts of plants (G), or may be recorded as records for a number of single, individual plants or parts of plants (S). In most cases, “G” provides a single record per variety and it is not possible or necessary to apply statistical methods in a plant-by-plant analysis for the assessment of distinctness.

In cases where more than one method of observing the characteristic is indicated in the Table of Characteristics (e.g. VG/MG), guidance on selecting an appropriate method is provided in document TGP/9, Section 4.2.

4.2 Uniformity

4.2.1 It is of particular importance for users of these Test Guidelines to consult the General Introduction prior to making decisions regarding uniformity. However, the following points are provided for elaboration or emphasis in these Test Guidelines:

4.2.2 For the assessment of {indicate type of varieties} 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 seed or plant stock to ensure that it exhibits the same characteristics as those shown by the initial material supplied.

5. Grouping of Varieties and Organization of the Growing Trial

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

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

5.3 The following have been agreed as useful grouping characteristics:

(a) Nut: shape (characteristic 31)
(b) Nut: color of skin (characteristic 37)
(c) Nut: size (characteristic 38)
(d) Time of maturity for consumption (characteristic 45)

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 indicated its species as (A), (B), (C) after variety denomination.
(A): *Castanea sativa* Mill.
(B): *Castanea crenata* Siebold & Zucc.
(C): *Castanea mollissima* Blume

6.5 Legend

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1 2	**3 4**	**5 6**	**7**			
	Name of characteristics in English	**Nom du caractère en français**	**Name des Merkmals auf Deutsch**	**Nombre del carácter en español**		
	states of expression	types d'expression	Ausprägungsstufen	tipos de expresión		

1 Characteristic number

2 (*) Asterisked characteristic – see Chapter 6.1.2

3 Type of expression
QL Qualitative characteristic – see Chapter 6.3
QN Quantitative characteristic – see Chapter 6.3
PQ Pseudo-qualitative characteristic – see Chapter 6.3

4 Method of observation (and type of plot, if applicable)
MG, MS, VG, VS – see Chapter 4.1.5

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

6 (a)-(f) See Explanations on the Table of Characteristics in Chapter 8.1

7 Growth stage key See Explanations on the Table of Characteristics in Chapter 8

8 Species of example varieties
(A): *Castanea sativa* Mill. - see chapter 6.4
(B): *Castanea crenata* Siebold & Zucc. - see chapter 6.4
(C): *Castanea mollissima* Blume - see chapter 6.4

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

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1.		**QN VG**	**(+) (a)**				
		Tree: vigor					
		weak	faible	schwach	débil	Hong Mao Zao(C), Toyotamawase(B)	3
		medium	moyenne	mittel	medio	Ibuki(B), Ishizuchi(B), Zhong Chi Li(C)	5
		strong	forte	stark	fuerte	Da Hong Pao(C), Ganne(B), Tsukuba(B)	7
2.	**(*)**	**QN VG**	**(+) (a)**				
		Tree: growth habit					
		upright	dressé	aufrecht	erguido	Akatyu(B), Arima(B), Bouche rouge(A), Song Jia Zao(C), Tsukuba(B)	1
		semi-upright	demi-dressé	halbaufrecht	semierguido	Maraval(A), Otomune(B), Rihei(B), Yan Hong(C)	2
		spreading	divergent	breitwüchsig	extendido	Belle Epine(A), Ibuki(B), Zhong Chi Li(C)	3
3.	**(*)**	**QN MG/VG**	**(b)**				
		Current seson's shoot: thickness					
		thin				Arima(B), Ginrei(B), Marsol(A)	1
		medium				Ginyose(B), Ishizuchi(B), Marron de Chevanceaux(A), Tanzawa(B)	3
		thick				Belle Epine(A), Ibuki(B), Tsukuba(B)	5
4.	**(*)**	**QN MS/VG**	**(b)**				
		Current season's shoot: length of internodes					
		short				Ibuki(B), Marigoule(A), 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)	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
5.	**(*)**	**QL VG**	**(+) (b)**				
		Current season's shoot: phyllotaxis					
		one half				Marsol(A)	1
		two fifths				Belle Epine(A)	2
6.	**(*)**	**PQ VG**	**(b)**				
		Current season's shoot: color of upper side of stem					
		yellow brown				Ganne(B), Ishizuchi(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), Tamatsukuri(B)	3
7.	**(*)**	**QN VG**	**(b)**				
		Current seson's shoot: density of lenticels					
		sparse				Marsol(A), Yan Kui(B)	1
		medium				Da Ban Hong(C), Ginyose(B), Ibuki(B), Rousse de Nay(A), Tanzawa(B), Tsukuba(B)	3
		dense				Boumette(A), Ginrei(B), Tamatsukuri(B), Taziriginyose(B), Yin Feng(C)	5
8.		**QN MS/VG**	**(+) (d)**				
		<u>Shoot: number of female flowers</u>					
		few				Moriwase(B)	1
		medium				Tanzawa(B), Tsukuba(B)	3
		many				Arima(B), Ishizuchi(B)	5
9.	**(*)**	**QN MS/VG**	**(d)**				
		Male flower: length of filament					
		very short				Bouche rouge(A)	1
		short				Marron d' Olargues(A)	2
		medium				Marron de Redon(A)	3
		long				Belle Epine(A)	4
		very long					5

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
10.	**(*)**	**QN VG**	**(+) (d)**				
		Unisexual catkin: length					
		shot				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 Goujo unac(A)	5
		long				Arima(B), Chu Shu Hong(C), Ibuki(B), Marron de Chevanceaux(A), Tanzawa(B), Tsukuba(B)	7
11.	**(*)**	**QL VG**	**(+) (c)**				
		Young leaf: bronze coloration					
		absent				Bouche rouge(A)	1
		present				Belle Epine(A)	9
12.	**(*)**	**QN MS/VG**	**(+) (c)**				
		Leaf: size					
		small				Maraval(A), Moriwase(B), Toyotamawase(B), Wu Hua Li(C)	3
		medium				Boumette(A), Ginyose(B), Ibuki(B), Kui Li(C), Tanzawa(B)	5
		large				Marsol(A), Qian Ci Da Ban Li(C), Riheiguri(B), Tsukuba(B)	7
13.		**QN VG**	**(+) (c)**				
		Leaf: profile in cross section					
		straight				Belle Epine(A)	1
		slightly concave					2
		strongly concave				Comballe(A)	3
14.		**QN VG**	**(c)**				
		Leaf: symmetry					
		symmetric to slightly asymmetric				Marsol(A)	1
		moderately asymmetric					2
		strongly asymmetric				Boumette(A)	3

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
15.		**QN MS/VG**	**(+) (c)**				
		Leaf: length/width ratio					
		low				Marsol(A)	3
		medium				Marron de Chevanceaux(A)	5
		high				Boumette(A)	7
16.		**QN VG**	**(+) (c)**				
		Leaf: attitude in relation to shoot					
		upwards				Bouche rouge(A)	1
		outwards				Belle Epine(A)	2
		downwards				Marron de Chevanceaux(A)	3
17.	**(*)**	**QN VG**	**(c)**				
		Leaf blade: intensity of green color of upper side					
		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 Pinzho ng(C)	5
18.	**(*)**	**QL VG**	**(c)**				
		Leaf: color of lower side					
		whitish				Banseki(B), Marsol(A)	1
		light green				Bouche rouge(A), Ginyose(B)	2
19.	**(*)**	**PQ VG**	**(c)**				
		Leaf: shape					
		lanceolate				Jiu Yue Han(C)	1
		narrow elliptic				Dae han(B), Ganne(B), Ginyose(B), Mipung(B), Qian Ci Da Ban Li(C), Tsukuba(B)	2
		broad elliptic				Zhong Chi Li(C)	3

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
20.	**(*)**	**PQ VG**	**(+) (c)**				
		Leaf: shape of apex					
		narrow acuminate				Ishizuchi(B), Qian Ci Da Ban Li(C), Tanzawa(B), Tsukuba(B)	1
		broad acuminate				Ginyose(B), Ibuki(B), Jian Ding You Li(C)	2
		acute				Ginrei(B), Imakita(B)	3
21.	**(*)**	**PQ VG**	**(+) (c)**				
		Leaf: shape of base					
		acute				Boumette(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
22.	**(*)**	**PQ VG**	**(+) (c)**				
		Leaf: shape of margin					
		needle shape				Ibuki(B), Ishizuchi(B), Tanzawa(B)	1
		acute				Akatyu(B), Izumo(B)	2
		flare shape				Marsol(A)	3
23.	**(*)**	**QN VG**	**(c)**				
		Leaf: symmetry of base					
		symmetric or slightly asymmetric				Belle Epine(A)	1
		moderately asymmetric					2
		strongly asymmetric				Marsol(A)	3
24.	**(*)**	**QL VG**	**(c)**				
		Leaf: color of petiole					
		yellow				Marsol(A)	1
		green				Belle Epine(A)	2

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
25.	**(*)**	**QN MS/VG**	**(c)**				
		Leaf: ratio length of leaf blade/length of petiole					
		low				Arima(B), Maraval(A), Riheiguri(B), Tsukuba(B)	3
		medium				Ginyose(B), Ishizuchi(B), Marsol(A), Tanzawa(B)	5
		high				Ganne(B), Ibuki(B), Toyotamawase(B), Verdale(A)	7
26.	**(*)**	**PQ VG**	**(+)** **(e)**				
		Bur: shape					
		globose				Ganne(B), Ibuki(B), Jiao Ci(C)	1
		obloid				Arima(B), Ishizuchi(B), Jiu Jia Zhong(C), Tanzawa(B), Tsukuba(B)	2
		transverse cylindric				Ginyose(B), Imakita(B)	3
27.	**(*)**	**QN VG**	**(e)**				
		Bur: density of prickles					
		sparse				Duan Ci You Li(C), Tanzawa(B), Tsukuba(B)	1
		medium				Cha Wan Li(C), Moriwase(B)	3
		dense				Ginyose(B), Ishizuchi(B), Shen Ci Da Ban Li(C)	5
28.	**(*)**	**QL VG**	**(+)** **(f)**				
		Nut: embryony					
		mono-embryonic				Belle Epine(A)	1
		poly-embryonic				Laguepie(A)	2
29.	**(*)**	**QN VG**	**(f)**				
		Poly-embryonic varieties only: Nut: coherence of embryos					
		weak				Maraval(A)	3
		medium				Precoce Migoule(A)	5
		strong				Laguepie(A)	7

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
30.	**(*)**	**QN VG**	**(f)**				
		Nut: degree of penetration of seed coat into embryo					
		absent or very weak				Marigoule(A)	1
		weak				Maraval(A)	3
		medium				Boumette(A)	5
		strong				Laguepie(A)	7
31.	**(*)**	**PQ VG**	**(+) (f)**				
		Nut: shape					
		medium ovate				Jian Ding You Li(C), Marki(A)	1
		broad ovate				Marsol(A)	2
		circular				Arima(B), Da Hong Pao(C), Ishizuchi(B), Marron de Chevanceaux(A)	3
		medium oblate				Laguepie(A)	4
		broad oblate				Izumo(B), Marigoule(A), Qian Ci Da Ban Li(C), Riheiguri(B)	5
32.	**(*)**	**QN VG**	**(+) (f)**				
		Nut: area of pubescence on upper part					
		small				Ginyose(B), Tamatsukuri(B), Tsukuba(B), You Li(C)	1
		medium				Ibuki(B), Ishizuchi(B), Tanzawa(B)	3
		large				Ganne(B), Riheiguri(B), Yang Mao Li(C)	5
33.	**(*)**	**QN MS/VG**	**(+) (f)**				
		Nut: area of hilum					
		small				Comballe(A), Da Ban Hong(C), Ishizuchi(B), Riheiguri(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

		English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
34.	**(*)**	**PQ**	**VG**		**(f)**				
		Nut: shape of border line of hilum and pericarp							
		straight						Arima(B), Cui Jia Bao Zi 2399(C), Imakita(B)	1
		curved						Hong Li(C), Ibuki(B), Tanzawa(B), Tsukuba(B)	2
		wavy						Ganne(B), Otomune(B), Riheiguri(B), Xinyang Da Ban Li(C)	3
35.	**(*)**	**QN**	**VG**		**(f)**				
		Nut: conspicuousness of hilum							
		inconspicuous						Rousse de Nay(A)	1
		moderately conspicuous						Marigoule(A)	2
36.	**(*)**	**QN**	**VG**	**(+)**	**(f)**				
		Nut: glossiness							
		absent or weak						Marigoule(A)	1
		medium						Belle Epine(A)	2
37.	**(*)**	**PQ**	**VG**		**(f)**				
		Nut: color of skin							
		light brown						Comballe(A), Hangawii(B), Hong Guang(C), Otomune(B), Tanzawa(B)	1
		medium brown						Arima(B), Belle Epine(A), Mipung(B), Okkwang(B), Taziriginyose(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 de Var(A)	4
		blackish brown						Marigoule(A), Riheiguri(B), WuKe Li(C)	5

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
38.	**(*)**	**QN MS/VG**	**(f)**				
		Nut: size					
		small				Hangan Tie Dan Li(C), Imakita(B), Roussette de Montpazier(A), Toyotamawase(B)	3
		medium				Arima(B), Ibuki(B), Laguepie(A), Tanzawa(B), Yan Hong(C)	5
		large				Ganne(B), Ginyose(B), Marigoule(A), Tsukuba(B), Xinyang Da Ban Li(C)	7
39.	**(*)**	**QN VG**	**(+) (f)**				
		Seed coat: adherence to kernel					
		weak				Marigoule(A), Riheiguri(B)	3
		medium				Akatyu(B), Ishizuchi(B), Tanzawa(B)	5
		strong				Ginyose(B), Ibuki(B), Laguepie(A), Tsukuba(B)	7
40.	**(*)**	**PQ VG**	**(f)**				
		Kernel: color of flesh					
		white				Akatyu(B), Ginrei(B), Hubei You Li(C), Imakita(B), Marigoule(A)	1
		whitish yellow				Arima(B), Belle Epine(A), Ginyose(B), Hangawii(B), Ishizuchi(B), Okkwang(B), Yu Luo Hong(C)	2
		yellow				Ibuki(B), Mipung(B), Riheiguri(B), Tanzawa(B), Tsukuba(B), Zhong Chi Ban Li(C)	3
41.	**(*)**	**QL VG**	**(f)**				
		Mono-embryonic varieties only: Kernel: inner cavity					
		absent				Belle Epine(A)	1
		present				Bouche rouge(A)	9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
42. (*)	**QN MG/VG**	**(+)**				
	Time of leaf bud burst					
	very early	très précoce	sehr früh	muy temprana	Maraval(A), Shen Ci Da Ban Li(C)	1
	early	précoce	früh	temprana	Ginyose(B), Precoce de Vans(A), Toyotamawase(B), Zao Li Zi(C)	3
	medium	moyenne	mittel	media	Doree de Lyon(A), Er Hung Zao(C), Ganne(B), Tanzawa(B), Tsukuba(B)	5
	late	tardive	spät	tardía	Arima(B), Ishizuchi(B), Marron Dauphine(A), Riheiguri(B), Yan Chang(C)	7
	very late				Banseki(B), Marron Comballe(A), Yin Feng(C)	9
43. (*)	**QN MG/VG**	**(+)**				
	Time of male flowering					
	very early	très précoce	sehr früh	muy temprana	Moriwase(B), Shandong Lai Xi Da You Li(C), Soulage Premiere(A)	1
	early	précoce	früh	temprana	Akatyu(B), Marigoule(A), Qing Mao Zao(C), Tamatsukuri(B), Toyotamawase(B)	3
	medium	moyenne	mittel	media	Chu Shu Hong(C), Ginyose(B), Ibuki(B), Marron de Chevanceaux(A), Tanzawa(B)	5
	late	tardive	spät	tardía	Belle Epine(A), Ganne(B), Ishizuchi(B), Jiu Jia Zhong(C), Tsukuba(B)	7
	very late	très tardive	sehr spät	muy tardía	Banseki(B), Jiu Hua 2(C), Marron de Goujo unac(A)	9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
44. (*)	**QN MG/VG**	**(+)**				
	Time of female flowering					
	very early				Chu Shu Hong(C), Moriwase(B), Soulage Premiere(A)	1
	early				Akatyu(B), Jiu Jia Zhong(C), Marigoule(A), Tamatsukuri(B)	3
	medium				Arima(B), Bouche rouge(A), Hua Guang(C), Ibuki(B)	5
	late				Belle Epine(A), Ishizuchi(B), Qing Mao Ruan Ci(C)	7
	very late				Banseki(B), Verdale(A)	9
45. (*)	**QN MG/VG**	**(+)**				
	Time of maturity for consumption					
	very early	très précoce	sehr früh	muy precoz	Bouche de Betizac(A), Eli1(C), Moriwase(B), Toyotamawase(B)	1
	early	précoce	früh	precoz	Izumo(B), Precoce Migoule(A), Song Jia Zao(C), Tamatsukuri(B), Tanzawa(B)	3
	medium	moyenne	mittel	media	Arima(B), Hua Guang(C), Marigoule(A), Tsukuba(B)	5
	late	tardive	spät	tardía	Bouche rouge(A), Ganne(B), Ishizuchi(B), Qing Mao Ruan Ci(C)	7
	very late	très tardive	sehr spät	muy tardía	Banseki(B), Verdale(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) Plant: Observations on the plant should be made in the dormant season.

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

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

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

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

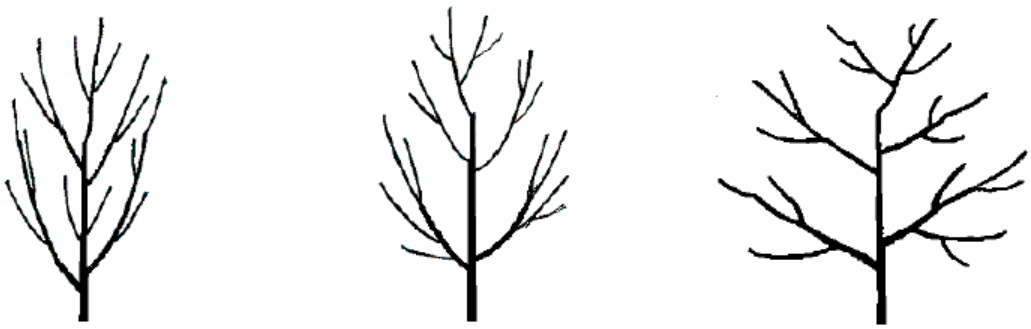
(f) Nut: Observations on the nut should be made on nuts mature for consumption. In case of bur containing three nuts, the middle one should be disregarded.

8.2 Explanations for individual characteristics

Ad. 1: Tree: vigor

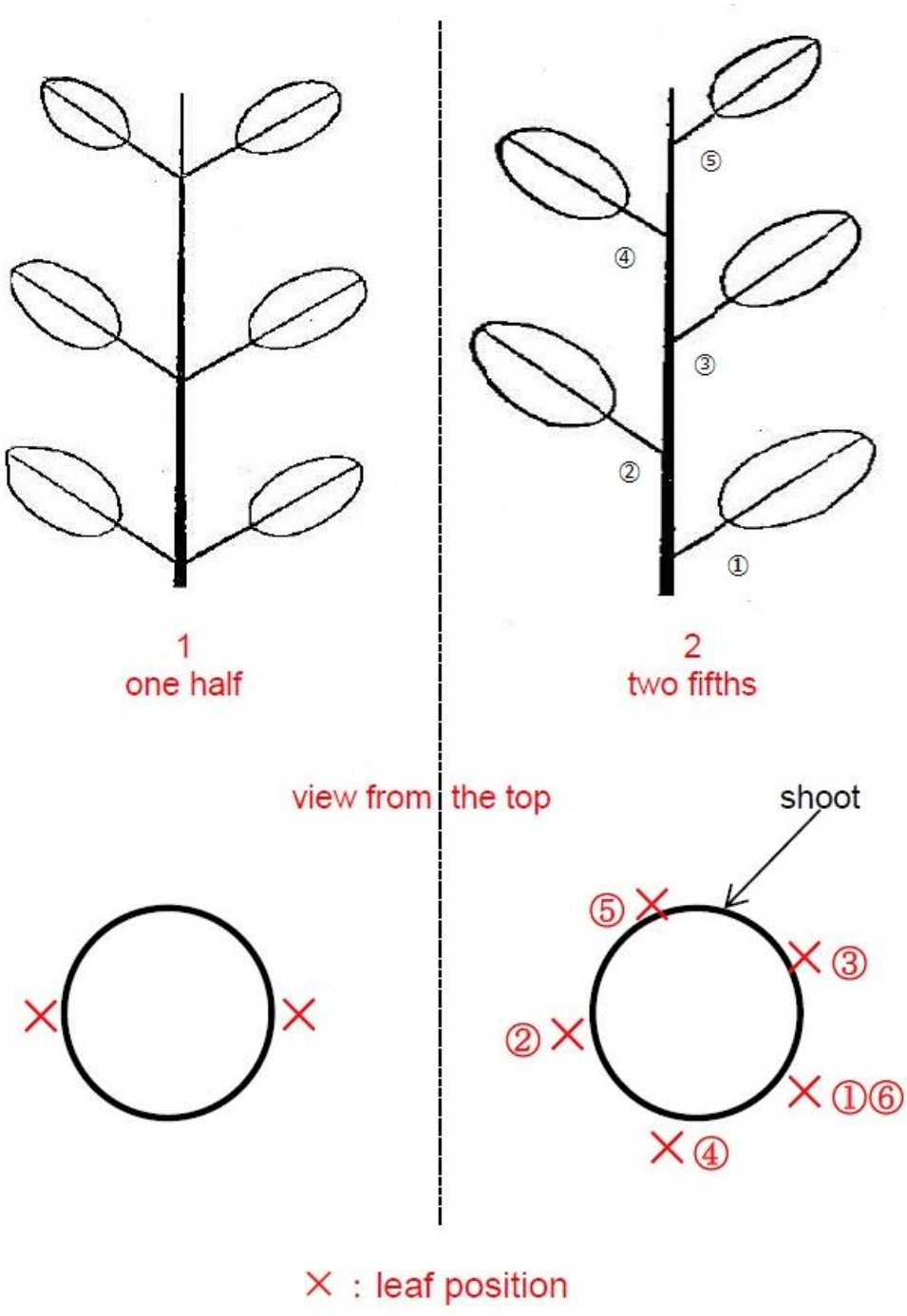
The vigor of the tree should be considered as the overall abundance of vegetative growth.

Ad. 2: Tree: growth habit



1 upright | 2 semi- upright | 3 spreading

Ad. 5: Current season's shoot: phyllotaxis

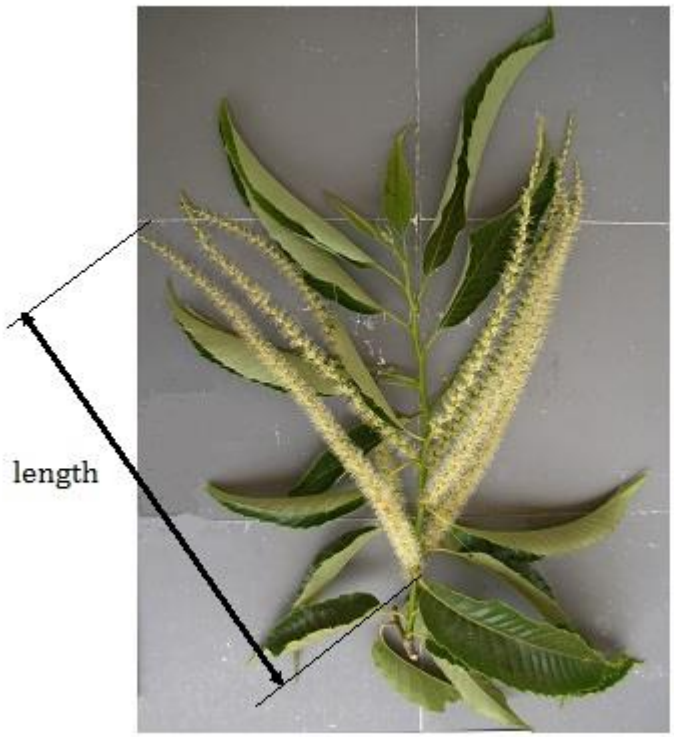


Ad. 8: Shoot: number of female flowers

The number of female flowers should be observed on the bearing shoots at full flowering time.

Ad. 10: Unisexual catkin: length

The length of catkin should be observed on the longest catkin at the full flowering time.



Ad. 11: Young leaf: bronze coloration

Bronze coloration of young leaf should be observed at distal part of current shoot.

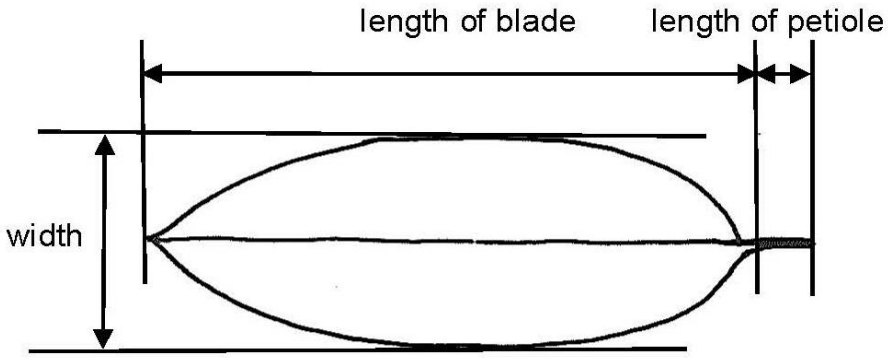
Ad. 12: Leaf: size

The size of leaf should be observed on the leaf blade.

Ad. 13: Leaf: profile in cross section

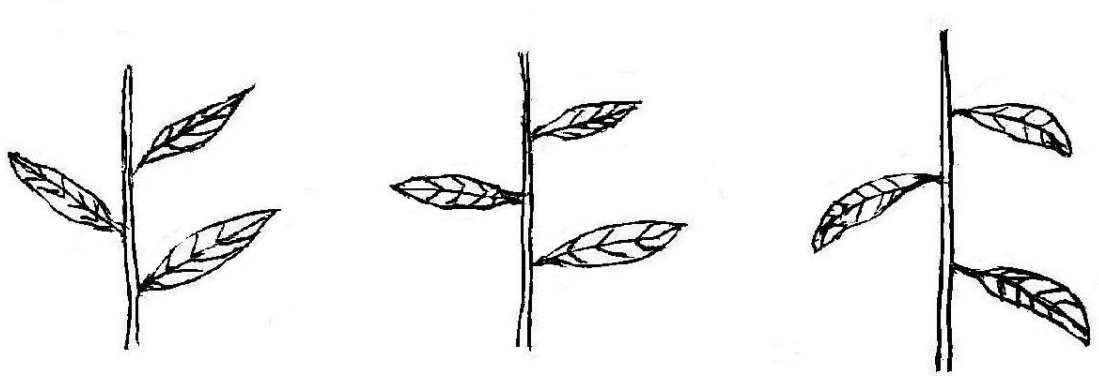
1	2	3
straight	slightly concave	strongly concave

Ad. 15: Leaf: length/width ratio



Ad. 16: Leaf: attitude inrelation to shoot

The attitude should be observed on upright shoots vertically.

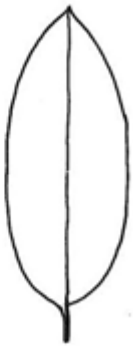


1	2	3
upwards	outwards	downwards

Ad. 19: Leaf: shape

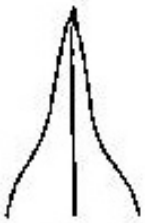
1
lanceolate

2
narrow elliptic

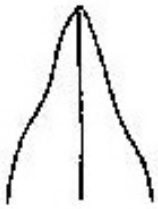


3
broad elliptic

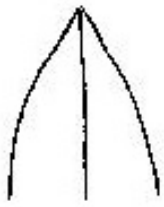
Ad. 20: Leaf: shape of apex



1
narrow acuminate

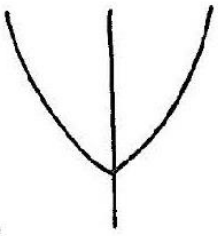


2
broad acuminate

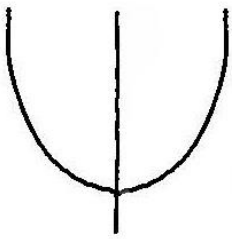


3
acute

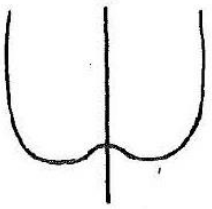
Ad. 21: Leaf: shape of base



1
acute

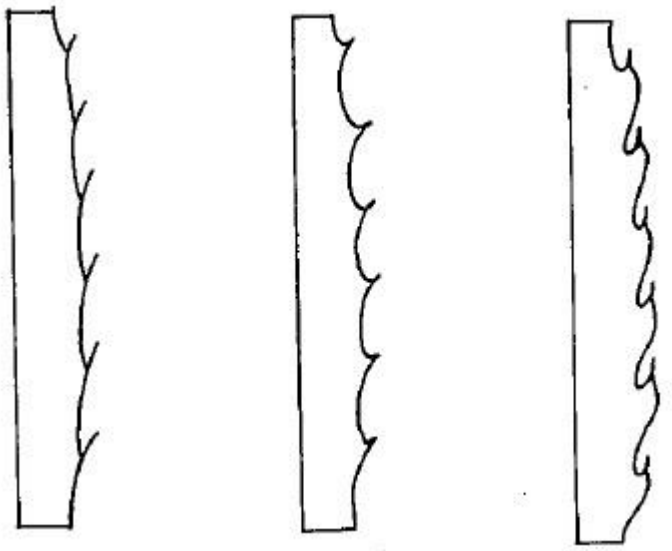


2
obtuse



3
cordate

Ad. 22: Leaf: shape of margin

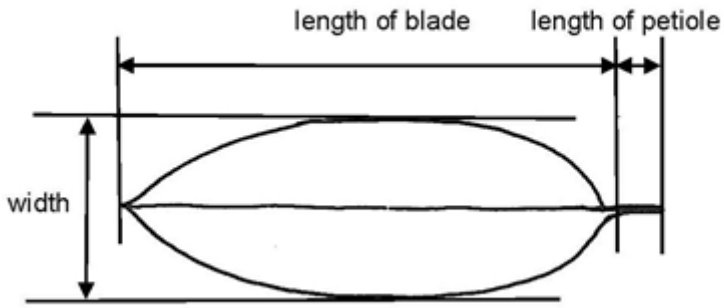


1
needle shape

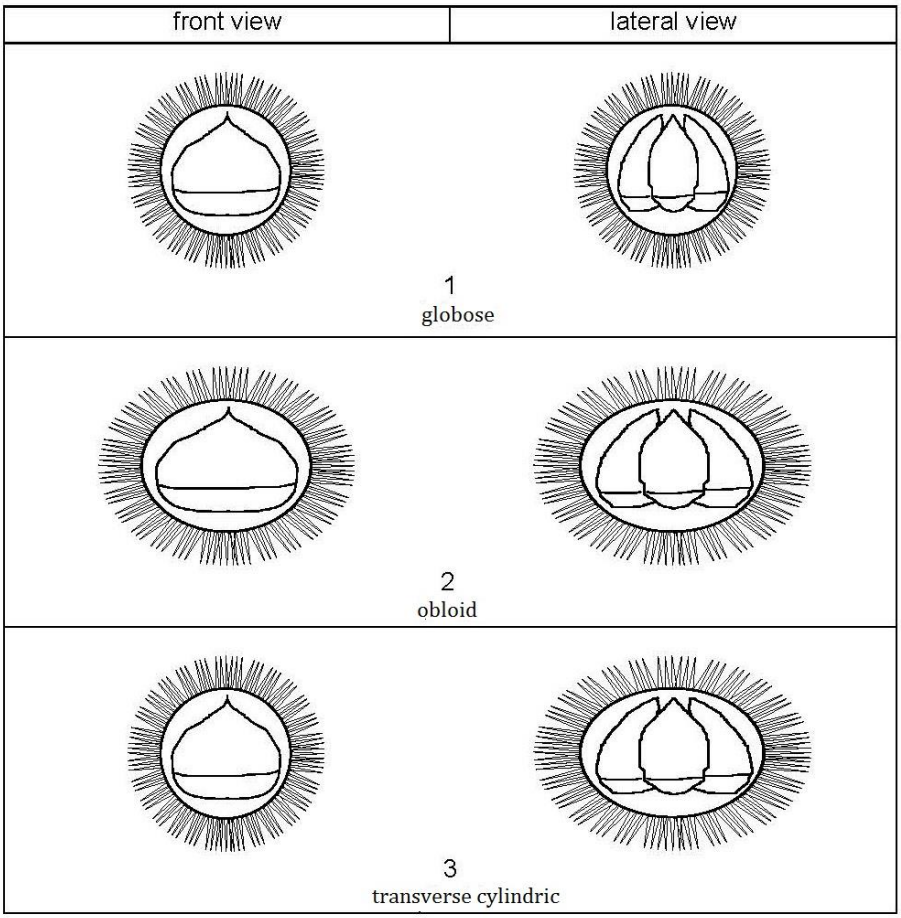
2
acute

3
flare shape

Ad. 25: Leaf: ratio length of leaf blade/length of petiole



Ad. 26: Bur: shape



Ad. 28: Nut: embryony

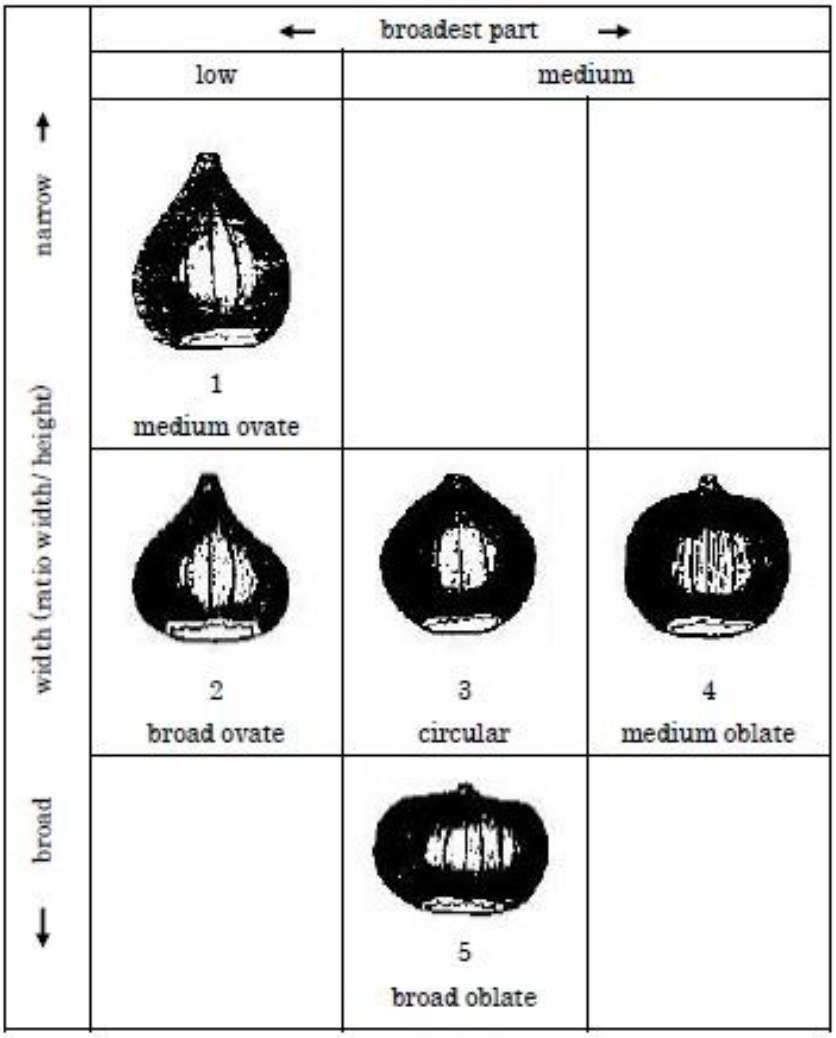
1

mono-embryonic

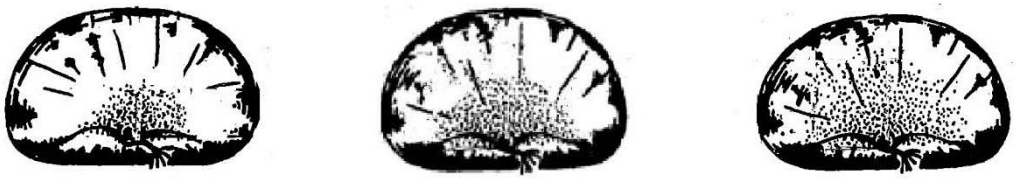
2

poly-embryonic

Ad. 31: Nut: shape



Ad. 32: Nut: area of pubescence on upper part



1
Small

3
medium

5
large

Ad. 33: Nut: area of hilum

Ad. 34: Nut: shape of border line of hilum and pericarp

Ad. 36: Nut: glossiness

The glossiness of nut should be observed immediately after opening of involucre.

Ad. 39: Seed coat: adherence to kernel

The adherence to kernel should be determined by observation of easiness of peeling seed coat by hand after just harvested nuts are steamed for 50 minutes or roasted for 10 to 15 minutes at 200-250C. Nuts should be cracked with a knife in half of nut skin before steaming or roasting.

Ad. 42: Time of leaf bud burst

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

Ad. 43: Time of male flowering

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

Ad. 44: Time of female flowering

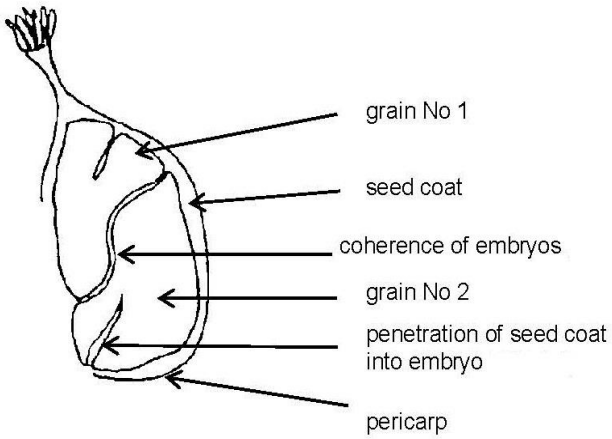
The time of male and female flowering should be considered as the middle day when 20% of the flowers are fully open and the day when 80% of the flower are fully open.

Ad. 45: Time of maturity for consumption

The time of maturity for consumption should be considered as the middle day between the day when 20% nuts are harvested and the day when 100% nuts are harvested.

8.3

8.1 (f)



9. Literature

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Chapa, J.- INRA, 1982: Situation de la castaneiculture francaise. Convegno internazionale di Frutticoltura montana, Saint – Vincent d'Aoste, IT

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Shimura, I. et al., 1999: Chestnut, The encyclopedia of fruit horticulture, Nosangyoson Bunka Kyokai, v.5, JP

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	*Castanea crenata* Sieold & Zucc.	[ ]
1.1.2	Common name	Japanese chestnut	
1.2.1	Botanical name	*Castanea mollissima* Blume	[ ]
1.2.2	Common name	Chinese Chestnut	
1.3.1	Botanical name	*Castanea sativa* Mill.	[ ]
1.3.2	Common name	Chestnut	
1.4.1	Botanical name	*Castanea* x *Castanea*	[ ]
1.4.2	Common name	Chestnut (in case of interspecific hybrid)	

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 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

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			

Comments:

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

#7. Additional information which may help in the examination of the variety

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

Yes [ ] No [ ]

(If yes, please provide details)

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

Yes [ ] No [ ]

(If yes, please provide details)

7.3 Other information

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:

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.

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]