PROTOCOL FOR TESTS ON DISTINCTNESS, UNIFORMITY AND STABILITY

*Allium schoenoprasum* L.

**CHIVES**

UPOV Code: **ALLIU_SCH**

**Adopted on 11/03/2015**

**Entry into force on 01/03/2015**
# TABLE OF CONTENTS

**CPVO-TP/198/2**

1. SUBJECT OF THE PROTOCOL AND REPORTING ................................................................. 3
   1.1 Scope of the technical protocol .................................................................................. 3
   1.2 Entry Into Force ........................................................................................................ 3
   1.3 Reporting between Examination Office and CPVO and Liaison with Applicant .......... 3
2. MATERIAL REQUIRED ...................................................................................................... 4
   2.1 Plant material requirements ..................................................................................... 4
   2.2 Informing the applicant of plant material requirements ............................................. 4
   2.3 Informing about problems on the submission of material ........................................... 4
3. METHOD OF EXAMINATION .......................................................................................... 4
   3.1 Number of growing cycles ......................................................................................... 4
   3.2 Testing Place ............................................................................................................. 4
   3.3 Conditions for Conducting the Examination .............................................................. 4
   3.4 Test design ................................................................................................................ 4
   3.5 Additional tests ........................................................................................................ 4
   3.6 Constitution and maintenance of a variety collection ................................................ 5
4. ASSESSMENT OF DISTINCTNESS, UNIFORMITY AND STABILITY ................................ 6
   4.1 Distinctness ............................................................................................................. 6
   4.2 Uniformity ................................................................................................................. 7
   4.3 Stability ................................................................................................................... 7
5. GROUPING OF VARIETIES AND ORGANIZATION OF THE GROWING TRIAL .......... 7
6. INTRODUCTION TO THE TABLE OF CHARACTERISTICS .......................................... 8
   6.1 Characteristics to be used ......................................................................................... 8
   6.2 Example Varieties ................................................................................................... 8
   6.3 Legend ...................................................................................................................... 8
7. TABLE OF CHARACTERISTICS ..................................................................................... 9
8. EXPLANATIONS ON THE TABLE OF CHARACTERISTICS ........................................... 12
   8.1 Explanations covering several characteristics ........................................................ 12
   8.2 Explanations for individual characteristics .............................................................. 12
9. LITERATURE .................................................................................................................. 15
10. TECHNICAL QUESTIONNAIRE ................................................................................... 16
1. SUBJECT OF THE PROTOCOL AND REPORTING

1.1 Scope of the technical protocol


1.2 Entry into Force

The present protocol enters into force on 01/03/2015. Any on-going DUS examination of candidate varieties started before the aforesaid date will not be affected by the approval of the Technical Protocol. Technical examinations of candidate varieties are carried out according to the TP in force when the DUS test starts. The starting date of a DUS examination is considered to be the due date for submitting of plant material for the first test period.

In cases where the Office requests to take-over a DUS report for which the technical examination has either been finalized or which is in the process to be carried out at the moment of this request, such report can only be accepted if the technical examination has been carried out according to the CPVO TP which was in force at the moment when the technical examination started.

1.3 Reporting between Examination Office and CPVO and Liaison with Applicant

1.3.1 Reporting between Examination Office and CPVO

The Examination Office shall deliver to the CPVO a preliminary report (“the preliminary report”) no later than two weeks after the date of the request for technical examination by the CPVO.

The Examination Office shall also deliver to the CPVO a report relating to each growing period (“the interim report”) and, when the Examination Office considers the results of the technical examination to be adequate to evaluate the variety or the CPVO so requests, a report relating to the examination (“the final report”).

The final report shall state the opinion of the Examination Office on the distinctness, uniformity and stability of the variety. Where it considers those criteria to be satisfied, or where the CPVO so requests, a description of the variety shall be added to the report. If a report is negative the Examination Office shall set out the detailed reasons for its findings.

The interim and the final reports shall be delivered to the CPVO as soon as possible and no later than on the deadlines as laid down in the designation agreement.

1.3.2 Informing on problems in the DUS test

If problems arise during the course of the test the CPVO should be informed immediately so that the information can be passed on to the applicant. Subject to prior permanent agreement, the applicant may be directly informed at the same time as the CPVO particularly if a visit to the trial is advisable.

1.3.3 Sample keeping in case of problems

If the technical examination has resulted in a negative report, the CPVO shall inform the Examination Office as soon as possible in case that a representative sample of any relevant testing material shall be kept.
2. MATERIAL REQUIRED

2.1 Plant material requirements
Information with respect to the agreed closing dates and submission requirements of plant material for the technical examination of varieties can be found on http://cpvo.europa.eu/applications-and-examinations/technical-examinations/submission-of-plant-material-s2-publication in the special issue S2 of the Official Gazette of the Office. General requirements on submission of samples are also to be found following the same link.

2.2 Informing the applicant of plant material requirements
The CPVO informs the applicant that
- he is responsible for ensuring compliance with any customs and plant health requirements.
- the plant material supplied should be visibly healthy, not lacking in vigor, nor affected by any important pest or disease.
- 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.

2.3 Informing about problems on the submission of material
The Examination Office shall report to the CPVO immediately in cases where the test material of the candidate variety has not arrived in time or in cases where the material submitted does not fulfil the conditions laid down in the request for material issued by the CPVO. In cases where the examination office encounters difficulties to obtain plant material of reference varieties the CPVO should be informed.

3. METHOD OF EXAMINATION

3.1 Number of growing cycles
The minimum duration of tests should normally be two independent growing cycles.

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" http://www.upov.int/edocs/tgpdocs/en/tgp_9.pdf.

3.3 Conditions for Conducting the Examination
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 Each test should be designed to result in a total of at least 60 plants which should be divided between at least two replicates.

3.4.2 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.

3.5 Additional tests
In accordance with Article 83(3) of Council Regulation No. 2100/94 an applicant may claim either in the Technical Questionnaire or during the test that a candidate has a characteristic which would be helpful in establishing distinctness. If such a claim is made and is supported by reliable technical data, an additional test may be undertaken providing that a technically acceptable test procedure can be devised.

Additional tests will be undertaken, with the agreement of the President of CPVO, where distinctness is unlikely to be shown using the characters listed in the protocol.
3.6 Constitution and maintenance of a variety collection

The process for the constitution and the maintenance of a variety collection can be summarized as follows:

Step 1: Making an inventory of the varieties of common knowledge

Step 2: Establishing a collection ("variety collection") of varieties of common knowledge which are relevant for the examination of distinctness of candidate varieties

Step 3: Selecting the varieties from the variety collection which need to be included in the growing trial or other tests for the examination of distinctness of a particular candidate variety.

3.6.1 Forms of variety collection

(a) Fruit species and seed propagated agricultural and vegetable species

The variety collection shall comprise variety descriptions and living plant material, thus a living reference collection. The variety description shall be produced by the EO unless special cooperation exists between EOs and the CPVO. The descriptive and pictorial information produced by the EO shall be held and maintained in a form of a database.

(b) Vegetatively propagated agricultural and vegetable species

The variety collection shall comprise variety descriptions; no living reference collection is required. The variety description shall be produced by the EO unless special cooperation exists between EOs and the CPVO. The descriptive and pictorial information produced by the EO shall be held and maintained in a form of a database.

3.6.2 Living Plant Material

(a) Fruit species and seed propagated agricultural and vegetable species

The examination office shall collect and maintain living plant material of varieties of the species concerned in the variety collection.

(b) Vegetatively propagated agricultural and vegetable species and ornamental species

The examination office shall obtain living plant material of reference varieties as and when those varieties need to be included in growing trials or other tests.

3.6.3 Range of the variety collection

The living variety collection shall cover at least those varieties that are suitable to climatic conditions of a respective EO.

3.6.4 Making an inventory of varieties of common knowledge for inclusion in the variety collection

The inventory shall take into account the list of protected varieties and the official, or other, registers of varieties, in particular:

The inventory shall include varieties protected under National PBR (UPOV contracting parties) and Community PBR, varieties registered in the Common Catalogue, the OECD list, the Conservation variety list and varieties in trade or in commercial registers for those species not covered by a National or the Common Catalogue.

3.6.5 Maintenance and renewal/update of a living variety collection

(a) Seed propagated species

The examination office shall maintain seeds in conditions which will ensure germination and viability, periodical checks, and renewal as required. For the renewal of existing living material the identity of replacement living plant material shall be verified by conducting side-by-side plot comparisons between the material in the collection and the new material.

(b) Vegetatively propagated species

The examination office shall maintain the variety collection under appropriate growing conditions (e.g. glasshouse, orchard, in vitro), where it shall be ensured that the plants are adequately irrigated, fertilised, pruned and protected from harmful pests and diseases. For the renewal of existing living material the identity of replacement living plant material shall be verified by conducting side-by-side plot comparisons between the material in the collection and the new material or by checking the identity of the new material against the variety description.
4. **ASSESSMENT OF DISTINCTNESS, UNIFORMITY AND STABILITY**

The prescribed procedure is to assess distinctness, uniformity and stability in a growing trial.

4.1 **Distinctness**

4.1.1 **General recommendations**

It is of particular importance for users of this Technical Protocol to consult the UPOV-General Introduction to DUS (link in chapter 1 of this document) and TGP 9 "Examining Distinctness" ([http://www.upov.int/edocs/tgpdocs/en/tgp_9.pdf](http://www.upov.int/edocs/tgpdocs/en/tgp_9.pdf)) prior to making decisions regarding distinctness. However, the following points are provided for elaboration or emphasis in this Technical Protocol.

Further guidance is provided in documents TGP/9 "Examining Distinctness" and TGP/8 "Trial Design and Techniques Used in the Examination of Distinctness, Uniformity and Stability".

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 Technical Protocols are familiar with the recommendations contained in the UPOV-General Introduction to DUS prior to making decisions regarding distinctness.

4.1.4 **Number of plants/parts of plants to be examined**

Unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 30 plants or parts taken from each of 30 plants and any other observations made on all plants in the test, disregarding any off-type plants.

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 third column of the Table of Characteristics (see document TGP/9 "Examining Distinctness", Section 4 "Observation of characteristics"):

- **MG**: single measurement of a group of plants or parts of plants
- **MS**: measurement of a number of individual plants or parts of plants
- **VG**: visual assessment by a single observation of a group of plants or parts of plants
- **VS**: visual assessment by observation of individual plants or parts of plants

**Type of observation:** visual (V) or measurement (M)

"Visual" observation (V) is an observation made on the basis of the expert's judgment. For the purposes of this document, "visual" observation refers to the sensory observations of the experts and, therefore, also includes smell, taste and touch. Visual observation includes observations where the expert uses reference points (e.g. diagrams, example varieties, side-by-side comparison) or non-linear charts (e.g. color charts). Measurement (M) is an objective observation against a calibrated, linear scale e.g. using a ruler, weighing scales, colorimeter, dates, counts, etc.

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

For the purposes of distinctness, observations may be recorded as a single record for a group of plants or parts of plants (G), or may be recorded as records for a number of single, individual plants or parts of plants (S). In most cases, "G" provides a single record per variety and it is not possible or necessary to apply statistical methods in a plant-by-plant analysis for the assessment of distinctness.

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

It is of particular importance for users of this Technical Protocol to consult the UPOV-General Introduction to DUS (link in chapter 1 of this document) and TGP 10 'Examining Uniformity' (http://www.upov.int/edocs/tgpdocs/en/tgp_10.pdf) prior to making decisions regarding uniformity. However, the following points are provided for elaboration or emphasis in this Technical Protocol:

(a) Cross-pollinated varieties
The assessment of uniformity should be according to the recommendations for cross-pollinated varieties in the UPOV-General Introduction to DUS.

(b) Hybrid varieties
The assessment of uniformity for hybrid varieties depends on the type of hybrid and should be according to the recommendations for hybrid varieties in the UPOV-General Introduction to DUS.

(c) Vegetatively propagated varieties
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 60 plants, 2 off-types are allowed.

4.3 Stability

4.3.1 It is of particular importance for users of this Technical Protocol to consult the UPOV-General Introduction to DUS (link in chapter 1 of this document) and TGP 11 'Examining Stability' (http://www.upov.int/edocs/tgpdocs/en/tgp_11.pdf).

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 stock to ensure that it exhibits the same characteristics as those shown by the initial material supplied.

5. GROUPING OF VARIETIES AND ORGANIZATION OF THE GROWING TRIAL

5.1 The selection of varieties of common knowledge to be grown in the trial with the candidate varieties and the way in which these varieties are divided into groups to facilitate the assessment of distinctness are aided by the use of grouping characteristics.

5.2 Grouping characteristics are those in which the documented states of expression, even where produced at different locations, can be used, either individually or in combination with other such characteristics: (a) to select varieties of common knowledge that can be excluded from the growing trial used for examination of distinctness; and (b) to organize the growing trial so that similar varieties are grouped together.

5.3 The following have been agreed as useful grouping characteristics:

(a) Plant: height (characteristic 1)
(b) Leaf: diameter (characteristic 7)
(c) Male sterility (characteristic 14)

5.4 If other characteristics than those from the TP are used for the selection of varieties to be included into the growing trial, the EO shall inform the CPVO and seek the prior consent of the CPVO before using these characteristics.
6. INTRODUCTION TO THE TABLE OF CHARACTERISTICS

6.1 Characteristics to be used

The characteristics to be used in DUS tests and preparation of descriptions shall be those referred to in the table of characteristics. All the characteristics shall be used, providing that observation of a characteristic is not rendered impossible by the expression of any other characteristic, or the expression of a characteristic is prevented by the environmental conditions under which the test is conducted or by specific legislation on plant health. In the latter case, the CPVO should be informed.

The Administrative Council empowers the President, in accordance with Article 23 of Commission Regulation N°874/2009, to insert additional characteristics and their expressions in respect of a variety.

Technical Protocols with asterisked characteristics (only for certain vegetable species)

6.1.2 In the case of disease resistance characteristics, only those resistances marked with an asterisk (*) in the CPVO column are compulsory.

States of expression and corresponding notes

In the case of qualitative and pseudo-qualitative characteristics, 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:

<table>
<thead>
<tr>
<th>State</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>small</td>
<td>3</td>
</tr>
<tr>
<td>medium</td>
<td>5</td>
</tr>
<tr>
<td>large</td>
<td>7</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>State</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>very small</td>
<td>1</td>
</tr>
<tr>
<td>very small to small</td>
<td>2</td>
</tr>
<tr>
<td>small</td>
<td>3</td>
</tr>
<tr>
<td>small to medium</td>
<td>4</td>
</tr>
<tr>
<td>medium</td>
<td>5</td>
</tr>
<tr>
<td>medium to large</td>
<td>6</td>
</tr>
<tr>
<td>large</td>
<td>7</td>
</tr>
<tr>
<td>large to very large</td>
<td>8</td>
</tr>
<tr>
<td>very large</td>
<td>9</td>
</tr>
</tbody>
</table>

6.2 Example Varieties

Where appropriate, example varieties are provided to clarify the states of expression of each characteristic.

6.3 Legend

For the CPVO N° column:

G Grouping characteristic – see Chapter 5
(*) Asterisked characteristic – see Chapter 6.1.2
MG, MS, VG, VS – see Chapter 4.1.5
QL Qualitative characteristic
QN Quantitative characteristic
PQ Pseudo-qualitative characteristic
(a)-(b) See Explanations on the Table of Characteristics in Chapter 8.1
(+). See Explanations on the Table of Characteristics in Chapter 8.2

For the UPOV N° column:

The numbering of the characteristics is provided as a reference to the ad hoc UPOV guideline.

(*) UPOV Asterisked characteristic – Characteristics that are important for the international harmonization of variety descriptions.
### 7. TABLE OF CHARACTERISTICS

<table>
<thead>
<tr>
<th>CPVO No.</th>
<th>UPOV No.</th>
<th>Stage, Method</th>
<th>Characteristics</th>
<th>Examples</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1.</td>
<td>MG/VG</td>
<td>Plant: height</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(*)</td>
<td>QN</td>
<td>medium</td>
<td>Divonne</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>tall</td>
<td>Biggy, Jowisz</td>
<td></td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>2.</td>
<td>VG</td>
<td>Foliage: attitude</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(+)</td>
<td>(+)</td>
<td>(a) erect</td>
<td>Biggy, Marlau</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>QN</td>
<td>QN</td>
<td>(a) erect to semi-erect</td>
<td>Jeilo</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>semi-erect</td>
<td>Divonne</td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>3.</td>
<td>VG</td>
<td>Leaf: curvature</td>
<td></td>
<td></td>
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<tr>
<td>(+)</td>
<td>(+)</td>
<td>QN</td>
<td>Very light</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>QN</td>
<td>QN</td>
<td>weak</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>QN</td>
<td>medium</td>
<td>Polystar</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>QN</td>
<td>strong</td>
<td>Grande</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>QN</td>
<td>very strong</td>
<td>Jemná</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>4.</td>
<td>VG</td>
<td>Leaf: waxiness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QN</td>
<td>QN</td>
<td>(a) weak</td>
<td>Staro</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>QN</td>
<td>medium</td>
<td>Jeilo, Polystar</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>QN</td>
<td>strong</td>
<td>Erecta</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>5.</td>
<td>VG</td>
<td>Leaf: intensity of green colour</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QN</td>
<td>QN</td>
<td>(a) very light</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>QN</td>
<td>light</td>
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<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>QN</td>
<td>medium</td>
<td>Divonne</td>
<td>3</td>
<td></td>
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<tr>
<td></td>
<td>QN</td>
<td>dark</td>
<td>Polyfire</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>QN</td>
<td>very dark</td>
<td>Marlau</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>CPVO No.</td>
<td>UPOV No.</td>
<td>Stage, Method</td>
<td>Characteristics</td>
<td>Examples</td>
<td>Note</td>
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<tr>
<td>6.</td>
<td>6.</td>
<td>VG/MS</td>
<td>Leaf: length</td>
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<tr>
<td>(+)</td>
<td>(a)</td>
<td>short</td>
<td>Divonne, Naomi</td>
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<tr>
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<td>medium</td>
<td>long</td>
<td>Jowisz</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>7.      (*</td>
<td>VG/MS</td>
<td>Leaf: diameter</td>
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<td>QN</td>
<td>(a)</td>
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<td>Twiggy</td>
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<td>Marlau</td>
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<td>5</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>large</td>
<td>Staro</td>
<td></td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>8.</td>
<td>MG</td>
<td>Time of sprouting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(+)</td>
<td>(b)</td>
<td>early</td>
<td>Polytvit</td>
<td>3</td>
<td></td>
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<tr>
<td>QN</td>
<td>medium</td>
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<td></td>
<td>late</td>
<td>Erecta</td>
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<tr>
<td>9.</td>
<td>9.</td>
<td>VG</td>
<td>Bud: shape</td>
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<tr>
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<td>(b)</td>
<td>elliptic</td>
<td>Erecta</td>
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<td>round</td>
<td>Prazská</td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>broad ovated</td>
<td>Jemná, Staro</td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>10.</td>
<td>VG/MS</td>
<td>Bud: size</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(+)</td>
<td>(b)</td>
<td>small</td>
<td>Twiggy</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>QN</td>
<td>medium</td>
<td>Divonne</td>
<td></td>
<td>3</td>
<td></td>
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<tr>
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<td>large</td>
<td>Staro</td>
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<tr>
<td>11.</td>
<td>11.</td>
<td>MG</td>
<td>Time of beginning of flowering</td>
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</tr>
<tr>
<td>(+)</td>
<td>(b)</td>
<td>early</td>
<td>Athlet</td>
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<tr>
<td>QN</td>
<td>medium</td>
<td>Divonne</td>
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<tr>
<td></td>
<td>late</td>
<td>Erecta</td>
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<td>12.</td>
<td>12.</td>
<td>VG/MS</td>
<td>Inflorescence: diameter</td>
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<tr>
<td>(+)</td>
<td>(b)</td>
<td>small</td>
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<td>medium</td>
<td>Polyvert</td>
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<td>UPOV No.</td>
<td>Stage, Method</td>
<td>Characteristics</td>
<td>Examples</td>
<td>Note</td>
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<td>-----------------</td>
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<tr>
<td>13</td>
<td>PQ</td>
<td>VG (b)</td>
<td>Flower: colour</td>
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<td></td>
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<td>Jemná</td>
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<td>violet</td>
<td>Jeilo</td>
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<td>14</td>
<td>(+)</td>
<td>VS (b)</td>
<td>Male sterility</td>
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<td>absent to very low</td>
<td>Twiggy</td>
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<td>QN</td>
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<td>low</td>
<td>Toplau</td>
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<td></td>
<td>G</td>
<td></td>
<td>very high</td>
<td>Marlau</td>
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</table>
8. EXPLANATIONS ON THE TABLE OF CHARACTERISTICS

8.1 Explanations covering several characteristics

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

(a) Observations should be made in the first year at the time of fully developed plants, before leaves start to desiccate.

(b) Observations should be made in the second year. Observations of the inflorescence and flower should be made at full flowering stage.

8.2 Explanations for individual characteristics

Ad. 2: Foliage: attitude

1 erect
2 erect to semi erect
3 semi erect

Ad. 3: Leaf: curvature

1 absent or very weak
2 weak
3 medium
4 strong
Ad. 6: Leaf: length

The length of the leaves is defined by the length from the end of the pseudostem to the top of the leaves, in a straight line.

Ad. 8: Time of sprouting

The time of sprouting is when 10% of one-year-old plants show new sprouts at the beginning of the next year after sowing.

Ad. 9: Bud: shape

Observations should be made when 10% of the plants have a bud and directly after bud emergence.

Ad. 10: Bud: size

Observations should be made on fully developed inflorescences, when the spath is fresh and before the start of desiccation.

Ad. 11: Time of beginning of flowering

The time of flowering is when 10% of the plants show flowers.

Ad. 12: Inflorescence: diameter

Observations should be made at the broadest part of fully flowering inflorescences.
Ad. 14: Male sterility
Should be observed at the time of just fully opened flowers, in the second year. In dry weather, when flowers are completely open, male sterility should be assessed by checking if pollen is released from the anthers. This characteristic has to be observed plant by plant; the expression represents the percentage of male sterile plants.

<table>
<thead>
<tr>
<th>State</th>
<th>Note</th>
<th>% male sterility</th>
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<tbody>
<tr>
<td>absent to very low</td>
<td>1</td>
<td>&lt; 10%</td>
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<tr>
<td>low</td>
<td>2</td>
<td>11-80%</td>
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<tr>
<td>very high</td>
<td>3</td>
<td>&gt; 80%</td>
</tr>
</tbody>
</table>
9. **LITERATURE**


Kallos, G. and Bergh, B.O., 1993: “Genetic Improvement of Vegetable Crops.”


10. TECHNICAL QUESTIONNAIRE

The Technical Questionnaire is available on the CPVO website under the following reference: CPVO-TQ/198/2