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| **TG/186/2(proj.3)** |
| **ORIGINAL:** English |
| **DATE:** 2022-04-08 |

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

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| *Saccharum* L. |

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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 Agricultural Crops* |

 |
| *at its fifty-first session, to be held in Cambridge, United Kingdom,* |
|

|  |
| --- |
| *from 2022-05-23 to 2022-05-27* |

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 |
| *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* |
|

|  |
| --- |
| *Saccharum* L. |

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|  |
| --- |
| Sugarcane |

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|  |
| --- |
| Canne à sucre |

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|  |
| --- |
| Zuckerrohr |

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| --- |
| Caña de azúcar |

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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 *Saccharum* L. |

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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 vegetative cuttings which are about 6 to 12 months old. |

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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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| 12 segments of culm with 3 buds each |

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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 a single growing cycle. |
|  |   |
|

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| 3.1.2 |

 | The testing of a variety may be concluded when the competent authority can determine with certainty the outcome of the test. |
|  |   |
| *3.2* | *Testing Place* |
|  |   |
|  | Tests are normally conducted at one place. In the case of tests conducted at more than one place, guidance is provided in TGP/9 “Examining Distinctness”.  |
|  |   |
| *3.3* | *Conditions for Conducting the Examination* |
|  |   |
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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. |
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| 3.3.2 |

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| All characteristics should be observed on plants aged between 10 to 12 months, in the first vegetative cycle of the crop (from planting to the first harvest). |

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| *3.4* | *Test Design* |
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| Each test should be designed to result in a total of at least 24 plants, which should be divided between at least 2 replicates. |

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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, all observations for qualitative characteristics should be made on 6 culms or parts taken from 6 culms.Unless otherwise indicated, all observations for quantitative characteristics should be made on 24 culms or parts taken from each of 24 culms.Unless otherwise indicated, all observations on single culms should be made on 6 culms or parts taken from each of 6 culms. |

 |
|  |   |
| 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) |
|  |   |

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|  | “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. |
|  |   |
| 4.1.6 |

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| Unless otherwise indicated, all observations for qualitative characteristics should be made on 6 culms or parts taken from 6 culms.Unless otherwise indicated, all observations for quantitative characteristics should be made on 24 culms or parts taken from each of 24 culms.Unless otherwise indicated, all observations on single culms should be made on 6 culms or parts taken from each of 6 culms.  |

 |
|  |   |
| *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 | 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 24 plants, 1 off-type is allowed. |
|  |   |
| *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 seed or 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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| --- |
| Internode: cross section (characteristic 8) |

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

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|  |
| --- |
| Internode: color where not exposed to sun (characteristic 10) |

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|

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| --- |
| (c) |

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| --- |
| Node: presence of wing on bud (characteristic 19) |

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| --- |
| (d) |

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| Node: shape of bud (characteristic 20) |

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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 | 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. |

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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* |
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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)-(e) |

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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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| **Plant: growth habit** |

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 |  |  |
|  |  | erect |  |  |  | Q 121, Q186 | 1 |
|  |  | erect to semi-erect |  |  |  |  | 2 |
|  |  | semi-erect |  |  |  | Q96, RB72-454 | 3 |
|  |  | semi-erect to intermediate |  |  |  |  | 4 |
|  |  | intermediate |  |  |  | Q168 | 5 |
|  |  | intermediate to semi-prostrate |  |  |  |  | 6 |
|  |  | semi-prostrate |  |  |  | H56-752 | 7 |
|  |  | semi-prostrate to prostrate |  |  |  |  | 8 |
|  |  | prostrate |  |  |  |  | 9 |
| **2.** | **(\*)** | **QN** | **VS** | **(+)** |  |  |
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| **Plant: adherence of leaf sheath** |

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 |  |  |
|  |  | very weak |  |  |  |  | 1 |
|  |  | very weak to weak |  |  |  |  | 2 |
|  |  | weak |  |  |  | H56-752, Q96 | 3 |
|  |  | weak to medium |  |  |  |  | 4 |
|  |  | medium |  |  |  | Q124, Q186 | 5 |
|  |  | medium to strong |  |  |  |  | 6 |
|  |  | strong |  |  |  | NCo310, Q120, Q201 | 7 |
|  |  | strong to very strong |  |  |  |  | 8 |
|  |  | very strong |  |  |  |  | 9 |
| **3.** |  | **QN** | **VG** |  |  |  |
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| **Plant: number of tillers** |

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|  |  | very few |  |  |  |  | 1 |
|  |  | very few to few |  |  |  |  | 2 |
|  |  | few |  |  |  | Q124 | 3 |
|  |  | few to medium |  |  |  |  | 4 |
|  |  | medium |  |  |  | RB72-454 | 5 |
|  |  | medium to many |  |  |  |  | 6 |
|  |  | many |  |  |  | Q138 | 7 |
|  |  | many to very many |  |  |  |  | 8 |
|  |  | very many |  |  |  |  | 9 |

|  |  | English | français | deutsch | español | Example VarietiesExemplesBeispielssortenVariedades ejemplo | Note/Nota |
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| **4.** | **(\*)** | **QN** | **MS** | **(+)** |  |  |
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| **Culm: height** |

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|  |  | very short |  |  |  |  | 1 |
|  |  | very short to short |  |  |  |  | 2 |
|  |  | short |  |  |  | Q117 | 3 |
|  |  | short to medium |  |  |  |  | 4 |
|  |  | medium |  |  |  | Q124, Q138, Q170 | 5 |
|  |  | medium to long |  |  |  |  | 6 |
|  |  | long |  |  |  | Q136, RB72-454 | 7 |
|  |  | long to very long |  |  |  |  | 8 |
|  |  | very long |  |  |  |  | 9 |

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| **5.** |  | **QN** | **MS** |  | **(a)** |  |
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| **Internode: length on the bud side** |

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|  |  | very short |  |  |  |  | 1 |
|  |  | very short to short |  |  |  |  | 2 |
|  |  | short |  |  |  | Q117 | 3 |
|  |  | short to medium |  |  |  |  | 4 |
|  |  | medium |  |  |  | Q138, Q170 | 5 |
|  |  | medium to long |  |  |  |  | 6 |
|  |  | long |  |  |  | Q124 | 7 |
|  |  | long to very long |  |  |  |  | 8 |
|  |  | very long |  |  |  |  | 9 |
| **6.** | **(\*)** | **QN** | **MS** | **(+)** | **(a)** |  |
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| **Internode: diameter** |

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|  |  | very thin |  |  |  |  | 1 |
|  |  | very thin to thin |  |  |  |  | 2 |
|  |  | thin |  |  |  | Q136 | 3 |
|  |  | thin to medium |  |  |  |  | 4 |
|  |  | medium |  |  |  | H56-752, Q124, Q170 | 5 |
|  |  | medium to thick |  |  |  |  | 6 |
|  |  | thick |  |  |  | Q117 | 7 |
|  |  | thick to very thick |  |  |  |  | 8 |
|  |  | very thick |  |  |  |  | 9 |

|  |  | English | français | deutsch | español | Example VarietiesExemplesBeispielssortenVariedades ejemplo | Note/Nota |
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| **7.** | **(\*)** | **PQ** | **VG** | **(+)** | **(a)** |  |
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| **Internode: shape** |

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|  |  | cylindrical |  |  |  | Q169, RB72-454 | 1 |
|  |  | tumescent |  |  |  | Q205 | 2 |
|  |  | bobbin-shaped |  |  |  | H56-752 | 3 |
|  |  | conoidal |  |  |  | Q177, Q178 | 4 |
|  |  | obconoidal |  |  |  | H60-3802 | 5 |
|  |  | concave-convex |  |  |  | Q115 | 6 |
| **8.** | **(\*)** | **QN** | **VG** |  | **(a)** |  |
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| **Internode: cross section** |

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|  |  | circular |  |  |  | Q 121, RB72-454 | 1 |
|  |  | circular to ovate |  |  |  |  | 2 |
|  |  | ovate |  |  |  | Q152, Q186, Q96 | 3 |
| **9.** | **(\*)** | **PQ** | **VG** | **(+)** | **(a)** |  |
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| **Internode: color where exposed to sun** |

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|  |  | yellow |  |  |  | Q230 | 1 |
|  |  | yellow green |  |  |  | SRA24, SRA25 | 2 |
|  |  | grey yellow |  |  |  | SRA10 | 3 |
|  |  | grey orange |  |  |  | Q165 | 4 |
|  |  | grey red |  |  |  |  | 5 |
|  |  | grey purple |  |  |  | RB72-454 | 6 |
|  |  | purple |  |  |  |  | 7 |
| **10** | **(\*)** | **PQ** | **VG** | **(+)** | **(a)** |  |
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| **Internode: color where not exposed to sun** |

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|  |  | yellow |  |  |  |  | 1 |
|  |  | yellow green |  |  |  | SRA24, SRA25 | 2 |
|  |  | grey yellow |  |  |  | QS01-1078 | 3 |
|  |  | grey orange |  |  |  | Q220 | 4 |
|  |  | grey red |  |  |  |  | 5 |
|  |  | grey purple |  |  |  | SRA9 | 6 |
|  |  | purple |  |  |  |  | 7 |

|  |  | English | français | deutsch | español | Example VarietiesExemplesBeispielssortenVariedades ejemplo | Note/Nota |
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| **11** |  | **QN** | **MS/VS** | **(+)** |  |  |
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| **Internode: number of growth cracks** |

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 |  |  |
|  |  | absent or very few |  |  |  | H56-752, RB72-454 | 1 |
|  |  | very few to few |  |  |  |  | 2 |
|  |  | few |  |  |  | Q124 | 3 |
|  |  | few to medium |  |  |  |  | 4 |
|  |  | medium |  |  |  | Q121 | 5 |
|  |  | medium to many |  |  |  |  | 6 |
|  |  | many |  |  |  | Q179 | 7 |
|  |  | many to very many |  |  |  |  | 8 |
|  |  | very many |  |  |  |  | 9 |
| **12** | **(\*)** | **QN** | **VG** | **(+)** |  |  |
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| **Internode: degree of zigzag** |

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|  |  | absent or weak |  |  |  | Q124 | 1 |
|  |  | medium |  |  |  | Q135, Q152 | 2 |
|  |  | strong |  |  |  | H56-752 | 3 |
| **13** |  | **QN** | **VS** |  | **(a)** |  |
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| **Internode: waxiness** |

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|  |  | absent or very weak |  |  |  | Q179 | 1 |
|  |  | very weak to weak |  |  |  |  | 2 |
|  |  | weak |  |  |  | Q138 | 3 |
|  |  | weak to medium |  |  |  |  | 4 |
|  |  | medium |  |  |  | Q121, RB72-454 | 5 |
|  |  | medium to strong |  |  |  |  | 6 |
|  |  | strong |  |  |  | H56-752, Q117 | 7 |
|  |  | strong to very strong |  |  |  |  | 8 |
|  |  | very strong |  |  |  |  | 9 |

|  |  | English | français | deutsch | español | Example VarietiesExemplesBeispielssortenVariedades ejemplo | Note/Nota |
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| **14** |  | **QN** | **VG** |  | **(a)** |  |
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| **Internode: depth of bud groove** |

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|  |  | absent or very shallow |  |  |  | Q117, Q121, Q186 | 1 |
|  |  | very shallow to shallow |  |  |  |  | 2 |
|  |  | shallow |  |  |  | Q138, Q170, RB72-454 | 3 |
|  |  | shallow to medium |  |  |  |  | 4 |
|  |  | medium |  |  |  | Q179 | 5 |
|  |  | medium to deep |  |  |  |  | 6 |
|  |  | deep |  |  |  | Q174 | 7 |
|  |  | deep to very deep |  |  |  |  | 8 |
|  |  | very deep |  |  |  |  | 9 |
| **15** |  | **QN** | **VS** | **(+)** |  |  |
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| **Internode: depth of growth cracks** |

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|  |  | absent or very shallow |  |  |  | RB72-454 | 1 |
|  |  | shallow |  |  |  | Q124 | 2 |
|  |  | medium |  |  |  | Q121 | 3 |
|  |  | deep |  |  |  | Q179 | 4 |
|  |  | very deep |  |  |  |  | 5 |
| **16** |  | **QN** | **MS/VG** |  | **(a)** |  |
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| **Node: width of root band** |

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 |  |  |
|  |  | very narrow |  |  |  |  | 1 |
|  |  | very narrow to narrow |  |  |  |  | 2 |
|  |  | narrow |  |  |  | Q215 | 3 |
|  |  | narrow to medium |  |  |  |  | 4 |
|  |  | medium |  |  |  | SRA6 | 5 |
|  |  | medium to wide |  |  |  |  | 6 |
|  |  | wide |  |  |  | Q202 | 7 |
|  |  | wide to very wide |  |  |  |  | 8 |
|  |  | very wide |  |  |  |  | 9 |

|  |  | English | français | deutsch | español | Example VarietiesExemplesBeispielssortenVariedades ejemplo | Note/Nota |
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| **17** |  | **PQ** | **VG** | **(+)** | **(a)** |  |
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| **Node: shape of root band** |

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|  |  | tall |  |  |  |  | 1 |
|  |  | constricted |  |  |  |  | 2 |
|  |  | conoidal |  |  |  |  | 3 |
|  |  | obconoidal |  |  |  |  | 4 |

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| **18** |  | **QN** | **VS** |  | **(a)** |  |
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| **Node: width of wax ring** |

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|  |  | absent or very narrow |  |  |  | Q179 | 1 |
|  |  | very narrow to narrow |  |  |  |  | 2 |
|  |  | narrow |  |  |  | Q180 | 3 |
|  |  | narrow to medium |  |  |  |  | 4 |
|  |  | medium |  |  |  | Q113, Q96, RB72-454 | 5 |
|  |  | medium to wide |  |  |  |  | 6 |
|  |  | wide |  |  |  | Q115, Q138 | 7 |
|  |  | wide to very wide |  |  |  |  | 8 |
|  |  | very wide |  |  |  | Q195 | 9 |
| **19** | **(\*)** | **QL** | **VG** |  | **(a)** |  |
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| **Node: presence of wing on bud** |

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|  |  | absent |  |  |  |  | 1 |
|  |  | present |  |  |  |  | 9 |
| **20** | **(\*)** | **PQ** | **VG** | **(+)** | **(a)** |  |
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| **Node: shape of bud** |

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|  |  | triangular-pointed |  |  |  | RB72-454 | 1 |
|  |  | oval |  |  |  | Q138 | 2 |
|  |  | obovate |  |  |  | Q202 | 3 |
|  |  | pentagonal |  |  |  | Q182 | 4 |
|  |  | rhomboid |  |  |  | Q217 | 5 |
|  |  | round |  |  |  | Q124, Q179 | 6 |
|  |  | ovate |  |  |  | Q115, Q170, Q186 | 7 |
|  |  | rectangular |  |  |  | Q215 | 8 |

|  |  | English | français | deutsch | español | Example VarietiesExemplesBeispielssortenVariedades ejemplo | Note/Nota |
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| **21** |  | **QN** | **MS/VG** |  | **(a), (e)** |  |
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| **Node: length of bud** |

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|  |  | very short |  |  |  |  | 1 |
|  |  | very short to short |  |  |  |  | 2 |
|  |  | short |  |  |  |  | 3 |
|  |  | short to medium |  |  |  |  | 4 |
|  |  | medium |  |  |  |  | 5 |
|  |  | medium to long |  |  |  |  | 6 |
|  |  | long |  |  |  |  | 7 |
|  |  | long to very long |  |  |  |  | 8 |
|  |  | very long |  |  |  |  | 9 |
| **22** |  | **QN** | **MS** |  | **(a), (e)** |  |
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| **Node: width of bud** |

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|  |  | very narrow |  |  |  | Q186 | 1 |
|  |  | very narrow to narrow |  |  |  |  | 2 |
|  |  | narrow |  |  |  | Q138 | 3 |
|  |  | narrow to medium |  |  |  |  | 4 |
|  |  | medium |  |  |  | Q178 | 5 |
|  |  | medium to wide |  |  |  |  | 6 |
|  |  | wide |  |  |  | Q121, Q124 | 7 |
|  |  | wide to very wide |  |  |  |  | 8 |
|  |  | very wide |  |  |  | H56-752, Q136 | 9 |
| **23** | **(\*)** | **QN** | **VS** | **(+)** |  |  |
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| **Node: bud prominence** |

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|  |  | very weak |  |  |  | Q152 | 1 |
|  |  | very weak to weak |  |  |  |  | 2 |
|  |  | weak |  |  |  | RB72-454 | 3 |
|  |  | weak to medium |  |  |  |  | 4 |
|  |  | medium |  |  |  | H56-752, Q121 | 5 |
|  |  | medium to strong |  |  |  |  | 6 |
|  |  | strong |  |  |  | Q136 | 7 |
|  |  | strong to very strong |  |  |  |  | 8 |
|  |  | very strong |  |  |  |  | 9 |

|  |  | English | français | deutsch | español | Example VarietiesExemplesBeispielssortenVariedades ejemplo | Note/Nota |
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| **24** |  | **QN** | **VS** |  | **(a)** |  |
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| **Node: position of bud tip in relation to growth ring** |

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|  |  | clearly below |  |  |  | Q171, SRAW18 | 1 |
|  |  | intermediate |  |  |  | Q179, RB72-454 | 2 |
|  |  | clearly above |  |  |  | Q172, SRA9 | 3 |

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| **25** |  | **QN** | **VS** | **(+)** | **(a)** |  |
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| **Node: bud cushion** |

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|  |  | absent or very narrow |  |  |  | Q121, Q186 | 1 |
|  |  | very narrow to narrow |  |  |  |  | 2 |
|  |  | narrow |  |  |  | Q96 | 3 |
|  |  | narrow to medium |  |  |  |  | 4 |
|  |  | medium |  |  |  | Q181, RB72-454 | 5 |
|  |  | medium to wide |  |  |  |  | 6 |
|  |  | wide |  |  |  | Q170 | 7 |
|  |  | wide to very wide |  |  |  |  | 8 |
|  |  | very wide |  |  |  |  | 9 |
| **26** |  | **QN** | **VS** |  | **(a)** |  |
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| **Node: width of bud wing** |

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|  |  | narrow |  |  |  | RB72-454 | 1 |
|  |  | narrow to medium |  |  |  |  | 2 |
|  |  | medium |  |  |  | Q121 | 3 |
|  |  | medium to wide |  |  |  |  | 4 |
|  |  | wide |  |  |  | BN81-1394 | 5 |
| **27** |  | **PQ** | **VG** |  | **(a)** |  |
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| **Node: color of root band where not exposed to sun** |

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 |  |  |
|  |  | white and green |  |  |  |  | 1 |
|  |  | yellow and green |  |  |  |  | 2 |
|  |  | yellow and purple |  |  |  |  | 3 |
|  |  | green |  |  |  |  | 4 |
|  |  | purple |  |  |  |  | 6 |

|  |  | English | français | deutsch | español | Example VarietiesExemplesBeispielssortenVariedades ejemplo | Note/Nota |
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| **28** |  | **PQ** | **VG** |  | **(a)** |  |
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| **Node: color of growth ring where not exposed to sun** |

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|  |  | white and green |  |  |  |  | 1 |
|  |  | yellow and green |  |  |  |  | 2 |
|  |  | yellow and purple |  |  |  |  | 3 |
|  |  | green |  |  |  |  | 4 |
|  |  | green and purple |  |  |  |  | 5 |
|  |  | purple |  |  |  |  | 6 |
| **29** |  | **QN** | **MS** | **(+)** | **(b)** |  |
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| **Leaf sheath: length** |

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|  |  | very short |  |  |  |  | 1 |
|  |  | very short to short |  |  |  |  | 2 |
|  |  | short |  |  |  | Q117 | 3 |
|  |  | short to medium |  |  |  |  | 4 |
|  |  | medium |  |  |  | Q136, Q170 | 5 |
|  |  | medium to long |  |  |  |  | 6 |
|  |  | long |  |  |  | Q121, Q124 | 7 |
|  |  | long to very long |  |  |  |  | 8 |
|  |  | very long |  |  |  |  | 9 |
| **30** |  | **QN** | **VG** |  | **(b), (c)** |  |
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| **Leaf sheath: number of hairs** |

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 |  |  |
|  |  | absent or very few |  |  |  | Q186, RB72-454 | 1 |
|  |  | very few to few |  |  |  |  | 2 |
|  |  | few |  |  |  | Q170 | 3 |
|  |  | few to medium |  |  |  |  | 4 |
|  |  | medium |  |  |  | Q117, Q179 | 5 |
|  |  | medium to many |  |  |  |  | 6 |
|  |  | many |  |  |  | Q124 | 7 |
|  |  | many to very many |  |  |  |  | 8 |
|  |  | very many |  |  |  | Q169 | 9 |

|  |  | English | français | deutsch | español | Example VarietiesExemplesBeispielssortenVariedades ejemplo | Note/Nota |
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| **31** |  | **QN** | **VG** |  | **(b), (c)** |  |
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| **Leaf sheath: length of hairs** |

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 |  |  |
|  |  | very short |  |  |  |  | 1 |
|  |  | very short to short |  |  |  |  | 2 |
|  |  | short |  |  |  | Q186 | 3 |
|  |  | short to medium |  |  |  |  | 4 |
|  |  | medium |  |  |  | Q117, Q138, Q179 | 5 |
|  |  | medium to long |  |  |  |  | 6 |
|  |  | long |  |  |  | Q121 | 7 |
|  |  | long to very long |  |  |  |  | 8 |
|  |  | very long |  |  |  |  | 9 |
| **32** |  | **PQ** | **VG** |  | **(b), (c)** |  |
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| **Leaf sheath: distribution of hairs** |

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 |  |  |
|  |  | only lateral |  |  |  | Q138, Q170 | 1 |
|  |  | lateral and dorsal |  |  |  | SRA5 | 2 |
|  |  | only dorsal |  |  |  | SRA19 | 3 |
| **33** |  | **QN** | **VS** |  | **(b), (c)** |  |
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| **Leaf sheath: length of ligule hairs (c)** |

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 |  |  |
|  |  | very short |  |  |  |  | 1 |
|  |  | very short to short |  |  |  |  | 2 |
|  |  | short |  |  |  | Q152, Q170, Q96 | 3 |
|  |  | short to medium |  |  |  |  | 4 |
|  |  | medium |  |  |  | Q179, RB72-454 | 5 |
|  |  | medium to long |  |  |  |  | 6 |
|  |  | long |  |  |  | BN81-1394, Q124 | 7 |
|  |  | long to very long |  |  |  |  | 8 |
|  |  | very long |  |  |  |  | 9 |

|  |  | English | français | deutsch | español | Example VarietiesExemplesBeispielssortenVariedades ejemplo | Note/Nota |
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| **34** |  | **PQ** | **VS** | **(+)** | **(b)** |  |
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| **Leaf sheath: shape of ligule** |

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 |  |  |
|  |  | strap-shaped |  |  |  | Argos | 1 |
|  |  | deltoid |  |  |  | H56-752, Q170 | 2 |
|  |  | crescent-shaped |  |  |  | Q121, Q179, Q96 | 3 |
|  |  | bow-shaped |  |  |  |  | 4 |
|  |  | asymmetrical, steeply sloping |  |  |  | Vertix 1 Vertix 7 | 5 |
|  |  | asymmetrical, horizontal |  |  |  | IACSP942094, RB72-454 | 6 |

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| **35** |  | **QN** | **VS** |  | **(b), (c)** |  |
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| **Leaf sheath: density of ligule hairs (c)** |

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|  |  | absent or very sparse |  |  |  | SRA6 | 1 |
|  |  | very sparse to sparse |  |  |  |  | 2 |
|  |  | sparse |  |  |  | SRA25 | 3 |
|  |  | sparse to medium |  |  |  |  | 4 |
|  |  | medium |  |  |  | Q152 | 5 |
|  |  | medium to dense |  |  |  |  | 6 |
|  |  | dense |  |  |  | Q121, RB72-454 | 7 |
|  |  | dense to very dense |  |  |  |  | 8 |
|  |  | very dense |  |  |  | Q179 | 9 |
| **36** |  | **QN** | **VS** |  | **(b)** |  |
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| **Leaf sheath: width of ligule** |

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|  |  | narrow |  |  |  | SRAW17 | 1 |
|  |  | medium |  |  |  | Q115, Q179, Q186 | 2 |
|  |  | wide |  |  |  | H56-752, Q170 | 3 |
| **37** |  | **QL** | **VS** |  | **(b)** |  |
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| **Leaf sheath: underlapping auricle** |

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|  |  | absent |  |  |  |  | 1 |
|  |  | present |  |  |  | Q186 | 9 |

|  |  | English | français | deutsch | español | Example VarietiesExemplesBeispielssortenVariedades ejemplo | Note/Nota |
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| **38** | **(\*)** | **PQ** | **VS** | **(+)** | **(b)** |  |
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| **Leaf sheath: shape of underlapping auricle** |

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 |  |  |
|  |  | deltoid |  |  |  | Q186 | 1 |
|  |  | dentoid |  |  |  | SRA1, SRA2 | 2 |
|  |  | unciform |  |  |  |  | 3 |
|  |  | calcarifom |  |  |  | Q196 | 4 |
|  |  | lanceolate |  |  |  | H56-752, RB72-454 | 5 |
|  |  | falcate |  |  |  | SRA16 | 6 |
| **39** |  | **QN** | **VS** |  | **(b)** |  |
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| **Leaf sheath: size of underlapping auricle** |

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|  |  | very small |  |  |  |  | 1 |
|  |  | very small to small |  |  |  |  | 2 |
|  |  | small |  |  |  | Q96 | 3 |
|  |  | small to medium |  |  |  |  | 4 |
|  |  | medium |  |  |  | Q201 | 5 |
|  |  | medium to large |  |  |  |  | 6 |
|  |  | large |  |  |  | Q135 | 7 |
|  |  | large to very large |  |  |  |  | 8 |
|  |  | very large |  |  |  |  | 9 |
| **40** |  | **QL** | **VS** |  | **(b)** |  |
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| **Leaf sheath: overlapping auricle** |

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|  |  | absent |  |  |  |  | 1 |
|  |  | present |  |  |  | SRA24 | 9 |
| **41** | **(\*)** | **PQ** | **VS** | **(+)** | **(b)** |  |
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| **Leaf sheath: shape of overlapping auricle** |

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|  |  | deltoid |  |  |  | Q117, RB72-454 | 1 |
|  |  | dentoid |  |  |  |  | 2 |
|  |  | unciform |  |  |  |  | 3 |
|  |  | calcariform |  |  |  |  | 4 |
|  |  | lanceolate |  |  |  | Q138 | 5 |
|  |  | falcate |  |  |  |  | 6 |

|  |  | English | français | deutsch | español | Example VarietiesExemplesBeispielssortenVariedades ejemplo | Note/Nota |
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| **42** |  | **QN** | **MS/VS** |  | **(b)** |  |
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| **Leaf sheath: size of overlapping auricle** |

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|  |  | very small |  |  |  |  | 1 |
|  |  | very small to small |  |  |  |  | 2 |
|  |  | small |  |  |  | SRA20, SRA25 | 3 |
|  |  | small to medium |  |  |  |  | 4 |
|  |  | medium |  |  |  | Q251, SRA11 | 5 |
|  |  | medium to large |  |  |  |  | 6 |
|  |  | large |  |  |  | Q198, Q215 | 7 |
|  |  | large to very large |  |  |  |  | 8 |
|  |  | very large |  |  |  |  | 9 |

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| **43** |  | **QN** | **MS** |  | **(b)** |  |
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| **Leaf blade: length** |

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|  |  | very short |  |  |  |  | 1 |
|  |  | very short to short |  |  |  |  | 2 |
|  |  | short |  |  |  | Q124 | 3 |
|  |  | short to medium |  |  |  |  | 4 |
|  |  | medium |  |  |  | Q136 | 5 |
|  |  | medium to long |  |  |  |  | 6 |
|  |  | long |  |  |  | Q170 | 7 |
|  |  | long to very long |  |  |  |  | 8 |
|  |  | very long |  |  |  |  | 9 |
| **44** | **(\*)** | **QN** | **MS** |  | **(b)** |  |
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| **Leaf blade: width at the longitudinal mid-point** |

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|  |  | very narrow |  |  |  |  | 1 |
|  |  | very narrow to narrow |  |  |  |  | 2 |
|  |  | narrow |  |  |  | Q113, Q186 | 3 |
|  |  | narrow to medium |  |  |  |  | 4 |
|  |  | medium |  |  |  | Q121, Q124 | 5 |
|  |  | medium to broad |  |  |  |  | 6 |
|  |  | broad |  |  |  | Q138, Q179 | 7 |
|  |  | broad to very broad |  |  |  |  | 8 |
|  |  | very broad |  |  |  |  | 9 |

|  |  | English | français | deutsch | español | Example VarietiesExemplesBeispielssortenVariedades ejemplo | Note/Nota |
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| **45** |  | **QN** | **MS** |  | **(b)** |  |
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| **Leaf: midrib width at the longitudinal mid-point** |

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|  |  | very narrow |  |  |  | Q203 | 1 |
|  |  | very narrow to narrow |  |  |  |  | 2 |
|  |  | narrow |  |  |  | Q121 | 3 |
|  |  | narrow to medium |  |  |  |  | 4 |
|  |  | medium |  |  |  | Q124, Q170 | 5 |
|  |  | medium to wide |  |  |  |  | 6 |
|  |  | wide |  |  |  | Q202, SRA5 | 7 |
|  |  | wide to very wide |  |  |  |  | 8 |
|  |  | very wide |  |  |  | Q138 | 9 |
| **46** |  | **QN** | **MS** |  | **(b)** |  |
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| **Leaf: ratio leaf blade width/midrib width** |

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|  |  | very low |  |  |  |  | 1 |
|  |  | very low to low |  |  |  |  | 2 |
|  |  | low |  |  |  | SRA5, SRA6 | 3 |
|  |  | low to medium |  |  |  |  | 4 |
|  |  | medium |  |  |  | H56-752, Q124 | 5 |
|  |  | medium to high |  |  |  |  | 6 |
|  |  | high |  |  |  | Q215, SRA11 | 7 |
|  |  | high to very high |  |  |  |  | 8 |
|  |  | very high |  |  |  |  | 9 |
| **47** |  | **QN** | **MS/VG** |  | **(d)** |  |
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| **Cane top: length** |

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|  |  | very short |  |  |  |  | 1 |
|  |  | very short to short |  |  |  |  | 2 |
|  |  | short |  |  |  |  | 3 |
|  |  | short to medium |  |  |  |  | 4 |
|  |  | medium |  |  |  |  | 5 |
|  |  | medium to long |  |  |  |  | 6 |
|  |  | long |  |  |  |  | 7 |
|  |  | long to very long |  |  |  |  | 8 |
|  |  | very long |  |  |  |  | 9 |

|  |  | English | français | deutsch | español | Example VarietiesExemplesBeispielssortenVariedades ejemplo | Note/Nota |
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| **48** |  | **QL** | **VG** |  | **(d)** |  |
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| **Cane top: shape of cross-section** |

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|  |  | circular |  |  |  |  | 1 |
|  |  | ovate |  |  |  |  | 2 |

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| **49** |  | **QN** | **VG** |  | **(d)** |  |
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| **Cane top: waxiness** |

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|  |  | absent or very weak |  |  |  |  | 1 |
|  |  | very weak to weak |  |  |  |  | 2 |
|  |  | weak |  |  |  |  | 3 |
|  |  | weak to medium |  |  |  |  | 4 |
|  |  | medium |  |  |  |  | 5 |
|  |  | medium to strong |  |  |  |  | 6 |
|  |  | strong |  |  |  |  | 7 |
|  |  | strong to very strong |  |  |  |  | 8 |
|  |  | very strong |  |  |  |  | 9 |

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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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| Unless otherwise indicated, observations should be made at time of maturity. |

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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 on the longest internode of a representative culm.wordml://76.png |

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| (b) |

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| Observations should be made on the top visible dewlap (TVD) leaf. |

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| (c) |

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| Leaf sheath hairs to be observed on hair groups 57 and 60.Distribution of hairs is dorsal when only hair group 57 is present. Distribution of hairs is lateral and dorsal when both hair groups 57 and 60 are present.Distribution of hairs is lateral when only hair group 60 is present.Leaf sheath ligule hairs to be observed on hair group 61.wordml://77.png |

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| (d) |

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| The cane top is the region between the youngest exposed visible dewlap and the insertion of the fourth youngest fully extended leaf (leaf + 4) in the culm. |

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| (e) |

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| Observations should be made excluding the bud wings. |

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| *8.2* |

 | *Explanations for individual characteristics* |
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| Ad. 1: Plant: growth habitwordml://78.pngObservations should be made 2-3 months after planting. |

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| Ad. 2: Plant: adherence of leaf sheathObservations should be made on the lower half of the stool on the senescing leaves. |

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| Ad. 4: Culm: heightMeasurements should be made from the base of the culm at soil level to the base of the Top Visible Dewlap (TVD) leaf.wordml://79.png |

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| Ad. 6: Internode: diameter Observations should be made at central part of the internode on the axis going through the bud |

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| Ad. 7: Internode: shape

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| --- | --- | --- |
| wordml://80.png | wordml://81.png | wordml://82.png |
| 1 | 2 | 3 |
| cylindrical | tumescent | bobbin-shaped |

|  |  |  |
| --- | --- | --- |
| wordml://84.png | wordml://86.png | wordml://88.png |
| 4 | 5 | 6 |
| conoidal | obconoidal | concave-convex |

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| Ad. 9: Internode: color where exposed to sunObservations should be made after three days of exposure to the sun on a culm, on which the wax has been removed. |

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| Ad. 10: Internode: color where not exposed to sunObservations should be made on a culm protected from the sun, on which the wax has been removed. |

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| Ad. 11: Internode: number of growth cracksObservations should be made across the entire length of the culm. |

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| Ad. 12: Internode: degree of zigzag

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| --- | --- | --- |
| wordml://89.png | wordml://90.png | wordml://91.png |
| 1 | 2 | 3 |
| absent or  weak | medium | strong |

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| Ad. 15: Internode: depth of growth cracksObservations should be made across the entire length of the culm. |

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| Ad. 17: Node: shape of root bandwordml://92.png |

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| Ad. 20: Node: shape of bud

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| wordml://93.png | A.    Triangular pointed B.    Oval C.    Obovate D.    Pentagonal E.    Rhomboid F.    Round G.    Ovate H.    Rectangular   |

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| Ad. 23: Node: bud prominenceTo be observed on node below where second senescent leaf from the top was attached. |

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| Ad. 25: Node: bud cushionTo be observed as the space between base of bud and leaf scar. |

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| Ad. 29: Leaf sheath: length Measurements should be made from the leaf sheath base (point of attachment to the culm) to the dewlap (the junction between the leaf blade and the leaf sheath). |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Ad. 34: Leaf sheath: shape of ligule

|  |  |  |
| --- | --- | --- |
| wordml://94.png | wordml://95.png | wordml://96.png |
| 1 | 2 | 3 |
| strap-shaped | deltoid | crescent-shaped |

|  |  |  |
| --- | --- | --- |
| wordml://97.png | wordml://98.png | wordml://99.png |
| 4 | 5 | 6 |
| bow-shaped | asymmetrical, steeply sloping | asymmetrical, horizontal |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Ad. 38: Leaf sheath: shape of underlapping auricle

|  |  |  |
| --- | --- | --- |
| wordml://100.png | wordml://101.png | wordml://102.png |
| 1 | 2 | 3 |
| deltoid | dentoid | unciform |

|  |  |  |
| --- | --- | --- |
| wordml://103.png | wordml://104.png | wordml://105.png |
| 4 | 5 | 6 |
| calcariform | lanceolate | falcate |

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| --- |
| Ad. 41: Leaf sheath: shape of overlapping auricleSee Ad. 38 |

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| 9. | Literature |

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| Artschwager, E., 1940:  Journal of Agricultural Research, v. 60, n. 8, pp. 503-508.Artschwager, E. 1940:  Morphology of the vegetative organs of sugarcane.  Journal of Agricultural Research, 60 (8): 503-549.Artschwager, E. and Brandes, E.W. 1958:  Sugarcane (*Saccharum officinarum* L.). Origin, classification, characteristics and descriptions of representative clones.  US Department of Agriculture, Agriculture Handbook.  122: 1-307.Gallacher, D.J., 1994:  Development of a minimum descriptor set for individuals of *Saccharum* spp.  Hybrid germplasm.  Thesis submitted for Ph.D., Department of Botany and Tropical Agriculture, James Cook University of North Queensland, AU.Gallacher, D.J. and Berding, N.  1997:  Purpose selection and application of descriptors for sugarcane germplasm.  *Aust. J. Agric. Res* 48:  759-67.Gallacher, D.J., 1997:  Evaluation of sugarcane morphological descriptors using variance components analysis.  *Aust. J. Agric. Res* 48:  769-73.Gallacher, D.J., 1997:  Optimised descriptors recommended for Australian sugarcane germplasm (*Saccharum* spp. hybrid) *Aust. J. Agric. Res* 48:  775-79.Portz G., do Amaral, L.R. and Molin, J.P.  2012:  Measuring sugarcane height in complement to biomass sensor for nitrogen management.  11th International Conference on Precision Agriculture. |

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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 |

 |
|

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

|  |
| --- |
| 1.1 |

 | Botanical name |

|  |
| --- |
| *Saccharum* L. |

 |

|  |
| --- |
|  |

 |
|  |   |  |   |  |
|  |

|  |
| --- |
| 1.2 |

 | Common name |

|  |
| --- |
| Sugarcane |

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|  |   |   |

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|  |   |  |   |  |

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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 |
|  | 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 |
|  |

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| 4.2.1 |

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|  |
| --- |
| Vegetative propagation |

 |  |
|

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

 |

|  |
| --- |
| Cuttings |

 | [ ] |
|

|  |
| --- |
| (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). |
|  |   |  |  |

 |

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

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

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

 |

|  |
| --- |
| **Plant: adherence of leaf sheath** |

 |  |  |
|  |

|  |
| --- |
| very weak |

 |

|  |
| --- |
|  |

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| --- |
| 1 [   ] |

 |
|  |

|  |
| --- |
| very weak to weak |

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| --- |
| 2 [   ] |

 |
|  |

|  |
| --- |
| weak |

 |

|  |
| --- |
| H56-752, Q96 |

 |

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| --- |
| 3 [   ] |

 |
|  |

|  |
| --- |
| weak to medium |

 |

|  |
| --- |
|  |

 |

|  |
| --- |
| 4 [   ] |

 |
|  |

|  |
| --- |
| medium |

 |

|  |
| --- |
| Q124, Q186 |

 |

|  |
| --- |
| 5 [   ] |

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|  |

|  |
| --- |
| medium to strong |

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|  |
| --- |
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| --- |
| 6 [   ] |

 |
|  |

|  |
| --- |
| strong |

 |

|  |
| --- |
| NCo310, Q120, Q201 |

 |

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| --- |
| 7 [   ] |

 |
|  |

|  |
| --- |
| strong to very strong |

 |

|  |
| --- |
|  |

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| --- |
| 8 [   ] |

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|  |

|  |
| --- |
| very strong |

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| --- |
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| --- |
| 9 [   ] |

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

|  |
| --- |
| **(7)** |

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|  |
| --- |
| **Internode: shape** |

 |  |  |
|  |

|  |
| --- |
| cylindrical |

 |

|  |
| --- |
| Q169, RB72-454 |

 |

|  |
| --- |
| 1 [   ] |

 |
|  |

|  |
| --- |
| tumescent |

 |

|  |
| --- |
| Q205 |

 |

|  |
| --- |
| 2 [   ] |

 |
|  |

|  |
| --- |
| bobbin-shaped |

 |

|  |
| --- |
| H56-752 |

 |

|  |
| --- |
| 3 [   ] |

 |
|  |

|  |
| --- |
| conoidal |

 |

|  |
| --- |
| Q177, Q178 |

 |

|  |
| --- |
| 4 [   ] |

 |
|  |

|  |
| --- |
| obconoidal |

 |

|  |
| --- |
| H60-3802 |

 |

|  |
| --- |
| 5 [   ] |

 |
|  |

|  |
| --- |
| concave-convex |

 |

|  |
| --- |
| Q115 |

 |

|  |
| --- |
| 6 [   ] |

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

|  |
| --- |
| **(8)** |

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| --- |
| **Internode: cross section** |

 |  |  |
|  |

|  |
| --- |
| circular |

 |

|  |
| --- |
| Q 121, RB72-454 |

 |

|  |
| --- |
| 1 [   ] |

 |
|  |

|  |
| --- |
| circular to ovate |

 |

|  |
| --- |
|  |

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| --- |
| 2 [   ] |

 |
|  |

|  |
| --- |
| ovate |

 |

|  |
| --- |
| Q152, Q186, Q96 |

 |

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| --- |
| 3 [   ] |

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

|  |
| --- |
| **(9)** |

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| --- |
| **Internode: color where exposed to sun** |

 |  |  |
|  |

|  |
| --- |
| yellow |

 |

|  |
| --- |
| Q230 |

 |

|  |
| --- |
| 1 [   ] |

 |
|  |

|  |
| --- |
| yellow green |

 |

|  |
| --- |
| SRA24, SRA25 |

 |

|  |
| --- |
| 2 [   ] |

 |
|  |

|  |
| --- |
| grey yellow |

 |

|  |
| --- |
| SRA10 |

 |

|  |
| --- |
| 3 [   ] |

 |
|  |

|  |
| --- |
| grey orange |

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|  |
| --- |
| Q165 |

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| --- |
| 4 [   ] |

 |
|  |

|  |
| --- |
| grey red |

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| --- |
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| --- |
| 5 [   ] |

 |
|  |

|  |
| --- |
| grey purple |

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|  |
| --- |
| RB72-454 |

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| --- |
| 6 [   ] |

 |
|  |

|  |
| --- |
| purple |

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|  |
| --- |
|  |

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|  |
| --- |
| 7 [   ] |

 |
|  |  |  |  |

|  | Characteristics | Example Varieties | Note |
| --- | --- | --- | --- |
|  |  |  |  |
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|  |
| --- |
| **5.5** |

|  |
| --- |
| **(10)** |

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| --- |
| **Internode: color where not exposed to sun** |

 |  |  |
|  |

|  |
| --- |
| yellow |

 |

|  |
| --- |
|  |

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|  |
| --- |
| 1 [   ] |

 |
|  |

|  |
| --- |
| yellow green |

 |

|  |
| --- |
| SRA24, SRA25 |

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|  |
| --- |
| 2 [   ] |

 |
|  |

|  |
| --- |
| grey yellow |

 |

|  |
| --- |
| QS01-1078 |

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|  |
| --- |
| 3 [   ] |

 |
|  |

|  |
| --- |
| grey orange |

 |

|  |
| --- |
| Q220 |

 |

|  |
| --- |
| 4 [   ] |

 |
|  |

|  |
| --- |
| grey red |

 |

|  |
| --- |
|  |

 |

|  |
| --- |
| 5 [   ] |

 |
|  |

|  |
| --- |
| grey purple |

 |

|  |
| --- |
| SRA9 |

 |

|  |
| --- |
| 6 [   ] |

 |
|  |

|  |
| --- |
| purple |

 |

|  |
| --- |
|  |

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|  |
| --- |
| 7 [   ] |

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|  |  |  |  |
|

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

|  |
| --- |
| **(12)** |

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|  |
| --- |
| **Internode: degree of zigzag** |

 |  |  |
|  |

|  |
| --- |
| absent or weak |

 |

|  |
| --- |
| Q124 |

 |

|  |
| --- |
| 1 [   ] |

 |
|  |

|  |
| --- |
| medium |

 |

|  |
| --- |
| Q135, Q152 |

 |

|  |
| --- |
| 2 [   ] |

 |
|  |

|  |
| --- |
| strong |

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|  |
| --- |
| H56-752 |

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| --- |
| 3 [   ] |

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

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| --- |
| **(20)** |

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| --- |
| **Node: shape of bud** |

 |  |  |
|  |

|  |
| --- |
| triangular-pointed |

 |

|  |
| --- |
| RB72-454 |

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| --- |
| 1 [   ] |

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|  |

|  |
| --- |
| oval |

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|  |
| --- |
| Q138 |

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| --- |
| 2 [   ] |

 |
|  |

|  |
| --- |
| obovate |

 |

|  |
| --- |
| Q202 |

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|  |
| --- |
| 3 [   ] |

 |
|  |

|  |
| --- |
| pentagonal |

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|  |
| --- |
| Q182 |

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|  |
| --- |
| 4 [   ] |

 |
|  |

|  |
| --- |
| rhomboid |

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|  |
| --- |
| Q217 |

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| --- |
| 5 [   ] |

 |
|  |

|  |
| --- |
| round |

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|  |
| --- |
| Q124, Q179 |

 |

|  |
| --- |
| 6 [   ] |

 |
|  |

|  |
| --- |
| ovate |

 |

|  |
| --- |
| Q115, Q170, Q186 |

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| --- |
| 7 [   ] |

 |
|  |

|  |
| --- |
| rectangular |

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|  |
| --- |
| Q215 |

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| --- |
| 8 [   ] |

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

|  |
| --- |
| **(44)** |

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| --- |
| **Leaf blade: width at the longitudinal mid-point** |

 |  |  |
|  |

|  |
| --- |
| very narrow |

 |

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| --- |
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| --- |
| 1 [   ] |

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|  |

|  |
| --- |
| very narrow to narrow |

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| --- |
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| --- |
| 2 [   ] |

 |
|  |

|  |
| --- |
| narrow |

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|  |
| --- |
| Q113, Q186 |

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| --- |
| 3 [   ] |

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|  |

|  |
| --- |
| narrow to medium |

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| --- |
|  |

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| --- |
| 4 [   ] |

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|  |

|  |
| --- |
| medium |

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|  |
| --- |
| Q121, Q124 |

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| --- |
| 5 [   ] |

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|  |

|  |
| --- |
| medium to broad |

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| --- |
| 6 [   ] |

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|  |

|  |
| --- |
| broad |

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| --- |
| Q138, Q179 |

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| --- |
| 7 [   ] |

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|  |

|  |
| --- |
| broad to very broad |

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|  |
| --- |
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| --- |
| 8 [   ] |

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|  |

|  |
| --- |
| very broad |

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| --- |
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| --- |
| 9 [   ] |

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

 |
|   |
|

|  |  |
| --- | --- |
| 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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| *Node: shape of bud* |

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|  |
| --- |
| *round* |

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|  |
| --- |
| *oval* |

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 |
|  | Comments:    |

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| #7. |

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