

UPOV

TGP/10.2 Draft 1

ORIGINAL: English

DATE: June 3, 2002

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS
GENEVA

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/10
“EXAMINING UNIFORMITY”

Section TGP/10.2: Assessing Uniformity According to the Features of Propagation

Document prepared by an expert from Germany

to be considered by the

Technical Working Party on Automation and Computer Programs (TWC), at its twentieth session to be held in Texcoco, Mexico, from June 17 to 20, 2002

Technical Working Party for Vegetables (TWV), at its thirty-sixth session to be held in Tsukuba, Japan, from September 9 to 13, 2002

Technical Working Party for Agricultural Crops (TWA), at its thirty-first session to be held in Rio de Janeiro, Brazil, from September 23 to 27, 2002

Technical Working Party for Ornamental Plants and Forest Trees (TWO), at its thirty-fifth session to be held in Quito, from November 18 to 22, 2002

Technical Working Party for Fruit Crops (TWF), at its thirty-third session to be held in San Carlos de Bariloche, Argentina, from November 25 to 29, 2002

SECTION 10.2**ASSESSING UNIFORMITY ACCORDING TO
THE FEATURES OF PROPAGATION**

1. The variation in the expression of characteristics within varieties is the critical consideration in the judgment of uniformity. This variation has both genotypic and environmental components. The genotypic component is mainly influenced by the features of propagation. According to Article 8 of the 1991 Act of the UPOV Convention, uniformity of a variety is therefore considered on the basis of "... the variation that may be expected from the particular features of its propagation, ..." The level of environmental variation depends on the sensitivity of individual plants to environmental influences. There is usually little environmental variation for qualitative characteristics. For quantitative characteristics, the level of environmental variation can differ from species to species and from characteristic to characteristic.

(a) A high level of genotypic homogeneity is expected for vegetatively propagated and truly self-pollinated varieties. Variation within such varieties should result, predominantly, from environmental influences.

(b) Variation within mainly self-pollinated varieties should also result, predominantly, from environmental influences but a low level of genotypical variation caused by some cross pollination is accepted. Therefore, the tolerance limit for uniformity may be higher than for vegetatively propagated and truly self-pollinated varieties.

(c) In cross-pollinated varieties (including synthetic varieties) variation within varieties results from both genotypical and environmental components. In relation to self-pollinated, vegetatively propagated and mainly self-pollinated varieties a higher genotypical variation is accepted. The overall level of variation is, therefore, generally higher in cross-pollinated and synthetic varieties.

(d) Genotypic variation in hybrid varieties depends on the type of hybrid (single- or multiple-cross), the level of genotypical variation in the parental lines (inbred lines or others) and the system for hybrid seed production (mechanical emasculation, system of male sterility etc.). The tolerance limits for uniformity are set according to the specific situation.

2. The variation within varieties, which results from the features of propagation and environmental influence, is important for the choice of the method for uniformity assessment (off-types vs. variances). Appropriate uniformity standards for different types of varieties must be developed according to the features of propagation (certain population standards).

10.2.1 Uniformity Assessment on the Basis of Off-Types

3. For characteristics with a low level of genotype and environmental variation it is possible to detect plants which are visually different to the variety and are considered as off-types. A plant is considered to be an off-type if it can be clearly distinguished from the variety in the expression of any characteristic that is used in the testing of distinctness. The

standard for the recognition of an off-type in a variety is the same as for distinctness between varieties. This makes it clear that the variation within varieties is considered in relation to the standard for distinctness. In cases where off-types can be detected, the off-type procedure is recommended for the assessment of uniformity.

4. The proportion of off-types tolerated in a variety depends on the features of its propagation.

(a) In vegetatively propagated, self-pollinated and mainly self-pollinated varieties, the recommended limit for the number of off-types is based on a fixed population standard and acceptance probability (absolute population standard, see Section 10.3.2.1). The population standard and the acceptance probability as well as the acceptable number of off types for a given sample size are specified in the individual Test Guidelines.

(b) The recommended limit for the number of off-types in cross-pollinated varieties (including synthetic varieties) is based on the limit for off-types in comparable varieties. The comparable varieties or types are the basis for the population standard (relative population standard, see Section 10.3.2.2) which is used with a fixed acceptance probability. If the calculated relative population standard would be more stringent than the standard for the same sample size in self-pollinated varieties, the latter should also be applied in cross-pollinated varieties. An appropriate fixed population standard should also be applied in the case of a very low number of comparable varieties.

5. If off-types cannot be detected visually, uniformity must be assessed on the basis of variances. In some cases it may be appropriate to detect off-types in measurements or visual observations taken from individual plants. Guidance for such procedures is given in Section 10.3.2.

10.2.2 Uniformity Assessment on the Basis of Variances

6. If the detection of off-types is not possible because of considerable genotypic and/or environmental variation within varieties, uniformity should be assessed after taking this variation into account. The variability of a candidate variety should not exceed the variability of comparable varieties or types. The comparison between a candidate variety and comparable varieties is carried out on the basis of variances calculated from individual plant observations. The COYU procedure is the recommended statistical method for this comparison (see Section 10.3.1). This procedure calculates the tolerance limit on the basis of comparable varieties already known i.e. uniformity is assessed using a relative tolerance limit.

10.2.3 Uniformity Assessment for Varieties with Segregating Characteristics

7. For multiple cross hybrids and synthetic varieties, a segregation of certain characteristics, in particular qualitative characteristics, is accepted if it is compatible with the expression of the parental lines and the method of propagating the variety. If the inheritance of a segregating characteristic is known, the variety is considered to be uniform if the characteristic behaves in the predicted manner. Guidance for assessing consistency with the predicted segregation ratio is provided in Section 10.3.3.

8. If the inheritance of a clear-cut segregating characteristic is not known, the expression of the characteristic is treated in the same way as other characteristics in cross-pollinated varieties (including synthetic varieties). The observed segregation ratio should be described. An assessment of uniformity is not possible for these characteristics. (The rules outlined for predictable segregation ratios in Chapter 10.3.3 should be used for testing stability.)

9. In quantitative characteristics segregation in multiple hybrids may result in a continuous variation. In such cases uniformity is assessed as in cross-pollinated varieties on the basis of relative uniformity standards calculated from the range of variation of comparable varieties.

[End of document]