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TWA/29/15
ORIGINAL: English
DATE: June 2, 2000

UPOV

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS
GENEVA

TECHNICAL WORKING PARTY FOR AGRICULTURAL CROPS

Twenty-Ninth Session
Uppsala, Sweden, June 27 to 30, 2000

DIFFERENT LEVELS OF UNIFORMITY IN CHARACTERISTICS USED FOR DISTINCTNESS

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DIFFERENT LEVELS OF UNIFORMITY IN CHARACTERISTICS USED FOR DISTINCTNESS:

The Use of Additional Characteristics, Introduction of New Characteristics and the Development of Sets of Characteristics for New Types and Species

This paper examines the importance of guidance on different levels of uniformity in characteristics used for distinctness with particular consideration of:

the use of additional or new characteristics for existing variety types
the development of a suitable set of characteristics for new types and species.

It is important to understand at the outset that the introduction of the concept of Essential Derivation in the UPOV Convention removes the need to consider whether the use of characteristics will erode the protection for varieties. This paper will consider the technical requirement for the use of characteristics to demonstrate that varieties are clearly distinguishable as required by the UPOV Convention.

Another fundamental principle which should be clarified is that once a variety has been determined to be sufficiently uniform for registration there can be no requirement to require that uniformity for new or additional characteristics can be sought, retrospectively, under the UPOV Convention.

A. Use of Additional or New Characteristics for Existing Types

In some situations it may be appropriate to consider new or additional characteristics to establish the distinctness of varieties. For the purpose of this paper "additional" characteristics are those which are not used in routine DUS assessment but may be used to resolve distinctness where this is not possible using the routine set of characteristics. "New" characteristics are those which have not been used previously for DUS but may now be useful either as a part of the routine DUS assessment or as additional characteristics.

The common factor for both types of characteristic is that the DUS assessment of existing varieties or candidates will not have considered UNIFORMITY for these characteristics.

The situation may then occur that the candidate variety is uniform for the new or additional characteristic but a similar reference variety is not uniform or vice-versa. The issue is whether the candidate variety can be considered to be distinct by using a character which is not uniform. There are two possibilities:

1. Lack of absolute uniformity in a characteristic <u>but no</u> overlap between the varieties e.g. (characteristic which can exist in different forms)

Example	Candidate Variety	Reference Variety
i)	Form A	Form B (50%): C (50%)
ii)	Form A (50%): B (50%)	Form C (50%)
iii)	Form A (50%): B (50%)	Form C (50%): D (50%)

Proposal:

In these situations the candidate variety is clearly distinguishable.

Indeed it could be interpreted as absolute uniformity for absence of certain forms; in example i) "absence of form A" is 100% absent in the candidate variety but 100% present in the reference variety.

Some people may conclude that there is no need to require "absolute" uniformity in the routine DUS characteristics but this would greatly reduce the scope for distinctness. This is explored further in section B (the development of a suitable set of characteristics for new types and species).

2. Lack of absolute uniformity in a characteristic <u>and</u> overlap between the varieties

In this situation there is a need to address the interpretation of ***sufficient*** uniformity within different types of variety e.g. self-pollinated / cross-pollinated / synthetic / vegetative etc... .

The draft UPOV General Introduction (TC/36/8)recognises these differences by establishing two different approaches to the determination of sufficient uniformity:

a) OFF-TYPES: For vegetatively propagated varieties, self-pollinated varieties and in-bred lines of hybrid varieties the assessment of uniformity is based on the concept of off-types (TC/36/8, Section 7.4)

b) RELATIVE TOLERANCE LIMITS: For cross-pollinated, mainly cross-pollinated and synthetic varieties relative tolerance limits are set by comparison with existing varieties (TC/36/8, Section 7.5)

It is necessary to consider the situation separately for these different approaches:

a) OFF-TYPES

The following example is for a characteristic which exists in various forms. If a variety is uniform for one form (e.g. form A) it would be recognised as distinct from a variety which was uniform for a different form (e.g. form B).

Example	Candidate Variety X	Reference Variety Y
i)	Form A	Form A (50%): B (50%)
ii)	Form A (50%): B (50%)	Form A (50%)
iii)	Form A (50%): B (50%)	Form B (50%): C (50%)

In these circumstances it is difficult to envisage how the candidate and reference variety can be considered to be clearly distinguishable. Certain anomalies would arise. For example i), certain plants (those of form B) of variety Y in variety X would be off-types but plants of variety in X in Y would always be considered to be the variety Y. The concept of variety distinctness and off-types are specifically linked (TC/36/8 section 7.4) and it would be anomalous to accept a variety which would not always be considered to be an off-type in another variety.

Proposal: Where uniformity is assessed using the concept of off-types, distinctness must only be determined on characteristics for which there is sufficient uniformity in the varieties

In some situations it may be very desirable to be able to develop the “uniform” form of a characteristic which is non-uniform in an existing variety. For example, variety X may be made up of two forms; one of which is resistant to a new strain of disease and one which is susceptible. Under the proposed rule above a new variety which contained 100% of the resistant form could not be considered distinct. However, in the following examples possible solutions are explored:

Original variety forms	Developer of New Variety	Means of Resolution	Original variety: new definitive sample	New variety
80% Susceptible: 20% Resistant	Owner	Develop maintenance programme which selects only resistant form	100% Resistant	n/a
80% Susceptible: 20% Resistant	Breeder A	Breeder A develops 100% resistant form. This would be an EDV and Breeder A would require authorisation from the owner of the original variety and (although unlikely to be achieved) would require the owner to accommodate the new variety by maintaining the original variety in 100% susceptible form	100% Susceptible	100% Resistant
99% Susceptible: 1% Resistant	Breeder A	Consider the original variety is susceptible and resistant form is an off-type. The "off-type" variety would be an EDV.	100% Susceptible	100% Resistant

b) RELATIVE TOLERANCE LIMITS

If the variety contains distinct forms, as illustrated in the example for off-types, the off-type procedure can be applied. However, it is often the case that the characteristics will contain a range of expression. There are two possible situations which may arise.

i) Different range of expression but same mean value:

Example	Candidate Variety X		Reference Variety Y	
	Range	Mean Value	Range	Mean Value
*1	58-72	65	63-67	65
*2	63-67	65	58-72	65

In both these examples it is accepted that the candidate variety would fail the distinctness requirement.

ii) Different range of expression and different mean value:

Example	Candidate Variety X		Reference Variety Y	
	Range	Mean Value	Range	Mean Value
*1	56-66	61	58-72	65
*2	58-64	61	58-72	65
*3	58-70	64	58-72	65

Example *1 is the typical situation which is found where relative uniformity is used and it is accepted that X and Y are clearly distinguishable provided the range of expression is within the acceptable limits for relative uniformity.

Example *2 is a situation where X has been selected entirely from within the variability in Y. (If this variety is granted PBR it will be an EDV.). The candidate variety must be sufficiently uniform if Y is accepted as uniform. However, the key consideration is whether X and Y are clearly distinguishable. There is no reason why these should not be considered to be clearly distinguishable if X and Y in *1 are considered clearly distinguishable. The only logical explanation for not accepting distinctness would be if distinctness requires that at least some of the plants of X are different from at least some of the plants of Y. This test has not been applied in normal DUS assessments.

Propose for characteristics where relative tolerance limits are used for assessment of uniformity that, provided uniformity requirements are met, distinctness can be established by different mean values (where these are sufficient for distinctness) regardless of whether the range of expression in one variety is contained entirely within the other.

Example *3 illustrates where variety X and Y would probably not be distinct because the difference would not be sufficient.

B. The Development of a Suitable Set of Characteristics for New Types and Species.

As explained above, it is possible to establish distinctness (in some circumstances) where varieties are not uniform in absolute terms. However, it is preferable to require reasonable uniformity in a set of characteristics which will be most important in establishing distinctness for a range of varieties, even where the characteristics concerned may not be used for distinctness in a particular variety. This is a fundamental basis of the harmonisation of the Test Guidelines.

The need for uniformity in a set of characteristics is particularly important where uniformity is based on off-types. If there is a lack of uniformity in important characteristics it will greatly restrict the scope for distinctness within a collection of varieties. For this reason the UPOV General Introduction (TC/36/8 section 7.1 and TGP/10) sets out this requirement.

Where uniformity is assessed on the basis of relative tolerance limits the lack of uniformity for the first variety of a type is less of a problem for restricting distinctness in future varieties. We have seen above that varieties can be selected from entirely within existing varieties. However, there is still an important need for setting reasonable uniformity standards in the first varieties of a new type. If new varieties are allowed to set a very low uniformity standard they may occupy the majority of the variation to be found in that type. Although the distinctness of subsequent varieties could still be established (see above) it could lead to all new varieties being considered to be EDV's.

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