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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-third session
from 2022-07-11 to 2022-07-15

Disclaimer: this document does not represent UPOV policies or guidance

Alternative names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Corylus avellana L., *Corylus maxima* Mill., *Corylus pontica* K. Koch	Hazelnut	Noisetier	Haselnuss	Avellano
Corylus colurna L., *Corylus iberica* 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. These Test Guidelines only apply to varieties intended for fruit production, not for ornamental ones.

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.

The tests should be carried under conditions ensuring normal growth and should normally be conducted at one place.

If certain important characteristics of the variety cannot be seen at that place, the variety may be tested at an additional place.

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

The minimum quantity of plant material to be supplied by the applicant is 5 plants.

2.4 The plant material supplied should be visibly healthy, not lacking in vigor, nor affected by any important pest or disease.

2.5 The plant material should not have undergone any treatment which would affect the expression of the characteristics of the variety, unless the competent authorities allow or request such treatment. If it has been treated, full details of the treatment must be given.

3. Method of Examination

3.1 Number of Growing Cycles

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.

3.4 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 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 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.

4.2.3 The off-types are observed visually and considering 5 plants no off-type are admitted.

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) Leaf blade: shape (characteristic 12)
(b) Involucre: ratio length to length of nut (characteristic 18)
(c) Involucre: indentation (characteristic 19)
(d) Involucre: size of basal support (characteristic 21)
(e) Nut: size (characteristic 26)
(f) Nut: shape in lateral view (characteristic 27)
(g) Nut: shape in cross section (characteristic 28)
(h) Nut: percentage of kernel (/by weight) (characteristic 45)
(i) Time of male flowering (characteristic 46)
(j) Time of female flowering (characteristic 47)
(k) Time of harvest maturity (characteristic 50)

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 All relevant states of expression are presented in the characteristic.

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

7 Growth stage key See Explanations on the Table of Characteristics in Chapter 8.3

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)**	**a**			
		Plant: vigor					
		absent or very weak					1
		very weak to weak					2
		weak				Negret, Tonda Romana	3
		weak to medium					4
		medium				Tonda Gentile delle Langhe	5
		medium to strong					6
		strong				Fertile de Coutard	7
		strong to very strong					8
		very strong					9
2.	**(*)**	**QN VG**	**(a)**	**a**			
		Plant: growth habit					
		very erect				Daviana	1
		very erect to erect					2
		erect				San Giovanni, Segorbe	3
		erect to semi erect					4
		semi erect				Fertile de Coutard, Negret, Tonda Gentile delle Langhe	5
		semi erect to spreading					6
		spreading				Morell, Tombul	7
		spreading to drooping					8
		drooping				Imperiale de Trebizonde	9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
3.	**QN VG**	**(a), (b)**	**a**			
	Plant: density of shoots					
	absent or very sparse					1
	very sparse to sparse					2
	sparse					3
	sparse to medium					4
	medium				Fertile de Coutard, Negret, Tonda Gentile delle Langhe	5
	medium to dense					6
	dense					7
	dense to very dense					8
	very dense					9
4.	**QN VG**	**(+)**	**c**			
	Plant: tendency to produce suckers					
	absent or very weak				Tonda Bianca	1
	very weak to weak					2
	weak				Cosford, Daviana	3
	weak to medium					4
	medium				Segorbe	5
	medium to strong					6
	strong				Fertile de Coutard	7
	strong to very strong					8
	very strong				Imperiale de Trebizonde	9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
5.		**QN VG**	**(+)** **(a), (b), (c)**	**a**			
		One year old shoot hairiness					
		very weak					1
		very weak to weak					2
		weak				Mortarella, Segorbe	3
		weak to medium					4
		medium				Fertile de Coutard, Tonda Gentile delle Langhe	5
		medium to strong					6
		strong				Imperiale de Trebizonde, Tonda di Giffoni	7
		strong to very strong					8
		very strong					9
6.		**QN VG**	**(+)** **(a), (b), (c)**	**a**			
		One-year-old shoot: density of lenticels					
		sparse				Negret, Segorbe	1
		medium				Mortarella	2
		dense				San Giovanni, Tonda Gentile delle Langhe	3
7.		**PQ VG**	**(+)** **(a), (b), (c)**	**a**			
		Bud: shape					
		conical				Cosford, Merveille de Bollwiller	1
		ovoid				Fertile de Coutard, Negret	2
		globular				Du Chilly	3
8.	**(*)**	**PQ VG**	**(+)** **(b)**	**a**			
		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
9.		**QN VG**	**(b), (c), (e)**	**b**			
		Male inflorescence: length					
		very short					1
		very short to short					2
		short				Negret	3
		short to medium					4
		medium				Fertile de Coutard, Tonda Gentile delle Langhe	5
		medium to long					6
		long				Segorbe	7
		long to very long					8
		very long					9
10	**(*)**	**PQ VG**		**b**			
		Male inflorescence: color					
		green				Fertile de Coutard, Segorbe, Tonda Gentile delle Langhe	1
		pink brown				Bergeri, Cosford, Merveille de Bollwiller	2
		red				Comun	3
11	**(*)**	**PQ VG**		**b**			
		Stigma: color					
		pink				San Giovanni	1
		red				Fertile de Coutard	2
		purple red				Merveille de Bollwiller	3
		pale yellow				OSU 899.010 Oregon selection	4
12	**(*)**	**PQ VG**	**(+)** **(b), (c), (d)**	**c**			
		Leaf blade: shape					
		elliptic				Merveille de Bollwiller	1
		ovate				Du Chilly	2
		obovate				Tonda di Giffoni	3
		circular				Segorbe	4

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
13	**(*)**	**QN MG/VG**	**(b), (c), (d)**	**c**			
		Leaf blade: size					
		very small					1
		very small to small					2
		small				Cosford, Imperatrice Eugenie, Merveille de Bollwiller	3
		small to medium					4
		medium				Fertile de Coutard	5
		medium to large					6
		large				Segorbe, Tonda di Giffoni	7
		large to very large					8
		very large					9
14		**QN VG**	**(b), (c), (d)**	**c**			
		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
15		**QN MG/VG**	**(b), (c), (d)**	**c**			
		Petiole: length					
		very short					1
		very short to short					2
		short				Fertile de Coutard, Tonda di Giffoni	3
		short to medium					4
		medium				Segorbe	5
		medium to long					6
		long				Cosford, Tonda Gentile delle Langhe	7
		long to very long					8
		very long					9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
16	**(*)**	**QN VG**	**(b), (c), (d)**	**c**			
		Petiole: hairiness					
		absent or very weak					1
		very weak to weak					2
		weak				Segorbe	3
		weak to medium					4
		medium				Merveille de Bollwiller	5
		medium to strong					6
		strong				Fertile de Coutard, Tonda di Giffoni	7
		strong to very strong					8
		very strong					9
17	**(*)**	**QL VG**	**(+)**	**d**			
		Involucre: constriction					
		absent				Fertile de Coutard, Tonda Gentile delle Langhe	1
		present				Imperiale de Trebizonde	9
18	**(*)**	**QN MG/VG**	**(+)** **(c), (f)**	**d**			
		Involucre: ratio length to length of nut					
		much shorter					1
		much shorter to shorter					2
		shorter				Tonda Bianca	3
		shorter to equal					4
		equal				Cosford, Fertile de Coutard, Merveille de Bollwiller	5
		equal to longer					6
		longer				Du Chilly, Imperiale de Trebizonde, Segorbe, Tombul, Tonda Gentile delle Langhe	7
		longer to much longer					8
		much longer					9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
19	**(*)**	**QN VG**	**(+) (f)**	**d**			
		Involucre: indentation					
		weak				Du Chilly, Tombul	1
		weak to medium					2
		medium				Fertile de Coutard, Tonda Gentile delle Langhe	3
		medium to strong					4
		strong				Gunslebert, Negret	5
20	**(*)**	**QN VG**	**(+) (f)**	**d**			
		Involucre: serration of indentation					
		very weak				Du Chilly, Segorbe, Tombul, Tonda Bianca	1
		weak					2
		medium				Fertile de Coutard, Tonda Gentile delle Langhe	3
		medium to strong					4
		strong				Gunslebert, Morell, Negret	5
21	**(*)**	**QN VG**	**(+) (f)**	**d**			
		Involucre: size of basal support					
		thin				Cosford	1
		thin to medium					2
		medium				Merveille de Bollwiller, Segorbe	3
		medium to thick					4
		thick				Fertile de Coutard, Tonda di Giffoni	5
22	**(*)**	**QL VG**	**(f)**	**d**			
		involucre: hairiness					
		absent				Morell, Tonda Bianca	1
		present				Tonda di Giffoni	9

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
23	**QN VG**	**(+) (f)**	**d**			
	Involucre: density of hairiness					
	absent or very sparse				Morell, Tonda Bianca	1
	very sparse to sparse					2
	sparse				Cosford, Du Chilly, Imperatrice Eugenie, Segorbe	3
	sparse to medium					4
	medium				Fertile de Coutard, Tonda Gentile delle Langhe	5
	medium to dense					6
	dense				Tonda di Giffoni	7
	dense to very dense					8
	very dense					9
24	**QN VG**	**(+) (f)**	**d**			
	Involucre: jointing of bracts					
	not present				Gunslebert	1
	on one side only				Fertile de Coutard, Negret, Tonda di Giffoni, Tonda Gentile delle Langhe	2
	on both sides				Imperiale de Trebizonde, Tombul	3
25	**QN VG**	**(c), (f)**	**d**			
	Infructescence: number of nuts per cluster					
	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
26	**(*)**	**QN MS/VG**	**(g), (h)**	**d**			
		Nut: size					
		very small				Morell	1
		very small to small					2
		small				Negret, Tombul, Tonda Gentile delle Langhe	3
		small to medium					4
		medium				Segorbe, Tonda di Giffoni	5
		medium to large					6
		large				Fertile de Coutard, Merveille de Bollwiller	7
		large to very large					8
		very large				Apoldaer Zellernuss, Bergeri, Ennis	9
27	**(*)**	**PQ VG**	**(+) (h)**	**d**			
		Nut: shape in lateral view					
		globose				Clark, Fertile de Coutard, Tonda Gentile delle Langhe	1
		conical				Ennis, Jean's, Merveille de Bollwiller	2
		ovoid				Imperatrice Eugenie, Negret	3
		obloid				Imperiale de Trebizonde	4
		short sub-cylindical				Cosford	5
		long sub-cylindrical				Du Chilly	6
28	**(*)**	**PQ VG**	**(+) (g), (h)**	**d**			
		Nut: shape in cross section					
		elliptic				Du Chilly, Negret	1
		circular				Merveille de Bollwiller, Tonda Romana	2
		triangular				Tonda Gentile delle Langhe	3
		rectangular				Gunslebert	4

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
29		**QL VG**	**(+)**	**d**			
		Nut: 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
30		**QN VG**	**(+)**	**d**			
		Nut: conspicuousness of stripes on shell					
		few				Imperiale de Trebizonde, Segorbe	1
		medium				Cosford, Daviana	2
		many				Campanica	3
31	**(*)**	**PQ VG**	**(+)**	**d**			
		Nut: shape of apex					
		narrow acute				Imperatrice Eugenie, Jean's, Negret	1
		broad acute				Merveille de Bollwiller	2
		obtuse				Fertile de Coutard, Tonda Gentile delle Langhe	3
		truncate				Imperiale de Trebizonde	4
32	**(*)**	**QN VG**	**(+)**	**d**			
		Nut: mucron aspect					
		flat or very slightly prominent					1
		very slightly prominent to slightly prominent					2
		slightly prominent				Cosford, Fertile de Coutard, Tonda di Giffoni	3
		slightly prominent to medium prominent					4
		medium prominent				Du Chilly	5
		medium prominent to strongly prominent					6
		strongly prominent				Tonda Romana	7
		strongly prominent to very strongly prominent					8
		very strongly prominent					9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
33	**(*)**	**QN VG**	**(+)**	**d**			
		Nut: size of pistil scar					
		very small					1
		very small to small					2
		small				Negret, Tonda Gentile delle Langhe	3
		small to medium					4
		medium				Fertile de Coutard, Tonda di Giffoni	5
		medium to large					6
		large				Cosford, Imperiale de Trebizonde, San Giovanni	7
		large to very large					8
		very large					9
34	**(*)**	**QN VG**	**(+)**	**d**			
		Nut: hairiness at apex					
		absent or very weak					1
		very weak to weak					2
		weak				Cosford, Imperiale de Trebizonde	3
		weak to medium					4
		medium				Fertile de Coutard	5
		medium to strong					6
		strong				Apoldaer Zellernuss, Du Chilly	7
		strong to very strong					8
		very strong					9

		English		français		deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
35	**(*)**	**QN**	**VG**	**(+)**		**d**			
		Nut: size of basal scar related to nut size							
		very small							1
		very small to small							2
		small						Segorbe, Tonda Gentile delle Langhe	3
		small to medium							4
		medium						Fertile de Coutard	5
		medium to large							6
		large						Cosford, Imperiale de Trebizonde, Merveille de Bollwiller	7
		large to very large							8
		very large							9
36	**(*)**	**PQ**	**VG**	**(+)**		**d**			
		Nut: curvature of basal scar							
		concave						Tonda Rossa	1
		even						Imperiale de Trebizonde, Merveille de Bollwiller	2
		convex						Cosford, Du Chilly, Negret	3
37	**(*)**	**QN**	**MG/VG**		**(h)**	**d**			
		Kernel: size							
		very small						Sivri, Tombul	1
		very small to small							2
		small						Negret, Tonda Gentile delle Langhe	3
		small to medium							4
		medium						Segorbe, Tonda di Giffoni, Tonda Romana	5
		medium to large							6
		large						Daviana, Fertile de Coutard, Merveille de Bollwiller	7
		large to very large							8
		very large						Pallagrossa	9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
38	**(*)**	**PQ VG**	**(+)**	**d**			
		Kernel: shape in lateral view					
		globose				Segorbe, Tonda di Giffoni, Tonda Gentile delle Langhe, Tonda Romana	1
		obloid				Imperiale de Trebizonde	2
		ovoid				Imperatrice Eugenie, Merveille de Bollwiller	3
		short sub-cylindrical				Daviana, San Giovanni	4
		long sub-cylindrical				Cosford, Gunslebert	5
39		**PQ VG**	**(+)**	**d**			
		Kernel: shape of apex					
		pointed				Du Chilly, Fertile de Coutard, Negret	1
		obtuse				Gunslebert, San Giovanni, Tonda Romana	2
		truncate				Imperiale de Trebizonde	3
40		**PQ VG**	**(+)**	**4**			
		Kernel: shape in cross section					
		elliptic				Du Chilly	1
		circular				Imperiale de Trebizonde, Tonda Romana	2
		triangular				Tonda Gentile delle Langhe	3
41		**PQ VG**	**(+)**	**d**			
		Kernel: shape of base					
		pointed				Tombul	1
		rounded				Fertile de Coutard, Merveille de Bollwiller, Negret	2
		truncate				Imperiale de Trebizonde, Tonda Gentile delle Langhe, Tonda Romana	3
42	**(*)**	**QL VG**	**(+)**	**d**			
		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
43	**(*)**	**PQ VG**	**(+)**	**d**			
		Kernel presence of fiber					
		absent or very weak				Daviana, Du Chilly, Imperiale de Trebizonde	1
		very weak to weak					2
		weak					3
		weak to medium					4
		medium				Cosford, Fertile de Coutard, Negret, Segorbe	5
		medium to strong					6
		strong					7
		strong to very strong					8
		very strong				Campanica, Ennis	9
44		**QN VG**		**d**			
		Kernel: inner cavity					
		absent or very small				Imperiale de Trebizonde	1
		medium				Cosford, Negret, Tonda Gentile delle Langhe, Tonda Romana	2
		large				Fertile de Coutard, Segorbe, Tonda di Giffoni	3
45	**(*)**	**QN MG/VG**	**(h)**	**d**			
		Nut: percentage of kernel (/by weight)					
		very low				Merveille de Bollwiller	1
		very low to low					2
		low				Fertile de Coutard, Segorbe	3
		low to medium					4
		medium				Negret, Tonda Gentile delle Langhe	5
		medium to high					6
		high				Daviana, Imperatrice Eugenie	7
		high to very high					8
		very high				Cosford, Tombul	9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
46	**(*)**	**QN MG**	**(e)**	**b**			
		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
47	**(*)**	**QN MG**	**(e)**	**b**			
		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
48	**(*)**	**QN MG**		**b**			
		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
49	**(*)**	**QN MG**		**a**			
		Time of beginning of leaf budburst					
		very early				San Giovanni	1
		very early to early					2
		early				Tonda di Giffoni, Tonda Gentile delle Langhe	3
		early to medium					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
50	**(*)**	**QN MG**	**(g)**	**d**			
		Time of harvest maturity					
		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

8. Explanations on the Table of Characteristics

8.1 Explanations covering several characteristics

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

(a) All observation on the plants as well has those on the shoots, leaf, buds, should be recorded in dormant period (winter).

(b) The observation on the shoots and leaf buds should be recorded in the central third of the branches.

(c) All observation determined by measurements, weighing or counting (the true quantitative characteristics) should be made from a minimum sample of 15 typical organs or plant parts.

(d) All observations on the leaves should be recorded on fully developed leaves.

(e) All observation on the inflorescence and the stigmas as well as those on the time of flowering of the male or female flowers should be recorded when 50% of the respective inflorescences are in full flowering (pollen dehiscence or fully developed stigmas).

(f) All the observation on the involucre, with the exception of its adherence on the fruit, should be made before drying off, on normal developed fruits.

(g) The time of ripening is reached when 50 to 70% of the fruits have fallen off.

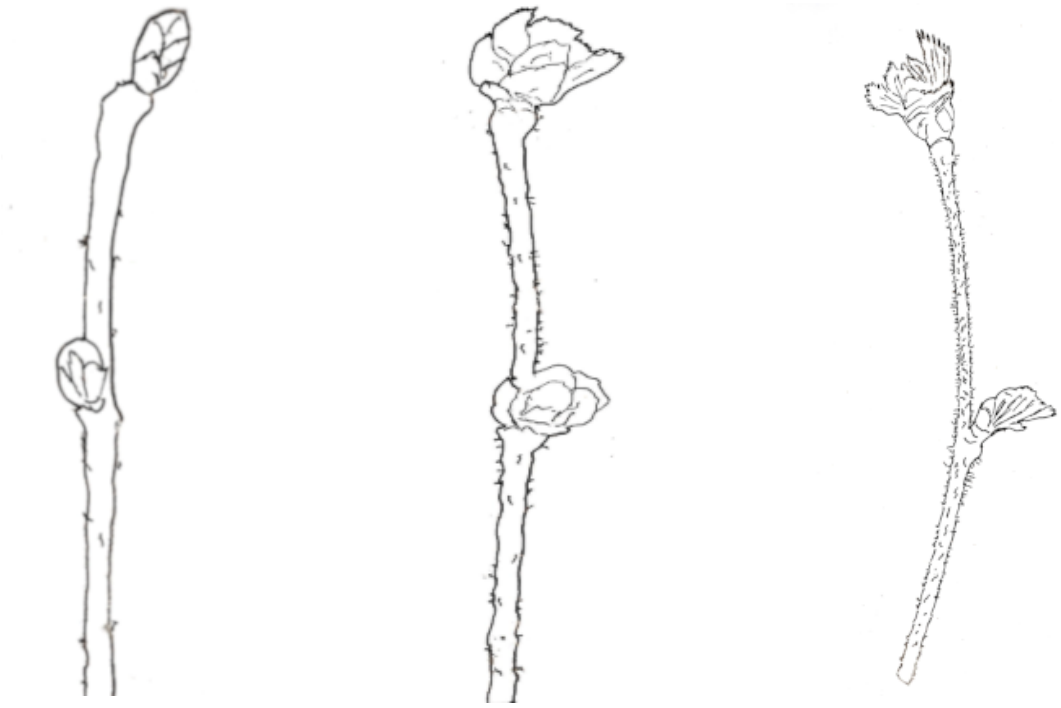
(h) All observation on the fruit and kernel should be made on at least 25 fruits with a humidity content of less than 8% (about one month after harvesting).

8.2 Explanations for individual characteristics

Ad. 4: Plant: tendency to produce suckers

The observation on the emission of suckering should be made in June

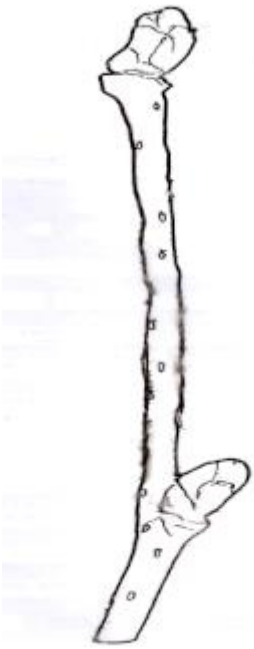
Ad. 5: One year old shoot hairiness



3 weak | 5 medium | 7 strong

Ad. 6: One-year-old shoot: density of lenticels

1
weak



2
medium

3
strong

Ad. 7: Bud: shape

1
conical

2
ovoid

3
globular

Ad. 8: Bud: color

1
green

2
reddish green

3
red

Ad. 12: Leaf blade: shape

1
elliptic

2
ovate

3
obovate

4
circular

Ad. 17: Involucre: constriction

1
absent

9
present

Ad. 18: Involucre: ratio length to length of nut

3
shorter

5
equal

7
longer

Ad. 19: Involucre: indentation

1
weak

3
medium

5
strong

Ad. 20: Involucre: serration of indentation

1
very weak

3
medium

5
strong

Ad. 21: Involucre: size of basal support

1
thin

3
medium

5
thick

Ad. 23: Involucre: density of hairiness

1
absent or very sparse

3
sparse

5
medium

7
dense

Ad. 24: Involucre: jointing of bracts

1
not present

2
on one side

3
on both sides

Ad. 27: Nut: shape in lateral view

1
globose

2
conical

3
ovoid

4
obloid

5
short sub-cylindical

6
long sub-cylindrical

Ad. 28: Nut: shape in cross section

1
elliptical

2
circular

3
triangular

4
rectangular

Ad. 29: Nut: color

1
greenish yellow

2
light brown

3
brown

Ad. 30: Nut: conspicuousness of stripes on shell

1
few

2
medium

3
many

Ad. 31: Nut: shape of apex

1
narrow acute

2
broad acute

3
obtuse

4
truncate

Ad. 32: Nut: mucron aspect

3
slightly prominent

5
medium prominent

7
strongly prominent

Ad. 33: Nut: size of pistil scar

3
small

5
medium

7
large

Ad. 34: Nut: hairiness at apex

3
weak

5
medium

7
strong

Ad. 35: Nut: size of basal scar related to nut size

3
small

5
medium

7
large

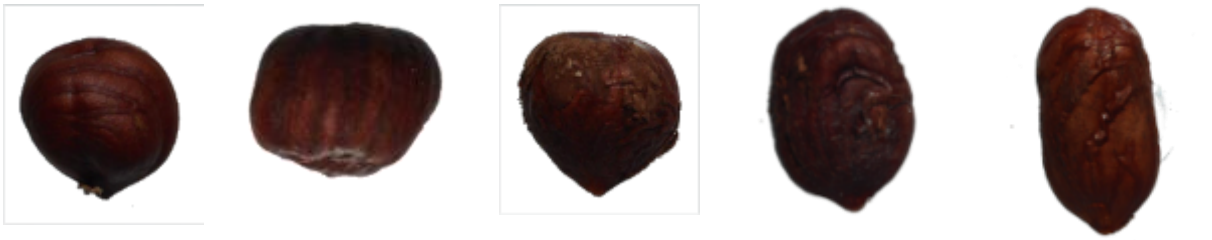
Ad. 36: Nut: curvature of basal scar

1
concave

2
even

3
convex

Ad. 38: Kernel: shape in lateral view



1 globose | 2 obloid | 3 ovoid | 4 short sub-cylindrical | 5 long sub-cylindrical

Ad. 39: Kernel: shape of apex

1 pointed | 2 obtuse | 3 truncate

Ad. 40: Kernel: shape in cross section

1 elliptic | 2 circular | 3 triangular

Ad. 41: Kernel: shape of base

1
pointed

2
rounded

3
truncate

Ad. 42: Kernel: lateral groove

1
absent

9
present

Ad. 43: Kernel presence of fiber

1
absent or very weak

5
medium

9
strong

8.3 Growth stages

Phenological phases are indicated as follows:

a Observation should be made in the dormant season
b Observation should be made during flowering
c Observation should be made on fully developed leaves
d Observation should be made at the time of harvest maturity

9. Literature

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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	*Corylus avellana* L.	[ ]
1.1.2	Common name	Hazelnut	
1.2.1	Botanical name	*Corylus colurna* L.	[ ]
1.2.2	Common name	Turkish Hazel	

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 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:

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
5.1 (12)	**Leaf blade: shape**		
	elliptic	Merveille de Bollwiller	1 [ ]
	ovate	Du Chilly	2 [ ]
	obovate	Tonda di Giffoni	3 [ ]
	circular	Segorbe	4 [ ]
5.2 (18)	**Involucre: ratio length to length of nut**		
	much shorter		1 [ ]
	much shorter to shorter		2 [ ]
	shorter	Tonda Bianca	3 [ ]
	shorter to equal		4 [ ]
	equal	Cosford, Fertile de Coutard, Merveille de Bollwiller	5 [ ]
	equal to longer		6 [ ]
	longer	Du Chilly, Imperiale de Trebizonde, Segorbe, Tombul, Tonda Gentile delle Langhe	7 [ ]
	longer to much longer		8 [ ]
	much longer		9 [ ]
5.3 (19)	**Involucre: indentation**		
	weak	Du Chilly, Tombul	1 [ ]
	weak to medium		2 [ ]
	medium	Fertile de Coutard, Tonda Gentile delle Langhe	3 [ ]
	medium to strong		4 [ ]
	strong	Gunslebert, Negret	5 [ ]
5.4 (21)	**Involucre: size of basal support**		
	thin	Cosford	1 [ ]
	thin to medium		2 [ ]
	medium	Merveille de Bollwiller, Segorbe	3 [ ]
	medium to thick		4 [ ]
	thick	Fertile de Coutard, Tonda di Giffoni	5 [ ]

	Characteristics	Example Varieties	Note
5.5 (26)	**Nut: size**		
	very small	Morell	1 [ ]
	very small to small		2 [ ]
	small	Negret, Tombul, Tonda Gentile delle Langhe	3 [ ]
	small to medium		4 [ ]
	medium	Segorbe, Tonda di Giffoni	5 [ ]
	medium to large		6 [ ]
	large	Fertile de Coutard, Merveille de Bollwiller	7 [ ]
	large to very large		8 [ ]
	very large	Apoldaer Zellernuss, Bergeri, Ennis	9 [ ]
5.6 (27)	**Nut: shape in lateral view**		
	globose	Clark, Fertile de Coutard, Tonda Gentile delle Langhe	1 [ ]
	conical	Ennis , Jean's, Merveille de Bollwiller	2 [ ]
	ovoid	Imperatrice Eugenie, Negret	3 [ ]
	obloid	Imperiale de Trebizonde	4 [ ]
	short sub-cylindical	Cosford	5 [ ]
	long sub-cylindrical	Du Chilly	6 [ ]

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

A representative color photograph of the variety displaying its main distinguishing feature(s), should accompany the Technical Questionnaire. The photograph will provide a visual illustration of the candidate variety which supplements the information provided in the Technical Questionnaire.

The key points to consider when taking a photograph of the candidate variety are:

- Indication of the date and geographic location
- Correct labeling (breeder's reference)
- Good quality printed photograph (minimum 10 cm x 15 cm) and/or sufficient resolution electronic format version (minimum 960 x 1280 pixels)"

Further guidance on providing photographs with the Technical Questionnaire is available in document TGP/7 "Development of Test Guidelines", Guidance Note 35 (http://www.upov.int/tgp/en/).

[The link provided may be deleted by members of the Union when developing authorities' own test guidelines.]

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]