

UPOV

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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS
GENEVA

DRAFT

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/11

“EXAMINING STABILITY”

Document prepared by an expert from the European Union

*to be considered by the Enlarged Editorial Committee at its meeting
to be held in Geneva, Switzerland, on January 6, 2011*

Note for Draft version

Footnotes will be retained in published document

Endnotes are for background information when considering this draft and will not appear in the final, published document

1. INTRODUCTION

The General Introduction (document TG/1/3) explains the following with regard to Stability:

“7.1 Requirements of the UPOV Convention

Article 6 (1)(d) of the 1961/1972 and 1978 Acts of the UPOV Convention require that a variety “must be stable in its essential characteristics, that is to say, it must remain true to its description after repeated reproduction or propagation or, where the breeder has defined a particular cycle of reproduction or multiplication, at the end of each cycle.” Similarly, Article 9 of the 1991 Act of the UPOV Convention requires that a variety “shall be deemed to be stable if its relevant characteristics remain unchanged after repeated propagation or, in the case of a particular cycle of propagation, at the end of each such cycle.”

“7.2 Relevant / Essential Characteristics

The relevant or essential characteristics include at least all characteristics used for the examination of DUS or included in the variety description established at the date of grant of protection of that variety. Therefore, all obvious characteristics may be considered, irrespective of whether they appear in the Test Guidelines or not.”

Thus it is clear that in the context of the UPOV Convention, references to Stability and its examination refer to the stability **of the variety itself**, after repeated propagation. Differences in the expression of a characteristic that occur on a part of the plant are to be considered with regard to uniformity, and not stability. This is outlined in document TGP/10/1 Sections 4.2.2.4 and 4.2.2.3.

2. EXAMINATION OF STABILITY

2.1 Nature of stability and its connection with uniformity

2.1.1 The General Introduction explains the following with regard to the examination of Stability:

“7.3.1.1 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. Furthermore, if the variety is not stable, material produced will not conform to the characteristics of the variety, and where the breeder is unable to provide material conforming to the characteristics of the variety, the breeder’s right may be cancelled.

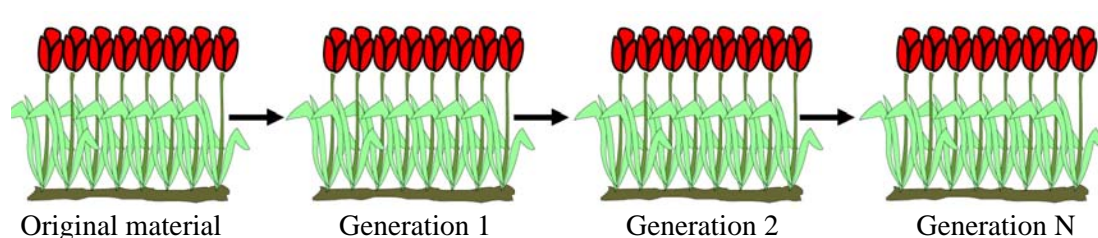
“7.3.1.2 Where appropriate, or in cases of doubt, stability may be tested, either by growing a further generation, or by testing a new seed or plant stock to ensure that it exhibits the same characteristics as those shown by the previous material supplied. Further guidance on the examination of stability is considered in document TGP/11, “Examining Stability.” ”

The purpose of document TGP/11, therefore, is to provide guidance, in the form of illustrative examples, on the examination of stability where this is considered suitable by the examination authority.

2.1.2 The stability of the candidate variety depends on the maintenance breeding effort in order to ensure that the variety will remain in conformity to the type and uniform. Samples resulting from repeated propagation of the candidate variety should be uniform and conform to the initial sample for all relevant characteristics. The examination of stability does not have to be made on the subsequent generation as that examined for distinctness and uniformity; stability could be examined by observation of plant material produced after several intervening cycles of propagation. Stability can therefore be considered to be uniformity over time, as illustrated below:

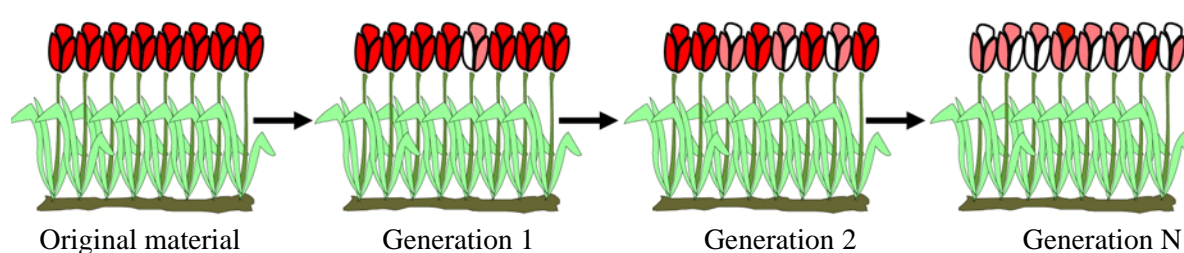
Stable variety

The relevant characteristics of the variety do not change through the generations



Variety is not stable

The relevant characteristics of the variety change through the generations. The plant grouping no longer retains the expression of the relevant characteristics of the original variety.



2.2 Practical aspects to consider for the examination of stability

Where considered appropriate, the testing of stability should be conducted by either: (i) testing a new seed or plant stock, or (ii) testing a seed or plant stock obtained from propagation of the initial sample. In the case of (i), the examination authority should request the applicant to provide the sample of plant material to be tested for stability. In the case of (ii) the propagation cycle can be undertaken by the examination authority as long as it can ensure the safety and reliability of the propagation procedure; this should nonetheless be an exceptional situation.

2.3 Examples of examining for stability

2.3.1 The examples in the following Annexes illustrate possible approaches of how individual authorities address the examination of stability. These examples relate to situations where the examination authority has chosen to ascertain whether the stability criterion has been met by the candidate varieties as a matter of routine; no examples are provided though for cases of doubt concerning the stability of a particular variety.

[Annex I follows]

ANNEX I

Annex I Examination based on samples submitted by the breeder

I.1 *Phaseolus vulgaris* in Australia: Two seed samples of the candidate variety, from different cycles of propagation, are requested from the breeder and sown in the DUS trial side by side. For testing stability, the second sample of the candidate variety is compared to the first sample to establish that there is no difference between them in their relevant characteristics. The variety is considered to be stable if the two samples conform with each other.

I.2 A similar approach as under I.1 is used for hybrid varieties where the stability is tested on the hybrid itself. The breeder is requested to submit samples from different cycles of propagation, which are compared side-by-side in the field.

I.3 *Malus domestica* mutation varieties in New Zealand: Five trees of the candidate variety on a designated rootstock are provided to the examination authority, with no more than 20% of the trees coming from any single stick of budwood. A separate sample of second generation trees of the candidate variety on the same designated rootstock (also with no more than 20% of trees coming from any single stick of budwood) is planted at the same time as the trees supplied to the examination authority, although this trial can be at a different location if the applicant expresses such a wish. For testing stability, the second sample of the candidate variety is compared to the first sample to establish that there is no difference between them in their relevant characteristics.

[Annex II follows]

ANNEX II

Annex II Examination based on a sample harvested by the authority from the initial sample

II.1 *Zea mays* parental lines in France: seed from the initial sample of the candidate variety is to be sown alongside the subsequent generation of seed of the candidate variety.

(a) When the technical examination is carried out as a two-year DUS test by the examination authority, a part of the submitted seed sample is sown in a specific trial to produce selfings. In the second year the seeds harvested on six selfings are sown in ear-rows besides a two-row plot sown with seeds of the submitted sample. All the characteristics are checked on the ear-rows in comparison with the plot. The candidate parent line variety is declared stable if at least 5 ear-rows conform to the plot.

(b) When the technical examination is carried out partly using the applicant's results (one year of testing for distinctness and uniformity carried out by the applicant) the applicant is asked to provide to the examination authority seeds of the candidate variety in the year "n-1" (the year in which the applicant carries out half of the test for distinctness and uniformity) and 6 non-thrashed ears of the candidate variety are sent to the examination authority in year "n". The ears are threshed by the examination authority and sown in ear-rows close by a plot sown with seeds of the submitted seed sample. All the characteristics are checked on the ear-rows in comparison with the plot. The candidate parent line variety is declared stable if at least 5 ear-rows conform to the plot. The only objective is to look at the conformity of the two generations in their relevant characteristics.

II.2 In the case of maize hybrids in France, the DUS examination on hybrids involves the examination of the hybrid by examination of the parent lines and the parent formula. The stability of the hybrid is based on the stability of the parental lines, as described in II.1, and the verification of the formula on the basis of the initial sample of the hybrid.

[End of Annex II and of document]

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Background notes to document TGP/11 Draft 9

At its forty-fifth session, held in Geneva from March 30 to April 1, 2009, the Technical Committee (TC) considered document TGP/11/1 Draft 5 and agreed that the following aspects should be addressed in the subsequent draft:

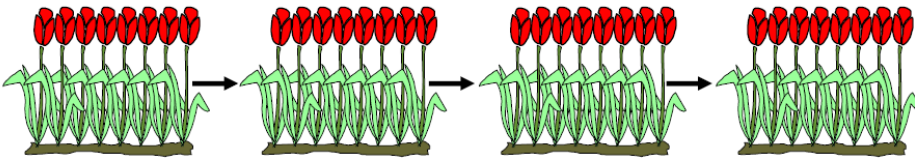
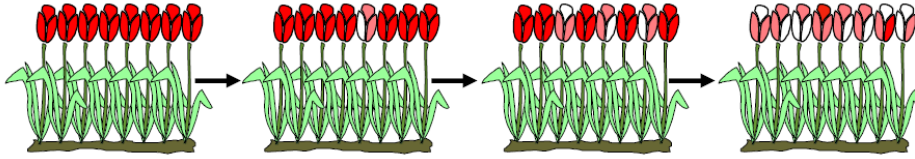
- (i) as agreed by the CAJ [see document CAJ/58/6 "Report on the Conclusions", paragraph 11], to consider only the examination of stability in the context of the DUS examination;
- (ii) to explain the nature of stability and why it is connected to uniformity in such a way that the General Introduction states that "for many types of variety, when a variety has been shown to be uniform, it can also be considered to be stable" (General Introduction, Chapter 7.3.1.1);

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- (iii) to avoid text stating that “stability is not examined” (see Sections 2.1.2, 2.1.3, 2.1.5(a));
 - (iv) to avoid explanations of uniformity (e.g. Section 2.1.4 (a) and (b)) – if necessary to explain aspects of uniformity, to make a reference to TGP/10/1 “Examining Uniformity” or to quote text of TGP/10/1;
 - (v) to focus the document on providing practical guidance on situations concerning specifically stability (not uniformity), e.g. Section 2.1.4 (c);
 - (vi) in addition to guidance on the examination of stability through the examination of uniformity, to provide guidance on the direct examination of stability, with the assistance of experts from Australia; and
 - (vii) in relation to Section 2.2.3, to note that the TC-EDC has proposed that the standard wording for stability in Test Guidelines be amended as follows (see document TGP/7/2 Draft 2 ASW 9 (TG Template Chapter 4.3.2) – Stability assessment general)

“Where appropriate, or in cases of doubt, stability may be further examined ~~tested, either by growing a further generation, or by testing a new [seed or plant] stock to ensure that it exhibits the same characteristics as those shown by the previous initial material supplied.~~”

The following comments were made on document TGP/11 Draft 8 by the Technical Working Parties at their sessions in 2010:

1.	(TWA, agreed by TWV) to replace the paragraph after the extract from the General Introduction with a text incorporating a reference to document TGP/10/1, Section 4.2.2.4, in order to explain that differences in the expression of a characteristic that occur on a part of the plant are considered with regard to uniformity.
1.	(TWO, agreed by TWF) to add to the paragraph after the extract from the General Introduction with a text incorporating a reference to document TGP/10/1, Sections 4.2.2.4 and 4.2.3, in order to explain that differences in the expression of a characteristic that occur on a part of the plant are considered with regard to uniformity.
2.1.1	(TWA, agreed by TWV) to add an explanation that the purpose of document TGP/11 is to provide guidance, in the form of illustrative examples, on the examination of stability where that is considered appropriate.
2.1.2	(TWA, agreed by TWV) to read “The stability of the candidate variety depends on the maintenance breeding effort in order to ensure that the variety will remain in conformity to the type and uniform. Samples resulting from repeated propagation of the candidate variety should be uniform and conform to the initial sample for all relevant characteristics.”
2.1.2	(TWO, agreed by TWF) to emphasize the importance of the maintenance breeding effort in order to ensure that the variety will remain in conformity to the type and uniform.
2.1.2	(TWO, agreed by TWF) to clarify that stability does not have to be examined by looking at the subsequent generation, i.e. stability could be examined by observation of material produced after several intervening cycles of propagation
2.1.2	(TWO, agreed by TWF) to elaborate on why stability can be considered to be uniformity over time, with the aid of an illustration such as that provided in the DL-205 course as follows:

	<div data-bbox="422 232 1370 539"> <p style="text-align: center;">Stable variety</p> <p>The relevant characteristics of the variety <u>do not change</u> through the generations.</p>  <p style="text-align: center;">Original material Generation 1 Generation 2 Generation N</p> </div> <div data-bbox="422 562 1370 920"> <p style="text-align: center;">Variety not stable</p> <p>The relevant characteristics of the variety <u>change</u> through the generations. The plant grouping no longer retains the expression of the relevant characteristics of the original variety.</p>  <p style="text-align: center;">Original material Generation 1 Generation 2 Generation N</p> </div>
2.2	<p>(TWA) to read “Where considered appropriate, the testing of stability should be conducted by either: (i) testing a new seed or plant stock, or (ii) testing a seed or plant stock obtained from propagation of the initial sample. In the case of (i), the examination authority should request the applicant to provide the sample of plant material to be tested for stability. In the case of (ii), the propagation cycle can be undertaken by the examination authority as long as it can ensure the safety and reliability of the propagation procedure.”</p> <p><i>Comments on TWA proposal</i></p> <p><i>(TWV) with regard to the TWA proposal, it should be clarified that approach (ii) should be an exceptional situation</i></p>
2.3	<p>(TWO, agreed by TWF) to explain that the examples only relate to situations where the examination authority has chosen to ascertain whether the stability criterion has been met by candidate varieties as a matter of routine and that no examples are provided for cases of doubt concerning the stability of a particular variety</p>

2.3

(TWA) to read as follows:

“2.3.1 The following examples illustrate possible approaches of how individual authorities address examination of stability.

2.3.2 *Examination based on samples submitted by the breeder*

2.3.2.1 *Phaseolus vulgaris* in Australia: Two seed samples of the candidate variety, from different cycles of propagation, are requested from the breeder and sown in the DUS trial side by side. For testing stability, the second sample of the candidate variety is compared to the first sample to establish that there is no difference between them in their relevant characteristics. The variety is considered to be stable if the 2 samples conform with each other.

2.3.2.2 A similar approach as under 2.3.2.1 is used for hybrid varieties where the stability is tested on the hybrid itself. The breeder is requested to submit samples from different cycles of propagation, which are compared side-by-side in the field.

2.3.3 *Examination based on a sample harvested by the authority from the initial sample*

2.3.3.1 *Zea mays* parental lines in France: seed from the initial sample of the candidate variety is to be sown alongside the subsequent generation of seed of the candidate variety.

(a) When the technical examination is carried out as a two-year DUS test by the examination authority, a part of the submitted seed sample is sown in a specific trial to produce selfings. In the second year the seeds harvested on six selfings are sown in ear-rows besides a two-row plot sown with seeds of the submitted sample. All the characteristics are checked on the ear-rows in comparison with the plot. The candidate parent line variety is declared stable if at least 5 ear-rows conform to the plot (1 different ear-row is accepted to take into account the risk of a mistake by the authority when producing selfings).

	<p>(b) When the technical examination is carried out partly using the applicant's results (one year of testing for distinctness and uniformity carried out by the applicant) the applicant is asked to provide to the examination authority seeds of the candidate variety in the year "n-1" (the year in which the applicant carries out half of the test for distinctness and uniformity) and 6 non-threshed ears of the candidate variety are sent to the examination authority in year "n". The ears are threshed by the examination authority and sown in ear-rows close by a plot sown with seeds of the submitted seed sample. All the characteristics are checked on the ear-rows in comparison with the plot. The candidate parent line variety is declared stable if at least 5 ear-rows conform to the plot (1 different ear-row is accepted to take into account the risk of mistake done by the authority when producing selfings).</p> <p>The only objective is to look at the conformity of the 2 generations in their relevant characteristics.</p> <p>2.3.3.2 In the case of hybrids, stability is based on the stability of the parental lines, as described in 2.3.3.1, and the verification of the formula on the basis of the initial sample of the hybrid."</p> <p><i>Comments on TWA proposal:</i></p> <p><i>(TWC, agreed by TWV) with regard to the TWA proposal, the last sentence of 2.3.3.1 (a) and (b) to read "The candidate parent line variety is declared stable if at least 5 ear-rows conform to the plot (1 different ear-row is accepted to take into account the risk of mistake done by the authority when producing selfings)." </i></p> <p><i>(TWC) to consider adding examples for vegetable, fruit and/or ornamental crops to TWA proposal.</i></p> <p><i>(TWV)</i></p> <p style="padding-left: 40px;"><i>(a) the illustrative examples in Section 2.3 should be presented as Annexes;</i></p> <p style="padding-left: 40px;"><i>(b) example 2.3.3 (Zea mays) should clarify that, in France, the DUS examination on hybrids involves the examination of the hybrid by examination of the parent lines and the parent formula; and</i></p> <p style="padding-left: 40px;"><i>(c) with regard to the TWC proposal to add examples for vegetable crops, Phaseolus vulgaris is a vegetable crop</i></p>
2.3	(TWF) to add an example for the testing of stability of apple mutation varieties in New Zealand
2.3.4	(TWA, agreed by TWV, TWO) to be deleted.
2.4	(TWA, agreed by TWV, TWO) to be deleted.

In response to the ongoing concerns of the International Seed Federation (ISF), with regard to the submission of parent lines for hybrid varieties of vegetables where the parent lines were not examined as a part of the DUS examination of the hybrid, the TWV, at its forty-fourth session, agreed to propose to the TC that it consider organizing a seminar to discuss that issue.