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Associated Document
to the
General Introduction to the Examination
of Distinctness, Uniformity and Stability and the
Development of Harmonized Descriptions of New Varieties of Plants (document TG/1/3)

DOCUMENT TGP/13
“GUIDANCE FOR NEW TYPES AND SPECIES”

prepared by the Office of the Union
to be considered by the
Council at its forty-third session,
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TABLE OF CONTENTS**PAGE**

1.	INTRODUCTION	3
2.	NEW SPECIES.....	3
2.1	<i>Introduction to “new” species: what is considered as a new species?</i>	<i>3</i>
2.2	<i>Information provided in the Technical Questionnaire or application form</i>	<i>4</i>
2.3	<i>Preparation of the DUS examination/Test Guidelines</i>	<i>5</i>
2.4	<i>Testing distinctness.....</i>	<i>6</i>
2.5	<i>Testing uniformity.....</i>	<i>6</i>
2.6	<i>Testing stability</i>	<i>7</i>
2.7	<i>Variety description</i>	<i>7</i>
3.	INTERSPECIFIC/INTERGENERIC HYBRIDS	9
3.1	<i>Introduction to interspecific/intergeneric hybrids.....</i>	<i>9</i>
3.2	<i>Information provided by the Technical Questionnaire or application form.....</i>	<i>9</i>
3.3	<i>Preparation of the DUS examination</i>	<i>9</i>
3.4	<i>Testing distinctness.....</i>	<i>10</i>
3.5	<i>Testing uniformity.....</i>	<i>10</i>
3.6	<i>Testing stability</i>	<i>10</i>
3.7	<i>Variety description</i>	<i>10</i>
4.	NEW TYPES OF VARIETIES	10
4.1	<i>Introduction to new types of varieties.....</i>	<i>10</i>
4.2	<i>Information given in the Technical Questionnaire or application form.....</i>	<i>11</i>
4.3	<i>Preparation of the technical examination</i>	<i>11</i>
4.4	<i>Testing distinctness.....</i>	<i>12</i>
4.5	<i>Testing uniformity.....</i>	<i>12</i>
4.6	<i>Testing stability</i>	<i>13</i>
4.7	<i>Variety description</i>	<i>13</i>

1. INTRODUCTION

1.1 The 1991 Act of the UPOV Convention requires that its provisions are, within a specified time, applied to all plant genera and species. Testing authorities, especially in relation to ornamental plants, can often be faced with applications for varieties which represent the first application for protection within a plant genus or species.

1.2 As a result of advances in plant breeding, new types of varieties and novel interspecific or intergeneric hybrids continue to be developed.

1.3 This document seeks to provide general guidance for the examination of DUS (the “DUS test”) of varieties with the background described above. It considers new species, novel interspecific or intergeneric hybrids and new types of varieties, each being reviewed with respect to the points that need particular attention for organizing the DUS test and providing a variety description. The starting point in each section of this document is the information provided in the Technical Questionnaire or application form, which is of particular importance given the lack of DUS testing experience for the varieties concerned.

2. NEW SPECIES

2.1 Introduction to “new” species: what is considered as a new species?

2.1.1 A new species is considered to be a species of which the authority responsible for the DUS test has no, or very little, previous experience. This situation covers various possibilities that might be considered as new species, including:

- (a) species for which there have been no previous applications for protection and/or no DUS testing has been performed by the authority concerned;
- (b) species for which there have been no previous applications for protection within UPOV; and
- (c) species which have not previously existed (e.g. intergeneric and interspecific hybrids).

2.1.2 For many species, synonyms exist. As a first step, the botanical name should be checked in the GENIE database [*web address to be provided*], to see if there are other botanical names associated with the relevant UPOV code. The GENIE database, or document TGP/5/1 “Experience and Cooperation in DUS testing”: Section 9: List of Species in Which Practical Knowledge has Been Acquired or for Which National Test Guidelines Have Been Established (TGP/5/1 Section 9), can also identify if any other members of the Union have practical experience of DUS testing for the species concerned. In cases where there is no UPOV code, the Office of the Union should be notified in order that an appropriate UPOV code can be created. In the absence of a UPOV code for the species, it is useful to check in the GRIN database¹ or other relevant sources in order to find the appropriate botanical classification and to check for synonyms which may not be included in the

¹ USDA, ARS, National Genetic Resources Program. *Germplasm Resources Information Network - (GRIN)* [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: <http://www.ars-grin.gov/cgi-bin/npgs/html/taxfam.pl> (February 8, 2006).

GENIE database. In cases of doubt (e.g. where there has been reclassification within genera), the allocation of the UPOV code may also play a significant role in identifying the appropriate botanical classification of the application(s).

2.1.3 It may be necessary to ensure that a claimed new type of variety (e.g. inter-specific hybrid) is indeed a new type for the purposes of distinctness. Document TGP/4/1, Section 2 “Constitution of Variety Collections” explains some factors to be taken into account when establishing a collection of varieties of common knowledge (“variety collection”) which are relevant for the examination of distinctness of candidate varieties. For example, document TGP/4/1, Section 2.2.1.1 explains that “A variety collection may encompass a whole species, or more than one species if there are interspecific hybrids, or may be limited to a subspecies or to types of varieties or groups of varieties within a species or subspecies. [...]”. The use of the variety collection to select varieties to be included in the growing trial or other tests, is addressed in document TGP/9 “Examining Distinctness” (document TGP/9/1), Section 2: Selecting Varieties for the Growing Trial.

2.2 Information provided in the Technical Questionnaire or application form

2.2.1 A Technical Questionnaire for the genus or species concerned might not be available. In cases where a Technical Questionnaire does not exist, the standard Technical Questionnaire provided in document TGP/7: Annex 1 “TG Template”, Chapter 10, can be used as a basis to obtain relevant information from the breeder. This section highlights the importance of the information obtained from the breeder of the candidate variety.

2.2.2 The Technical Questionnaire (see TGP/7/1 Annex I: TG template) or application form is a valuable initial source of information, so it is of paramount importance that it is completed accurately and in full: in completing the Technical Questionnaire or application form, the breeder has a first, important role to play, by providing information on the origin, breeding background, maintenance and reproduction of the variety and a preliminary description of the most important characteristics. Information is often provided on the most similar varieties to the candidate variety which can be useful for confirming the descriptive information given for grouping purposes and can also be used to direct the authority towards the most appropriate varieties for inclusion in the DUS test. There might be also a need to ask the breeder for more information concerning the genus or species to which the variety belongs. It is advisable to verify the information supplied by the breeder concerning the candidate variety and the most similar varieties. This can be done in a preliminary examination of DUS test material, or during the growing trial as soon as the essential descriptive characteristics of the new candidate variety have been determined.

2.2.3 For a candidate variety which is declared to have been “discovered and developed”, details about this discovery and development should be provided.

2.2.4 The breeder should clearly specify the growing conditions of the variety.

2.3 Preparation of the DUS examination/Test Guidelines

2.3.1 As explained above, an authority may receive an application for a variety of a species of which they have no previous experience. In that situation, the first step should be to determine whether UPOV Guidelines for the Conduct of Tests for Distinctness, Uniformity and Stability (Test Guidelines) exist. The list of Test Guidelines can be found at <http://www.upov.int/en/publications/tg-rom/index.html> and relevant Test Guidelines will also be indicated in the GENIE database. If there are no Test Guidelines, a search should be made in TGP/5 Section 9 or the GENIE Database to identify if other members of the Union have practical experience of DUS testing in the species concerned. If this is unsuccessful, it will be necessary to establish an appropriate protocol for the DUS test. The use of Test Guidelines of a similar species and close cooperation with the breeder can help in the development of an appropriate protocol.

2.3.2 For the preparation of an individual authority's guidelines for the conduct of tests for distinctness, uniformity and stability (authority test guidelines) in the absence of Test Guidelines, guidance on the key issues to be addressed is provided in the General Introduction (document TG/1/3, see Chapter 9: Conduct of DUS Testing in the Absence of Test Guidelines) and in document TGP/7/1 "Development of Test Guidelines" and it may also be helpful to discuss the guidelines with neighboring countries or countries which have experience in DUS testing in this or similar species. It should be noted that, for the first applications of a new species, it might not be possible and necessary to develop guidelines with all details foreseen in document TGP/7/1. The DUS testing for a new species and for new variety types does not differ in principle from the testing of any variety. The difference is in the level of testing experience and the details known about that new species.

2.3.3 Before testing begins, it is important to learn as much about the new species as possible and to collect relevant information. The breeder, in addition to the information he provides in the Technical Questionnaire or application form, is the first source of information. Furthermore, the breeder can be requested to submit plant material of parent varieties, however, this is not always possible. In this case other sources of plant material should be explored. Possible other sources of information include botanical literature, trade and industry publications, trade catalogues, information available on the internet, national research institutes, amateur plant collectors and botanical gardens. Knowledge of the growing conditions is important information and sometimes, taking into account particular growing conditions, it might be more efficient or even necessary to organize the testing at the premises of the breeder. Information concerning such an approach can be found in TGP/6 "Arrangements for DUS Testing".

2.3.4 Once an authority has acquired experience in testing a particular species, it should communicate this to the Office of the Union for updating the list of genera and species for which authorities have practical experience in the examination of Distinctness, Uniformity and Stability (document TGP/5 Section 9). Where considered appropriate, according to the factors for prioritizing the commissioning of Test Guidelines set out in TGP/7 "Development of Test Guidelines", Section 2, proposals may be made for the development or revision of Test Guidelines.

2.4 Testing distinctness

2.4.1 For the purposes of distinctness, it is necessary to examine if a new candidate variety is clearly distinguishable from all other varieties whose existence is a matter of common knowledge (“varieties of common knowledge”). The General Introduction (document TG/1/3), Section 5.2 “Varieties of Common Knowledge”, provides guidance on the criteria for “variety” and on aspects which establish “common knowledge”. The selection of varieties of common knowledge for inclusion in the growing trial for comparison with a candidate variety is an important step in the DUS examination and guidance is provided in documents TGP/4 “Constitution and Maintenance of Variety Collections” and TGP/9 “Examining Distinctness”.

2.4.2 It may be useful to consider information on the breeding origin of the candidate variety to gain further background knowledge about the new species. The breeding origin of a variety might provide information on the existence of varieties of common knowledge. It would be useful therefore to contact the authorities in the country of the botanical origin and/or the country of breeding to try to obtain relevant information. It should always be assumed that there are varieties of common knowledge until clear evidence is determined to the contrary. Guidance is available with respect to varieties of common knowledge in TGP/4 and TGP/9. The following scenarios illustrate some considerations with regard to varieties of common knowledge, whilst recognizing that each situation should always be considered on a case-by-case basis:

(i) a variety obtained by propagation from a plant, originating from a population in the wild, of a species not in cultivation. In such a case, if the population(s) in the wild does not (do not) meet the definition of a variety according to Article 1(vi) of the 1991 Act of the UPOV Convention it is possible that there are no varieties of common knowledge;

(ii) a variety obtained by propagation from a plant in a population of a species which is in commercial production. In such a case, if the population(s) in commercial production does not (do not) meet the definition of a variety according to Article 1(vi) of the 1991 Act of the UPOV Convention the chance that there are varieties of common knowledge is rather low.

2.4.3 For further information on the determination of distinctness in various crop types, reference should be made to document TGP/9, “Examining Distinctness”, and to individual Test Guidelines.

2.5 Testing uniformity

2.5.1 Article 8 of the UPOV Convention states that a “variety shall be deemed to be uniform if, subject to the variation that may be expected from the particular features of its propagation, it is sufficiently uniform in its relevant characteristics”.

2.5.2 The General Introduction (document TG/1/3: Section 6.4) states that “where all the plants of a variety are very similar, and in particular for vegetatively propagated and self-pollinated varieties, it is possible to assess uniformity by the number of obviously different plants – “off-types” – that occur. However, where the range of variation within a variety is larger, because of the features of its propagation, and in particular for cross-pollinated, including synthetic, varieties, the plants are not all very similar and it is not

possible to visualize which plants should be considered as atypical or “off-types”. In this case the uniformity can be assessed by considering the overall range of variation, observed across all the individual plants, to determine whether it is similar to comparable varieties”.

2.5.3 The question of how uniformity can be assessed arises if the new variety is the first in a new species and, in particular, if there are no comparable varieties. The level of uniformity required for a candidate variety may sometimes be based upon past experience of what is known to be attainable by the breeding method used and has been shown to have been successful in the maintenance and multiplication of varieties of a similar type in other related species. Information on the setting of uniformity standards, including those for new types and species, is provided in document TGP/10 “Examining Uniformity”, Section 4 “Uniformity Assessment on the Basis of Off-Types” and Section 5 “Uniformity Assessment on the Basis of Standard Deviations”.

2.6 Testing stability

Guidance on testing stability is provided in the General Introduction (document TG/1/3).

2.7 Variety description

2.7.1 Chapter 4.3 of the General Introduction states that in order “to enable varieties to be tested and a variety description to be established, the range of expression of each characteristic in the Test Guidelines is divided into a number of states for the purpose of description, and the wording of each state is attributed a numerical note”.

2.7.2 In the case of the examination of a candidate variety of a new species a description might be developed according to the botanical and the chronological order of plant characteristics described in document TGP/7, “Development of Test Guidelines”, Annex 3, Guidance Note GN26. Relevant publications, including descriptions of the wild species in botanical literature, might serve as a basis to prepare such a description and provide information on the possible variation present within the species. Examples of relevant literature include:

Bioversity International (formerly IPGRI): the list of available descriptors is provided at http://www.bioversityinternational.org/Themes/Germplasm_Documentation/Crop_Descriptors/index.asp

The new Royal Horticultural Society dictionary of Gardening, A. Huxley, M. Griffiths, M. Levy, 1999, Macmillan Reference Ltd, London, UK, ISBN: 0-333-770188 (paperback version, 4 volumes).

Hortica, color cyclopedia of garden flora and indoor plants, Alfred Byrd Graf, 1992, Roehrs Company, Rutherford, NJ, USA, ISBN: 0-911266-25-9.

Exotica, pictorial cyclopedia of exotic plants, Alfred Byrd Graf, 1982, Roehrs Company, Rutherford, NJ, USA, ISBN: 0-911-266-19-4.

Botanica, the illustrated A-Z of over 10,000 garden plants and how to cultivate them, 1999, third edition, Welcome Rain Publisher LLC, New York, USA, ISBN: 1-56649-175-4.

2.7.3 In situations where the variety is the first of the species to be examined by any member of the Union and there are few, or no, varieties of common knowledge against which to make a direct comparison, it is important to choose characteristics which will give a precise indication of the variety, whilst taking into account the fact that little information exists about other varieties of common knowledge, as well as leaving the possibility open for future varieties to be developed which could express different traits. For this reason it is preferable to consider the range of variation within the plant species and to:

- (a) select a set of, more or less, general plant characteristics, starting with a description of the whole plant (shape, length, width), followed by the plant organs such as: stems, leaves, inflorescence, flower, flower parts, fruits etc, as applied in botanical (or Linnaean) descriptions (cf. Dictionary of Gardening);
- (b) list these characteristics in a Table of Characteristics in the format of Test Guidelines;
- (c) states of expression are not required for the characteristics at this stage, but to mention the actual value of the qualitative characteristic, e.g.: 'netted', 'kidney-shaped', etc;
- (d) observe (and consequently describe) qualitative characteristics rather than quantitative or pseudo-qualitative characteristics, since that greatly reduces the chances of allocating an incorrect state of expression;
- (e) if pseudo-qualitative or quantitative characteristics need to be used, instead of using states of expression (as the extremes are not known), in these cases only for the time being to mention the actual measured value, e.g. "plant height approximately 80 cm". These data facilitate the formulation of states of expression later in the process (see Section 2.7.4).

2.7.4 When sufficient varieties of common knowledge, or other plant material, can be collected, or after applications for several varieties have been made for the same species, it should be possible to develop a list of characteristics with states of expression for that species according to the Test Guidelines format. At the time of developing authority test guidelines, more emphasis can be paid to quantitative and pseudo-qualitative characteristics, in addition to the qualitative characteristics which were used for the first varieties to have undergone DUS testing for that species. It is important to try to cover the maximum range of expression of the characteristics within the species concerned in order to develop the new guideline. It should further be kept in mind that future developments in breeding within the species could be inserted into the guideline. The attribution of states of expression should, therefore, leave open the possibility to extend the states of expression for that characteristic. An example of this could be the flower diameter, which might increase with breeding developments for the species. It would, therefore, be advisable to avoid the extreme states of expression for such a characteristic (very small (1) and very large (9)) to describe the first varieties within a species."

3. INTERSPECIFIC/INTERGENERIC HYBRIDS

3.1 Introduction to interspecific/intergeneric hybrids

An interspecific, or intergeneric, hybrid can be considered as a special form of a new species. Although there is a large overlap with the items which are handled in the new species paragraphs of Chapter 2, this section considers the specific problems related to such hybrids.

3.2 Information provided by the Technical Questionnaire or application form

Together with the species name of the parent varieties, the variety description and the species name of the most similar varieties provide useful information.

3.3 Preparation of the DUS examination

3.3.1 The parent species may be well known but the resulting hybrid is new. An example is “plumcots” (*Prunus salicina* (Japanese plum) x *P. armeniaca* (apricot)). In this case, Test Guidelines exist for both parent species and could be used separately or in combination. The first step, in determining whether existing Test Guidelines would be appropriate, is to assess the variety characteristics and determine if the variety is more like one parent than the other. That information may already be available to the examiner via the Technical Questionnaire which the applicant has chosen to complete. With the aforementioned “plumcot” situation, the applicant could be of the opinion that the candidate resembles an apricot more than a Japanese plum, or *vice versa*, and would thus utilize the relevant Technical Questionnaire as the basis of the application; he could also be free to note down the characteristics which are attributable to the parent from the other species. In the planning of the DUS trial, further useful information on the expression of the characteristics of the interspecific/intergeneric candidate variety can be obtained by close analysis of the color photographs which the applicant may have provided together with the application. If one parent has strongly influenced the variety characteristics, then the Test Guidelines for that parent might be used. If a small number of characteristics or states do not correspond to the Test Guidelines selected, then the Test Guidelines for the other parent are also available as a possible source of further appropriate characteristics to enable a full variety description. If the examiner is still unsure about which Test Guidelines to use as the basis of the DUS test, (possibly because there may even be a 50:50 influence from both the parents) he could also request further information from the breeder in order to clarify matters. The resulting variety description at the end of the DUS examination may thus be a mixture of characteristics from both Test Guidelines used for the DUS test; according to the situation and if it is likely that there will be future candidate varieties with a similar parentage, it may become necessary to prepare new authority test guidelines for the interspecific/intergeneric hybrid and potentially new Test Guidelines if hybrid varieties are to be tested in the territories of other members of the Union.

3.3.2 Some Test Guidelines are designed to cover the testing of all varieties in a genus. When Test Guidelines are prepared for a genus, they are usually most suited to a few species within the genus, where there is testing experience. However, that should not limit their use, and genus based Test Guidelines are suitable for the testing of interspecific varieties, where there are not already Test Guidelines existing which cover the parent species of the interspecific hybrid.

3.3.3 Where considered appropriate, according to the factors for prioritizing the commissioning of Test Guidelines set out in TGP/7 “Development of Test Guidelines”, Section 2, proposals may be made for the development or revision of Test Guidelines.

3.4 Testing distinctness

Guidance on testing distinctness is provided in the General Introduction and TGP/9 “Examining Distinctness”.

3.5 Testing uniformity

3.5.1 It might be assumed that the uniformity standard applied to an interspecific/intergeneric hybrid should be the same as for its parents. However, that might not always be appropriate. For example, as a result of the crossing of different genera or species, sterility might be an outcome of the crossing. In the case of seed-propagated crops, the resulting interspecific/intergenic variety may be vegetatively propagated and as a consequence, different uniformity standards to the parents may be necessary.

3.5.2 Guidance on testing uniformity is provided in the General Introduction and TGP/10 “Examining Uniformity”.

3.6 Testing stability

Guidance on testing stability is provided in the General Introduction (document TG/1/3).

3.7 Variety description

As mentioned in paragraph 3.3.1, the parent Test Guidelines, or in case of interspecific hybrids the Test Guidelines of a genus concerned, should be used if possible.

4. NEW TYPES OF VARIETIES

4.1 Introduction to new types of varieties

4.1.1 New breeding techniques are continually becoming available to breeders, often transposed from more advanced breeding or multiplication systems used in other species. As a result, novel variety types such as: complex hybrid variety systems with varying levels of plant-to-plant uniformity; clonal varieties derived from within sexually reproduced and more variable populations; and species where more variable seed-propagated varieties in addition to hitherto highly uniform vegetatively propagated varieties, are increasingly being introduced. More generally speaking, new types of varieties are particularly related to varieties propagated by methods which are new for the species concerned.

4.1.2 The DUS testing of new types of varieties does not differ in principle from the testing of any variety, since, unless otherwise specified, the same set of characteristics in the relevant Test Guidelines is applicable. The examiner should, however, be aware that new types of

varieties may require additional considerations to be taken into account when setting up the trial design and assessing distinctness and uniformity.

4.2 Information given in the Technical Questionnaire or application form

4.2.1 The information given in the Technical Questionnaire or application form allows the examiner to identify a variety as a new type. If doubts arise as to whether the candidate is a new type of a variety, the breeder should be contacted to provide more detailed information, since it is important to know about the breeding background of the variety as well as its maintenance and reproduction. The examiner should find out from the breeder the features which make the new type different to varieties commonly developed in the species in question in order to gauge whether this information may have an impact on the usual preparation of the trial conditions and conduct of the technical examination.

4.2.2 It is important to collect as much information as possible on the new type, for example by searching for botanical literature or contacting research institutes.

4.2.3 It is highly recommended to contact examiners from other testing stations in order to find out if a similar variety has already been tested elsewhere, and if so, to learn as much as possible from their experience.

4.3 Preparation of the technical examination

4.3.1 Most of the cases concerning a new type of variety relate to a new propagation method. Under these circumstances it is advisable to use as a starting point the Test Guidelines applicable to the species concerned. The examiner should use as many of the characteristics outlined in the Test Guidelines as possible, and only those which may not be expressed due to the nature of the new type should be excluded. The standards given in the Test Guidelines concerning distinctness and uniformity might need to be adapted (see Sections 4.5 and 4.6 below).

4.3.2 If there are special growing conditions for the new type of variety, the breeder should declare this. Depending on the breeding background and/or the method of propagation, if this is different from normal for a given species, the trial set up might need to be changed. For example, for certain species where hybrids are a new occurrence, the examiner needs to evaluate the possibility or necessity to include in the trial the parental lines. Depending on the hybrid system, it needs to be clarified which components need to be grown: It can be sufficient to include only the female and the male parent, but in other cases it might be necessary to include also the maintainer and/or restorer components.

4.3.3 In case of traditionally seed-propagated species where vegetatively propagated varieties appear, it might be appropriate to review the quantity of plant material requested and the number of growing cycles, taking into account the high level of uniformity expected for this material.

4.3.4 In case of seed-propagated varieties in a species where vegetative propagation is predominant, it might be helpful to grow both types of varieties, seed-propagated and vegetatively propagated, at the same time in order to get a better idea of the variation of the varieties in each propagation type. The same applies for species which are predominantly

seed-propagated and where the new type is vegetatively propagated. This can be helpful for the definition of an adequate uniformity standard for the new type.

4.4 Testing distinctness

4.4.1 The document TGP/3 “Varieties of common knowledge” gives guidance with respect to the varieties to be considered for comparison in the framework of the assessment of distinctness.

4.4.2 It should be noted that a different feature of propagation is not a basis for distinctness. In the same respect, a new type of variety is not distinct to an already existing variety of the commonly used propagation method just because it is more, or less, uniform. Consequently, the new type of variety should always be compared to the similar varieties of the same species although they might have different propagation methods.

4.4.3 Guidance on testing distinctness is provided in the General Introduction and TGP/9 “Examining Distinctness”.

4.5 Testing uniformity

4.5.1 General information on the principles of testing uniformity should be sought in TGP/10 “Examining Uniformity”.

4.5.2 Uniformity standards are fixed taking into account the features of propagation. Often a new type differs in the way of propagation. Consequently, the usually applied standard in a species might need to be adapted to the new type.

4.5.3 If, in a normally seed-propagated species, the new type is vegetatively propagated, it should be no problem to apply the UPOV standards for vegetatively propagated species (by taking into account the sample size).

4.5.4 If, in a normally vegetatively propagated species, the new type is seed-propagated and self-pollinated, it might be helpful to grow both types side-by-side (as explained above) in order to see the difference in variation especially in the new type of variety. The examiner should try to find the adequate population standard, together with the adequate acceptance probability. Given the assumption that self-pollinated varieties by nature should not have a bigger intra-varietal variation than vegetatively propagated varieties, the number of off-types allowed in the new type should be similar to those in the commonly used types.

4.5.5 If the new type is a cross-pollinated variety, relative uniformity standards should be applied. For some species, material with a similar method of propagation might exist in the market. This material could be grown in order to have an idea of its level of uniformity. However, relative uniformity standards might not exist because the new variety is the first of its type. In this case it is recommended to find out the uniformity standards applied in similar species where varieties of the same type have been tested already. It is important to choose a balanced uniformity standard: Setting the uniformity standard too low could have the consequence of protecting a variety with a large variation in the expression of its characteristics and this way making it more difficult to establish distinctness for subsequent candidate varieties of that new species or type. Setting uniformity standard too high may lead

to the rejection of the variety although, under consideration of the genetic background, the variety could not be more uniform due to the inherent genetic variation.

4.5.6 The uniformity standards for hybrids depend on the hybrid system, the type of the hybrid and the genetic variation in the parental lines. It is important to obtain as much information as possible from the breeder about the new type in order to choose the adequate standards.

4.5.7 The exchange of information and opinions with other examiners is very important with view to a harmonized standard setting throughout the different testing stations (where this is possible according to the environmental conditions).

4.6 Testing stability

Guidance on testing stability is provided in the General Introduction (document TG/1/3).

4.7 Variety description

4.7.1 The variety description of a new type of variety should be based on the given Test Guidelines and therefore similar to the usual variety descriptions. The agreed UPOV template of variety descriptions gives the possibility to add specific features, due to the new type, in the variety description.

4.7.2 In cases where the new type represents a hybrid system where the components have been observed as well, they could also be described and added to the variety description.

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