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| International Union for the Protection of New Varieties of Plants |  |

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uniformity assessment on the basis of off‑types: Method for more than one single test (year)

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# EXECUTIVE SUMMARY

 The purpose of this document is to report on developments concerning the revision of guidance in document TGP/8/2: Part II: Section 8: “The method of uniformity assessment on the basis of off‑types” in order to reflect the practice within members of the Union on the use of methods for more than one single test (year), in conjunction with the revision of document TGP/10 on “Assessing uniformity by off-types on the basis of more than one growing cycle or on the basis of sub-samples”.

 The TC-EDC is invited to consider inviting the expert from the United Kingdom to draft a proposal for the revision of guidance in document TGP/8/2: Part II: Section 8: Subsection 8.1.7: “Method for more than one single test (year)” for consideration by the TWC, at its session in 2018.

# BACKGROUND

 The TC, at its fifty-third session, held in Geneva from April 3 to 5, 2017, considered document TC/53/19 “Revision of document TGP/10: New section: Assessing uniformity by off-types on basis of more than one growing cycle or on the basis of sub-samples” and agreed that, in conjunction with the revision of document TGP/10, the guidance in document TGP/8/2: Part II: 8: “The method of uniformity assessment on the basis of off‑types” should be revised to reflect the practice within members of the Union on the use of methods for more than one single test (year) (see document TC/53/31 “Report”, paragraph 125).

## Current guidance in document TGP/8

 The current guidance in document TGP/8: Part II: Section 8: “The method of uniformity assessment on the basis of off‑types”, Subsection 8.1.7: “Method for more than one single test (year)” is reproduced as an Annex to this document.

# Proposal

 It is proposed that the TC-EDC consider inviting the expert from the United Kingdom to draft a proposal for the revision of guidance in document TGP/8/2: Part II: Section 8: Subsection 8.1.7: “Method for more than one single test (year)” for consideration by the TWC, at its session in 2018.

 *The TC-EDC is invited to consider inviting the expert from the United Kingdom to draft a proposal for the revision of guidance in document TGP/8/2: Part II: Section 8: Subsection 8.1.7: “Method for more than one single test (year)” for consideration by the TWC, at its session in 2018.*

[Annex follows]

Extract from document TGP/8: Part II: Section 8: “THE METHOD OF UNIFORMITY ASSESSMENT ON THE BASIS OF OFF‑TYPES”

*“8.1.7 Method for more than one single test (year)*

*“8.1.7.1 Introduction*

*“*8.1.7.1.1 Often a candidate variety is grown in two (or three years). The question then arises of how to combine the uniformity information from the individual years. Two methods will be described:

 *“*(a) Make the decision after two (or three) years based on the total number of plants examined and the total number of off-types recorded. (A combined test).

 *“*(b) Use the result of the first year to see if the data suggests a clear decision (reject or accept). If the decision is not clear then proceed with the second year and decide after the second year. (A two-stage test).

*“*8.1.7.1.2 However, there are some alternatives (e.g. a decision may be made in each year and a final decision may be reached by rejecting the candidate variety if it shows too many off-types in both (or two out of three years)). Also there are complications when more than one single year test is done. It is therefore suggested that a statistician should be consulted when two (or more) year tests have to be used.

*“8.1.7.2 Combined test*

*“*The sample size in test i is ni. So after the last test we have the total sample size n = ni. A decision scheme is set in exactly the same way as if this total sample size had been obtained in a single test. Thus, the total number of off-types recorded through the tests is compared with the maximum number of off-types allowed by the chosen decision scheme.

*“8.1.7.3 Two-stage test*

*“*8.1.7.3.1 The method for a two-year test may be described as follows: In the first year take a sample of size n. Reject the candidate variety if more than r1 off-types are recorded and accept the candidate variety if less than a1 off-types are recorded. Otherwise, proceed to the second year and take a sample of size n (as in the first year) and reject the candidate variety if the total number of off-types recorded in the two years’ test is greater than r. Otherwise, accept the candidate variety. The final risks and the expected sample size in such a procedure may be calculated as follows:

α = P(K1 > r1) + P(K1 + K2 > rK1)

 = P(K1 > r1) + P(K2 > r-K1K1)



β q = P(K1 < α 1) + P(K1 + K2  rK1)

= P(K1 < α 1) + P(K2  r-K1K1)





*“*where

*“*P = population standard

*“*α = probability of actual Type I error for P

*“*βq = probability of actual Type II error for q P

*“*ne = expected sample size

*“*r1, a1 and r are decision-parameters

*“*Pq = q times population standard = q P

*“*K1 and K2 are the numbers of off-types found in years 1 and 2 respectively.

*“*The decision parameters, a1, r1 and r, may be chosen according to the following criteria:

1. α must be less than α0, where α0 is the maximum Type I error, i.e. α0 is 100 minus the required acceptance probability
2. βq (for q=5) should be as small as possible but not smaller than α0
3. if βq (for q=5) < α0 ne should be as small as possible

*“*8.1.7.3.2 However, other strategies are available. No tables/figures are produced here as there may be several different decision schemes that satisfy a certain set of risks. It is suggested that a statistician should be consulted if a 2-stage test (or any other sequential tests) is required.

*“8.1.7.4 Sequential tests*

*“*The two-stage test mentioned above is a type of sequential test where the result of the first stage determines whether the test needs to be continued for a second stage. Other types of sequential tests may also be applicable. It may be relevant to consider such tests when the practical work allows analyses of off-types to be carried out at certain stages of the examination. The decision schemes for such methods can be set up in many different ways and it is suggested that a statistician should be consulted when sequential methods are to be used.”

 [End of Annex and of document]