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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

DRAFT

HAZELNUT

UPOV Code(s): CRYLS_AVE;
 CRYLS_COL

Corylus avellana L.;
Corylus colurna L.

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

*prepared by experts from Italy
 to be considered by the
 Technical Working Party for Fruit Crops
 at its fifty-first session, to be held in Nîmes, France,
 from 2020-07-06 to 2020-07-10*

Disclaimer: this document does not represent UPOV policies or guidance

Alternative names:*

<i>Botanical name</i>	<i>English</i>	<i>French</i>	<i>German</i>	<i>Spanish</i>
<i>Corylus avellana</i> L., <i>Corylus maxima</i> Mill., <i>Corylus pontica</i> K. Koch	Hazelnut	Noisetier	Haselnuss	Avellano
<i>Corylus colurna</i> L., <i>Corylus iberica</i> Wittm. ex Bobrov	Turkish Hazel	Noisetier de Byzance, Noisetier de Turquie	Baumhasel, Türkische Baumhasel	Avellano de Turquía

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 *Corylus avellana* L. and *Corylus colurna* L.

2. Material Required

2.1 The competent authorities decide on the quantity and quality of the plant material required for testing the variety and when and where it is to be delivered. Applicants submitting material from a State other than that in which the testing takes place must ensure that all customs formalities and phytosanitary requirements are complied with.

2.2 The material is to be supplied in the form of one or two year old own rooted plants.

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

8 plants

The plants should be accompanied by a Phytosanitary Certificate indicating the status of the material according to national law

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 two independent growing cycles may be observed from a single planting, examined in two separate growing cycles.

3.1.3 In particular, it is essential that the plants produce a satisfactory crop of fruit in each of the two growing cycles.

3.1.4 The growing cycle is considered to be the duration of a single growing season, beginning with bud burst (flowering and/or vegetative), flowering and fruit harvest and concluding when the following dormant period ends with the swelling of new season buds.

3.1.5 The testing of a variety may be concluded when the competent authority can determine with certainty the outcome of the test.

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.

3.3.2 The optimum stage of development for the assessment of each characteristic is indicated by a number in the Table of Characteristics. The stages of development denoted by each number are described in Chapter 8.

- 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. The color chart and version used should be specified in the variety description.

3.4 *Test Design*

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

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.

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 6.

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 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 These Test Guidelines have been developed for the examination of vegetatively propagated varieties. For varieties with other types of propagation, the recommendations in the General Introduction and document TGP/13 "Guidance for new types and species" Section 4.5 "Testing Uniformity" should be followed.

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) Time of beginning of leaf bud burst (characteristic 10)
- (b) Time of male flowering (characteristic 14)
- (c) Time of female flowering (characteristic 15)
- (d) Leaf blade: shape (characteristic 17)
- (e) Involucre: length compared to fruit length (characteristic 23)
- (f) Involucre: indentation (characteristic 24)
- (g) Involucre: serration of indentation (characteristic 25)
- (h) Fruit: size (characteristic 31)
- (i) Fruit: general shape (characteristic 32)
- (j) Fruit: shape in cross section (characteristic 33)

- (k) Time of ripening (characteristic 51)
- (l) Fruit: percentage of kernel (by weight) (characteristic 53)

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:

<i>State</i>	<i>Note</i>
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:

<i>State</i>	<i>Note</i>
very small	1
very small to small	2
small	3
small to medium	4
medium	5
medium to large	6
large	7
large to very large	8
very large	9

6.2.3 Further explanation of the presentation of states of expression and notes is provided in document TGP/7 “Development of Test Guidelines”.

6.3 *Types of Expression*

An explanation of the types of expression of characteristics (qualitative, quantitative and pseudo-qualitative) is provided in the General Introduction.

6.4 *Example Varieties*

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

6.5 *Legend*

English				français		deutsch	español	Example Varieties Exemples Beispielsorten 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 8.1
- 6 Not applicable
- 7 Not applicable

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		dormancy			
	Plant: vigor					
	weak				Negret, Tonda Romana	3
	medium				Tonda Gentile delle Langhe	5
	strong				Fertile de Coutard	7
2. (*)	QN VG		dormancy			
	Plant: growth habit	Plante : port	Pflanze: Wuchsform	Planta: hábito de crecimiento		
	very erect				Daviana	1
	erect				San Giovanni, Segorbe	3
	semi erect				Fertile de Coutard, Negret, Tonda Gentile delle Langhe	5
	spreading				Morell, Tombul	7
	drooping				Imperiale de Trebizonde	9
3.	QN VG		dormancy			
	Plant: density of shoots					
	sparse					3
	medium				Fertile de Coutard, Negret, Tonda Gentile delle Langhe	5
	dense					7
4.	QN VGJA		dormancy			
	Plant: tendency to produce suckers					
	absent or very weak				Corylus columna	1
	weak				Cosford, Daviana	3
	medium				Segorbe	5
	strong				Fertile de Coutard	7
	very strong				Imperiale de Trebizonde	9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
5.	QN	MS A VS A			dormancy	
	One-year-old shoot: thickness					
	thin				Bergeri, Cosford	3
	medium				Tonda Gentile delle Langhe	5
	thick				Fertile de Coutard	7
6.	QN	VG A	(+)		dormancy	
	One year old shoot: hairiness					
	weak				Mortarella, Segorbe	3
	medium				Fertile de Coutard, Tonda Gentile delle Langhe	5
	strong				Tonda di Giffoni	7
7.	QN	VG A	(+)		dormancy	
	One-year-old shoot: density of lenticels					
	weak				Negret, Segorbe	1
	medium				Mortarella	2
	strong				San Giovanni, Tonda Gentile delle Langhe	3
8.	QL	VG A	(+)		dormancy	
	Bud: shape					
	conical				Cosford, Merveille de Bollwiller	1
	ovoid				Fertile de Coutard, Negret	2
	globular				Du Chilly	3
9. (*)	QL	VG A	(+)		dormancy	
	Vegetative bud: color					
	green				Du Chilly, Segorbe	1
	reddish green				Bergeri, Gunslebert, Negret	2
	red				Merveille de Bollwiller	3

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
10. (*)	QN VGJA	(+)				
	Time of beginning of leaf bud burst					
	very early				San Giovanni	1
	very early to early					2
	early				Tonda di Giffoni, Tonda Gentile delle Langhe	3
	early to medium				Fertile de Coutard	4
	medium				Negret, Tonda Romana	5
	medium to late				Daviana, Gunslebert, Segorbe	6
	late				Bergeri, Cosford, Du Chilly, Merveille de Bollwiller	7
	late to very late					8
	very late					9
11.	QN VGJA		flowering			
	Male inflorescence: length					
	short				Negret	3
	medium				Fertile de Coutard, Tonda Gentile delle Langhe	5
	long				Segorbe	7
12. (*)	QL VGJA		flowering			
	Male inflorescence: color					
	green				Fertile de Coutard, Segorbe, Tonda Gentile delle Langhe	1
	pink brown				Bergeri, Cosford, Merveille de Bollwiller	2
13. (*)	QL VGJA		flowering			
	Stigma: color					
	pink				San Giovanni	1
	red				Fertile de Coutard	2
	purple red				Merveille de Bollwiller	3

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
14. (*)	QN VGJA	(+)	flowering			
	Time of male flowering					
	very early					1
	very early to early				Tonda Gentile delle Langhe	2
	early					3
	early to medium				Fertile de Coutard, San Giovanni, Segorbe	4
	medium				Negret	5
	medium to late				Cosford, Daviana, Tonda Romana	6
	late				Du Chilly, Merveille de Bollwiller	7
	late to very late					8
	very late					9
15. (*)	QN VGJA	(+)	flowering			
	Time of female flowering					
	very early					1
	very early to early				Negret, San Giovanni	2
	early				Tonda di Giffoni	3
	early to medium					4
	medium				Fertile de Coutard, Tonda Gentile delle Langhe	5
	medium to late				Morell, Segorbe	6
	late				Daviana, Du Chilly, Merveille de Bollwiller	7
	late to very late				Bergeri	8
	very late					9
16. (*)	QN VGJA		flowering			
	Time of female flowering compared to time of male flowering					
	earlier				Negret, San Giovanni, Tonda Romana	1
	same time				Merveille de Bollwiller, Morell	2
	later				Bergeri, Cosford, Tonda Gentile delle Langhe	3

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
17. (*)	PQ	VG A	full vegetation			
	Leaf blade: shape					
	elliptic				Merveille de Bollwiller	1
	ovate				Du Chilly	2
	circular				Segorbe, Tonda di Giffoni	3
18.	QN	MS A VG A	full vegetation			
	Leaf blade: size					
	small				Cosford, Imperatrice Eugenie, Merveille de Bollwiller	3
	medium				Fertile de Coutard	5
	large				Segorbe, Tonda di Giffoni	7
19.	QN	VG A	full vegetation			
	Leaf: hairiness of lower side					
	weak				Fertile de Coutard, Merveille de Bollwiller, Negret, Tonda Gentile delle Langhe	1
	medium				Imperatrice Eugenie	2
	strong				Segorbe, Tonda di Giffoni	3
20.	QN	MS A VG A	full vegetation			
	Petiole: length					
	short				Fertile de Coutard, Tonda di Giffoni	3
	medium				Segorbe	5
	long				Cosford, Tonda Gentile delle Langhe	7
21. (*)	QN	VG A	full vegetation			
	Petiole: hairiness					
	weak				Segorbe	3
	medium				Merveille de Bollwiller	5
	strong				Fertile de Coutard, Tonda di Giffoni	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
22. (*)	PQ	VG A	(+)	ripening		
	Involucre: constriction					
	absent				Fertile de Coutard, Tonda Gentile delle Langhe	1
	present				Imperiale de Trebizonde	9
23. (*)	QN	MS A VG A	(+)	ripening		
	Involucre: length compared to fruit length					
	shorter				Tonda Bianca	3
	equal				Cosford, Fertile de Coutard, Merveille de Bollwiller	5
	longer				Du Chilly, Imperiale de Trebizonde, Segorbe, Tombul, Tonda Gentile delle Langhe	7
24. (*)	PQ	VG A	(+)	ripening		
	Involucre: indentation					
	weak				Du Chilly, Tombul	3
	medium				Fertile de Coutard, Tonda Gentile delle Langhe	5
	strong				Gunslebert, Negret	7
25. (*)	PQ	VG A		ripening		
	Involucre: serration of indentation					
	weak				Du Chilly, Segorbe, Tombul	3
	medium				Fertile de Coutard, Tonda Gentile delle Langhe	5
	strong				Gunslebert, Negret	7
26. (*)	PQ	VG A		ripening		
	Involucre: thickness of callus at base					
	thin				Cosford	3
	medium				Merveille de Bollwiller, Segorbe	5
	thick				Fertile de Coutard, Tonda di Giffoni	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
27. (*)	QN	VGJA	(+)	ripening		
	involucre: hairiness					
	absent				Morell, Tonda Bianca	1
	present				Tonda di Giffoni	9
28.	QN	VGJA		ripening		
	Involucre: density of hairiness					
	weak				Cosford, Du Chilly, Imperatrice Eugenie, Segorbe	3
	medium				Fertile de Coutard, Tonda Gentile delle Langhe	5
	strong				Tonda di Giffoni	7
29.	PQ	VGJA	(+)	ripening		
	Involucre: jointing of bracts					
	absent					1
	on one side				Fertile de Coutard, Negret, Tonda di Giffoni, Tonda Gentile delle Langhe	2
	on both sides				Imperiale de Trebizonde, Tombul	3
30.	QN	VGJA		ripening		
	Cluster: predominant number of fruits					
	one				Daviana, Tonda Bianca	1
	one to two				Cosford, Merveille de Bollwiller	2
	two to three				Fertile de Coutard, Tonda di Giffoni	3
	three to four				Negret, Segorbe	4
	more than four				Tombul	5

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
31. (*)	QN	MS A VG A			ripening	
	Fruit: size					
	very small				Morell	1
	small				Negret, Tombul, Tonda Gentile delle Langhe	3
	medium				Segorbe, Tonda di Giffoni	5
	large				Fertile de Coutard, Merveille de Bollwiller	7
	very large				Bergeri, Ennis	9
32. (*)	PQ	VG A	(+)		ripening	
	Fruit: general shape					
	globular				Fertile de Coutard, Tonda Gentile delle Langhe	1
	conical				Jean's, Merveille de Bollwiller	2
	ovoid				Imperatrice Eugenie, Negret	3
	short sub-sub-cylindrical				Daviana	4
	long sub-cylindrical				Cosford, Du Chilly	5
33. (*)	PQ	VG A	(+)		ripening	
	Fruit: shape in cross section					
	elliptical				Du Chilly, Negret	1
	circular				Merveille de Bollwiller, Tonda Romana	2
	triangular				Tonda Gentile delle Langhe	3
	rectangular				Gunslebert	4
34.	QL	VG A	(+)		ripening	
	Fruit: color					
	greenish yellow				Tonda Bianca	1
	light brown				Cosford, Daviana, Imperiale de Trebizonde, Morell, Tonda Gentile delle Langhe	2
	brown				Ennis, Fertile de Coutard, Negret, Tonda Romana	3

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
35.	QN	VG A	(+)	ripening		
	Fruit: number of stripes on shell					
	few				Imperiale de Trebizonde, Segorbe	3
	medium				Cosford, Daviana	5
	many				Campanica	7
36. (*)	PQ	VG A	(+)	ripening		
	Fruit: shape of top					
	narrow acute				Imperatrice Eugenie, Jean's, Negret	1
	broad acute				Merveille de Bollwiller	2
	obtuse				Fertile de Coutard, Tonda Gentile delle Langhe	3
	flat				Imperiale de Trebizonde	4
37. (*)	PQ	VG A	(+)	ripening		
	Fruit: shape of apex					
	slightly prominent				Cosford, Fertile de Coutard, Tonda di Giffoni	3
	medium prominent				Du Chilly	5
	strongly prominent				Tonda Romana	7
38. (*)	PQ	VG A	(+)	ripening		
	Fruit: size of pistil scar					
	small				Negret, Tonda Gentile delle Langhe	3
	medium				Fertile de Coutard, Tonda di Giffoni	5
	large				Cosford, Imperiale de Trebizonde, San Giovanni	7
39. (*)	QN	VG A	(+)	ripening		
	Fruit: hairiness of top					
	weak				Cosford, Imperiale de Trebizonde	3
	medium				Fertile de Coutard	5
	strong				Apolda, Du Chilly	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
40. (*)	QN	VG A	(+)	ripening		
	Fruit: size of basal scar					
	small				Segorbe, Tonda Gentile delle Langhe	3
	medium				Fertile de Coutard	5
	large				Cosford, Merveille de Bollwiller	7
41.	PQ	VG A	(+)	ripening		
	Fruit: curvature of basal scar					
	concave					1
	plane				Imperiale de Trebizonde, Merveille de Bollwiller	2
	convex				Cosford, Du Chilly, Negret	3
42.	QN	VG A		ripening		
	Fruit: double kernels					
	absent				Merveille de Bollwiller	1
	present					9
43. (*)	QN	MS VG A		ripening		
	Kernel: size					
	very small					1
	small				Negret, Tombul, Tonda Gentile delle Langhe	3
	medium				Segorbe, Tonda di Giffoni, Tonda Romana	5
	large				Daviana, Fertile de Coutard, Merveille de Bollwiller	7
	very large					9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
44.	PQ	VG A	ripening			
	Kernel: shape					
	globular				Segorbe, Tonda di Giffoni, Tonda Gentile delle Langhe, Tonda Romana	1
	ovoid				Imperatrice Eugenie, Merveille de Bollwiller, Negret	2
	short cylindrical				Cosford, Daviana, Gunslebert, San Giovanni	3
	long cylindrical				Du Chilly	4
45.	PQ	VG A	ripening			
	Kernel: cross section					
	elliptical				Du Chilly	1
	circular				Imperiale de Trebizonde, Tonda Romana	2
	triangular				Tonda Gentile delle Langhe	3
46.	PQ	VG A	ripening			
	Kernel: shape of top					
	pointed				Du Chilly, Fertile de Coutard, Negret	1
	obtuse				Gunslebert, San Giovanni, Tonda Romana	2
	flat				Imperiale de Trebizonde	3
47.	PQ	VG A	ripening			
	Kernel: shape of base					
	pointed					1
	rounded				Fertile de Coutard, Merveille de Bollwiller, Negret	2
	flat				Imperiale de Trebizonde, Tonda Gentile delle Langhe, Tonda Romana	3
48. (*)	PQ	VG A	ripening			
	Kernel: lateral groove					
	absent				Fertile de Coutard, Merveille de Bollwiller	1
	present				Du Chilly, Imperatrice Eugenie, Tonda di Giffoni	9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
49. (*)	PQ VGJA				ripening	
	Kernel: appearance of skin					
	not corky or very slightly corky				Daviana, Du Chilly, Imperiale de Trebizonde	1
	slightly corky				Negret, Segorbe	3
	medium corky				Fertile de Coutard	5
	strongly corky				Cosford	7
	very strongly corky					9
50.	PQ VGJA				ripening	
	Kernel: inside cavity					
	absent or very small					1
	small				Imperiale de Trebizonde	3
	medium				Cosford, Negret, Tonda Gentile delle Langhe, Tonda Romana	5
	large				Fertile de Coutard, Segorbe, Tonda di Giffoni	7
	very large					9
51. (*)	QN VGJA				ripening	
	Time of ripening					
	very early				San Pere	1
	very early to early					2
	early				Tonda Gentile delle Langhe	3
	early to medium				Grossal, San Giovanni	4
	medium				Daviana, Morell, Tonda Romana	5
	medium to late				Fertile de Coutard	6
	late				Merveille de Bollwiller, Negret	7
	late to very late					8
	very late					9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
52.	PQ	VG A	ripening			
	Fruit: adherence of involucre on fruits (after fruit fall)					
	absent or very weak				Negret, Tonda Gentile delle Langhe	1
	weak				Cosford, Fertile de Coutard	3
	medium				Daviana, San Giovanni, Segorbe	5
	strong				Du Chilly, Imperatrice Eugenie, Tombul	7
	very strong					9
53. (*)	QN	MS A VG A	ripening			
	Fruit: percentage of kernel (by weight)					
	very low				Merveille de Bollwiller	1
	low				Fertile de Coutard, Segorbe	3
	medium				Negret, Tonda Gentile delle Langhe	5
	high				Daviana, Imperatrice Eugenie	7
	very high				Cosford, Tombul	9
54. (*)	QN	VG A				
	Time of leaf fall					
	very early				Daviana	1
	early				Tonda Gentile delle Langhe	3
	medium				Fertile de Coutard	5
	late				Negret, San Giovanni	7
	very late					9

8.1 Explanations for individual characteristics

Ad. 6: One year old shoot: hairiness



3
weak



5
medium



7
strong

Ad. 7: One-year-old shoot: density of lenticels



1
weak



2
medium



3
strong

Ad. 8: Bud: shape



1
conical



2
ovoid



3
globular

Ad. 9: Vegetative bud: color



1
green



2
reddish green



3
red

Ad. 10: Time of beginning of leaf bud burst

When 10% of buds are showing green shoots.

Ad. 14: Time of male flowering

The time of flowering should be recorded when 50% of the inflorescence are in full flowering (pollen dehiscence)

Ad. 15: Time of female flowering

Time of flowering should be recorded when 50% of the inflorescence are in full flowering (fully developed stigmas)

Ad. 22: Involucre: constriction



1
absent



9
present

Ad. 23: Involucre: length compared to fruit length



3
shorter



5
equal



7
longer

Ad. 24: Involucre: indentation



3
weak



5
medium



7
strong

Ad. 27: involucre: hairiness



1
absent



9
present

Ad. 29: Involucre: jointing of bracts



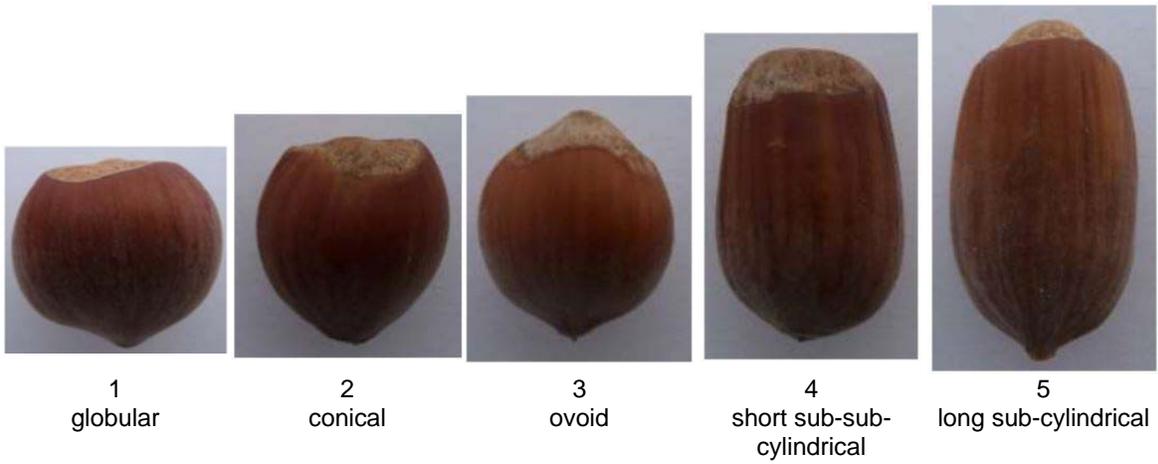
1
absent

2
on one side

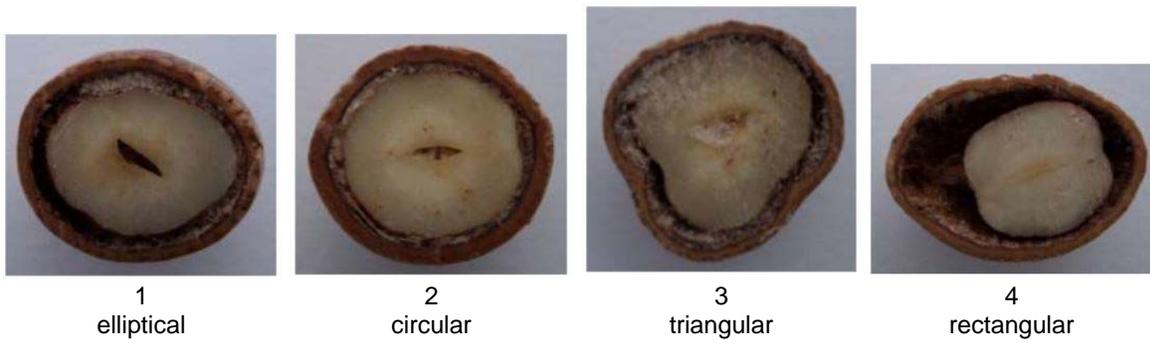


3
on both sides

Ad. 32: Fruit: general shape



Ad. 33: Fruit: shape in cross section



Ad. 34: Fruit: color



Ad. 35: Fruit: number of stripes on shell



3
few



5
medium



7
many

Ad. 36: Fruit: shape of top



1
narrow acute



2
broad acute



3
obtuse



4
flat

Ad. 37: Fruit: shape of apex



3
slightly prominent



5
medium prominent



7
strongly prominent

Ad. 38: Fruit: size of pistil scar



3
small



5
medium



7
large

Ad. 39: Fruit: hairiness of top



3
weak



5
medium



7
strong

Ad. 40: Fruit: size of basal scar



3
small



5
medium



7
large

Ad. 41: Fruit: curvature of basal scar

1
concave



2
plane



3
convex

9. Literature

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De Salvador, F.R., Giorgioni M., Massari D., Bizzarri S., Onorati P., Kaswalder F., 2002. La collezione di Vico Matrino (VT) per il rinnovo varietale ed il miglioramento qualitativo del nocciolo. 2° Convegno Nazionale sul nocciolo, Giffoni V.P., 171-177.

De Salvador, F.R., Bignami, C., Bizzarri, S., Cristoferi, V., 2005. Monografia di cultivar di nocciolo. Regione Lazio - Area D20 Servizi di sviluppo Agricolo e Informazione Socio-economica. Stampato da Tipolitografia C.S.R. - Centro Stampa e Riproduzione-Roma - IT

P. Manzo, G. Tamponi, Monografia di cultivar di nocciolo, 1982. Istituto Sperimentale per la Frutticoltura – Roma - IT

Mehlenbacher S.A., 1994. Genetic improvement of the hazelnut. *Acta Horticulturae* 351, 23-38.

Rovira M., 1997. Genetic variability among hazelnut (*Corylus avellana* L.) cultivars. *Acta Horticulturae*. 445: 45-50.

Tombesi A., Limongelli F., 2002. Varietà e miglioramento genetico del nocciolo. 2° Convegno Nazionale sul nocciolo, Giffoni V.P., ottobre 2002, 11:27.

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="Corylus avellana L."/> []
1.1.2	Common name	<input type="text" value="Hazelnut"/>
1.2.1	Botanical name	<input type="text" value="Corylus colurna L."/> []
1.2.2	Common name	<input type="text" value="Turkish Hazel"/>
2. Applicant		
	Name	<input type="text"/>
	Address	<input type="text"/>
	Telephone No.	<input type="text"/>
	Fax No.	<input type="text"/>
	E-mail address	<input type="text"/>
	Breeder (if different from applicant)	<input type="text"/>
3. Proposed denomination and breeder's reference		
	Proposed denomination (if available)	<input type="text"/>
	Breeder's reference	<input type="text"/>

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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#4. Information on the breeding scheme and propagation of the variety

4.1 Breeding scheme

Variety resulting from:

4.1.1 Crossing

(a) controlled cross []

(please state parent variety)

(.....) 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:
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4.2	Method of propagating the variety	
4.2.1	Other (Please provide details)	[]
	<input type="text"/>	

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
5.1 Time of beginning of leaf bud burst (10)		
very early	San Giovanni	1 []
very early to early		2 []
early	Tonda di Giffoni, Tonda Gentile delle Langhe	3 []
early to medium	Fertile de Coutard	4 []
medium	Negret, Tonda Romana	5 []
medium to late	Daviana, Gunslebert, Segorbe	6 []
late	Bergeri, Cosford, Du Chilly, Merveille de Bollwiller	7 []
late to very late		8 []
very late		9 []
5.2 Time of male flowering (14)		
very early		1 []
very early to early	Tonda Gentile delle Langhe	2 []
early		3 []
early to medium	Fertile de Coutard, San Giovanni, Segorbe	4 []
medium	Negret	5 []
medium to late	Cosford, Daviana, Tonda Romana	6 []
late	Du Chilly, Merveille de Bollwiller	7 []
late to very late		8 []
very late		9 []
5.3 Time of female flowering (15)		
very early		1 []
very early to early	Negret, San Giovanni	2 []
early	Tonda di Giffoni	3 []
early to medium		4 []
medium	Fertile de Coutard, Tonda Gentile delle Langhe	5 []
medium to late	Morell, Segorbe	6 []
late	Daviana, Du Chilly, Merveille de Bollwiller	7 []
late to very late	Bergeri	8 []
very late		9 []

Characteristics	Example Varieties	Note
5.4 Leaf blade: shape (17)		
elliptic	Merveille de Bollwiller	1 []
ovate	Du Chilly	2 []
circular	Segorbe, Tonda di Giffoni	3 []
5.5 Involucre: length compared to fruit length (23)		
shorter	Tonda Bianca	3 []
equal	Cosford, Fertile de Coutard, Merveille de Bollwiller	5 []
longer	Du Chilly, Imperiale de Trebizonde, Segorbe, Tombul, Tonda Gentile delle Langhe	7 []
5.6 Involucre: indentation (24)		
weak	Du Chilly, Tombul	3 []
medium	Fertile de Coutard, Tonda Gentile delle Langhe	5 []
strong	Gunslebert, Negret	7 []
5.7 Involucre: serration of indentation (25)		
weak	Du Chilly, Segorbe, Tombul	3 []
medium	Fertile de Coutard, Tonda Gentile delle Langhe	5 []
strong	Gunslebert, Negret	7 []
5.8 Fruit: size (31)		
very small	Morell	1 []
small	Negret, Tombul, Tonda Gentile delle Langhe	3 []
medium	Segorbe, Tonda di Giffoni	5 []
large	Fertile de Coutard, Merveille de Bollwiller	7 []
very large	Bergeri, Ennis	9 []
5.9 Fruit: general shape (32)		
globular	Fertile de Coutard, Tonda Gentile delle Langhe	1 []
conical	Jean's, Merveille de Bollwiller	2 []
ovoid	Imperatrice Eugenie, Negret	3 []
short sub-sub-cylindrical	Daviana	4 []
long sub-cylindrical	Cosford, Du Chilly	5 []

Characteristics	Example Varieties	Note
5.10 Time of ripening (51)		
very early	San Pere	1 []
very early to early		2 []
early	Tonda Gentile delle Langhe	3 []
early to medium	Grossal , San Giovanni	4 []
medium	Daviana, Morell, Tonda Romana	5 []
medium to late	Fertile de Coutard	6 []
late	Merveille de Bollwiller, Negret	7 []
late to very late		8 []
very late		9 []

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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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	Characteristic(s) in which your candidate variety differs	Describe the expression of the characteristic(s) for the	Describe the expression of the characteristic(s) for your
<i>Example</i>			
<p>Comments:</p>			

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		

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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8. Authorization for release

(a) Does the variety require prior authorization for release under legislation concerning the protection of the environment, human and animal health?

Yes [] No []

(b) Has such authorization been obtained?

Yes [] No []

If the answer to (b) is yes, please attach a copy of the authorization.

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]