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| |  |  |  | | --- | --- | --- | |  |  | **E** | |  |  |  | |  | wordml://75.png | |  | | --- | | **TG/71/4(proj.4)** | | **ORIGINAL:** English | | **DATE:** 2023-05-23 | | | **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-fourth session, to be held in Nîmes, France,* | | |  | | --- | | *from 2023-07-03 to 2023-07-07* | | | | | | *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. | |  | | | | |

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| |  |  | | --- | --- | | TABLE OF CONTENTS | PAGE | |  |  | | |  |  |  | | --- | --- | --- | | 1. | SUBJECT OF THESE TEST GUIDELINES.......................................................................................................... | [4](#Section1) | |  |  |  | | 2. | MATERIAL REQUIRED..................................................................................................................... | [4](#Section2) | |  |  |  | | 3. | METHOD OF EXAMINATION............................................................................................................... | [4](#Section3) | |  |  |  | |  | |  |  |  | | --- | --- | --- | | 3.1 | Number of Growing Cycles................................................................................................................. | [4](#Section3-1) | | 3.2 | Testing Place................................................................................................................... | [5](#Section3-2) | | 3.3 | Conditions for Conducting the Examination............................................................................................... | [5](#Section3-3) | | 3.4 | Test Design................................................................................................................. | [6](#Section3-4) | | 3.5 | Additional Tests................................................................................................................... | [6](#Section3-5) | | | |  |  |  | | 4. | ASSESSMENT OF DISTINCTNESS, UNIFORMITY AND STABILITY................................................................. | [6](#Section4) | |  |  |  | |  | |  |  |  | | --- | --- | --- | | 4.1 | Distinctness.......................................................................................................... | [6](#Section4-1) | | 4.2 | Uniformity............................................................................................................ | [7](#Section4-2) | | 4.3 | Stability............................................................................................................... | [7](#Section4-3) | | | |  |  |  | | 5. | GROUPING OF VARIETIES AND ORGANIZATION OF THE GROWING TRIAL................................................ | [8](#Section5) | |  |  |  | | 6. | INTRODUCTION TO THE TABLE OF CHARACTERISTICS................................................................................ | [9](#Section6) | |  |  |  | |  | |  |  |  | | --- | --- | --- | | 6.1 | Categories of Characteristics...................................................................................................... | [9](#Section6-1) | | 6.2 | States of Expression and Corresponding Notes........................................................................................ | [9](#Section6-2) | | 6.3 | Types of Expression............................................................................................................ | [9](#Section6-3) | | 6.4 | Example Varieties.............................................................................................................. | [9](#Section6-4) | | 6.5 | Legend................................................................................................................. | [10](#Section6-5) | | | |  |  |  | | 7. | TABLE OF CHARACTERISTICS/TABLEAU DES CARACTÈRES/MERKMALSTABELLE/TABLA DE CARACTERES.................................................................................................................. | [11](#Section7) | |  |  |  | | 8. | EXPLANATIONS ON THE TABLE OF CHARACTERISTICS............................................................................... | [27](#Section8) | |  | |  |  |  | | --- | --- | --- | | 8.1 | Explanations covering several characteristics........................................................................................... | [27](#Section8-1) | | |  | | --- | | 8.2 | | Explanations for individual characteristics................................................................................................. | [28](#Section8-2) | | | |  |  |  | | 9. | LITERATURE................................................................................................................... | [41](#Section9) | |  |  |  | | 10 | TECHNICAL QUESTIONNAIRE............................................................................................................ | [42](#Section10) | |  |  |  | |  | |  | | --- | |  | |  | | | |

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| 1. | Subject of these Test Guidelines |
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|  | |  | | --- | | These Test Guidelines apply to all varieties of *Corylus avellana* L. and *Corylus colurna* L. excluding   ornamental  varieties. | |

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| 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: | |
|  |  |
|  | |  | | --- | | 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. | |

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| 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. |
|  |  |

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| --- | --- |
| *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. |

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| 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 3 plants or parts of plants taken from each of 3 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 visully and considering  5 plants  no of-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. |

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| 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: length in relation to length of nut (characteristic 17) | | | |  | | --- | | (c) | |  | |  | | --- | | Involucre: depth of indentation  (characteristic 18) | | | |  | | --- | | (d) | |  | |  | | --- | | Involucre: size of basal support  (characteristic 20) | | | |  | | --- | | (e) | |  | |  | | --- | | Nut: size (characteristic 25) | | | |  | | --- | | (f) | |  | |  | | --- | | Nut: shape in lateral view (characteristic 26) | | | |  | | --- | | (g) | |  | |  | | --- | | Nut: shape in cross section  (characteristic 27) | | | |  | | --- | | (h) | |  | |  | | --- | | Nut: percentage of kernel  (characteristic 44) | | | |  | | --- | | (i) | |  | |  | | --- | | Time of male flowering (characteristic 45) | | | |  | | --- | | (j) | |  | |  | | --- | | Time of female flowering (characteristic 46) | | |

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  |  |  |  |  | | --- | --- | --- | --- | --- | | |  | | --- | | (k) | |  | |  | | --- | | Time of harvest maturity (characteristic 49) | | | |  |  | | --- | --- | | |  | | --- | |  | | | | | |
| 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”. |

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| 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. |

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| *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)** | **1** | | | |
|  |  | |  | | --- | | **Plant: vigor** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | weak | |  | |  |  | Negret, Tonda Romana | 1 |
|  |  | weak to medium | |  | |  |  |  | 2 |
|  |  | medium | |  | |  |  | Tonda Gentile delle Langhe | 3 |
|  |  | medium to strong | |  | |  |  |  | 4 |
|  |  | strong | |  | |  |  | Fertile de Coutard | 5 |
| **2.** | **(\*)** | **QN** | **VG** |  | **(a)** | **1** | | | |
|  |  | |  | | --- | | **Plant: growth habit** | | |  | |  |  |  |  |
|  |  | fastigiate | |  | |  |  | Corylus colurna, Daviana | 1 |
|  |  | upright | |  | |  |  | Butler, San Giovanni, Segorbe | 2 |
|  |  | semi upright | |  | |  |  | Fertile de Coutard, Negret, Tonda Gentile delle Langhe,  Tonda Romana | 3 |
|  |  | spreading | |  | |  |  | Morell, Tombul | 4 |
|  |  | drooping | |  | |  |  | Imperiale de Trebizonde, Palaz | 5 |
| **3.** |  | **QN** | **VG** |  | **(a), (b)** | **1** | | | |
|  |  | |  | | --- | | **Plant: density of shoots** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | 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** | **(+)** |  | **3** | | | |
|  |  | |  | | --- | | **Plant: tendency to produce suckers** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | very few | |  | |  |  | Tonda Bianca | 1 |
|  |  | few | |  | |  |  | Cosford, Daviana | 2 |
|  |  | medium | |  | |  |  | Segorbe | 3 |
|  |  | many | |  | |  |  | Fertile de Coutard | 4 |
|  |  | very many | |  | |  |  | Imperiale de Trebizonde | 5 |
| **5.** |  | **QN** | **VG** | **(+)** | **(a), (b), (c)** | **1** | | | |
|  |  | |  | | --- | | **One year old shoot: density of hairs** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | very sparse | |  | |  |  |  | 1 |
|  |  | sparse | |  | |  |  | Mortarella, Segorbe | 2 |
|  |  | medium | |  | |  |  | Fertile de Coutard, Tonda Gentile delle Langhe | 3 |
|  |  | dense | |  | |  |  | Imperiale de Trebizonde, Tonda di Giffoni | 4 |
|  |  | very dense | |  | |  |  |  | 5 |
| **6.** |  | **QN** | **VG** | **(+)** | **(a), (b), (c)** | **1** | | | |
|  |  | |  | | --- | | **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)** | **1** | | | |
|  |  | |  | | --- | | **Bud: shape** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | conical | |  | |  |  | Cosford,  Merveille de Bollwiller | 1 |
|  |  | ovoid | |  | |  |  | Fertile de Coutard, Negret | 2 |
|  |  | globular | |  | |  |  | Du Chilly | 3 |
| **8.** | **(\*)** | **PQ** | **VG** | **(+)** | **(b)** | **1** | | | |
|  |  | |  | | --- | | **Bud: color** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | green | |  | |  |  | Du Chilly, Segorbe | 1 |
|  |  | reddish green | |  | |  |  | Bergeri, Gunslebert, Negret | 2 |
|  |  | red | |  | |  |  | Merveille de Bollwiller | 3 |
| **9.** |  | **QN** | **VG** |  | **(b), (c), (e)** | **2** | | | |
|  |  | |  | | --- | | **Male  inflorescence: length** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | very short | |  | |  |  |  | 1 |
|  |  | short | |  | |  |  | Negret | 2 |
|  |  | medium | |  | |  |  | Fertile de Coutard, Tonda Gentile delle Langhe | 3 |
|  |  | long | |  | |  |  | Segorbe | 4 |
|  |  | very long | |  | |  |  |  | 5 |
| **10.** | **(\*)** | **PQ** | **VG** |  | **(e)** | **2** | | | |
|  |  | |  | | --- | | **Male inflorescence: color** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | green | |  | |  |  | Fertile de Coutard, Segorbe, Tonda Gentile delle Langhe | 1 |
|  |  | pink brown | |  | |  |  | Bergeri, Cosford, Merveille de Bollwiller | 2 |
|  |  | red | |  | |  |  |  | 3 |
| **11.** | **(\*)** | **PQ** | **VG** |  | **(e)** | **2** | | | |
|  |  | |  | | --- | | **Stigma: color** | | |  | |  |  |  |  |
|  |  | light yellow | |  | |  |  | OSU 899.010 Oregon selection | 1 |
|  |  | pink | |  | |  |  | San Giovanni | 2 |
|  |  | red | |  | |  |  | Fertile de Coutard | 3 |
|  |  | purple red | |  | |  |  | Merveille de Bollwiller | 4 |
| **12.** | **(\*)** | **PQ** | **VG** | **(+)** | **(b), (c), (d)** | **3** | | | |
|  |  | |  | | --- | | **Leaf blade: shape** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | elliptic | |  | |  |  | Merveille de Bollwiller | 1 |
|  |  | ovate | |  | |  |  | Du Chilly | 2 |
|  |  | obovate | |  | |  |  | Tonda di Giffoni | 3 |
|  |  | circular | |  | |  |  | Segorbe | 4 |
| **13.** | **(\*)** | **QN** | **MG/VG** |  | **(b), (c), (d)** | **3** | | | |
|  |  | |  | | --- | | **Leaf blade: size** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | very small | |  | |  |  |  | 1 |
|  |  | small | |  | |  |  | Cosford,  Imperatrice Eugenie, Merveille de Bollwiller | 2 |
|  |  | medium | |  | |  |  | Fertile de Coutard | 3 |
|  |  | large | |  | |  |  | Segorbe, Tonda di Giffoni | 4 |
|  |  | very large | |  | |  |  |  | 5 |
| **14.** |  | **QN** | **MG/VG** |  | **(b), (c), (d)** | **3** | | | |
|  |  | |  | | --- | | **Petiole: length** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | very short | |  | |  |  |  | 1 |
|  |  | short | |  | |  |  | Fertile de Coutard,  Tonda di Giffoni | 2 |
|  |  | medium | |  | |  |  | Segorbe | 3 |
|  |  | long | |  | |  |  | Cosford, Tonda Gentile delle Langhe | 4 |
|  |  | very long | |  | |  |  |  | 9 |
| **15.** | **(\*)** | **QN** | **VG** |  | **(b), (c), (d)** | **3** | | | |
|  |  | |  | | --- | | **Petiole: density of hairs** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | sparse | |  | |  |  | Segorbe | 1 |
|  |  | medium | |  | |  |  | Merveille de Bollwiller | 2 |
|  |  | dense | |  | |  |  | Fertile de Coutard,  Tonda di Giffoni | 3 |
| **16.** | **(\*)** | **QL** | **VG** | **(+)** | **(f)** | **4** | | | |
|  |  | |  | | --- | | **Involucre: constriction** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | absent | |  | |  |  | Fertile de Coutard, Tonda Gentile delle Langhe | 1 |
|  |  | present | |  | |  |  | Imperiale de Trebizonde | 9 |
| **17.** | **(\*)** | **QN** | **MG/VG** | **(+)** | **(c), (f)** | **4** | | | |
|  |  | |  | | --- | | **Involucre: length in relation to length of nut** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | much shorter | |  | |  |  |  | 1 |
|  |  | shorter | |  | |  |  | Tonda Bianca | 2 |
|  |  | equal | |  | |  |  | Cosford,  Fertile de Coutard, Merveille de Bollwiller | 3 |
|  |  | longer | |  | |  |  | Du Chilly,  Imperiale de Trebizonde, Segorbe, Tombul, Tonda Gentile delle Langhe | 4 |
|  |  | much longer | |  | |  |  |  | 5 |
| **18.** | **(\*)** | **QN** | **VG** | **(+)** | **(f)** | **4** | | | |
|  |  | |  | | --- | | **Involucre: depth of: indentation** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | shallow to medium | |  | |  |  | 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 |
| **19.** | **(\*)** | **QN** | **VG** | **(+)** | **(f)** | **4** | | | |
|  |  | |  | | --- | | **Involucre: serration of indentation** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | very weak | |  | |  |  | Du Chilly, Segorbe, Tombul, Tonda Bianca | 1 |
|  |  | weak | |  | |  |  |  | 2 |
|  |  | medium | |  | |  |  | Fertile de Coutard, Tonda Gentile delle Langhe | 3 |
|  |  | strong | |  | |  |  |  | 4 |
|  |  | very strong | |  | |  |  | Gunslebert, Morell, Negret | 5 |
| **20.** | **(\*)** | **QN** | **VG** | **(+)** | **(f)** | **4** | | | |
|  |  | |  | | --- | | **Involucre: size of basal support** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | thin | |  | |  |  | Cosford | 1 |
|  |  | medium | |  | |  |  | Merveille de Bollwiller, Segorbe | 2 |
|  |  | thick | |  | |  |  | Fertile de Coutard,  Tonda di Giffoni | 3 |
| **21.** | **(\*)** | **QL** | **VG** |  | **(f)** | **4** | | | |
|  |  | |  | | --- | | **Involucre: hairiness** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | absent | |  | |  |  | Morell, Tonda Bianca | 1 |
|  |  | present | |  | |  |  | Tonda di Giffoni | 9 |
| **22.** |  | **QN** | **VG** | **(+)** | **(f)** | **4** | | | |
|  |  | |  | | --- | | **Involucre: density of hairs** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | absent or very sparse | |  | |  |  | Morell, Tonda Bianca | 1 |
|  |  | sparse | |  | |  |  | Cosford, Du Chilly, Imperatrice Eugenie, Segorbe | 2 |
|  |  | medium | |  | |  |  | Fertile de Coutard, Tonda Gentile delle Langhe | 3 |
|  |  | dense | |  | |  |  | Tonda di Giffoni | 4 |
|  |  | very dense | |  | |  |  |  | 5 |
| **23.** |  | **QN** | **VG** | **(+)** | **(f)** | **4** | | | |
|  |  | |  | | --- | | **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 |
| **24.** |  | **QN** | **VG** |  | **(c), (f)** | **4** | | | |
|  |  | |  | | --- | | **Infructescence: number of nuts per cluster** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | only one | |  | |  |  | Daviana, Tonda Bianca | 1 |
|  |  | one or two | |  | |  |  | Cosford,  Merveille de Bollwiller | 2 |
|  |  | two or three | |  | |  |  | Fertile de Coutard,  Tonda di Giffoni | 3 |
|  |  | three or four | |  | |  |  | Negret, Segorbe | 4 |
|  |  | more than four | |  | |  |  | Tombul | 5 |
| **25.** | **(\*)** | **QN** | **MS/VG** |  | **(g), (h)** | **4** | | | |
|  |  | |  | | --- | | **Nut: size** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | very small | |  | |  |  |  | 1 |
|  |  | small | |  | |  |  | Negret, Tombul, Tonda Gentile delle Langhe | 2 |
|  |  | medium | |  | |  |  | Morell, Segorbe,  Tonda di Giffoni | 3 |
|  |  | large | |  | |  |  | Fertile de Coutard, Merveille de Bollwiller | 4 |
|  |  | very large | |  | |  |  | Apoldaer Zellernuss, Bergeri, Ennis | 5 |
| **26.** | **(\*)** | **PQ** | **VG** | **(+)** | **(h)** | **4** | | | |
|  |  | |  | | --- | | **Nut: shape in lateral view** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | globose | |  | |  |  | Clark, Fertile de Coutard, Tonda Gentile delle Langhe | 1 |
|  |  | conical | |  | |  |  | Ennis , Jean's,  erveille de Bollwiller | 2 |
|  |  | ovoid | |  | |  |  | Imperatrice Eugenie, Negret | 3 |
|  |  | obloid | |  | |  |  | Imperiale de Trebizonde | 4 |
|  |  | short sub-cylindrical | |  | |  |  | Butler | 5 |
|  |  | long sub-cylindrical | |  | |  |  | Cosford, Du Chilly | 6 |
| **27.** | **(\*)** | **PQ** | **VG** | **(+)** | **(h)** | **4** | | | |
|  |  | |  | | --- | | **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 |
| **28.** |  | **PQ** | **VG** | **(+)** | **(h)** | **4** | | | |
|  |  | |  | | --- | | **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 |
| **29.** |  | **QN** | **VG** | **(+)** | **(h)** | **4** | | | |
|  |  | |  | | --- | | **Nut: presence of stripes on shell** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | weak | |  | |  |  | Imperiale de Trebizonde, Segorbe | 1 |
|  |  | medium | |  | |  |  | Cosford, Daviana | 2 |
|  |  | strong | |  | |  |  | Campanica | 3 |
| **30.** | **(\*)** | **PQ** | **VG** | **(+)** | **(h)** | **4** | | | |
|  |  | |  | | --- | | **Nut: shape of apex** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | narrow acute | |  | |  |  | Imperatrice Eugenie, Jean's | 1 |
|  |  | broad acute | |  | |  |  | Merveille de Bollwiller, Negret | 2 |
|  |  | obtuse | |  | |  |  | Fertile de Coutard, Tonda Gentile delle Langhe | 3 |
|  |  | truncate | |  | |  |  | Imperiale de Trebizonde | 4 |
| **31.** | **(\*)** | **QN** | **VG** | **(+)** | **(h)** | **4** | | | |
|  |  | |  | | --- | | **Nut: prominence of mucron** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | weak | |  | |  |  | Cosford,  Fertile de Coutard,  Tonda di Giffoni | 1 |
|  |  | medium | |  | |  |  | Du Chilly | 2 |
|  |  | strong | |  | |  |  | Tonda Romana | 3 |
| **32.** | **(\*)** | **QN** | **VG** | **(+)** | **(h)** | **4** | | | |
|  |  | |  | | --- | | **Nut: size of pistil scar** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | small | |  | |  |  | Negret, Tonda Gentile delle Langhe | 1 |
|  |  | medium | |  | |  |  | Fertile de Coutard,  Tonda di Giffoni | 2 |
|  |  | large | |  | |  |  | Cosford,  Imperiale de Trebizonde, San Giovanni | 3 |
| **33.** | **(\*)** | **QN** | **VG** | **(+)** | **(h)** | **4** | | | |
|  |  | |  | | --- | | **Nut: hairiness at apex** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | weak | |  | |  |  | Cosford,  Imperiale de Trebizonde | 1 |
|  |  | medium | |  | |  |  | Fertile de Coutard | 2 |
|  |  | strong | |  | |  |  | Apoldaer Zellernuss,  Du Chilly | 3 |
| **34.** | **(\*)** | **QN** | **VG** | **(+)** | **(h)** | **4** | | | |
|  |  | |  | | --- | | **Nut: relation of basal scar size to nut size** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | small | |  | |  |  | Segorbe, Tonda Gentile delle Langhe | 1 |
|  |  | medium | |  | |  |  | Fertile de Coutard | 2 |
|  |  | large | |  | |  |  | Cosford,  Imperiale de Trebizonde, Merveille de Bollwiller | 3 |
| **35.** | **(\*)** | **QN** | **VG** | **(+)** | **(h)** | **4** | | | |
|  |  | |  | | --- | | **Nut: curvature of basal scar** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | concave | |  | |  |  | Tonda Rossa | 1 |
|  |  | flat | |  | |  |  | Imperiale de Trebizonde, Merveille de Bollwiller | 2 |
|  |  | convex | |  | |  |  | Cosford, Du Chilly, Negret | 3 |
| **36.** | **(\*)** | **QN** | **MG/VG** |  | **(h)** | **4** | | | |
|  |  | |  | | --- | | **Kernel: size** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | very small | |  | |  |  | Sivri, Tombul | 1 |
|  |  | small | |  | |  |  | Negret, Tonda Gentile delle Langhe | 2 |
|  |  | medium | |  | |  |  | Segorbe,  Tonda di Giffoni, Tonda Romana | 3 |
|  |  | large | |  | |  |  | Daviana,  Fertile de Coutard, Merveille de Bollwiller | 4 |
|  |  | very large | |  | |  |  | Pallagrossa | 5 |
| **37.** | **(\*)** | **PQ** | **VG** | **(+)** | **(h)** | **4** | | | |
|  |  | |  | | --- | | **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 |
| **38.** |  | **PQ** | **VG** | **(+)** | **(h)** | **4** | | | |
|  |  | |  | | --- | | **Kernel: shape of apex** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | pointed | |  | |  |  | Du Chilly,  Fertile de Coutard,  Negret | 1 |
|  |  | obtuse | |  | |  |  | Gunslebert,  San Giovanni, Tonda Romana | 2 |
|  |  | truncate | |  | |  |  | Imperiale de Trebizonde | 3 |
| **39.** |  | **PQ** | **VG** | **(+)** | **(h)** | **4** | | | |
|  |  | |  | | --- | | **Kernel: shape in cross section** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | elliptic | |  | |  |  | Du Chilly | 1 |
|  |  | circular | |  | |  |  | Imperiale de Trebizonde, Tonda Romana | 2 |
|  |  | triangular | |  | |  |  | Tonda Gentile delle Langhe | 3 |
| **40.** |  | **PQ** | **VG** | **(+)** | **(h)** | **4** | | | |
|  |  | |  | | --- | | **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 |
| **41.** | **(\*)** | **QL** | **VG** | **(+)** | **(h)** | **4** | | | |
|  |  | |  | | --- | | **Kernel: lateral groove** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | absent | |  | |  |  | Fertile de Coutard, Merveille de Bollwiller | 1 |
|  |  | present | |  | |  |  | Du Chilly,  Imperatrice Eugenie, Tonda di Giffoni | 9 |
| **42.** | **(\*)** | **PQ** | **VG** | **(+)** | **(h)** | **4** | | | |
|  |  | |  | | --- | | **Kernel  presence of fiber** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | absent or very weak | |  | |  |  | Daviana, Du Chilly, Imperiale de Trebizonde | 1 |
|  |  | weak | |  | |  |  |  | 2 |
|  |  | medium | |  | |  |  | Cosford,  Fertile de Coutard, Negret, Segorbe | 3 |
|  |  | strong | |  | |  |  |  | 4 |
|  |  | very strong | |  | |  |  | Campanica, Ennis | 5 |
| **43.** |  | **QN** | **VG** |  | **(h)** | **4** | | | |
|  |  | |  | | --- | | **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 |
| **44.** | **(\*)** | **QN** | **MG/VG** |  | **(h)** | **4** | | | |
|  |  | |  | | --- | | **Nut: percentage of kernel** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | very low | |  | |  |  | Merveille de Bollwiller | 1 |
|  |  | low | |  | |  |  | Fertile de Coutard, Segorbe | 2 |
|  |  | medium | |  | |  |  | Negret, Tonda Gentile delle Langhe | 3 |
|  |  | high | |  | |  |  | Daviana,  Imperatrice Eugenie | 4 |
|  |  | very high | |  | |  |  | Cosford, Tombul | 5 |
| **45.** | **(\*)** | **QN** | **MG** |  | **(e)** | **2** | | | |
|  |  | |  | | --- | | **Time of male flowering** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | very early | |  | |  |  |  | 1 |
|  |  | early | |  | |  |  |  | 2 |
|  |  | medium | |  | |  |  | Negret | 3 |
|  |  | late | |  | |  |  | Du Chilly,  Merveille de Bollwiller | 4 |
|  |  | very late | |  | |  |  |  | 5 |
| **46.** | **(\*)** | **QN** | **MG** |  | **(e)** | **2** | | | |
|  |  | |  | | --- | | **Time of female flowering** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | very early | |  | |  |  | San Giovanni | 1 |
|  |  | early | |  | |  |  | Fertile de Coutard, Negret, Tonda di Giffoni | 2 |
|  |  | medium | |  | |  |  | Tonda Gentile delle Langhe | 3 |
|  |  | late | |  | |  |  | Daviana, Du Chilly, Merveille de Bollwiller, Morell, Segorbe | 4 |
|  |  | very late | |  | |  |  | Bergeri, Gunslebert, Tonda Bianca | 5 |
| **47.** | **(\*)** | **QN** | **MG** |  | **(e)** | **2** | | | |
|  |  | |  | | --- | | **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 |
| **48.** | **(\*)** | **QN** | **MG** |  | **(b)** | **1** | | | |
|  |  | |  | | --- | | **Time of beginning of leaf budburst** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | very early | |  | |  |  | San Giovanni | 1 |
|  |  | early | |  | |  |  | Tonda di Giffoni, Tonda Gentile delle Langhe | 2 |
|  |  | medium | |  | |  |  | Negret, Tonda Romana | 3 |
|  |  | late | |  | |  |  | Bergeri, Cosford,  Du Chilly,  Merveille de Bollwiller | 4 |
|  |  | very late | |  | |  |  |  | 5 |
| **49.** | **(\*)** | **QN** | **MG** |  | **(g)** | **4** | | | |
|  |  | |  | | --- | | **Time of harvest maturity** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | very early | |  | |  |  | San Pere | 1 |
|  |  | early | |  | |  |  | Tonda Gentile delle Langhe | 2 |
|  |  | medium | |  | |  |  | Daviana, Morell,  Tonda Romana | 3 |
|  |  | late | |  | |  |  | Merveille de Bollwiller, Negret | 4 |
|  |  | very late | |  | |  |  |  | 5 |

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| |  |  |  |  | | --- | --- | --- | --- | | 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) | | |  | | --- | | All observations on the buds, flower, leaves, shoots should be recorded in the central third of the branches. | | | | |  |  |  |  | | |  | | --- | | (c) | | |  | | --- | | All observations 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 observations on the fruit and kernel should be made on at least 25 fruits with a humidity content of less than 8% (the samples in paper bags shall stored in dry environment for 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: density of hairs     |  |  |  | | --- | --- | --- | | wordml://76.png | wordml://77.png | wordml://78.png | | 3 | 5 | 7 | | sparse | medium | dense | | | | |

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| |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Ad. 7: Bud: shape     |  |  |  | | --- | --- | --- | | wordml://82.png | wordml://83.png | wordml://84.png | | 1 | 2 | 3 | | conical | ovoid | globular | | | | |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Ad. 8: Bud: color     |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | |  |  |  | | --- | --- | --- | | wordml://85.png | wordml://86.png | wordml://87.png | | 1 | 2 | 3 | | green | reddish green | red | | | | |

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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | Ad. 41: Kernel: lateral groove   |  |  | | --- | --- | | wordml://160.png | wordml://161.png | | 1 | 9 | | absent | present | | | | |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Ad. 42: Kernel  presence of fiber     |  |  |  | | --- | --- | --- | | wordml://162.png | wordml://163.png | wordml://164.png | | 1 | 3 | 5 | | absent or very weak | medium | very strong | | | |
| |  |  | | --- | --- | |  | | | |  | | --- | | 8.3 | | |  | | --- | | *Growth stage key*  Phenological phases  are indicated  as follows:            1   Dormant season            2   During flowering            3   On fully developed leaves            4   At the time of harvest maturity | | |

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| |  |  | | --- | --- | | 10. | Technical Questionnaire | |
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| |  |  |  | | --- | --- | --- | | TECHNICAL QUESTIONNAIRE | Page {x} of {y} | Reference Number: | |
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| |  |  | | --- | --- | |  | 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 | |  | |  |  |  | |  | | --- | |  | |  | |  |  |  |  |  | |

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| |  |  |  |  |  | | --- | --- | --- | --- | --- | |  |  |  |  |  | | 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 | |  |  | |  |  |  |  |  | |

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| |  |  |  |  |  | | --- | --- | --- | --- | --- | | 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) | [ ] | |  |  | | |  |  | | | | | | |

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| |  |  |  | | --- | --- | --- | |  |  |  | |  | 4.2 | Method of propagating the variety | |  | |  |  |  | | --- | --- | --- | | |  | | --- | | 4.2.1 | | Other (Please provide details) | [ ] | |  |  |  | |  |  |  | |  |  |  | | | |  | |  |  | | --- | --- | | |  | | --- | |  | | | | |

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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 |
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| |  | | --- | | **5.1** |  |  | | --- | | **(12)** | | |  | | --- | | **Leaf blade: shape** | |  |  |
|  | |  | | --- | | elliptic | | |  | | --- | | Merveille de Bollwiller | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | ovate | | |  | | --- | | Du Chilly | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | obovate | | |  | | --- | | Tonda di Giffoni | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | circular | | |  | | --- | | Segorbe | | |  | | --- | | 4 [   ] | |
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| |  | | --- | | **5.2** |  |  | | --- | | **(17)** | | |  | | --- | | **Involucre: length in relation to length of nut** | |  |  |
|  | |  | | --- | | much shorter | | |  | | --- | |  | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | shorter | | |  | | --- | | Tonda Bianca | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | equal | | |  | | --- | | Cosford, Fertile de Coutard, Merveille de Bollwiller | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | longer | | |  | | --- | | Du Chilly, Imperiale de Trebizonde, Segorbe, Tombul, Tonda Gentile delle Langhe | | |  | | --- | | 4 [   ] | |
|  | |  | | --- | | much longer | | |  | | --- | |  | | |  | | --- | | 5 [   ] | |
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| |  | | --- | | **5.3** |  |  | | --- | | **(18)** | | |  | | --- | | **Involucre: depth of indentation** | |  |  |
|  | |  | | --- | | shallow to medium | | |  | | --- | | 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 [   ] | |
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| |  | | --- | | **5.4** |  |  | | --- | | **(20)** | | |  | | --- | | **Involucre: size of basal support** | |  |  |
|  | |  | | --- | | thin | | |  | | --- | | Cosford | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | medium | | |  | | --- | | Merveille de Bollwiller, Segorbe | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | thick | | |  | | --- | | Fertile de Coutard, Tonda di Giffoni | | |  | | --- | | 3 [   ] | |
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| |  | | --- | | **5.5** |  |  | | --- | | **(25)** | | |  | | --- | | **Nut: size** | |  |  |
|  | |  | | --- | | very small | | |  | | --- | |  | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | small | | |  | | --- | | Negret, Tombul, Tonda Gentile delle Langhe | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | medium | | |  | | --- | | Morell, Segorbe, Tonda di Giffoni | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | large | | |  | | --- | | Fertile de Coutard, Merveille de Bollwiller | | |  | | --- | | 4 [   ] | |
|  | |  | | --- | | very large | | |  | | --- | | Apoldaer Zellernuss, Bergeri, Ennis | | |  | | --- | | 5 [   ] | |
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|  | Characteristics | Example Varieties | Note |
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| |  | | --- | | **5.6** |  |  | | --- | | **(26)** | | |  | | --- | | **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-cylindrical | | |  | | --- | | Butler | | |  | | --- | | 5 [   ] | |
|  | |  | | --- | | long sub-cylindrical | | |  | | --- | | Cosford, Du Chilly | | |  | | --- | | 6 [   ] | |
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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 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: | |

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| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  | | --- | | #7. | | Additional information which may help in the examination of the variety | | | | |  |  |  | | | | 7.1 | In addition to the information provided in sections 5 and 6, are there any additional characteristics which may help to distinguish the variety? | | | | |  | Yes | [ ] | No | [ ] | |  | (If yes, please provide details) | | | | | 7.2 | Are there any special conditions for growing the variety or conducting the examination? | | | | |  | Yes | [ ] | No | [ ] | |  | (If yes, please provide details) | | | | | 7.3 | Other information | | | | |  |  |  |  |  | | A representative color photograph of the variety 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.] | | | | | |  |  |  |  |  | |

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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 |  |  | |  |  |  | |  |  | |  |  |  |  |  |  | | |
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