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| **TG/111/4(proj.4)** |
| **ORIGINAL:** English |
| **DATE:** 2018-10-05 |

 |
| **INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS** |
|  | Geneva  |  |
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|  | DRAFT |  |
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| **MACADAMIA** |
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| UPOV Code(s): MACAD\_INT; MACAD\_TET |

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| *Macadamia integrifolia* Maiden et Betche; *Macadamia tetraphylla* L. Johns. |

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

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| --- |
| *prepared by experts from Australia* |
| *to be considered by the* |
|

|  |
| --- |
| *Technical Working Party for Fruit Crops* |

 |
| *at its forty-ninth session, to be held in Santiago de Chile, Chile,* |
|

|  |
| --- |
| *from 2018-11-19 to 2018-11-23* |

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

 |
| *Botanical name* | *English* | *French* | *German* | *Spanish* |
|

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| --- |
| *Macadamia integrifolia* Maiden et Betche |

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|  |
| --- |
| Macadamia, Queensland Nut |

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| Macadamia |

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| Macadamia |

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| Macadamia |

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| *Macadamia tetraphylla* L. Johns. |

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| --- |
| Macadamia, Queensland Nut |

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| Macadamia |

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| Macadamia |

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| Macadamia |

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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 *Macadamia integrifolia* Maiden et Betch and *Macadamia tetraphylla* L. Johns.  and hybrids of these species.. |

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|  |   |
| 2. | Material Required |
|  |   |
| 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 grafted plants on a rootstock specified by the 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 |

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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 |

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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. |

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| 3.1.3 |

 | The growing cycle is considered to be the period ranging from the beginning of active vegetative growth or flowering, continuing through active vegetative growth or flowering and fruit development and concluding with the harvesting of fruit. |
|  |   |
| *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* |
|  |   |
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 | The tests should be carried out under conditions ensuring satisfactory growth for the expression of the relevant characteristics of the variety and for the conduct of the examination. |
|  |   |
| *3.4* | *Test Design* |
|  |   |
| 3.4.1 |

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

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| 3.4.0 |

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| The design of the tests should be such that plants or parts of plants may be removed for measurement or counting without prejudice to the observations which must be made up to the end of the growing cycle. |

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

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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 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 |

 |
|  |   |
|  | 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. |

 |
|  |   |
|  | 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. |

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|  |   |
| 4.2.3 |

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| For the assessment of uniformity of vegetatively propagated varieties, 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, 0 off-types are 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. |
|  |   |
| 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 |
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|  |   |
| 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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| --- |
| Tree: growth habit (characteristic 1) |

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

 |  |

|  |
| --- |
| Tree: height (characteristic 2) |

 |
|

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

 |  |

|  |
| --- |
| Tree: angle of primary branches (characteristic 3) |

 |
|

|  |
| --- |
| (d) |

 |  |

|  |
| --- |
| Stem: texture of surface (characteristic 5) |

 |
|

|  |
| --- |
| (e) |

 |  |

|  |
| --- |
| Inflorescence: color (characteristic 24) |

 |
|

|  |
| --- |
| (f) |

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| --- |
| Shell: shape (characteristic 29) |

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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 |
|  |   |
| *6.1* | *Categories of Characteristics*  |
| 6.1.1 | Standard Test Guidelines Characteristics |
|  | Standard Test Guidelines characteristics are those which are approved by UPOV for examination of DUS and from which members of the Union can select those suitable for their particular circumstances. |
| 6.1.2 | Asterisked Characteristics |
|  | Asterisked characteristics (denoted by \*) are those included in the Test Guidelines which are important for the international harmonization of variety descriptions and should always be examined for DUS and included in the variety description by all members of the Union, except when the state of expression of a preceding characteristic or regional environmental conditions render this inappropriate. |
| *6.2* | *States of Expression and Corresponding Notes*  |
| 6.2.1 | States of expression are given for each characteristic to define the characteristic and to harmonize descriptions. Each state of expression is allocated a corresponding numerical note for ease of recording of data and for the production and exchange of the description. |
| 6.2.2 | In the case of qualitative and pseudo-qualitative characteristics (see Chapter 6.3), all relevant states of expression are presented in the characteristic. However, in the case of quantitative characteristics with 5 or more states, an abbreviated scale may be used to minimize the size of the Table of Characteristics. For example, in the case of a quantitative characteristic with 9 states, the presentation of states of expression in the Test Guidelines may be abbreviated as follows: |
|  |

|  |  |
| --- | --- |
| *State* | *Note* |
| small | 3 |
| medium | 5 |
| large | 7 |

 |
|  | However, it should be noted that all of the following 9 states of expression exist to describe varieties and should be used as appropriate: |
|  |

|  |  |
| --- | --- |
| *State* | *Note* |
| very small | 1 |
| very small to small | 2 |
| small | 3 |
| small to medium | 4 |
| medium | 5 |
| medium to large | 6 |
| large | 7 |
| large to very large | 8 |
| very large | 9 |

 |
|  |   |
| 6.2.3 | Further explanation of the presentation of states of expression and notes is provided in document TGP/7 “Development of Test Guidelines”.  |
| *6.3* | *Types of Expression* |
|  | An explanation of the types of expression of characteristics (qualitative, quantitative and pseudo-qualitative) is provided in the General Introduction. |

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| --- | --- |
| *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 VarietiesExemplesBeispielssortenVariedades ejemplo | Note/Nota |
| --- | --- | --- | --- | --- | --- | --- | --- |
|

|  |
| --- |
| **1** |

 |

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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** |

 |

|  |
| --- |
| **Nom du caractère en français** |

 |

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

 |

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

 |  |  |
|  |  |

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

 |

|  |
| --- |
| 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 |
|  |   |  |  |
| 5 |

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

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| 6 |

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

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

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| 7 |

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

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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.** | **(\*)** | **PQ** | **VG** | **(+)** |  |  |
|  |  |

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

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 |  |  |
|  |  | upright |  |  |  | Hidden Valley A16, MRG-20 | 1 |
|  |  | upright to spreading |  |  |  |  | 2 |
|  |  | spreading |  |  |  |  | 3 |
|  |  | drooping |  |  |  | KRG-15 | 4 |
| **2.** | **(\*)** | **QN** | **VG** |  |  |  |
|  |  |

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| --- |
| **Tree: height** |

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 |  |  |
|  |  | short |  |  |  | Daleys Dwarf, MiniMaca | 3 |
|  |  | medium |  |  |  | Hidden Valley A4, Own Venture | 5 |
|  |  | tall |  |  |  | Daddow, Own Choice | 7 |
| **3.** | **(\*)** | **QN** | **VG** |  |  |  |
|  |  |

|  |
| --- |
| **Tree: angle of primary branches** |

 |

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|  |

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|  |

 |  |  |
|  |  | acute |  |  |  | MiniMaca | 1 |
|  |  | intermediate |  |  |  |  | 2 |
|  |  | obtuse |  |  |  |  | 3 |
| **4.** |  | **QN** | **VG** | **(+)** |  |  |
|  |  |

|  |
| --- |
| **Tree: density of foliage** |

 |

|  |
| --- |
| **Plante : densité du feuillage** |

 |

|  |
| --- |
| **Pflanze: Dichte des Laubes** |

 |

|  |
| --- |
| **Planta: densidad del follaje** |

 |  |  |
|  |  | sparse | lâche | locker | laxa | Hidden Valley A4 | 3 |
|  |  | medium | moyenne | mittel | media | Daddow | 5 |
|  |  | dense | dense | dicht | densa | Hidden Valley A16, Own Choice | 7 |
| **5.** | **(\*)** | **QN** | **VG** | **(+)** |  |  |
|  |  |

|  |
| --- |
| **Stem: texture of surface** |

 |

|  |
| --- |
| **Tige : texture de l’écorce** |

 |

|  |
| --- |
| **Trieb: Beschaffenheit der Rinde** |

 |

|  |
| --- |
| **Tallo: textura de la corteza** |

 |  |  |
|  |  | smooth | lisse | glatt | lisa |  | 1 |
|  |  | medium |  |  |  |  | 2 |
|  |  | rough |  |  |  |  | 3 |

|  |  | English | français | deutsch | español | Example VarietiesExemplesBeispielssortenVariedades ejemplo | Note/Nota |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **6.** |  | **QN** | **VG** | **(+)** |  |  |
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| **Branch:  number of leaves per whorl** |

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 |  |  |
|  |  | three |  |  |  | EMB-1, KRG-15, MRG-20, MRG-25 | 1 |
|  |  | four |  |  |  | KMB-3 | 2 |
|  |  | five |  |  |  |  | 3 |
| **7.** |  | **QL** | **VG** |  | **(a)** |  |
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| **Leaf: petiole** |

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| **Feuille : pétiole** |

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| **Blatt: Blattstiel** |

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| **Hoja: peciolo** |

 |  |  |
|  |  | absent |  |  |  | Kabere, MiniMaca | 1 |
|  |  | present |  |  |  | KMB-3, KRG-15, MRG-20, MRG-25, Own Venture | 9 |
| **8.** |  | **QN** | **MS/VG** |  | **(a)** |  |
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| **Petiole: length** |

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|  |  | short |  |  |  | Hidden Valley A16, KMB-3, MRG-20, MRG-25 | 1 |
|  |  | medium |  |  |  | Daddow, EMB-1 | 2 |
|  |  | long |  |  |  | KRG-15, Own Venture | 3 |
| **9.** |  | **QN** | **VG** | **(+)** | **(a)** |  |
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| **Leaf: conspicuousness of secondary veins** |

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 |  |  |
|  |  | weak |  |  |  | EMBU-1, KRG-15 | 1 |
|  |  | medium |  |  |  | KMB-3, MRG-20 | 2 |
|  |  | strong |  |  |  | Kabere | 3 |
| **10.** |  | **QN** | **MS/VG** |  | **(a)** |  |
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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** |

 |  |  |
|  |  | short |  |  |  | MiniMaca | 3 |
|  |  | medium |  |  |  | Daleys Dwarf, Hidden Valley A4, KRG-15, MRG-20, MRG-25 | 5 |
|  |  | long |  |  |  | Own Venture | 7 |

|  |  | English | français | deutsch | español | Example VarietiesExemplesBeispielssortenVariedades ejemplo | Note/Nota |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **11.** |  | **QN** | **MS/VG** |  | **(a)** |  |
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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** |

 |  |  |
|  |  | narrow |  |  |  | Hidden Valley A4 | 3 |
|  |  | medium |  |  |  | Own Choice | 5 |
|  |  | broad |  |  |  | Hidden Valley A16 | 7 |
| **12.** | **(\*)** | **PQ** | **VG** | **(+)** |  |  |
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| **Leaf blade: shape** |

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 |  |  |
|  |  | lanceolate |  |  |  |  | 1 |
|  |  | ovate |  |  |  |  | 2 |
|  |  | oblong |  |  |  |  | 3 |
|  |  | elliptic |  |  |  | Hidden Valley A4 | 4 |
|  |  | obovate |  |  |  | Daddow | 5 |
|  |  | oblanceolate |  |  |  | Own Venture | 6 |
| **13.** |  | **QL** | **VG** | **(+)** | **(a)** |  |
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| **Leaf blade: tip** |

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 |  |  |
|  |  | none |  |  |  |  | 1 |
|  |  | apiculate |  |  |  |  | 2 |
|  |  | acuminate |  |  |  |  | 3 |
|  |  | mucronate |  |  |  |  | 4 |
| **14.** |  | **PQ** | **VG** | **(+)** | **(a)** |  |
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| **Leaf blade: shape of apex excluding tip** |

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| **Feuille : forme du sommet** |

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| **Blatt: Form der Spitze** |

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| **Hoja: forma del ápice** |

 |  |  |
|  |  | acute |  |  |  | Hidden Valley A4, Kabere, KMB-3, KRG-15 | 1 |
|  |  | obtuse |  |  |  | Daleys Dwarf, EMBU-1, MRG-20, MRG-25, Own Venture | 2 |
|  |  | rounded |  |  |  | Daddow, Nelmak 26 | 3 |
| **15.** |  | **PQ** | **VG** |  | **(a)** |  |
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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** |

 |  |  |
|  |  | attenuate |  |  |  |  | 1 |
|  |  | acute |  |  |  |  | 2 |
|  |  | obtuse |  |  |  |  | 3 |

|  |  | English | français | deutsch | español | Example VarietiesExemplesBeispielssortenVariedades ejemplo | Note/Nota |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **16.** | **(\*)** | **QN** | **VG** |  | **(a)** |  |
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| **Leaf blade: undulation of margin** |

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| **Limbe: ondulation du bord** |

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| **Blattspreite: Randwellung** |

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| **Limbo: ondulación del borde** |

 |  |  |
|  |  | very weak |  |  |  |  | 1 |
|  |  | weak |  |  |  | Daleys Dwarf, EMB-1, Hidden Valley A4, MRG-25 | 2 |
|  |  | medium |  |  |  | KMB-3, KRG-15, MRG-20, Own Venture | 3 |
|  |  | strong |  |  |  |  | 4 |
|  |  | very strong |  |  |  | MiniMaca | 5 |
| **17.** |  | **QN** | **VG** |  | **(a)** |  |
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| **Leaf blade: depth of incisions of margin** |

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| **Feuille : incisions du bord** |

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| **Blatt: Randeinschnitte** |

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| **Hoja: incisiones del borde** |

 |  |  |
|  |  | shallow |  |  |  |  | 1 |
|  |  | medium |  |  |  |  | 2 |
|  |  | deep |  |  |  |  | 3 |
| **18.** | **(\*)** | **QN** | **VG** |  | **(a)** |  |
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| **Leaf blade: number of spines on margin** |

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 |  |  |
|  |  | absent or very few |  |  |  | Daleys Dwarf | 1 |
|  |  | few |  |  |  | MRG-20 | 3 |
|  |  | medium |  |  |  | EMB-1, KRG-15 | 5 |
|  |  | many |  |  |  | KMB-3, MiniMaca | 7 |
|  |  | very many |  |  |  | Kabere | 9 |
| **19.** |  | **PQ** | **VG** | **(+)** |  |  |
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| **Young leaf blade: color** |

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| **Limbe foliaire : couleur des nervures** |

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| **Blattspreite: Farbe der Adern** |

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| **Limbo: color de las venas** |

 |  |  |
|  |  | yellow green |  |  |  |  | 1 |
|  |  | light green |  |  |  | EMB-1, KRG-15, MRG-20 | 2 |
|  |  | medium green |  |  |  |  | 3 |
|  |  | reddish |  |  |  |  | 4 |
|  |  | purple |  |  |  |  | 5 |
|  |  | brown |  |  |  | KMB-3 | 6 |

|  |  | English | français | deutsch | español | Example VarietiesExemplesBeispielssortenVariedades ejemplo | Note/Nota |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **20.** |  | **QN** | **VG** |  | **(a)** |  |
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| **Leaf blade: intensity of green color on upper side** |

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 |  |  |
|  |  | light |  |  |  |  | 1 |
|  |  | medium |  |  |  |  | 2 |
|  |  | dark |  |  |  |  | 3 |

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| **21.** |  | **QN** | **MS/VG** |  |  |  |
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| **Inflorescence: length** |

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 |  |  |
|  |  | short |  |  |  |  | 3 |
|  |  | medium |  |  |  |  | 5 |
|  |  | long |  |  |  |  | 7 |
| **22.** |  | **QN** | **VG** |  |  |  |
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| **Inflorescence: density of flowers** |

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 |  |  |
|  |  | sparse |  |  |  |  | 1 |
|  |  | medium |  |  |  |  | 2 |
|  |  | dense |  |  |  |  | 3 |
| **23.** |  | **PQ** | **VG** |  |  |  |
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| **Inflorescence: attitude** |

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 |  |  |
|  |  | semi erect to horizontal |  |  |  |  | 1 |
|  |  | horizontal |  |  |  |  | 2 |
|  |  | semi drooping |  |  |  |  | 3 |
|  |  | drooping |  |  |  |  | 4 |
| **24.** | **(\*)** | **QL** | **VG** |  |  |  |
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| **Inflorescence: color** |

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 |  |  |
|  |  | white |  |  |  | Daleys Dwarf, EMB-1, KRG-15, MRG-20, MRG-25 | 1 |
|  |  | pink |  |  |  | KMB-3, MiniMaca | 2 |
| **25.** |  | **QN** | **VG** |  | **(b)** |  |
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| **Husk: size of neck** |

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 |  |  |
|  |  | absent or small |  |  |  | H2 | 1 |
|  |  | medium |  |  |  | Daddow, Own Choice | 2 |
|  |  | large |  |  |  | Hidden Valley A38 | 3 |

|  |  | English | français | deutsch | español | Example VarietiesExemplesBeispielssortenVariedades ejemplo | Note/Nota |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **26.** |  | **QN** | **VG** |  | **(b)** |  |
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| **Husk: size of apical point** |

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 |  |  |
|  |  | small |  |  |  | EMB-1, MRG-20 | 3 |
|  |  | medium |  |  |  | KMB-3, KRG-15, MRG-25 | 5 |
|  |  | large |  |  |  | Kabere | 7 |
| **27.** |  | **QN** | **VG** |  | **(b)** |  |
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| **Husk: thickness of pericarp** |

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 |  |  |
|  |  | very thin |  |  |  | Kabere | 1 |
|  |  | thin |  |  |  | EMB-1, KMB-3, KRG-15 | 3 |
|  |  | medium |  |  |  | MRG-20, MRG-25 | 5 |
|  |  | thick |  |  |  |  | 7 |
| **28.** |  | **QN** | **VG** | **(+)** | **(b)** |  |
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| **Shell: size** |

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|  |  | small |  |  |  |  | 1 |
|  |  | medium |  |  |  |  | 2 |
|  |  | large |  |  |  |  | 3 |
| **29.** | **(\*)** | **PQ** | **VG** | **(+)** | **(b)** |  |
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| **Shell: shape** |

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|  |  | ovate |  |  |  | Hidden Valley A16, Hidden Valley A4 | 1 |
|  |  | oblate |  |  |  | H2, MRG-20, MRG-25 | 2 |
|  |  | circular |  |  |  | Daleys Dwarf, EMB-1, Hidden Valley A38, KMB-3, MiniMaca | 3 |
|  |  | elliptic |  |  |  | Nelmak 1 | 4 |
|  |  | obovate |  |  |  | Kabere | 5 |
| **30.** |  | **QN** | **VG** |  | **(b)** |  |
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| **Shell: texture of surface** |

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 |  |  |
|  |  | smooth |  |  |  | Daleys Dwarf, EMB-1, Hidden Valley A38, KRG-15, MRG-25 | 1 |
|  |  | slightly rough |  |  |  | MiniMaca | 2 |
|  |  | moderately rough |  |  |  | KMB-3, MRG-20 | 3 |
|  |  | very rough |  |  |  |  | 4 |

|  |  | English | français | deutsch | español | Example VarietiesExemplesBeispielssortenVariedades ejemplo | Note/Nota |
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| **31.** |  | **QN** | **MS/VG** |  | **(b)** |  |
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| **Shell: thickness** |

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 |  |  |
|  |  | thin |  |  |  |  | 3 |
|  |  | medium |  |  |  |  | 5 |
|  |  | thick |  |  |  |  | 7 |
| **32.** |  | **QN** | **VG** |  | **(b)** |  |
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| **Shell: conspicuousness of suture** |

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| **Fruit : netteté de la suture** |

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| **Frucht: Ausprägung der Naht** |

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| **Fruto: visibilidad de la sutura** |

 |  |  |
|  |  | weak |  |  |  | Kabere, KMB-3, MRG-20 | 1 |
|  |  | medium |  |  |  |  | 2 |
|  |  | strong |  |  |  | MiniMaca | 3 |
| **33.** |  | **QN** | **VG** |  | **(b)** |  |
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| **Kernel: size** |

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| **Amande : taille** |

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| **Kern: Größe** |

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| **Almendra: tamaño** |

 |  |  |
|  |  | very small |  |  |  |  | 1 |
|  |  | small |  |  |  | Keaau (660) | 3 |
|  |  | medium |  |  |  |  | 5 |
|  |  | large |  |  |  | Hidden Valley A4 | 7 |
|  |  | very large |  |  |  |  | 9 |
| **34.** |  | **PQ** | **VG** |  | **(b)** |  |
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| **Kernel: color** |

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 |  |  |
|  |  | white |  |  |  |  | 1 |
|  |  | yellowish white |  |  |  |  | 2 |
|  |  | light brown |  |  |  |  | 3 |
|  |  | medium brown |  |  |  |  | 4 |
|  |  | dark brown |  |  |  |  | 5 |
| **35.** |  | **QN** | **VG** | **(+)** | **(b)** |  |
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| **Kernel: micropyle** |

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 |  |  |
|  |  | closed |  |  |  | KMB-3, KRG-15, MRG-20 | 1 |
|  |  | partially open |  |  |  |  | 2 |
|  |  | fully open |  |  |  | Kabere | 3 |

|  |  | English | français | deutsch | español | Example VarietiesExemplesBeispielssortenVariedades ejemplo | Note/Nota |
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| **36.** |  | **QN** | **MS/VG** | **(+)** | **(b)** |  |
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| **Kernel: length** |

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 |  |  |
|  |  | short |  |  |  |  | 3 |
|  |  | medium |  |  |  |  | 5 |
|  |  | long |  |  |  |  | 7 |
| **37.** |  | **QN** | **MS/VG** | **(+)** | **(b)** |  |
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| **Kernel: width** |

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 |  |  |
|  |  | narrow |  |  |  |  | 3 |
|  |  | medium |  |  |  |  | 5 |
|  |  | broad |  |  |  |  | 7 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| 8. | Explanations on the Table of Characteristics |
|   |
| *8.1* | *Explanations covering several characteristics* |
|   |
|  | Unless otherwise indicated, observations should be made on at least 3 year old trees.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 on leaves should be made on basal leaves of new vegetative flush in mid to late summer. |

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| --- |
| (b) |

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| wordml://76.png |  a: neck b: husk c: micropyle d: pericarp e: suture f: shell g: kernel   |

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| *8.2* |

 | *Explanations for individual characteristics* |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Ad. 1: Tree: growth habit

|  |  |  |  |
| --- | --- | --- | --- |
| wordml://77.png | wordml://78.png | wordml://79.png | wordml://80.png |
| 1 | 2 | 3 | 4 |
| upright | upright to spreading | spreading | drooping |

 |

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|

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| --- |
| Ad. 4: Tree: density of foliageObservations should be made at time of flowering. |

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| Ad. 5: Stem: texture of surfaceObservations should be made on the middle third of the main stem. |

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| Ad. 6: Branch:  number of leaves per whorlObservations should be made at flowering. |

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| Ad. 9: Leaf: conspicuousness of secondary veinsObservations should be made on fully developed leaf. |

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| Ad. 12: Leaf blade: shapewordml://81.png |

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| Ad. 13: Leaf blade: tip

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| wordml://82.png |
| 2 |
| apiculate |

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|  |
| --- |
| wordml://83.png |
| 3 |
| acuminate |

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|  |
| --- |
| wordml://84.png |
| 4 |
| mucronate |

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| Ad. 14: Leaf blade: shape of apex excluding tip

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|  |
| 1 |
| acute |

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| --- |
|  |
| 2 |
| obtuse |

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| --- |
|  |
| 3 |
| rounded |

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| Ad. 19: Young leaf blade: colorObservations should be made on terminal leaves of new vegetative flush in late winter to early spring. |

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| Ad. 28: Shell: sizeObservations should be made in lateral view. |

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| Ad. 29: Shell: shapeObservations should be made in lateral view  wordml://88.png |

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| Ad. 35: Kernel: micropyleThe micropyle is the white spot at the end of the nut that allows water to enter for the initiation of germination (see 8.1). |

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| Ad. 36: Kernel: length

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| wordml://89.png |

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| Ad. 37: Kernel: widthSee Ad. 36 |

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| 9. | Literature |

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| --- |
| Vock, N., Bell, D., Bryen, L., Firth, D., Jones, K., Gallagher, E., McConachie, I., O'Hare, P. and Stephenson, R., 1998: Macadamia Variety Identifier, Agrilink, Queensland Department of Primary Industries, Nambour, Queensland, Australia, 62pp  |

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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 QUESTIONNAIREto be completed in connection with an application for plant breeders' rights |

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

|  |
| --- |
| 1.1.1 |

 | Botanical name |

|  |
| --- |
| *Macadamia integrifolia* Maiden et Betche |

 |

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| --- |
| [  ] |

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|  |   |  |   |  |
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|  |
| --- |
| 1.1.2 |

 | Common name |

|  |
| --- |
| Macadamia, Queensland Nut |

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|  |  |  |   |  |
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| --- |
| 1.2.1 |

 | Botanical name |

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| --- |
| *Macadamia tetraphylla* L. Johns. |

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| [  ] |

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| 1.2.2 |

 | Common name |

|  |
| --- |
| Macadamia, Queensland Nut |

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|  |  |   |  |  |
| 2. | Applicant |
|  |  |  |   |  |
|  | Name |  |  |
|  |  |  |   |  |
|  | Address |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |   |  |
|  | Telephone No. |  |  |
|  |  |  |   |  |
|  | Fax No. |  |  |
|  |  |  |   |  |
|  | E-mail address |  |  |
|  |  |  |   |  |
|  | Breeder (if different from |  |  |
|  | applicant) |  |  |
|  |  |  |   |  |

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|  |  |  |   |  |
| 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: |
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|  |  |   |
| #4. | Information on the breeding scheme and propagation of the variety |
|  |  |   |
|  | 4.1 | Breeding scheme |
|  |  |   |

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| Variety resulting from:4.1.1       Crossing(a)        controlled cross                                                                                 [    ]             (please state parent varieties) (…………………..……………..…)                          x        (……………..…………………..…)female parent                                                                     male parent(b)        partially known cross                                                                        [    ]             (please state known parent variety(ies)) (…………………..……………..…)                          x        (……………..…………………..…)female parent                                                                     male parent(c)        unknown cross                                                                                  [    ]4.1.2       Mutation                                                                                          [    ](please state parent variety)

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|     |

 4.1.3       Discovery and development                                                               [    ](please state where and when discovered and how developed)

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|     |

 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 |
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| 4.2.1 |

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| Vegetative propagation |

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| --- |
| (a) |

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| Cuttings |

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| --- |
| (b) |

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| Other (state method) |

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| 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). |
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|  | Characteristics | Example Varieties | Note |
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| **5.1** |

|  |
| --- |
| **(1)** |

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

 |  |  |
|  |

|  |
| --- |
| upright |

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|  |
| --- |
| Hidden Valley A16, MRG-20 |

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| --- |
| 1 [   ] |

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|  |
| --- |
| upright to spreading |

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| 2 [   ] |

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| spreading |

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| 3 [   ] |

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| --- |
| drooping |

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| KRG-15 |

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| 4 [   ] |

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| **5.2** |

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

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| --- |
| **Tree: height** |

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|  |

|  |
| --- |
| short |

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| --- |
| Daleys Dwarf, MiniMaca |

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| 3 [   ] |

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|  |
| --- |
| medium |

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| --- |
| Hidden Valley A4, Own Venture |

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| 5 [   ] |

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|  |

|  |
| --- |
| tall |

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| Daddow, Own Choice |

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| 7 [   ] |

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| **5.3** |

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| **(3)** |

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| **Tree: angle of primary branches** |

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|  |
| --- |
| acute |

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| --- |
| MiniMaca |

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| intermediate |

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| obtuse |

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| **5.4** |

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| **(5)** |

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| **Stem: texture of surface** |

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| smooth |

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| 1 [   ] |

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| medium |

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| 2 [   ] |

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| rough |

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| 3 [   ] |

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| **5.5** |

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| **(24)** |

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| **Inflorescence: color** |

 |  |  |
|  |

|  |
| --- |
| white |

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|  |
| --- |
| Daleys Dwarf, EMB-1, KRG-15, MRG-20, MRG-25 |

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| 1 [   ] |

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|  |
| --- |
| pink |

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| --- |
| KMB-3, MiniMaca |

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| 2 [   ] |

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| **5.6** |

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| **(29)** |

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| **Shell: shape** |

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|  |
| --- |
| ovate |

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| --- |
| Hidden Valley A16, Hidden Valley A4 |

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| 1 [   ] |

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| --- |
| oblate |

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| H2, MRG-20, MRG-25 |

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| 2 [   ] |

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| circular |

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| --- |
| Daleys Dwarf, EMB-1, Hidden Valley A38, KMB-3, MiniMaca |

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| 3 [   ] |

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| elliptic |

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| Nelmak 1 |

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| obovate |

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| --- |
| Kabere |

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

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

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| Denomination(s) of variety(ies) similar to your candidate variety |

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| Characteristic(s) in which your candidate variety differs from the similar variety(ies) |

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| Describe the expression of the characteristic(s) for the **similar** variety(ies) |

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| Describe the expression of the characteristic(s) for **your** candidate variety |

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| *Example* |

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| *Plant: growth habit* |

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| --- |
| *upright* |

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|  |
| --- |
| *spreading* |

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

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| 8. | Authorization for release |
|  | (a) | Does the variety require prior authorization for release under legislation concerning the protection of the environment, human and animal health? |
|  |  | Yes | [ ] | No | [ ] |
|  | (b) | Has such authorization been obtained? |
|  |  | Yes | [ ] | No | [ ] |
|  | If the answer to (b) is yes, please attach a copy of the authorization. |
|  |  |  |   |  |  |

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| 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: |
|  |  |   |  |  |  |
|  |  |  |  |  |  |
|  | Applicant’s name |   |  |  |  |
|  |  |   |  |  |  |
|  |  Signature |  | Date |  |  |
|  |  |  |  |
|  |  |  |  |
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