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| **TG/MORUS(proj.6)** |
| **ORIGINAL:** English |
| **DATE:** 2023-09-15 |

 |
| **INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS** |
|  | Geneva  |  |
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|  | DRAFT |  |
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| **MULBERRY** |
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| UPOV Code(s): MORUS |

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| *Morus* L. |

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| **GUIDELINES** |
|   |
| **FOR THE CONDUCT OF TESTS** |
|   |
| **FOR DISTINCTNESS, UNIFORMITY AND STABILITY** |

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| *prepared by an expert from Japan**to be considered by**the Technical Committee at its fifty-ninth session**to be held in Geneva on October 23 and 24, 2023* |

 |
| *Disclaimer: this document does not represent UPOV policies or guidance* |
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| Alternative names:\* |

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 |
| *Botanical name* | *English* | *French* | *German* | *Spanish* |
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| *Morus* L. |

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| --- |
| Mulberry |

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| --- |
| Mûrier |

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| Maulbeerbaum |

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| Moro |

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| 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. |
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| **ASSOCIATED DOCUMENTS** |
| These Test Guidelines should be read in conjunction with the General Introduction and its associated TGP documents. |
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| 1. | Subject of these Test Guidelines |
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| These Test Guidelines apply to all varieties of *Morus* L. |

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| 2. | Material Required |
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| 2.1 |

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| 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. |

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| 2.2 |

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| The material is to be supplied in the form of plants on their own roots or on a rootstock specified by the competent authority. |

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| 2.3 |

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

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| --- |
| 5 plants for varieties resulting from crossing10 plants for varieties resulting from mutation |

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| 2.4 |

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

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| 2.5 |

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| 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* |
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| 3.1.1 |

 | The minimum duration of tests should normally be two independent growing cycles. |
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| 3.1.2 |

 | The two independent growing cycles may be observed from a single planting, examined in two separate growing cycles. |
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| 3.1.3 |

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| In particular, it is essential that the plants produce a satisfactory crop of fruit in each of the two growing cycles. In the case of male varieties, it is essential that the plants produce a satisfactory number of flowers in each of the two growing cycles. |

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| 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. |
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| 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”.  |
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| *3.3* | *Conditions for Conducting the Examination* |
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| 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* |
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| 3.4.1 |

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| In the case of varieties resulting from crossing, each test should be designed to result in a total of at least 5 plants. |

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| 3.4.2 |

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| In the case of varieties resulting from mutation, each test should be designed to result in a total of at least 10 plants. |

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*3.5* | *Additional Tests* |
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|  | 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. |
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| 4.1.4 |

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| Number of Plants or Parts of Plants to be Examined |

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| 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. |

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| In the case of observations of parts taken from single plants, the number of parts to be taken from each of the plants should at least be 2. |

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| 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”): |
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| 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 plantsVS: visual assessment by observation of individual plants or parts of plants |

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

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| 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. |

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|  | 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:  |
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| 4.2.2 |

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| 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. |

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| 4.2.3 |

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| For the assessment of uniformity of varieties resulting from crossing, a population standard of 1% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 5 plants, no off-types are allowed. |

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| 4.2.4 |

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| For the assessment of uniformity of varieties resulting from mutation, a population standard of 1% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 10 plants, 1 off-type is allowed. |

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| *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. |
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| 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. |
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| 5.3 | The following have been agreed as useful grouping characteristics: |
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| (a) |

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| Leaf bud: shape (characteristic 11) |

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| --- |
| (b) |

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| --- |
| Leaf: phyllotaxis (characteristic 13) |

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| --- |
| (c) |

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| --- |
| Leaf blade: presence of lobes (characteristic 23) |

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| --- |
| (d) |

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| Inflorescence: sex expression (characteristic 33) |

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| (e) |

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| Infructescence: color (characteristic 40) |

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| 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 |
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| *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* |
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|  |  | English | français | deutsch | español | Example VarietiesExemplesBeispielssortenVariedades ejemplo | Note/Nota |
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| **2** |

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| **3** |

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| **4** |

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| **5** |

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| **6** |

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| **7** |

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| **Name of characteristics in English** |

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| **Nom du caractère en français** |

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| --- |
| **Name des Merkmals auf Deutsch** |

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| --- |
| **Nombre del carácter en español** |

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|  |
| --- |
| states of expression |

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| --- |
| types d’expression |

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| --- |
| Ausprägungsstufen |

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| --- |
| tipos de expresión |

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| 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 |
|  |   |  |  |
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| See Explanations on the Table of Characteristics in Chapter 8.2 |

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| (a)-(d) |

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| See Explanations on the Table of Characteristics in Chapter 8.1 |

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| 7 |

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| Not applicable |

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

|  |  | English | français | deutsch | español | Example VarietiesExemplesBeispielssortenVariedades ejemplo | Note/Nota |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **1.** |  | **QN** | **VG** |  |  |  |
|  |  |

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| --- |
| **Tree: vigor** |

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| **Arbre : vigueur** |

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| **Baum: Wuchsstärke** |

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| **Árbol: vigor** |

 |  |  |
|  |  | weak | faible | gering | débil | Sekizaiso | 1 |
|  |  | medium | moyenne | mittel | medio | Ichinose | 2 |
|  |  | strong | forte | stark | fuerte | Kenmochi, Oyutaka, Senshin | 3 |
| **2.** | **(\*)** | **PQ** | **VG** | **(+)** |  |  |
|  |  |

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| **Tree: growth habit** |

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| **Arbre : port** |

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| **Baum: Wuchsform** |

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| **Árbol: hábito de crecimiento** |

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|  |  | upright | dressé | aufrecht | erguido | Mitsuminami, Piramidale, Tokiyutaka | 1 |
|  |  | semi-upright | demi-dressé | halbaufrecht | semierguido | Ichinose, Kenmochi | 2 |
|  |  | spreading | étalé | breitwüchsig | extendido | Ayanobori, Hayatesakari, Platanoide, Yukishinogi | 3 |
|  |  | drooping | pendant | überhängend | colgante | Sekizaiso | 4 |
|  |  | weeping | pleureur | lang überhängend | llorón | Pendula, Shidareguwa | 5 |
| **3.** |  | **QN** | **VG** |  | **(a)** |  |
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| **Current year's shoot: number** |

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| **Rameau de l'année en cours : nombre** |

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| **Diesjähriger Trieb: Anzahl** |

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| **Rama del año en curso: número** |

 |  |  |
|  |  | few | petit | gering | bajo | Shin-Ichinose | 1 |
|  |  | few to medium | petit à moyen | gering bis mittel | bajo a medio |  | 2 |
|  |  | medium | moyen | mittel | medio | Ichinose, Kenmochi | 3 |
|  |  | medium to many | moyen à élevé | mittel bis hoch | medio a alto |  | 4 |
|  |  | many | élevé | hoch | alto | Kairyo-Nezumigaeshi Yukishinogi | 5 |
| **4.** |  | **QN** | **VG** |  | **(a)** |  |
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| **Current year's shoot: number of lateral shoots** |

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| **Rameau de l'année en cours : nombre de rameaux latéraux** |

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| **Diesjähriger Trieb: Anzahl Seitentriebe** |

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| **Rama del año en curso: número de ramas laterales** |

 |  |  |
|  |  | absent or few | absent ou petit | fehlend oder gering | ausente o bajo | Ichinose, Kenmochi, Tokiyutaka | 1 |
|  |  | medium | moyen | mittel | medio | Kairyo-Nezumigaeshi | 2 |
|  |  | many | élevé | hoch | alto | Jumonji, Keikanso | 3 |
| **5.** |  | **QN** | **MG/MS/VG** |  | **(a)** |  |
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| **Current year's shoot: length** |

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| **Rameau de l'année en cours : longueur** |

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| **Diesjähriger Trieb: Länge** |

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| **Rama del año en curso: longitud** |

 |  |  |
|  |  | short | courte | kurz | corta | Negoyatakasuke | 1 |
|  |  | short to medium | courte à moyenne | kurz bis mittel | corta a media |  | 2 |
|  |  | medium | moyenne | mittel | media | Ichinose, Kenmochi | 3 |
|  |  | medium to long | moyenne à longue | mittel bis lang | media a larga |  | 4 |
|  |  | long | longue | lang | larga | Shin-Ichinose | 5 |
| **6.** | **(\*)** | **QN** | **VG** | **(+)** | **(a)** |  |
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| **Current year's shoot: zigzag habit** |

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| **Rameau de l'année en cours : port du zigzag** |

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| **Diesjähriger Trieb: Zickzack-Haltung** |

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| **Rama del año en curso: hábito de zigzag** |

 |  |  |
|  |  | absent or weak | absent ou faible | fehlend oder gering | ausente o débil | Ichinose, Yue Shen Da 10 | 1 |
|  |  | medium | moyen | mittel | medio | He Ye Bai | 2 |
|  |  | strong | fort | stark | fuerte | Hu Bei Wan Tiao, Unryu | 3 |
| **7.** |  | **QL** | **VG** | **(+)** | **(a)** |  |
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| **Current year's shoot: twisting** |

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| **Rameau de l'année en cours : torsion** |

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| **Diesjähriger Trieb: Drehung** |

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| **Rama del año en curso: torsión** |

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|  |  | absent | absente | fehlend | ausente |  | 1 |
|  |  | present | présente | vorhanden | presente | Sinuense | 9 |
| **8.** |  | **PQ** | **VG** |  | **(a)** |  |
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| **Current year's shoot: color** |

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| **Rameau de l'année en cours : couleur** |

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| **Diesjähriger Trieb: Farbe** |

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| **Rama del año en curso: color** |

 |  |  |
|  |  | greyish brown | brun grisâtre | gräulichbraun | marrón grisáceo | Mizusawaguwa | 1 |
|  |  | greenish brown | brun verdâtre | grünlichbraun | marrón verdoso | Shin-Ichinose | 2 |
|  |  | yellowish brown | brun jaunâtre | gelblichbraun | marrón amarillento | Fukushimaoha | 3 |
|  |  | reddish brown | brun rougeâtre | rötlichbraun | marrón rojizo | Ichibei | 4 |
|  |  | medium brown | brun moyen | mittelbraun | marrón medio | Rohachi | 5 |
|  |  | dark brown | brun foncé | dunkelbraun | marrón oscuro | Kenmochi | 6 |
|  |  | light grey | gris clair | hellgrau | gris claro | Ichinose | 7 |
| **9.** | **(\*)** | **QN** | **MG/MS/VG** | **(+)** | **(a)** |  |
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| **Current year's shoot: length of internode** |

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| **Rameau de l'année en cours : longueur de l'entre-nœud** |

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| **Diesjähriger Trieb: Länge des Internodiums** |

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| **Rama del año en curso: longitud del entrenudo** |

 |  |  |
|  |  | short | courte | kurz | corta | Sinuense, Tokiyutaka | 1 |
|  |  | medium | moyenne | mittel | media | Ichinose, Kenmochi | 2 |
|  |  | long | longue | lang | larga | Ichibei | 3 |
| **10.** | **(\*)** | **QN** | **VG** |  | **(a)** |  |
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| **Leaf bud: size** |

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| **Bourgeon à feuilles : taille** |

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| **Blattknospe: Größe** |

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| **Yema foliar: tamaño** |

 |  |  |
|  |  | small | petite | klein | pequeño | Shin-Ichinose | 1 |
|  |  | medium | moyenne | mittel | medio | Ichinose, Kenmochi | 2 |
|  |  | large | grande | groß | grande | Yukishinogi | 3 |
| **11.** | **(\*)** | **PQ** | **VG** | **(+)** | **(a)** |  |
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| **Leaf bud: shape** |

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| **Bourgeon à feuilles : forme** |

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| **Blattknospe: Form** |

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| **Yema foliar: forma** |

 |  |  |
|  |  | broad triangular | triangulaire large | breit dreieckig | triangular ancha | Atsubamidori, Filippine, Shin-Ichinose | 1 |
|  |  | medium triangular | triangulaire moyenne | mittel dreieckig | triangular media | Cattaneo fem., Florio, Ichinose, Kenmochi, Morettiana | 2 |
|  |  | narrow triangular | triangulaire étroite | schmal dreieckig | triangular estrecha | Wasemidori | 3 |
|  |  | ovate | ovale | eiförmig | oval | Negoyatakasuke | 4 |
| **12.** | **(\*)** | **PQ** | **VG** |  | **(a)** |  |
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| **Leaf bud: color** |

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| **Bourgeon à feuilles : couleur** |

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| **Blattknospe: Farbe** |

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| **Yema foliar: color** |

 |  |  |
|  |  | greyish brown | brun grisâtre | gräulichbraun | marrón grisáceo | Atsubamidori | 1 |
|  |  | yellowish brown | brun jaunâtre | gelblichbraun | marrón amarillento | Kokuso 27 | 2 |
|  |  | reddish brown | brun rougeâtre | rötlichbraun | marrón rojizo | Ichibei | 3 |
|  |  | medium brown | brun moyen | mittelbraun | marrón medio | Ichinose | 4 |
|  |  | dark brown | brun foncé | dunkelbraun | marrón oscuro | Kenmochi | 5 |
|  |  | light grey | gris clair | hellgrau | gris claro | Shin-Ichinose, Shiromeroso | 6 |
| **13.** | **(\*)** | **QL** | **VG** | **(+)** |  |  |
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| **Leaf: phyllotaxis** |

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| **Feuille : phyllotaxie** |

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| **Blatt: Blattstellung** |

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| **Hoja: filotaxis** |

 |  |  |
|  |  | one half | une moitié | ein Halb | una mitad | Chijimiguwa, Filippine, Negoyatakasuke | 1 |
|  |  | one third | un tiers | ein Drittel | un tercio |  | 2 |
|  |  | two fifth | deux cinquièmes | zwei Fünftel | dos quintos | Cattaneo fem., Florio, Ichinose, Kenmochi | 3 |
|  |  | three eighth | trois huitièmes | drei Achtel | tres octavos | Morettiana, Wasemidori | 4 |
|  |  | five thirteenth | cinq treizième | fünf Dreizehntel | cinco treceavos |  | 5 |
| **14.** | **(\*)** | **QN** | **VG** | **(+)** |  |  |
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| **Leaf: attitude** |

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| **Feuille : port** |

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| **Blatt: Haltung** |

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| **Hoja: porte** |

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|  |  | upwards | vers le haut | aufwärts gerichtet | ascendente | Jikunashi | 1 |
|  |  | outwards | vers l'extérieur | abstehend | orientado hacia el exterior | Ichinose, Kenmochi | 2 |
|  |  | downwards | vers le bas | abwärts gerichtet | orientado hacia abajo | Asayuki, Shin-Ichinose | 3 |
| **15.** | **(\*)** | **QN** | **MG/MS/VG** | **(+)** | **(b)** |  |
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| **Leaf blade: length** |

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| **Limbe : longueur** |

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| **Blattspreite: Länge** |

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| **Limbo: longitud** |

 |  |  |
|  |  | very short | très courte | sehr kurz | muy corta |  | 1 |
|  |  | very short to short | très courte à courte | sehr kurz bis kurz | muy corta a corta |  | 2 |
|  |  | short | courte | kurz | corta | Kibajumonji, Romana rabelaire | 3 |
|  |  | short to medium | courte à moyenne | kurz bis mittel | corta a media |  | 4 |
|  |  | medium | moyenne | mittel | media | Ichinose, Restelli | 5 |
|  |  | medium to long | moyenne à longue | mittel bis lang | media a larga |  | 6 |
|  |  | long | longue | lang | larga | Indiana, Platanoide, Popberry | 7 |
|  |  | long to very long | longue à très longue | lang bis sehr lang | larga a muy larga |  | 8 |
|  |  | very long | très longue | sehr lang | muy larga |  | 9 |
| **16.** | **(\*)** | **QN** | **MG/MS/VG** | **(+)** | **(b)** |  |
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| **Leaf blade: width** |

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| **Limbe : largeur** |

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| **Blattspreite: Breite** |

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| **Limbo: anchura** |

 |  |  |
|  |  | very narrow | très étroite | sehr schmal | muy estrecha | Nervosa | 1 |
|  |  | very narrow to narrow | très étroite à étroite | sehr schmal bis schmal | muy estrecha a estrecha |  | 2 |
|  |  | narrow | étroite | schmal | estrecha | Indiana, Kibajumonji | 3 |
|  |  | narrow to medium | étroite à moyenne | schmal bis mittel | estrecha a media |  | 4 |
|  |  | medium | moyenne | mittel | media | Ichinose | 5 |
|  |  | medium to broad | moyenne à large | mittel bis breit | media a ancha |  | 6 |
|  |  | broad | large | breit | ancha | Popberry | 7 |
|  |  | broad to very broad | large à très large | breit bis sehr breit | ancha a muy ancha |  | 8 |
|  |  | very broad | très large | sehr breit | muy ancha | Platanoide | 9 |
| **17.** |  | **QN** | **MG/MS/VG** |  | **(b)** |  |
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| **Leaf blade: ratio length/width** |

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| **Limbe : rapport longueur/largeur** |

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| **Blattspreite: Verhältnis Länge/Breite** |

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| **Limbo: relación longitud/anchura** |

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|  |  | low | bas | klein | baja |  | 1 |
|  |  | medium | moyen | mittel | media | Ichinose, Kenmochi | 2 |
|  |  | high | élevé | groß | alta |  | 3 |
| **18.** | **(\*)** | **QN** | **MG/MS/VG** | **(+)** | **(b)** |  |
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| **Leaf blade: thickness** |

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| **Limbe : épaisseur** |

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| **Blattspreite: Dicke** |

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| **Limbo: grosor** |

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|  |  | thin | mince | dünn | delgado | Kokuso 27, Shiwasuguwa, Yukishinogi | 1 |
|  |  | medium | moyenne | mittel | medio | Ichinose, Kenmochi | 2 |
|  |  | thick | épaisse | dick | grueso | Atsubamidori, Ayanobori, Shin-Kenmochi | 3 |
| **19.** | **(\*)** | **PQ** | **VG** | **(+)** | **(b)** |  |
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| **Leaf blade: length of tip** |

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| **Limbe : longueur de l'extrémité** |

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| **Blattklinge: Länge der Spitze** |

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| **Limbo: longitud de la punta** |

 |  |  |
|  |  | absent or short | absente ou courte | fehlend oder kurz | ausente o corta | Romana rabelaire, Rougetto | 1 |
|  |  | medium | moyenne | mittel | media | Indiana, Kenmochi, Limoncina | 2 |
|  |  | long | longue | lang | larga | Ascolana, Florio, Fukayuki, Takinokawa | 3 |
| **20.** |  | **PQ** | **VG** | **(+)** | **(b)** |  |
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| **Leaf blade: shape of apex** |

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| **Limbe : forme de l'apex** |

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| **Blattspreite: Form des Apex** |

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| **Limbo: forma del ápice** |

 |  |  |
|  |  | acute | aigue | spitz | aguda | Ichinose | 1 |
|  |  | obtuse | obtuse | stumpf | obtusa | Jikunashi | 2 |
|  |  | obcordate | obcordée | verkehrt herzförmig | obcordada | Niken | 3 |
| **21.** |  | **PQ** | **VG** |  | **(b)** |  |
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| **Leaf blade: shape** |

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| **Limbe : forme** |

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| **Blattspreite: Form** |

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| **Limbo: forma** |

 |  |  |
|  |  | triangular | triangulaire | dreieckig | triangular | Florio | 1 |
|  |  | cordate | cordiforme | herzförmig | cordada | Arancina, Ascolana | 2 |
|  |  | ovate | ovale | eiförmig | oval | Illinois Everbearing, Nervosa, Planifolia | 3 |
|  |  | circular | circulaire | kreisförmig | circular | Kokka | 4 |
|  |  | pentagonal | pentagonale | fünfeckig | pentagonal | Ichinose | 5 |
| **22.** | **(\*)** | **PQ** | **VG** | **(+)** | **(b)** |  |
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| **Leaf blade: shape of base** |

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| **Limbe : forme de la base** |

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| **Blattspreite: Form der Basis** |

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| **Limbo: forma de la base** |

 |  |  |
|  |  | cuneate | cunée | keilförmig | cuneada | Nervosa, Popberry | 1 |
|  |  | truncate | tronquée | gerade | truncada | Goshoerami, Jumonji, Kokuso 70, Negoyatakasuke | 2 |
|  |  | retuse | rétuse | eingedrückt | retusa | Kenmochi, Restelli, Rosa di Lombardia | 3 |
|  |  | cordate | cordiforme | herzförmig | cordada | Arancina, Ichinose, Romana rabelaire | 4 |
| **23.** | **(\*)** | **QL** | **VG** |  | **(b)** |  |
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| **Leaf blade: presence of lobes** |

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| **Limbe : présence de lobes** |

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| **Blattspreite: Vorhandensein von Lappen** |

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| **Limbo: presencia de lóbulos** |

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|  |  | absent | absente | fehlend | ausente | Arancina, Florio | 1 |
|  |  | present | présente | vorhanden | presente |  | 9 |
| **24.** | **(\*)** | **QN** | **VG** | **(+)** | **(b)** |  |
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| **Only varieties with lobes present: Leaf blade: depth of sinus** |

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| **Seulement variétés avec lobes présents : Limbe : profondeur du sinus** |

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| **Nur Sorten mit vorhandenen Lappen: Blattspreite: Tiefe der Einbuchtung** |

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| **Solo variedades con lóbulos presentes: Limbo: profundidad del seno** |

 |  |  |
|  |  | shallow | peu profonde | flach | poco profunda | Florio, Limoncina, Rohachi, Takinokawa | 1 |
|  |  | shallow to medium | peu profonde à moyenne | flach bis mittel | poco profunda a media | Akagi, Shimanouchi, Shin-Ichinose | 2 |
|  |  | medium | moyenne | mittel | media | Ichinose | 3 |
|  |  | medium to deep | moyenne à profonde | mittel bis tief | media a profunda | Indiana, Kenmochi | 4 |
|  |  | deep | profonde | tief | profunda | Platanoide | 5 |
| **25.** |  | **PQ** | **VG** | **(+)** | **(b)** |  |
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| **Leaf blade: margin** |

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| **Limbe : bord** |

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| **Blattspreite: Rand** |

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| **Limbo: borde** |

 |  |  |
|  |  | repand | onduleux | ausgeschweift | repando | Ichinose | 1 |
|  |  | crenate | crénelé | gekerbt | crenado | Kairyo-Roso, Kanmasari, Limoncina, Rougetto, Shin-Ichinose | 2 |
|  |  | dentate | denté | gezähnt | dentado | Ascolana, Fukushimaoha, Restelli | 3 |
|  |  | serrulate | serrulé | fein gesägt | serrulado | Kenmochi, Oshimaso, Planifolia | 4 |
|  |  | serrate | dentelé | gesägt | serrado | Akameroso, Hicks Fancy | 5 |
|  |  | biserrate | bidentelé | doppelt gesägt | biserrado | Florio | 6 |
|  |  | aristate | aristé | begrannt | aristado | Nervosa | 7 |
| **26.** |  | **QN** | **VG** |  | **(b)** |  |
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| **Leaf blade: texture** |

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| **Limbe : texture** |

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| **Blattspreite: Textur** |

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| **Limbo: textura** |

 |  |  |
|  |  | smooth | lisse | glatt | lisa | Florio, Indiana, Kairyo-Roso, Muki | 1 |
|  |  | medium | moyenne | mittel | media | Kokuso 27 | 2 |
|  |  | rough | rugueuse | rauh | rugosa | Ichibei, Korin | 3 |
| **27.** |  | **QN** | **VG** |  | **(b)** |  |
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| **Leaf blade: blistering of surface** |

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| **Limbe : cloqûre de la surface** |

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| **Blattspreite: Blasigkeit der Oberfläche** |

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| **Limbo: abullonado de la superficie** |

 |  |  |
|  |  | absent or weak | absente ou faible | fehlend oder gering | ausente o débil | Arancina, Illinois Everbearing | 1 |
|  |  | medium | moyenne | mittel | medio | Cattaneo fem., Florio | 2 |
|  |  | strong | forte | stark | fuerte | Platanoide | 3 |
| **28.** | **(\*)** | **PQ** | **VG** |  | **(b)** |  |
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| **Leaf blade: color of upper side** |

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| **Limbe : couleur de la face supérieure** |

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| **Blattspreite: Farbe der Oberseite** |

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| **Limbo: color del haz** |

 |  |  |
|  |  | light green | vert clair | hellgrün | verde claro | Hicks Fancy, Kairyo-Roso, Romana rabelaire | 1 |
|  |  | medium green | vert moyen | mittelgrün | verde medio | Ichinose, Illinois Everbearing | 2 |
|  |  | dark green | vert foncé | dunkelgrün | verde oscuro | Florio, Indiana, Kenmochi, Shin-Kenmochi, Yukiasahi | 3 |
|  |  | yellowish green | vert jaunâtre | gelblichgrün | verde amarillento | Goshoerami, Kibajumonji, Planifolia | 4 |
| **29.** |  | **QN** | **VG** |  | **(b)** |  |
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| **Leaf blade: glossiness of upper side** |

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| **Limbe : brillance de la face supérieure** |

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| **Blattspreite: Glanz der Oberseite** |

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| **Limbo: brillo del haz** |

 |  |  |
|  |  | absent or weak | absente ou faible | fehlend oder gering | ausente o débil | Ichibei, Keguwa | 1 |
|  |  | medium | moyenne | mittel | medio | Ichinose, Kenmochi | 2 |
|  |  | strong | forte | stark | fuerte | Shin-Kenmochi | 3 |
| **30.** |  | **QN** | **VG** | **(+)** | **(b)** |  |
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| **Leaf blade: shape in cross section** |

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| **Limbe : forme en section transversale** |

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| **Blattspreite: Form im Querschnitt** |

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| **Limbo: forma en sección transversal** |

 |  |  |
|  |  | concave | concave | konkav | cóncava | Lun Jian 109 | 1 |
|  |  | flat | plate | flach | plana | Yue Shen Da 10 | 2 |
|  |  | convex | convexe | konvex | convexa | Wan Nian Sang | 3 |
| **31.** |  | **QN** | **MG/MS/VG** |  | **(b)** |  |
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| **Petiole: length** |

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| **Pétiole : longueur** |

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| **Blattstiel: Länge** |

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| **Peciolo: longitud** |

 |  |  |
|  |  | absent or very short | absente ou très courte | fehlend oder sehr kurz | ausente o muy corta | Jikunashi | 1 |
|  |  | very short to short | très courte à courte | sehr kurz bis kurz | muy corta a corta |  | 2 |
|  |  | short | courte | kurz | corta | Queensland Black, Rougetto, Sanchutakasuke | 3 |
|  |  | short to medium | courte à moyenne | kurz bis mittel | corta a media |  | 4 |
|  |  | medium | moyenne | mittel | media | Arancina, Ascolana, Ichinose, Kenmochi | 5 |
|  |  | medium to long | moyenne à longue | mittel bis lang | media a larga |  | 6 |
|  |  | long | longue | lang | larga | Indiana, Kokka, Shiromekeiso | 7 |
|  |  | long to very long | longue à très longue | lang bis sehr lang | larga a muy larga |  | 8 |
|  |  | very long | très longue | sehr lang | muy larga | Nervosa | 9 |
| **32.** |  | **PQ** | **VG** |  |  |  |
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| **Flower bud: color** |

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| **Bouton floral : couleur** |

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| **Blütenknospe: Farbe** |

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| **Yema floral: color** |

 |  |  |
|  |  | light brown | brun clair | hellbraun | marrón claro | Indiana | 1 |
|  |  | medium brown | brun moyen | mittelbraun | marrón medio | Florio | 2 |
|  |  | dark brown | brun foncé | dunkelbraun | marrón oscuro | Cattaneo male | 3 |
|  |  | reddish brown | brun rougeâtre | rötlichbraun | marrón rojizo | Kokuso 21, Kokuso 27, Muki | 4 |
| **33.** | **(\*)** | **QL** | **VG** |  | **(c)** |  |
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| **Inflorescence: sex expression** |

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| **Inflorescence : expression du sexe** |

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| **Blütenstand: Geschlechtsverteilung** |

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| **Inflorescencia: expresión del sexo** |

 |  |  |
|  |  | male | mâle | männlich | masculina | Akameroso, Cattaneo male, Shimanouchi | 1 |
|  |  | hermaphrodite | hermaphrodite | zwittrig | hermafrodita | Akagi, Filippine, Oshimaso | 2 |
|  |  | female | femelle | weiblich | femenina | Cattaneo fem., Ichinose, Kenmochi | 3 |
| **34.** | **(\*)** | **QN** | **VG** |  | **(c)** |  |
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| **Excluding staminate varieties: Inflorescence: number of pistillate clusters** |

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| **À l'exclusion des variétés staminées : Inflorescence : nombre de bouquets pistillés** |

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| **Ohne staminate Sorten: Blütenstand: Anzahl pistillater Dolden** |

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| --- |
| **Excluidas las variedades estaminadas: Inflorescencia: número de racimos pistilados** |

 |  |  |
|  |  | few | petit | gering | bajo | Ichibei | 1 |
|  |  | medium | moyen | mittel | medio | Ichinose | 2 |
|  |  | many | élevé | groß | alto | Kenmochi | 3 |
| **35.** | **(\*)** | **PQ** | **VG** | **(+)** | **(d)** |  |
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| **Infructescence: shape** |

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| **Infructescence : forme** |

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| **Fruchtstand: Form** |

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| **Infructescencia: forma** |

 |  |  |
|  |  | globose | globuleuse | kugelförmig | globosa | Piramidale | 1 |
|  |  | ellipsoid | ellipsoïde | ellipsoid | elipsoide | Ascolana, Florio, Lalaberry | 2 |
|  |  | cylindric | cylindrique | zylindrisch | cilíndrica | Cattaneo fem., Ichinose, Kenmochi, Kokka, Platanoide | 3 |
| **36.** |  | **QN** | **MG/MS/VG** |  | **(d)** |  |
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| **Infructescence: length** |

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| **Infructescence : longueur** |

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| **Fruchtstand: Länge** |

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| **Infructescencia: longitud** |

 |  |  |
|  |  | short | courte | kurz | corta | Piramidale | 1 |
|  |  | short to medium | courte à moyenne | kurz bis mittel | corta a media | Akagi, Lhou | 2 |
|  |  | medium | moyenne | mittel | media | Ichinose, Kenmochi, Morettiana | 3 |
|  |  | medium to long | moyenne à longue | mittel bis lang | media a larga | Kokka, Muki | 4 |
|  |  | long | longue | lang | larga | Lalaberry, Planifolia, Popberry, Restelli | 5 |
| **37.** |  | **QN** | **MG/MS/VG** |  | **(d)** |  |
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| **Infructescence: width** |

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| **Infructescence : largeur** |

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| **Fruchtstand: Breite** |

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| **Infructescencia: anchura** |

 |  |  |
|  |  | narrow | étroite | schmal | estrecha | Planifolia, Platanoide | 1 |
|  |  | medium | moyenne | mittel | media | Filippine, Florio, Ichinose, Kenmochi | 2 |
|  |  | broad | large | breit | ancha | Ascolana, Lalaberry, Piramidale, Popberry | 3 |
| **38.** |  | **QN** | **MG/MS/VG** |  | **(d)** | **(e)** |
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| **Infructescence: ratio length/width** |

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| **Infructescence : rapport longueur/largeur** |

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| **Fruchtstand: Verhältnis Länge/Breite** |

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| --- |
| **Infrutescencia: relación longitud/anchura** |

 |  |  |
|  |  | low | bas | klein | baja |  | 1 |
|  |  | medium | moyen | mittel | media | Ichinose, Kenmochi | 2 |
|  |  | high | élevé | groß | alta |  | 3 |
| **39.** | **(\*)** | **QN** | **MG/MS** |  | **(d)** |  |
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| **Infructescence: weight** |

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| **Infructescence : poids** |

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| **Fruchtstand: Gewicht** |

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| **Infructescencia: peso** |

 |  |  |
|  |  | low | bas | gering | bajo | Piramidale | 1 |
|  |  | medium | moyen | mittel | medio | Ichinose, Kenmochi | 2 |
|  |  | high | élevé | hoch | alto | Lalaberry | 3 |
| **40.** | **(\*)** | **PQ** | **VG** |  | **(d)** |  |
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| **Infructescence: color** |

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| **Infructescence : couleur** |

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| **Fruchtstand: Farbe** |

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| --- |
| **Infructescencia: color** |

 |  |  |
|  |  | white | blanc | weiß | blanco | Ege Beyaz, Giazzola, Morettiana | 1 |
|  |  | yellowish white | blanc jaunâtre | gelblichweiß | blanco amarillento | Ascolana | 2 |
|  |  | pink | rose | rosa | rosa | Kokka, Muki, Piramidale | 3 |
|  |  | reddish purple | pourpre rougeâtre | rötlichpurpurn | púrpura rojizo | Kozaemon, Restelli | 4 |
|  |  | light purple | pourpre clair | hellpurpurn | púrpura claro | Tagowase | 5 |
|  |  | dark purple | pourpre foncé | dunkelpurpurn | púrpura oscuro | Florio, Lhou | 6 |
|  |  | black purple | pourpre noirâtre | schwarzpurpurn | negro púrpura | Cattaneo fem., Ichinose, Indiana, Kenmochi, Lalaberry | 7 |
| **41.** | **(\*)** | **QN** | **MG/MS/VG** |  | **(d)** |  |
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| --- |
| **Infructescence: length of peduncle** |

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| **Infructescence : longueur du pédoncule** |

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| --- |
| **Fruchtstand: Länge des Blütenstandsstiels** |

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| --- |
| **Infrutescencia: longitud del pedúnculo** |

 |  |  |
|  |  | short | courte | kurz | corta | Ascolana, Giazzola, Lalaberry | 1 |
|  |  | short to medium | courte à moyenne | kurz bis mittel | corta a media | Kokka | 2 |
|  |  | medium | moyenne | mittel | media | Cattaneo fem., Ichinose, Kenmochi | 3 |
|  |  | medium to long | moyenne à longue | mittel bis lang | media a larga | Filippine | 4 |
|  |  | long | longue | lang | larga | Kozaemon, Platanoide | 5 |
| **42.** | **(\*)** | **QN** | **MG/VG** | **(+)** |  |  |
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| **Time of leaf bud burst** |

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| **Époque du débourrement foliaire** |

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| **Zeitpunkt des Öffnens der Blattknopse** |

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| --- |
| **Época de brotación de la yema foliar** |

 |  |  |
|  |  | early | précoce | früh | temprana | Ichibei, Wasemidori | 1 |
|  |  | early to medium | précoce à moyenne | früh bis mittel | temprana a media |  | 2 |
|  |  | medium | moyenne | mittel | media | Ichinose, Kenmochi | 3 |
|  |  | medium to late | moyenne à tardive | mittel bis spät | media a tardía |  | 4 |
|  |  | late | tardive | spät | tardía | Akagi, Shinjiro | 5 |
| **43.** |  | **QN** | **MG/VG** | **(+)** |  |  |
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| **Time of flowering** |

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| **Époque de floraison** |

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| --- |
| **Zeitpunkt der Blüte** |

 |

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| --- |
| **Época de floración** |

 |  |  |
|  |  | early | précoce | früh | temprana |  | 1 |
|  |  | early to medium | précoce à moyenne | früh bis mittel | temprana a media |  | 2 |
|  |  | medium | moyenne | mittel | media | Ichinose, Kenmochi, Lalaberry | 3 |
|  |  | medium to late | moyenne à tardive | mittel bis spät | media a tardía |  | 4 |
|  |  | late | tardive | spät | tardía |  | 5 |
| **44.** | **(\*)** | **QN** | **MG/VG** | **(+)** |  |  |
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| **Time of fruit ripening** |

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| **Époque de maturité des fruits** |

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| --- |
| **Zeitpunkt der Fruchtreife** |

 |

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| --- |
| **Época de la madurez del fruto** |

 |  |  |
|  |  | early | précoce | früh | temprana |  | 1 |
|  |  | early to medium | précoce à moyenne | früh bis mittel | temprana a media |  | 2 |
|  |  | medium | moyenne | mittel | media | Ichinose, Kenmochi, Lalaberry | 3 |
|  |  | medium to late | moyenne à tardive | mittel bis spät | media a tardía |  | 4 |
|  |  | late | tardive | spät | tardía |  | 5 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| 8. | Explanations on the Table of Characteristics |
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| *8.1* | *Explanations covering several characteristics* |
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|  |   |  |  |
|  | Characteristics containing the following key in the Table of Characteristics should be examined as indicated below: |
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| (a) |

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| Observations should be made during winter dormancy. |

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|   |  |  |  |
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| --- |
| (b) |

 |

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| --- |
| Observations should be made on the largest leaf on the upper third of the shoot in harvest time. |

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|   |  |  |  |
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| --- |
| (c) |

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| Observations should be made at the time of full flowering. |

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| --- |
| (d) |

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| Observations should be made at the time of full maturity. |

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| *8.2* |

 | *Explanations for individual characteristics* |
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| Ad. 2: Tree: growth habit

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
| 1 | 2 | 3 | 4 | 5 |
| upright | semi-upright | spreading | drooping | weeping |

 |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Ad. 6: Current year's shoot: zigzag habit

|  |  |  |
| --- | --- | --- |
|  |  |  |
| 1  | 2 | 3 |
| absent or weak | medium | strong |

 |

 |
|

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| --- |
| Ad. 7: Current year's shoot: twistingTwisting is a three-dimensional characteristic. |

 |
|

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| Ad. 9: Current year's shoot: length of internodeTopBaseObservation should be made on the middle part between the middle third and the upper third of the branch.  |

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| Ad. 11: Leaf bud: shape

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| 1 | 2 | 3 | 4 |
| broad triangular | medium triangular | narrow triangular | ovate |

 |

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| Ad. 13: Leaf: phyllotaxisObservations should be made on the upper third of the branch. It is expressed by the number of rotations/number of leaves until two different leaves are located on the same vertical line.

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

|  |  |  |
| --- | --- | --- |
|  |  |  |
| 1 | 2 | 3 |
| one half | one third | two fifth |

|  |  |
| --- | --- |
|  |  |
| 4 | 5 |
| three eighth | five thirteenth |

 |

 |

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| Ad. 14: Leaf: attitude

|  |  |  |
| --- | --- | --- |
|  |  |  |
| 1 | 2 | 3 |
| upwards | outwards | downwards |

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| Ad. 15: Leaf blade: lengthWidthDepth of sinusThicknessLength |

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| Ad. 16: Leaf blade: widthSee Ad. 18 |

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| Ad. 18: Leaf blade: thicknessSee Ad. 18 |

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| Ad. 19: Leaf blade: length of tip

|  |  |  |
| --- | --- | --- |
|  |  |  |
| 1 | 2 | 3 |
| absent or short | medium | long |

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| Ad. 20: Leaf blade: shape of apex

|  |  |  |
| --- | --- | --- |
|  |  |  |
| 1 | 2 | 3 |
| acute | obtuse | obcordate |

 |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Ad. 22: Leaf blade: shape of base

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| 1 | 2 | 3 | 4 |
| cuneate | truncate | retuse | cordate |

 |

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| Ad. 24: Only varieties with lobes present: Leaf blade: depth of sinusSee Ad. 18 |

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| Ad. 25: Leaf blade: margin​

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| repand | crenate | dentate | serrulate | serrate | biserrate | aristate |

 |

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| Ad. 30: Leaf blade: shape in cross section

|  |  |  |
| --- | --- | --- |
|  |  |  |
| 1 | 2 | 3 |
| concave | flat | convex |

 |

 |

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|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Ad. 35: Infructescence: shape

|  |  |  |
| --- | --- | --- |
|  |  |  |
| 1 | 2 | 3 |
| globose | ellipsoid | cylindric |

 |

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|

|  |
| --- |
| Ad. 42: Time of leaf bud burstThe time of bud burst is when 10% of the buds show green points. |

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|

|  |
| --- |
| Ad. 43: Time of floweringThe time of flowering is when 50% of the flowers are fully open. |

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| --- |
| Ad. 44: Time of fruit ripeningTime of fruit ripening is when 50 % of the infructescences have reached suitable condition of consumption.  |

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| 9. | Literature |

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| --- |
| Cappellozza, L., Corradazzi, A. T., Tornadore, N.,1995: Studies on the phenotypic variability of seven cvs of *Morus alba* L. and three of *Morus multicaulis* P. (*Moraceae*). Part I. Sericologia, 35 (2). Padova, IT, pp. 257 to 270.Koyama, A., Yamanouchi, H. and Machii, H., 2001: Screening of mulberry genotypes suitable for fruit production and development of high-yielding strains with large fruits JARQ 35 (1). Ibaraki, JP, pp. 59 to 66  Machii, H., Koyama, A., and Yamanouchi, H., 2002: Mulberry Breeding, Cultivation and Utilization in Japan. In: Sánchez, M.D. (ed.) 2002. Mulberry for Animal Production. Animal Production and Health Paper 147. FAO, Rome, IT, pp. 63 to 71. Yamanouchi, H., Koyama, A., Takyu, T., and Yoshioka, T., 2008: Flow cytometric analysis of various organs and cytochimeras of mulberry (Morus spp.) Journal of insect biotechnology and sericology 77(2). Ibaraki, JP, pp. 95 to 108 |

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| --- | --- |
| 10. | Technical Questionnaire |

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

 |
|   |
|

|  |  |
| --- | --- |
|  | Application date:(not to be filled in by the applicant) |
| TECHNICAL QUESTIONNAIREto be completed in connection with an application for plant breeders' rights |

 |
|

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |   |  |  |
| 1. | Subject of the Technical Questionnaire |
|  |  |  |   |  |
|  |

|  |
| --- |
| 1.1 |

 | Botanical name |

|  |
| --- |
| *Morus* L. |

 |

|  |
| --- |
|  |

 |
|  |   |  |   |  |
|  |

|  |
| --- |
| 1.2 |

 | Common name |

|  |
| --- |
| Mulberry |

 |  |
|  |   |   |

|  |
| --- |
|  |

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|  |   |  |   |  |

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

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| --- | --- | --- |
|  |  |   |
|  | 4.2 | Method of propagating the variety |
|  |

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

|  |
| --- |
| 4.2.1 |

 |

|  |
| --- |
| Vegetative propagation |

 |  |
|

|  |
| --- |
| (a) |

 |

|  |
| --- |
| Budding or grafting |

 | [ ] |
|

|  |
| --- |
| (b) |

 |

|  |
| --- |
| Other (state method) |

 | [ ] |
|  |   |  |
|  |  |  |
|  |   |  |
|

|  |
| --- |
| 4.2.2 |

 | Other(Please provide details) | [ ] |
|  |   |  |
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| --- | --- | --- |
| TECHNICAL QUESTIONNAIRE | Page {x} of {y} | Reference Number: |

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|   |
|

|  |  |
| --- | --- |
| 5. | Characteristics of the variety to be indicated (the number in brackets refers to the corresponding characteristic in Test Guidelines; please mark the note which best corresponds). |
|  |   |  |  |

 |

|  | Characteristics | Example Varieties | Note |
| --- | --- | --- | --- |
|  |  |  |  |
|

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| --- |
| **5.1** |

|  |
| --- |
| **(2)** |

 |

|  |
| --- |
| **Tree: growth habit** |

 |  |  |
|  |

|  |
| --- |
| upright |

 |

|  |
| --- |
| Mitsuminami, Piramidale, Tokiyutaka |

 |

|  |
| --- |
| 1 [   ] |

 |
|  |

|  |
| --- |
| semi-upright |

 |

|  |
| --- |
| Ichinose, Kenmochi |

 |

|  |
| --- |
| 2 [   ] |

 |
|  |

|  |
| --- |
| spreading |

 |

|  |
| --- |
| Ayanobori, Hayatesakari, Platanoide, Yukishinogi |

 |

|  |
| --- |
| 3 [   ] |

 |
|  |

|  |
| --- |
| drooping |

 |

|  |
| --- |
| Sekizaiso |

 |

|  |
| --- |
| 4 [   ] |

 |
|  |

|  |
| --- |
| weeping |

 |

|  |
| --- |
| Pendula, Shidareguwa |

 |

|  |
| --- |
| 5 [   ] |

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|  |  |  |  |
|  |  |  |  |
|

|  |
| --- |
| **5.2** |

|  |
| --- |
| **(13)** |

 |

|  |
| --- |
| **Leaf: phyllotaxis** |

 |  |  |
|  |

|  |
| --- |
| one half |

 |

|  |
| --- |
| Chijimiguwa, Filippine, Negoyatakasuke |

 |

|  |
| --- |
| 1 [   ] |

 |
|  |

|  |
| --- |
| one third |

 |

|  |
| --- |
|  |

 |

|  |
| --- |
| 2 [   ] |

 |
|  |

|  |
| --- |
| two fifth |

 |

|  |
| --- |
| Cattaneo fem., Florio, Ichinose, Kenmochi |

 |

|  |
| --- |
| 3 [   ] |

 |
|  |

|  |
| --- |
| three eighth |

 |

|  |
| --- |
| Morettiana, Wasemidori |

 |

|  |
| --- |
| 4 [   ] |

 |
|  |

|  |
| --- |
| five thirteenth |

 |

|  |
| --- |
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| --- |
| 5 [   ] |

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|  |  |  |  |
|  |  |  |  |
|

|  |
| --- |
| **5.3** |

|  |
| --- |
| **(19)** |

 |

|  |
| --- |
| **Leaf blade: length of tip** |

 |  |  |
|  |

|  |
| --- |
| absent or short |

 |

|  |
| --- |
| Romana rabelaire, Rougetto |

 |

|  |
| --- |
| 1 [   ] |

 |
|  |

|  |
| --- |
| medium |

 |

|  |
| --- |
| Indiana, Kenmochi, Limoncina |

 |

|  |
| --- |
| 2 [   ] |

 |
|  |

|  |
| --- |
| long |

 |

|  |
| --- |
| Ascolana, Florio, Fukayuki, Takinokawa |

 |

|  |
| --- |
| 3 [   ] |

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

|  |
| --- |
| **5.4** |

|  |
| --- |
| **(23)** |

 |

|  |
| --- |
| **Leaf blade: presence of lobes** |

 |  |  |
|  |

|  |
| --- |
| absent |

 |

|  |
| --- |
| Arancina, Florio |

 |

|  |
| --- |
| 1 [   ] |

 |
|  |

|  |
| --- |
| present |

 |

|  |
| --- |
|  |

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|  |
| --- |
| 9 [   ] |

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|  |  |  |  |
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| --- |
| **5.5** |

|  |
| --- |
| **(28)** |

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|  |
| --- |
| **Leaf blade: color of upper side** |

 |  |  |
|  |

|  |
| --- |
| light green |

 |

|  |
| --- |
| Hicks Fancy, Kairyo-Roso, Romana rabelaire |

 |

|  |
| --- |
| 1 [   ] |

 |
|  |

|  |
| --- |
| medium green |

 |

|  |
| --- |
| Ichinose, Illinois Everbearing |

 |

|  |
| --- |
| 2 [   ] |

 |
|  |

|  |
| --- |
| dark green |

 |

|  |
| --- |
| Florio, Indiana, Kenmochi, Shin-Kenmochi, Yukiasahi |

 |

|  |
| --- |
| 3 [   ] |

 |
|  |

|  |
| --- |
| yellowish green |

 |

|  |
| --- |
| Goshoerami, Kibajumonji, Planifolia |

 |

|  |
| --- |
| 4 [   ] |

 |
|  |  |  |  |

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

|  | Characteristics | Example Varieties | Note |
| --- | --- | --- | --- |
|  |  |  |  |
|

|  |
| --- |
| **5.6** |

|  |
| --- |
| **(33)** |

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|  |
| --- |
| **Inflorescence: sex expression** |

 |  |  |
|  |

|  |
| --- |
| male |

 |

|  |
| --- |
| Akameroso, Cattaneo male, Shimanouchi |

 |

|  |
| --- |
| 1 [   ] |

 |
|  |

|  |
| --- |
| hermaphrodite |

 |

|  |
| --- |
| Akagi, Filippine, Oshimaso |

 |

|  |
| --- |
| 2 [   ] |

 |
|  |

|  |
| --- |
| female |

 |

|  |
| --- |
| Cattaneo fem., Ichinose, Kenmochi |

 |

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| --- |
| 3 [   ] |

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|  |  |  |  |
|  |  |  |  |
|

|  |
| --- |
| **5.7** |

|  |
| --- |
| **(35)** |

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|  |
| --- |
| **Infructescence: shape** |

 |  |  |
|  |

|  |
| --- |
| globose |

 |

|  |
| --- |
| Piramidale |

 |

|  |
| --- |
| 1 [   ] |

 |
|  |

|  |
| --- |
| ellipsoid |

 |

|  |
| --- |
| Ascolana, Florio, Lalaberry |

 |

|  |
| --- |
| 2 [   ] |

 |
|  |

|  |
| --- |
| cylindric |

 |

|  |
| --- |
| Cattaneo fem., Ichinose, Kenmochi, Kokka, Platanoide |

 |

|  |
| --- |
| 3 [   ] |

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

|  |
| --- |
| **5.8** |

|  |
| --- |
| **(39)** |

 |

|  |
| --- |
| **Infructescence: weight** |

 |  |  |
|  |

|  |
| --- |
| low |

 |

|  |
| --- |
| Piramidale |

 |

|  |
| --- |
| 1 [   ] |

 |
|  |

|  |
| --- |
| medium |

 |

|  |
| --- |
| Ichinose, Kenmochi |

 |

|  |
| --- |
| 2 [   ] |

 |
|  |

|  |
| --- |
| high |

 |

|  |
| --- |
| Lalaberry |

 |

|  |
| --- |
| 3 [   ] |

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|  |  |  |  |
|  |  |  |  |
|

|  |
| --- |
| **5.9** |

|  |
| --- |
| **(40)** |

 |

|  |
| --- |
| **Infructescence: color** |

 |  |  |
|  |

|  |
| --- |
| white |

 |

|  |
| --- |
| Ege Beyaz, Giazzola, Morettiana |

 |

|  |
| --- |
| 1 [   ] |

 |
|  |

|  |
| --- |
| yellowish white |

 |

|  |
| --- |
| Ascolana |

 |

|  |
| --- |
| 2 [   ] |

 |
|  |

|  |
| --- |
| pink |

 |

|  |
| --- |
| Kokka, Muki, Piramidale |

 |

|  |
| --- |
| 3 [   ] |

 |
|  |

|  |
| --- |
| reddish purple |

 |

|  |
| --- |
| Kozaemon, Restelli |

 |

|  |
| --- |
| 4 [   ] |

 |
|  |

|  |
| --- |
| light purple |

 |

|  |
| --- |
| Tagowase |

 |

|  |
| --- |
| 5 [   ] |

 |
|  |

|  |
| --- |
| dark purple |

 |

|  |
| --- |
| Florio, Lhou |

 |

|  |
| --- |
| 6 [   ] |

 |
|  |

|  |
| --- |
| black purple |

 |

|  |
| --- |
| Cattaneo fem., Ichinose, Indiana, Kenmochi, Lalaberry |

 |

|  |
| --- |
| 7 [   ] |

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

|  |
| --- |
| **5.10** |

|  |
| --- |
| **(42)** |

 |

|  |
| --- |
| **Time of leaf bud burst** |

 |  |  |
|  |

|  |
| --- |
| early |

 |

|  |
| --- |
| Ichibei, Wasemidori |

 |

|  |
| --- |
| 1 [   ] |

 |
|  |

|  |
| --- |
| early to medium |

 |

|  |
| --- |
|  |

 |

|  |
| --- |
| 2 [   ] |

 |
|  |

|  |
| --- |
| medium |

 |

|  |
| --- |
| Ichinose, Kenmochi |

 |

|  |
| --- |
| 3 [   ] |

 |
|  |

|  |
| --- |
| medium to late |

 |

|  |
| --- |
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 |

|  |
| --- |
| 4 [   ] |

 |
|  |

|  |
| --- |
| late |

 |

|  |
| --- |
| Akagi, Shinjiro |

 |

|  |
| --- |
| 5 [   ] |

 |
|  |  |  |  |

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

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

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|   |
|

|  |  |
| --- | --- |
| 6. | Similar varieties and differences from these varieties |
|

|  |
| --- |
| *Please use the following table and box for comments to provide information on how your candidate variety differs from the variety (or varieties) which, to the best of your knowledge, is (or are) most similar. This information may help the examination authority to conduct its examination of distinctness in a more efficient way.*   |

 |
|

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

|  |
| --- |
| Denomination(s) of variety(ies) similar to your 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* |

|  |
| --- |
| *Tree: vigor* |

 |

|  |
| --- |
| *weak* |

 |

|  |
| --- |
| *strong* |

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

 |
|  | Comments:    |

 |

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

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|   |
|

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

|  |
| --- |
| #7. |

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

|  |
| --- |
|              7.3.1 Main use             (a) Fruit [ ]             (b) Ornamental [ ]             (c) Silk worm feed [ ]             (c) Other            [ ]7.3.2 Please indicate the rootstock used:  ......................................................................... |

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

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

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| 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. |
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| 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: |

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| --- | --- | --- | --- | --- | --- |
|  | (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”. |  |
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| 10. | I hereby declare that, to the best of my knowledge, the information provided in this form is correct: |
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|  |  |   |  |
|  | Applicant’s name |  |
|  |  |   |  |  |  |
|  |  Signature |  | Date |  |  |
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