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TC/47/14
ORIGINAL: English
DATE: March 25, 2011

UPOV

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

TECHNICAL COMMITTEE

Forty-Seventh Session
Geneva, April 4 to 6, 2011

ASSESSING UNIFORMITY BY OFF-TYPES ON THE BASIS OF MORE THAN ONE SAMPLE OR SUB-SAMPLE

Document prepared by the Office of the Union

1. The purpose of this document is to present the information provided in reply to the questionnaire "Population standards used for assessing uniformity by off-types on the basis of more than one sample or sub-sample", issued by means of Circular E-1466 of February 7, 2011.

Background

2. At its twenty-second session, held in Tsukuba, Japan, from June 14 to 17, 2004, the Technical Working Party on Automation and Computer Programs (TWC) agreed to produce a questionnaire to seek information on population standards used in the assessment of uniformity by off-types, in particular when tests from more than one year were used.

3. At the twenty-fifth session of the TWC, held in Romania, from September 3 to 6, 2007, the TWC discussed the draft questionnaire on off-types contained in document TWC/25/18. The TWC noted that the questionnaire was intended to address only situations where uniformity by off-types was assessed on the basis of more than one sample, or on a sub-sample of a single sample, and agreed that the title of the questionnaire should be amended accordingly. The TWC agreed that the results of the questionnaire should be reviewed with a view to incorporating guidance in document TGP/8, Part II, "I. The Method of Uniformity Assessment on the Basis of Off-Types".

4. At its twenty-sixth session, held in Jeju, Republic of Korea, from September 2 to 5, 2008, the TWC considered document TWC/26/8 "Population standards used for assessing uniformity by off-types on the basis of more than one sample", prepared by experts from Germany, the United Kingdom and the Office of the Union. The TWC agreed that a questionnaire could be issued on the basis of the Annex to document TWC/26/8, with certain minor amendments. However, the TWC noted that the example provided in the Annex to document TWC/26/8 indicated that it would be useful for the TWC to discuss the use of such an approach.

Developments in 2009

Technical Committee

5. The Technical Committee (TC), at its forty-fifth session, held in Geneva from March 30 to April 1, 2009, considered the draft questionnaire "Population standards used for assessing uniformity by off-types on the basis of more than one sample", as presented in the Annex to document TC/45/3. The TC agreed that the draft questionnaire, as presented in the Annex to document TC/45/3, should be circulated for consideration by the Technical Working Parties (TWPs) at their sessions in 2009 and requested the Office of the Union to provide a new draft of the questionnaire, based on the TWP comments, for approval at the forty-sixth session of the TC in 2010. The TC agreed that the approved questionnaire should be issued by the Office of the Union to the TC representatives of the members of the Union and the replies presented for consideration by the TC at its forty-seventh session. On the basis of the replies, the TC would consider whether that matter should be included in a future revision of document TGP/8 "Trial Design and Techniques Used in the Examination of Distinctness, Uniformity and Stability".

Technical Working Party for Vegetables

6. At its forty-third session, held in Beijing, China, from April 20 to 24, 2009, the Technical Working Party for Vegetables (TWV) considered the draft questionnaire presented in the Annex to document TWV/43/14 "Assessing Uniformity by Off-Types on the Basis of More Than One Sample or Sub-Samples". The TWV agreed that the questionnaire should provide a further example to illustrate options where uniformity was assessed in a plant sample of 40 plants in each of two independent growing cycles, in two separate plantings. In the first option, the uniformity would be assessed in 80 plants over the two growing cycles. In the second option, the uniformity would be assessed in 40 plants in each of the two years, with a decision rule that failure in one year would lead to a third year of examination, with the final decision being based on two years out of three.

Technical Working Party on Automation and Computer Programs

7. At its twenty-seventh session, held in Alexandria, Virginia, United States of America, from June 16 to 19, 2009, the TWC considered the draft questionnaire presented in the Annex to document TWC/27/13 "Assessing Uniformity by Off-Types on the Basis of More Than One Sample or Sub-Samples". With regard to the draft questionnaire in the Annex to that document, it was agreed that paragraph 1.4 should read as follows "Please complete the attached form with information on how uniformity is assessed by off-types for cases where more than one sample or sub-sample are used, as explained in paragraph 1.3.".

Technical Working Party for Agricultural Crops

8. At its thirty-eighth session, held in Seoul, Republic of Korea, from August 31 to September 4, 2009, the Technical Working Party for Agricultural Crops (TWA) considered document TWA/38/12. The TWA agreed that the draft questionnaire presented in document TWA/38/12 should, before the example, present a blank questionnaire to clarify the questions on which information was requested. The TWA considered that the decision rule presented in the example in the Annex to the document was not clear and proposed that it be clarified, particularly for the decision rule at the end of each growing cycle, and agreed that reference should be made to growing "cycles" rather than "years".

9. The TWA considered that the experts from each Technical Working Party should be invited to complete the questionnaire with information for relevant crops/species. In that regard, it agreed that the TWA experts should be invited to supply information on potato and wheat or, if not suitable for the member of the Union concerned, to complete the questionnaire for another vegetatively propagated root crop and self-pollinated cereal.

Technical Working Party for Ornamental Plants and Forest Trees

10. At its forty-second session, held in Angers, France, from September 14 to 18, 2009, the Technical Working Party for Ornamental Plants and Forest Trees (TWO) considered document TWO/42/12 and agreed that it would not be relevant to request information on assessing uniformity by off-types on the basis of more than one sample or sub-samples for ornamental plants or forest trees.

Technical Working Party on Fruit Crops

11. At its fortieth session, held in Angers, France, from September 21 to 25, 2009, the Technical Working Party for Fruit Crops (TWF) considered document TWF/40/12 and agreed that TWF experts should be invited to supply information on apple by means of the questionnaire.

Developments in 2010

12. A its forty-sixth session, held in Geneva from March 22 to 24, 2010, the TC considered document TC/46/14 "Assessing Uniformity by Off-Types on the Basis of More Than One Sample or Sub-samples". The TC agreed that the TWV, at its forty-fourth session, to be held in Veliko Tarnovo, Bulgaria, from July 5 to 9, 2010, should be invited to agree on a vegetable crop for inclusion in the questionnaire. The Office of the Union would complete and issue the questionnaire after a vegetable crop had been selected by the TWV. The TC agreed that the translation of the questionnaire should be checked by the relevant language experts of the Editorial Committee and also agreed that paragraph 1.4 should be elaborated to explain that the process and the way in which the data was obtained and used in the decision-making process should be reflected in the responses to the questionnaire.

13. The TC requested the Office of the Union to send the questionnaire to the TC representatives of the members of the Union for completion, and to provide a document compiling the replies for consideration at the forty-seventh session of the TC. The TC also requested that the document identify any matters that might be considered in relation to the revision of document TGP/8.

14. At its forty-fourth session, held in Veliko Tarnovo, Bulgaria, from July 5 to 9, 2010, the TWV considered document TWV/44/9 "Assessing Uniformity by Off-Types on the Basis of More Than One Sample or Sub-Samples" and agreed that Cauliflower should be added as a vegetable example for the questionnaire "Population standards used for assessing uniformity by off-types on the basis of more than one sample", with the necessary information to be provided by experts from France.

Developments in 2011

15. On February 7, 2011, the Office of the Union issued Circular E-1466 to the designated persons of members in the Technical Committee with the questionnaire "Population standards used for assessing uniformity by off-types on the basis of more than one sample". Annexes I to VI to this document contain the replies to Circular E-1466 received from Bulgaria, Chile, the European Union, Croatia, Czech Republic, Georgia, Germany, Hungary, Ireland, Latvia, New Zealand, Republic of Moldova, Singapore, Spain and Sweden. The following table lists the replies by crop and indicates the Annex to this document in which the information is presented.

Crop/Species	Annex	UPOV Member
Wheat	Annex I	Bulgaria, Chile, Croatia, Czech Republic, European Union, Georgia, Germany, Hungary, New Zealand, Republic of Moldova, Spain, Sweden
Potato	Annex II	Bulgaria, Chile, Czech Republic, European Union, Georgia, Ireland, New Zealand, Republic of Moldova
Apple	Annex III	Bulgaria, Chile, Czech Republic, European Union, Georgia, Latvia, New Zealand, Republic of Moldova
Cauliflower	Annex IV	Bulgaria, Czech Republic, European Union, Spain
Chinese cabbage	Annex V	Singapore
Lettuce	Annex VI	New Zealand

16. The TC is invited to consider the information provided in Annexes I to VI to this document, in relation to matters that might be considered in a future version of document TGP/8.

[Annexes follow]

ANNEX I

Replies to the Questionnaire "Population standards used for assessing uniformity by off-types on the basis of more than one sample" for

WHEAT

Reply from: Bulgaria

Crop/Species: Wheat

Test Guidelines: TG/3/11 + Corr.

Explanation of the methodology for assessing uniformity by off-types on the basis of more than one sample or sub-samples

Sample size: - 2000 plants for all varieties

- 200 plants for hybrids
- 100 ear-rows

Population standard: - 0,3% for all varieties

- 10% for hybrids
- 1% for ear-rows

Acceptance probability: ≥ 95%

Uniformity standard: - for all varieties the number of off-types in a sample of 2000 plants or parts of plants should not exceed 10 in 2000

- for hybrids the number of off-types should not exceed 27 in 200
- for ear-rows the number of off-types should not exceed 3 in 100

Decision rule: A variety is considered within the uniformity standard in a given growing cycle if the number of off-types in all samples does not exceed the number of allowed off-types in either of the samples.

A variety is considered uniform if it is within the uniformity standard in both of the two growing cycles

A variety is considered non-uniform if it fails to meet the uniformity standard in both of the two growing cycles

If at the end of the two growing cycles the variety is within the uniformity standard in one growing cycle but is not within the uniformity standard in the other growing cycle, then uniformity is assessed in a third growing cycle. If in the third growing cycle the variety is within the uniformity standard, the variety is considered uniform. If at the end of the third growing cycle the variety fails to meet the uniformity standard, the variety is considered non-uniform.

Country/Organization:	Bulgaria/Executive Agency for Variety Testing, Field Inspection and Seed Control
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Reply from: Chile

Crop/Species: Wheat

Test Guidelines: TG/3/11 + Corr.

Explanation of the methodology for assessing uniformity by off-types on the basis of more than one sample or sub-samples

Sample size: Uniformity will be visually assessed by a single observation of a group of plants or parts of plants. The number of plants to be observed is 2000.

Population standard: 0.1%

Acceptance probability: 95%

Uniformity standard: The number of off-type plants should not exceed 5 in 2000.

Decision rule: A variety is considered uniform if it is within the uniformity standard in both of the two growing cycles

A variety is considered non uniform if it fails to meet the uniformity standard in both of the two growing cycles

If at the end of the two growing cycles the variety is within the uniformity standard in one growing cycle but is not within the uniformity standard in the other growing cycle, then uniformity is assessed in a third growing cycle. If in the third growing cycle the variety is within the uniformity standard, the variety is considered uniform. If at the end of the third growing cycle the variety fails to meet the uniformity standard, the variety is considered non uniform

Country/Organization:	CHILE
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Reply from: Community Plant Variety Office of the European Union

Crop/Species: Wheat

Test Guidelines: CPVO-TP 003/4 rev.2

The minimum duration of tests will normally be two independent growing cycles.

I - For the assessment of uniformity of characteristics observed on a sample size of 2000 plants or part of plants.

Sample size: 2000 plants

Population standard: 0.3 %

Acceptance probability: 95 %

Uniformity standard: the number of off-type plants or parts of plants should not exceed 10 in 2000.

Resubmission standard: 0.6%

Acceptance probability: 95 %

Uniformity standard: the number of off-type plants or parts of plants should not exceed 18 in 2000.

III- For the assessment of uniformity of characteristics observed on a sample size of 200 plants or part of plants in hybrid varieties

Sample size: 200 plants

Population standard: 10 %

Acceptance probability: 95 %

Uniformity standard: the number of off-type plants or parts of plants should not exceed 27 in 200.

IV – 2-step test for the assessment of uniformity of characteristics observed on a sample size of 100 plants or parts of plants

Sample size: 100 plants or parts of plants

Population standard: 1 %

Acceptance probability: 95 %

Uniformity standard:

First step, 20 plants or parts of plants are observed.

- No off-type plants in 20 plants = the variety does not exceed the number of allowed off-types for this characteristic for this growing cycle.
- More than 3 off-type plants = the variety exceeds the number of allowed off-types for this characteristic for this growing cycle.
- 1 to 3 off-type plants = go to second step

Second step: further 80 plants or parts of plants are observed

- 3 or less off-type plants in 100 (20 of step 1 + 80 of step 2) plants = the variety does not exceed the number of allowed off-types for this characteristic for this growing cycle.
- More than 3 off-type plants in 100 (20 of step 1 + 80 of step 2) plants = the variety exceeds the number of allowed off-types for this characteristic for this growing cycle.

Resubmission standard: 5%

Acceptance probability: 95 %

Uniformity standard: the number of off-type plants or parts of plants should not exceed 9 in 2000.

Decision rule: A variety is considered within the uniformity standard in a given growing cycle if the number of off-types in all samples does not exceed the number of allowed off-types in either of the samples.

A variety is considered uniform if it is within the uniformity standard in both of the two growing cycles

A variety is considered non-uniform if it fails to meet the uniformity standard in both of the two growing cycles

A re-submission of plant material may be allowed for the second growing cycle if in the first growing cycle the number of off-types did not exceed the relevant threshold (18 plants resp. 9 plants). If the variety fails to meet the re-submission standard in all or one of the samples in the first growing cycle, the variety is considered non-uniform and the application is refused after the first growing cycle.

If at the end of the two growing cycles the variety is within the uniformity standard in one growing cycle but is not within the uniformity standard in the other growing cycle, then uniformity is assessed in a third growing cycle. If in the third growing cycle the variety is within the uniformity standard, the variety is considered uniform. If at the end of the third growing cycle the variety fails to meet the uniformity standard, the variety is considered non-uniform.

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Reply from: Croatia

Crop/Species: Wheat

Test Guidelines: TG/3/11 + Corr.

I - For the assessment of uniformity of characteristics observed on a sample size of 2000 plants or part of plants.

Sample size: 2000 plants

Population standard: 0,1%

Acceptance probability: 95%

Uniformity standard: number of off-type plants or parts of plants should not exceed 5 in 2000.

II - For the assessment of uniformity of characteristics on single ear-rows, plants or parts of plants

The number of off-type ear rows, plants or parts of plants should not exceed 3 in 100.

III – Example of 2-step test for the assessment of uniformity of characteristics observed on a sample size of 100 plants or parts of plants

Sample size: 100 plants or parts of plants

Population standard: 0.1 %

Acceptance probability: 95 %

Uniformity standard:

First step, 20 plants or parts of plants are observed.

- No off-type plants in 20 plants = the variety does not exceed the number of allowed off-types for this characteristic for this growing cycle.
- More than 3 off-type plants = the variety exceeds the number of allowed off-types for this characteristic for this growing cycle.
- 1 to 3 off-type plants = go to second step

Second step: further 80 plants or parts of plants are observed

- 3 or less off-type plants in 100 (20 of step 1 + 80 of step 2) plants = the variety does not exceed the number of allowed off-types for this characteristic for this growing cycle.
- More than 3 off-type plants in 100 (20 of step 1 + 80 of step 2) plants = the variety exceeds the number of allowed off-types for this characteristic for this growing cycle.

Decision rule: A variety is considered within the uniformity standard in a given growing cycle if the number of off-types in all samples does not exceed the number of allowed off-types in either of the samples.

A variety is considered uniform if it is within the uniformity standard in both of the two

growing cycles A variety is considered non-uniform if it fails to meet the uniformity standard in both of the two growing cycles If at the end of the two growing cycles the variety is within the uniformity standard in one growing cycle but is not within the uniformity standard in the other growing cycle, then uniformity is assessed in a third growing cycle. If in the third growing cycle the variety is within the uniformity standard, the variety is considered uniform. If at the end of the third growing cycle the variety fails to meet the uniformity standard, the variety is considered non-uniform.

Country/Organization: Croatia Croatian Centre for Agriculture, Food and Rural Affairs – Institute for Seed and Seedlings	
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Reply from: Czech Republic

Crop/Species: Wheat

Test Guidelines: TG/3/11 + Corr.

I - For the assessment of uniformity of characteristics observed on a sample size of 2000 plants or part of plants.

Sample size: 2000 plants

Population standard: 0.3 %

Acceptance probability: 95 %

Uniformity standard: the number of off-type plants or parts of plants should not exceed 10 in 2000.

II – Example of 2-step test for the assessment of uniformity of characteristics observed on a sample size of 100 plants or parts of plants

Sample size: 100 plants or parts of plants

Population standard: 1 %

Acceptance probability: 95 %

Uniformity standard:

First step, 20 plants or parts of plants are observed.

- No off-type plants in 20 plants = the variety does not exceed the number of allowed off-types for this characteristic for this growing cycle.
- More than 3 off-type plants = the variety exceeds the number of allowed off-types for this characteristic for this growing cycle.
- 1 to 3 off-type plants = go to second step

Second step: further 80 plants or parts of plants are observed

- 3 or less off-type plants in 100 (20 of step 1 + 80 of step 2) plants = the variety does not exceed the number of allowed off-types for this characteristic for this growing cycle.
- More than 3 off-type plants in 100 (20 of step 1 + 80 of step 2) plants = the variety exceeds the number of allowed off-types for this characteristic for this growing cycle.

Decision rule: A variety is considered within the uniformity standard in a given growing cycle if the number of off-types in all samples does not exceed the number of allowed off-types in either of the samples.

A variety is considered uniform if it is within the uniformity standard in both of the two growing cycles.

A variety is considered non-uniform if it fails to meet the uniformity standard in both of the two growing cycles.

If at the end of the two growing cycles the variety is within the uniformity standard in one growing cycle but is not within the uniformity standard in the other growing cycle, then uniformity is assessed in a third growing cycle. If in the third growing cycle the variety is

within the uniformity standard, the variety is considered uniform. If at the end of the third growing cycle the variety fails to meet the uniformity standard, the variety is considered non-uniform.

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Reply from: Georgia

Crop/Species: Wheat

Test Guidelines: TG/3/11 + Corr.

Explanation of the methodology for assessing uniformity by off-types on the basis of more than one sample or sub-samples

Sample size: 200

Population standard: 0.1%

Acceptance probability: 95%

Uniformity standard: the number of off-type plants or parts of plants should not exceed 3 in 100 and 5 in 2000

Decision rule: A variety is considered within the uniformity standard in a given growing cycle if the number of off-type plants or parts of plants should not exceed 3 in 100 in that growing cycle.

A variety is considered uniform if it is within the uniformity standard in both of the two growing cycles

A variety is considered non-uniform if it fails to meet the uniformity standard in both of the two growing cycles

Country/Organization: National Intellectual Property Center "SAKPATENTI"	
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Reply from: Germany

Crop/Species: Wheat

Test Guidelines: TG/3/11 + Corr.

Explanation of the methodology for assessing uniformity by off-types on the basis of more than one sample or sub-samples

Sample size: **100 plants or parts of plants**

Population standard: 1%

Acceptance probability: >= 95%

Uniformity standard: 3 for inbred lines, 15 for hybrids

Decision rule: Assessment of **20 plants** or parts of plants.

For inbred lines: If no off-type is observed, the uniformity criterion is fulfilled.

If 1-3 off-types are observed, **additional 80** plants will be assessed. If there are not more than 3 in total 100, the uniformity criterion is fulfilled. If there more than 3 in 100, the variety will be rejected. If more than 3 off-types are observed, the variety will be rejected without assessment of further 80 plants

For hybrids: If 2 off-types are observed, the uniformity criterion is fulfilled. If 3-5 off-types are observed, **additional 80** plants will be assessed. If more than 5 off-types are observed, the variety will be rejected without assessment of further 80 plants. If there are not more than 15 in total 100, the uniformity criterion is fulfilled. If there are more than 15 in 100, the variety will be rejected.

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Reply from: Hungary

Crop/Species: Wheat (*Triticum aestivum L.*)

Test Guidelines: TG/3/11 + Corr.

Explanation of the methodology for assessing uniformity by off-types on the basis of more than one sample or sub-samples

I. For the assessment of uniformity of characteristics observed on a sample size of 2000 plants or part of plants:

Sample size: 2000 plants

The assessment for the characteristic 'Seasonal type' should be carried out on at least 500 plants.

Population standard: 0,3%

Acceptance probability: 95%

Uniformity standard: the number of off-type plants or parts of plants should not exceed 10 in 2000.

II. Example of 2-step test for the assessment of uniformity of characteristics observed on a sample size of 100 plants or parts of plants:

Sample size: 100 plants or parts of plants

Population standard: 1%

Acceptance probability: 95%

Uniformity standard:

First step: 20 plants or parts of plants are observed.

If no off-types are observed, the variety is declared to be uniform. If more than 3 off-types are observed, the variety is declared not to be uniform. If 1 to 3 off-types are observed, an additional sample of 80 plants or parts of plants must be observed.

Second step: further 80 plants or parts of plants are observed.

- 3 or less off-type plants in 100 (20+80) plants – the variety does not exceed the number of allowed off-types for this characteristic for this growing cycle.

- More than 3 off-type plants in 100 (20+80) plants – the variety exceeds the number of allowed off-types for this characteristic for this growing cycle.

III. Assessment of ear rows: each ear row to be assessed! If ear rows are used, tests should be conducted on 100 ears. The number of off-types in a sample size of 100 ear-rows, plants or parts of plants should not exceed 3 in 100 (Population standard of 1% with an acceptance probability of . 95%). An ear row is considered as off-type if there is more than 1 off-type plant within that ear row.
Decision rule: A variety is considered within the uniformity standard in a given growing cycle if the number of off-types in all samples does not exceed the number of allowed off-types in either of the samples. A variety is considered uniform if it is within the uniformity standard in both of the two growing cycles A variety is considered non-uniform if it fails to meet the uniformity standard in both of the two growing cycles If at the end of the two growing cycles the variety is within the uniformity standard in one growing cycle but is not within the uniformity standard in the other growing cycle, then uniformity is assessed in a third growing cycle. If in the third growing cycle the variety is within the uniformity standard, the variety is considered **uniform**. If at the end of the third growing cycle the variety fails to meet the uniformity standard, the variety is considered **non-uniform**

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Reply from: New Zealand

Crop/Species: Wheat

Test Guidelines: TG/3/11 + Corr.

Explanation of the methodology for assessing uniformity by off-types on the basis of more than one sample or sub-samples

Sample size: 2000 plants per independent growing cycle. Two cycles observed. Each cycle is treated as separate.

Population standard: 0.1 %

Acceptance probability: 95%

Uniformity standard: the number of off-type plants or parts of plants should not exceed 5 in 2000 for whole plots.

For single ear rows, the number of off-type ear- rows or parts of ear row, should not exceed 3 in 100.

Decision rule:

A variety is considered uniform if it is within the uniformity standard in both of the two growing cycles for whole plots and for ear rows.

A variety is considered non-uniform if it fails to meet the uniformity standard in both of the two growing cycles for whole plots and ear rows.

If at the end of the two growing cycles the variety is within the uniformity standard in one growing cycle but is not within the uniformity standard in the other growing cycle, then uniformity is assessed in a third growing cycle. If in the third growing cycle the variety is within the uniformity standard, the variety is considered uniform. If at the end of the third growing cycle the variety fails to meet the uniformity standard, the variety is considered non-uniform.

In cases where a variety is uniform in whole plots and not in single ear rows, or the reverse, a third cycle is carried out.

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Reply from: Norway

Crop/Species: Wheat

Test Guidelines: TG/3/11 + Corr.

Explanation of the methodology for assessing uniformity by off-types on the basis of more than one sample or sub-samples

Sample size: 100 plants

Population standard: 0,1 %

Acceptance probability: 95 %

Uniformity standard: As explained in example 1, II.

"First step, 20 plants or parts of plants are observed.

- No off-type plants in 20 plants = the variety does not exceed the number of allowed off-types for this characteristic for this growing cycle.
- More than 3 off-type plants = the variety exceeds the number of allowed off-types for this characteristic for this growing cycle.
- 1 to 3 off-type plants = go to second step

Second step: further 80 plants or parts of plants are observed

- 3 or less off-type plants in 100 (20 of step 1 + 80 of step 2) plants = the variety does not exceed the number of allowed off-types for this characteristic for this growing cycle.
- More than 3 off-type plants in 100 (20 of step 1 + 80 of step 2) plants = the variety exceeds the number of allowed off-types for this characteristic for this growing cycle."

Decision rule: If at the end of the two growing cycles the variety is within the uniformity standard in one growing cycle but is not within the uniformity standard in the other growing cycle, then uniformity is assessed in a third growing cycle. If in the third growing cycle the variety is within the uniformity standard, the variety is considered uniform. If at the end of the third growing cycle the variety fails to meet the uniformity standard, the variety is considered non uniform

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Reply from: Republic of Moldova

Crop/Species: Wheat

Test Guidelines: TG/3/11 + Corr.

Explanation of the methodology for assessing uniformity by off-types on the basis of more than one sample or sub-samples

Sample size: *500 plants per one growing cycle*

Population standard: *1%*

Acceptance probability: *95%*

Uniformity standard: *5 plants off-type is allowed*

Decision rule: A variety is considered uniform if the total number of off-types at the end of the two growing cycles does not exceed 10 in 1000 plants.

Country/Organization:	*MD, Republic of Moldova, The State Commission for Crops Variety Testing*
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Reply from: Spain

Crop/Species: Wheat (*Triticum aestivum* L. emend. Fiori et Paol.)

Test Guidelines: TG/3/11 + Corr.

For the assessment of uniformity of characteristics observed on a sample size of 2000 plants or part of plants

Sample size: 2.000 plantas

Population standard: 0,3%

Acceptance probability: 95%

Uniformity standard: The number of off-type plants should not be more than 10 in 2000.

For the assessment of uniformity of characteristics observed on a sample size of 100ants or part of plants

Sample size: 100 plants of parts of plants

Population standard: 1%

Acceptance probability: 95%

Uniformity standard:

First step, 20 plants or parts of plants are observed.

- No off-type plants in 20 plants = the variety does not exceed the number of allowed off-types for this characteristic for this growing cycle.
- More than 3 off-type plants = the variety exceeds the number of allowed off-types for this characteristic for this growing cycle.
- 1 to 3 off-type plants = go to second step

Second step: further 80 plants or parts of plants are observed

- 3 or less off-type plants in 100 (20 of step 1 + 80 of step 2) plants = the variety does not exceed the number of allowed off-types for this characteristic for this growing cycle.
- More than 3 off-type plants in 100 (20 of step 1 + 80 of step 2) plants = the variety exceeds the number of allowed off-types for this characteristic for this growing cycle.

For the assessment of uniformity on year-rows.

Sample size: 100 year-rows

Population standard: 1%

Acceptance probability: 95%

Uniformity standard: The number of off-type year-rows should not be more than 3 in 100. An year-row is considered off-type when there is more than one off-type plant within the year-row
Decision rule: A variety is considered within the uniformity standard in a given growing cycle if the average number of off-types between the two repetitions does not exceed the number of allowed off-types. A variety is considered uniform if it is within the uniformity standard in both of the two growing cycles A variety is considered non uniform if it fails to meet the uniformity standard in one of the two growing cycles

Country/Organization:	SPAIN/INIA
Person completing the form	
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Fax No.:	913474168

Reply from: Sweden

Crop/Species: Wheat Test Guidelines: CPVO-TP/003/4
Explanation of the methodology for assessing uniformity by off-types on the basis of more than one sample or sub-samples Sample size: 5000 plants Population standard: Acceptance probability: Uniformity standard: The uniformity should not exceed 0,1 % of number of number of plants in the plots We are following the CPVO's guideline in other aspects
Decision rule:

Country/Organization: Swedish Board of Agriculture	
Person completing the form	
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[Annex II follows]

ANNEX II

Replies to the Questionnaire "Population standards used for assessing uniformity by off-types on the basis of more than one sample" for

POTATO

Reply from: Bulgaria

Crop/Species: Potato

Test Guidelines: TG/23/6

Explanation of the methodology for assessing uniformity by off-types on the basis of more than one sample or sub-samples

Sample size: 60 plants

Population standard: 1%

Acceptance probability: 95%

Uniformity standard: the number of off-type plants or parts of plants should not exceed 2 in 60 plants

Decision rule: A variety is considered within the uniformity standard in a given growing cycle if the number of off-types in all samples does not exceed the number of allowed off-types in either of the samples.

A variety is considered uniform if it is within the uniformity standard in both of the two growing cycles.

A variety is considered non-uniform if it fails to meet the uniformity standard in both of the two growing cycles.

If at the end of the two growing cycles the variety is within the uniformity standard in one growing cycle but is not within the uniformity standard in the other growing cycle, then uniformity is assessed in a third growing cycle. If in the third growing cycle the variety is within the uniformity standard, the variety is considered uniform. If at the end of the third growing cycle the variety fails to meet the uniformity standard, the variety is considered non-uniform.

Country/Organization:	Bulgaria/Executive Agency for Variety Testing, Field Inspection and Seed Control
Person completing the form	
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Reply from: Chile

Crop/Species: Potato (*Solanum tuberiosum* L.) Test Guidelines: TG/23/6
The duration of the test is two independent growing cycles. Each test consists in 88 plants divided into two replicates. Sample size: 176 plants in the two independent growing cycles with 88 plants in each growing cycle. Population standard: 1% Acceptance probability: 95% Uniformity standard: the number of off-types plants or parts of plants should not be more than 3 in the 176 plants.
Decision rule: A variety is considered uniform when the total number of off-types at the end of the two growing cycles does not exceed 3 in 176 plants.

Country/Organization:	CHILE/SAG
Person completing the form	
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Fax No.:	56-64-232016

Reply from: Community Plant Variety Office of the European Union

Crop/Species: Potato

Test Guidelines: CPVO-TP 023/2

The minimum duration of tests will normally be two independent growing cycles.

Explanation of the methodology for assessing uniformity by off-types on the basis of more than one sample or sub-samples

Sample size: 60

Population standard: 1%

Acceptance probability: 95%

Uniformity standard: the number of off-type plants should not exceed 2 in 60 plants.

Decision rule: A variety is considered within the uniformity standard in a given growing cycle if the number of off-types does not exceed the number of allowed off-types.

A variety is considered uniform if it is within the uniformity standard in both of the two growing cycles

A variety is considered non-uniform if it fails to meet the uniformity standard in both of the two growing cycles

If at the end of the two growing cycles the variety is within the uniformity standard in one growing cycle but is not within the uniformity standard in the other growing cycle, then uniformity is assessed in a third growing cycle. If in the third growing cycle the variety is within the uniformity standard, the variety is considered uniform. If at the end of the third growing cycle the variety fails to meet the uniformity standard, the variety is considered non-uniform.

Country/Organization:	CPVO, European Union
Person completing the form	
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Reply from: Czech Republic

Crop/Species: Potato

Test Guidelines: TG/23/6

I - For the assessment of uniformity of characteristics observed on a sample size of 80 plants or parts of plants.

Sample size: 80 plants or parts of plants

Population standard: 1 %

Acceptance probability: 95 %

Uniformity standard: the number of off-type plants or parts of plants should not exceed 2 in 80.

II - For the assessment of uniformity of characteristics observed on a sample size of 20 plants or parts of plants.

Sample size: 20 plants or parts of plants

Population standard: 1 %

Acceptance probability: 95 %

Uniformity standard: the number of off-type plants or parts of plants should not exceed 1 in 20.

III - For the assessment of uniformity of characteristics observed on a sample size of 5 lightsprouts.

Sample size: 5 lightsprouts

Population standard: 1 %

Acceptance probability: 95 %

Uniformity standard: there is no off-type allowed.

Decision rule: A variety is considered within the uniformity standard in a given growing cycle if the number of off-types in all samples does not exceed the number of allowed off-types in either of the samples.

A variety is considered uniform if it is within the uniformity standard in both of the two growing cycles.

A variety is considered non-uniform if it fails to meet the uniformity standard in both of the two growing cycles.

If at the end of the two growing cycles the variety is within the uniformity standard in one growing cycle but is not within the uniformity standard in the other growing cycle, then uniformity is assessed in a third growing cycle. If in the third growing cycle the variety is within the uniformity standard, the variety is considered uniform. If at the end of the third growing cycle the variety fails to meet the uniformity standard, the variety is considered non-uniform.

Country/Organization:	Czech Republic/ÚKZÚZ
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Reply from: Georgia

Crop/Species: Potato Test Guidelines: TG/23/6
Explanation of the methodology for assessing uniformity by off-types on the basis of more than one sample or sub-samples Sample size: 60 Population standard: 0.1% Acceptance probability: 95% Uniformity standard: In the case of a sample size of 60plants, 2 off-types are allowed. In the case of a sample size of 6 plants, 1 off-type is allowed
Decision rule: A variety is considered within the uniformity standard in a given growing cycle if the number of off-type plants or parts of plants should not exceed 2 in 60 in that growing cycle.

Country/Organization: National Intellectual Property Center "SAKPATENTI"	
Person completing the form	
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Reply from: Ireland

Crop/Species: Potato Test Guidelines: TG/23/6
Explanation of the methodology for assessing uniformity by off-types on the basis of more than one sample or sub-samples Sample size: 60 plants Population standard: 1% Acceptance probability: 95% Uniformity standard: the number of off-type plants should not exceed 2 in 60 plants examined.
Decision rule: A variety is considered uniform if it is within the uniformity standard in both of the two growing cycles.

Country/Organization:	Department of Agriculture, Fisheries & Food, Ireland.
Person completing the form	
Name: Gerry Doherty	
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Reply from: Italy

Crop/Species: Potato

Test Guidelines: TG/23/6

The minimum duration of tests should normally be two independent growing cycles. Each test should be designed to result in a total of at least 60 plants, which should be divided between two or more replicates.

Sample size: 50 plants in two repetitions (100 in total) in each growing cycle.

Population standard: 1%

Acceptance probability: ≥95%

Uniformity standard: the number of off-type plants or parts of plants should not exceed 2 in 60 plants (3 in the total 100).

Decision rule: A variety is considered within the uniformity standard in a given growing cycle if the number of off-types plants or parts of plants does not exceed 2 in 60 plants (3 in the total 100) in that growing cycle.

A variety is considered uniform if it is within the uniformity standard in both of the two growing cycles

A variety is considered non uniform if it fails to meet the uniformity standard in both of the two growing cycles

If at the end of the two growing cycles the variety is within the uniformity standard in one growing cycle but is not within the uniformity standard in the other growing cycle, then the Ministry of Agriculture request the breeder of the variety if he or she wants to carry out a third growing cycle of testing. If the breeder does not accept, the variety will be considered non uniform. If the breeder accepts the variety will be tested a third growing cycle. If in the third growing cycle the variety is within the uniformity standard, the variety is considered uniform. If at the end of the third growing cycle the variety fails to meet the uniformity standard, the variety is considered non uniform

Country/Organization:	Italy – I.N.R.A.N. (ex E.N.S.E.)
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Reply from: New Zealand

Crop/Species: Potato

Test Guidelines: TG/23/6

Explanation of the methodology for assessing uniformity by off-types on the basis of more than one sample or sub-samples

Sample size: 60 plants in a single independent growing cycle.

Population standard: 1 %

Acceptance probability: 95%

Uniformity standard: the number of off-type plants or parts of plants should not exceed 2 in 60.

For light sprout the number of off-type tubers or parts of tuber should not exceed 1 in 6

Decision rule:

A variety is considered uniform if it is within the uniformity standard in the single growing cycle

A variety is considered non-uniform if it fails to meet the uniformity standard in the single growing cycle

If at the end of the growing cycle, there is any doubt that the variety is within the uniformity standard e.g. it not sufficiently clear whether or not a particular plant is an off-type, a second growing cycle may be carried out. If in the second cycle the variety is within the uniformity standard, the variety is considered uniform. If at the end of the second growing cycle the variety fails to meet the uniformity standard, the variety is considered non-uniform

In cases were a variety is uniform in the whole plot and not for light sprouts, or the reverse, a second cycle is carried out

Country/Organization:	New Zealand Plant Variety Rights Office
Person completing the form	
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Reply from: Republic of Moldova

Crop/Species: Potato Test Guidelines: TG/23/6
Explanation of the methodology for assessing uniformity by off-types on the basis of more than one sample or sub-samples Sample size: *60 plants per one growing cycle* Population standard: *1 %* Acceptance probability: *95 %* Uniformity standard: *2 plants off-type is allowed*
Decision rule: A variety is considered uniform if the total number of off-types at the end of the two growing cycles does not exceed 4 in 120 plants.

Country/Organization:	*MD, Republic of Moldova, The State Commission for Crops Variety Testing*
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[Annex III follows]

ANNEX III

Replies to the Questionnaire "Population standards used for assessing uniformity by off-types on the basis of more than one sample" for

APPLE

Reply from: Bulgaria

Crop/Species: Apple

Test Guidelines: TG/14/9

Explanation of the methodology for assessing uniformity by off-types on the basis of more than one sample or sub-samples

Sample size: 5 trees for varieties resulting from crossing and 10 trees for varieties obtained from mutations

Population standard: 1%

Acceptance probability: 95%

Uniformity standard: Table of maximum number of off-types allowed for uniformity standards:

Nr of plants	off-types allowed
≤ 5	0
6-35	1

Decision rule: A variety is considered uniform if it is within the uniformity standard in both of the two growing cycles.

A variety is considered non-uniform if it fails to meet the uniformity standard in both of the two growing cycles.

If at the end of the two growing cycles the variety is within the uniformity standard in one growing cycle but is not within the uniformity standard in the other growing cycle, then uniformity is assessed in a third growing cycle. If in the third growing cycle the variety is within the uniformity standard, the variety is considered uniform. If at the end of the third growing cycle the variety fails to meet the uniformity standard, the variety is considered non-uniform.

Country/Organization:	Bulgaria/Executive Agency for Variety Testing, Field Inspection and Seed Control
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Reply from: Chile

Crop/Species: Apple

Test Guidelines: TG/14/9

Explanation of the methodology for assessing uniformity by off-types on the basis of more than one sample or sub-samples

Sample size: 5 healthy trees

Population standard: 0

Acceptance probability: 95 %

Uniformity standard: Uniformity is assessed by a single visual observation of a group of trees or part of the trees. In the case of a sample size of 5 tress no off-types are allowed.

Decision rule:

A variety is considered uniform if it is within the uniformity standard in both of the two growing cycles

A variety is considered non uniform if it fails to meet the uniformity standard in both of the two growing cycles

Country/Organization:	CHILE/SAG
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Reply from: Community Plant Variety Office of the European Union

Crop/Species: Apple

Test Guidelines: CPVO-TP 014/2

The minimum duration of tests should normally be two independent fruiting cycles. The technical examination takes place in one location. The applicant provides the full sample of one-year old plants grafted on M9 at the start of the DUS trial.

Explanation of the methodology for assessing uniformity by off-types on the basis of more than one sample or sub-samples

Sample size: 5 plants for varieties resulting from crossings. 10 plants on varieties resulting from mutation

Population standard: 1%

Acceptance probability: 95%

Uniformity standard: No off-types in the sample of 5 plants for varieties resulting from crossings; 1 off-type in the sample of 10 plants on varieties resulting from mutations

Decision rule: (i) *Seedling varieties*: A variety is considered within the uniformity standard in a given fruiting cycle if there are no off-type plants or parts of plants in that fruiting cycle.

(ii) *Mutation varieties*: A variety is considered within the uniformity standard in a given fruiting cycle if the number of off-type plants or parts of plants should not exceed1 in 10 in that fruiting cycle.

A variety is considered uniform if it is within the uniformity standard in both of the two fruiting cycles

A variety is considered non-uniform if it fails to meet the uniformity standard in both of the two fruiting cycles.

If at the end of the two fruiting cycles the variety is within the uniformity standard in one fruiting cycle but is not within the uniformity standard in the other growing cycle, then uniformity can be assessed in a third fruiting cycle after consultation with the applicant. If in the third fruiting cycle the variety is within the uniformity standard, the variety is considered uniform. If at the end of the third fruiting cycle the variety fails to meet the uniformity standard, the variety is considered non-uniform.

However, it at the end of the first fruiting cycle the number of off-types is clearly above the permitted uniformity standards (e.g. 2 off-types within the sample of 5 plants for seedling varieties), then the CPVO can decide to draw up a negative technical report at that stage due to non-uniformity, in order to save the applicants the costs of the second fruiting cycle, since it will inevitably lead to a negative technical report anyway.

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Reply from: Czech Republic

Crop/Species: Apple

Test Guidelines: TG/14/9

I - For the assessment of uniformity of characteristics observed on a sample size of 5 trees or parts taken from each of 5 trees in case of varieties resulting from crossing.

For the assessment of uniformity of characteristics observed on a sample size of 10 trees or parts taken from each of 10 trees in case of varieties resulting from mutation.

Sample size: Varieties resulting from crossing: 5 trees, for measuring or counting 2 parts from each of the 5 plants are taken.
Varieties resulting from mutation: 10 trees, for measuring or counting 1 part from each of the 10 plants are taken.

Population standard: 1 %

Acceptance probability: 95 %

Uniformity standard: the number of off-type plants or parts of plants should not exceed 1 in case of varieties resulting from mutation and in case of varieties resulting from crossing there is no off-type allowed.

I - Observations on the fruit is made on a 10 kg bulk sample of typical fruits at the time of ripeness for eating. The terminal (king) fruits are excluded.

Sample size: 10 kg of fruits (c. 50 pcs.)

Population standard: -

Acceptance probability: -

Uniformity standard: uniformity is not assessed in this case.

Decision rule: A variety is considered within the uniformity standard in a given growing cycle if the number of off-types does not exceed the number of allowed off-types.

A variety is considered uniform if it is within the uniformity standard in both of the two growing cycles.

Since apple trees are perennial plants there is impossible to re-submit plant material. So if at the end of the two growing cycles the variety is within the uniformity standard in one growing cycle but is not within the uniformity standard in the other growing cycle, then the variety is considered non-uniform.

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Apple

Reply from: Georgia

Crop/Species: Apple Test Guidelines: TG/14/9
Explanation of the methodology for assessing uniformity by off-types on the basis of more than one sample or sub-samples Sample size: 10 Population standard: 0.1% Acceptance probability: 95% Uniformity standard: In the case of a sample size of 5 plants, none of off-types are allowed. In case of 10 plants, 1 off-type is allowed.
Decision rule: A variety is considered within the uniformity standard in a given growing cycle if the number of off-type plants or parts of plants should not exceed 1 in 10 in that growing cycle.

Country/Organization: National Intellectual Property Center "SAKPATENTI"	
Person completing the form	
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Reply from: Latvia

Crop/Species: Apple

Test Guidelines: TG/14/9

Explanation of the methodology for assessing uniformity by off-types on the basis of more than one sample or sub-samples

Observation of characteristics is done visually. Off-type is defined as a whole plant with one characteristic different from the other plants according to the criteria for the certain characteristic class (QL, QN, PQ). Atypical plants detected as resulting from environmental stress are excluded from evaluation.

Sample size:

5 trees for a variety resulting from crossing or 10 trees for a variety resulting from genetic mutation; evaluated for 2 growth seasons on the same plants.

Population standard: 1%

Acceptance probability: 95%

Uniformity standard:

A variety is considered uniform if no trees in 5 for varieties resulting from crossing or no more than 1 tree in 10 for varieties resulting from mutation is off-type.

Decision rule:

A variety is considered uniform if no off-types are found for any characteristic.

A variety is considered non-uniform if more than the acceptable number off-types are found for a certain characteristic during both growth seasons.

If off-types are found only in one growth season, evaluation is prolonged for 1 more year. If more than the acceptable number off-types are found in the 3rd season the variety is considered non-uniform and, in case of varieties resulting from mutation, not stable.

Country/Organization: Latvia	Latvia State Institute of Fruit-Growing, DUS Testing Laboratory
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Reply from: New Zealand

Crop/Species: Apple

Test Guidelines: TG/14/9

Explanation of the methodology for assessing uniformity by off-types on the basis of more than one sample or sub-samples

Sample size: 5 trees on MM106 rootstock for varieties originating as seedlings for a single independent growing cycle

30 trees on M9 rootstock for varieties originating as mutations for two independent growing cycles. The same set of trees is observed for both growing cycles.

Population standard: 1%

Acceptance probability: 95%

Uniformity standard: For 5 trees, no off type trees are allowed

For 30 trees, 1 off type tree is allowed

Decision rule: *For varieties originating as seedlings*:

A variety is considered uniform if it is within the uniformity standard in the single growing cycle.

A variety is considered non-uniform if it fails to meet the uniformity standard in the single growing cycle.

If at the end of the growing cycle, there is any doubt that the variety is within the uniformity standard e.g. it is not sufficiently clear whether or not a particular plant is an off type, a second growing cycle may be carried out. If in the second cycle the variety is within the uniformity standard, the variety is considered uniform. If at the end of the second growing cycle the variety fails to meet the uniformity standard, the variety is considered non-uniform.

For varieties originating as mutations

A variety is considered uniform if it is within the uniformity standard in both of the two growing cycles.

A variety is considered non-uniform if it fails to meet the uniformity standard in both of the two growing cycles.

If at the end of the two growing cycles the variety is within the uniformity standard in one growing cycle but is not within the uniformity standard in the other growing cycle, then uniformity is assessed in a third growing cycle. If in the third growing cycle the variety is within the uniformity standard, the variety is considered uniform. If at the end of the third growing cycle the variety fails to meet the uniformity standard, the variety is considered non-uniform.

Country/Organization:	New Zealand
Person completing the form	
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Fax No.:	

Reply from: Republic of Moldova

Crop/Species: Apple Test Guidelines: TG/14/9
Explanation of the methodology for assessing uniformity by off-types on the basis of more than one sample or sub-sample Sample size: *10 trees per one growing cycle* Population standard: *1 %* Acceptance probability: *95 %* Uniformity standard: *1 plants off-type is allowed*
Decision rule: A variety is considered uniform if the total number of off-types at the end of the two growing cycles does not exceed 2 in 20 plants.

Country/Organization:	*MD, Republic of Moldova, The State Commission for Crops Variety Testing*
Person completing the form	
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[Annex IV follows]

ANNEX IV

Replies to the Questionnaire "Population standards used for assessing uniformity by off-types on the basis of more than one sample" for

CAULIFLOWER

Reply from: Bulgaria

Crop/Species: Cauliflower

Test Guidelines: TG/45/7

Explanation of the methodology for assessing uniformity by off-types on the basis of more than one sample or sub-samples

Sample size: 60 plants

Population standard: - 1% for single cross hybrids and inbred lines

- 3% for inbred plants obviously resulting from the selfing of parent line in single cross hybrids

Acceptance probability: 95%

Uniformity standard: - for single cross hybrids and inbred lines in sample of 60 plants – 2 off-types are allowed

- for single cross hybrids – in sample of 60 plants – 4 inbred plants are allowed.

Decision rule: A variety is considered within the uniformity standard in a given growing cycle if the number of off-types in all samples does not exceed the number of allowed off-types in either of the samples.

A variety is considered uniform if it is within the uniformity standard in both of the two growing cycles.

A variety is considered non-uniform if it fails to meet the uniformity standard in both of the two growing cycles.

If at the end of the two growing cycles the variety is within the uniformity standard in one growing cycle but is not within the uniformity standard in the other growing cycle, then uniformity is assessed in a third growing cycle. If in the third growing cycle the variety is within the uniformity standard, the variety is considered uniform. If at the end of the third growing cycle the variety fails to meet the uniformity standard, the variety is considered non-uniform.

Country/Organization:	Bulgaria/Executive Agency for Variety Testing, Field Inspection and Seed Control
Person completing the form	
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Reply from: Community Plant Variety Office of the European Union

Crop/Species: Cauliflower

Test Guidelines: CPVO-TP 045/2

The minimum duration of tests should normally be two independent growing cycles. Each growing cycle includes a total of 40 plants, divided between two or more replicates. The DUS test can be organised as either (i) sowings in two separate seasons at the same location, or (ii) sowings at separate locations sufficiently far apart but within the same season. The applicant normally provided the full sample of seed to complete the technical examination at the start of the DUS trial. However, in exceptional circumstances, for parent line varieties the CPVO can consent to the submission of a reduced amount of seed for the first growing cycle, and the rest of the seed in time for the second growing cycle; if this is the case then part of the two seed samples are grown alongside each other in the second growing to compare the conformity of the variety.

Explanation of the methodology for assessing uniformity by off-types on the basis of more than one sample or sub-samples

Sample size: 120 plants (obtained in two independent growing cycles with 60 plants in each growing cycle).

Population standard: 1% for single cross hybrids and inbred lines. However, for single cross hybrids, a population standard of 3% is applied for inbred plants obviously resulting from the selfing of the parent line.

Acceptance probability: 95%

Uniformity standard: 2 off types are allowed in the sample size of 60 plants for single cross hybrids and inbred lines. For the single cross hybrids where there are inbred plants obviously resulting from the selfing of the parent line, 4 inbred plants are allowed in the sample of 60 plants.

Decision rule: A variety is considered within the uniformity standard in a given growing cycle if the number of off-type plants or parts of plants should not exceed 2 in 60 in that growing cycle for single cross hybrids and inbred lines. For the single cross hybrids where there are inbred plants obviously resulting from the selfing of the parent line, a variety is considered within the uniformity standard in a given growing cycle if the number of inbred plants should not exceed 4 in 60 in that growing cycle.

A variety is considered uniform if it is within the uniformity standard in both of the two growing cycles.

A variety is considered non-uniform if it fails to meet the uniformity standard in both of the two growing cycles.

If at the end of the two growing cycles the variety is within the uniformity standard in one growing cycle but is not within the uniformity standard in the other growing cycle, then uniformity can be assessed in a third growing cycle after consultation with the applicant. If in the third growing cycle the variety is within the uniformity standard, the variety is considered

uniform. If at the end of the third growing cycle the variety fails to meet the uniformity standard, the variety is considered non-uniform.

However, it at the end of the first growing cycle the number of off-types is clearly above the permitted uniformity standards (e.g. 5 off-types within the sample of 60 plants for inbred line varieties), then the CPVO can decide to draw up a negative technical report at that stage due to non-uniformity, in order to save the applicants the costs of the second growing cycle, since it will inevitably led to a negative technical report anyway.

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Reply from: Czech Republic

Crop/Species: Cauliflower

Test Guidelines: TG/45/7

I - For the assessment of uniformity of characteristics observed on a sample size of 60 plants or parts of plants.

Sample size: 60 plants or parts of plants

Population standard: 1 %

Acceptance probability: 95 %

Uniformity standard: the number of off-type plants or parts of plants should not exceed 2 in 60.

II - For the assessment of uniformity of characteristics observed on a sample size of 20 plants or parts of plants.

Sample size: 20 plants or parts of plants

Population standard: 1 %

Acceptance probability: 95 %

Uniformity standard: the number of off-type plants or parts of plants should not exceed 1 in 20.

Decision rule: A variety is considered within the uniformity standard in a given growing cycle if the number of off-types in all samples does not exceed the number of allowed off-types in either of the samples.

A variety is considered uniform if it is within the uniformity standard in both of the two growing cycles.

A variety is considered non-uniform if it fails to meet the uniformity standard in both of the two growing cycles.

If at the end of the two growing cycles the variety is within the uniformity standard in one growing cycle but is not within the uniformity standard in the other growing cycle, then uniformity is assessed in a third growing cycle. If in the third growing cycle the variety is within the uniformity standard, the variety is considered uniform. If at the end of the third growing cycle the variety fails to meet the uniformity standard, the variety is considered non-uniform.

Country/Organization:	Czech Republic/ÚKZÚZ
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Reply from: France

Crop/Species: Cauliflower

Test Guidelines: TG/45/7

Explanation of the methodology for assessing uniformity by off-types on the basis of more than one sample or sub-samples

Sample size: DUS = 2 independent cycles the same year in 2 locations
– first cycle : 84 plants – second cycle : 144 plants

Population standard: 1 %

Acceptance probability: > = 95 %

Uniformity standard: first cycle : 6 off types – second cycle : 8 off types – total : 10 off types

The number of off types allowed is increased of 50 % if the off types are the female inbred line.

Decision rule: The decision is taken on the base of the total number of plants observed (228) → allowed 10 off types.

If the number of off types observed is very different from one cycle to another, a third cycle could be realized to confirm the level of uniformity.

Variety X : first cycle : 2 off type
second cycle : 9 off type – Total : 11 (> acceptance 10)

third cycle : 3 – Total : 13 (< acceptance 11)
→ this variety is uniform.

Country/Organization:	GEVES (France)
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Reply from: Italy

Crop/Species: Cauliflower (*Brassica oleracea* L.covar. *botrytis* (L.) Alef. Var. *botrytis* L.)

Test Guidelines: TG/45/7

The minimum duration of tests should normally be two independent growing cycles. Each test should be designed to result in a total of at least 60 plants, which should be divided between two or more replicates.

Sample size: 33 plants in two repetitions (66 in total) in each growing cycle

Population standard: in the case of single cross hybrids and inbred lines (in hybrid varieties self pollinated plants are assessed separately and a populations standard of 3% is used)

Acceptance probability: always ≥ 95%

Uniformity standard:

Open pollinated varieties: the number of off-types should not exceed the number in already known varieties.

Single-cross hybrids and inbred lines:

- *Off-type plants:* no more than 2 off-type plants of parts of plants in 60 plants
- *Self pollinated plants:* no more than 4 self pollinated plants in 60 plants.

Decision rule: A variety is considered within the uniformity standard in a given growing cycle if the number of off-type plants (or parts of plants) does not exceed 2 , or 4 self pollinated plants in the 60 in each growing cycle.

If at the end of the two growing cycles the variety is within the uniformity standard in one growing cycle but is not within the uniformity standard in the other growing cycle, then the Ministry of Agriculture request the breeder of the variety if he or she wants to carry out a third growing cycle of testing. If the breeder does not accept, the variety will be considered non uniform. If the breeder accepts the variety will be tested a third growing cycle. If in the third growing cycle the variety is within the uniformity standard, the variety is considered uniform. If at the end of the third growing cycle the variety fails to meet the uniformity standard, the variety is considered non uniform

Country/Organization:	Italy – I.N.R.A.N. (ex E.N.S.E.)
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Reply from: Spain

Crop/Species: Cauliflower Test Guidelines: TG/45/7
Explanation of the methodology for assessing uniformity by off-types on the basis of more than one sample or sub-samples Sample size: 75 Population standard: 1% (híbridos) Acceptance probability: 95% Uniformity standard: 2 off-type plants are allowed.
Decision rule: 2 growing cycles are considered with a total of 150 plants. - If the sum of the total number of off-types of both growing cycles is >5, the variety is considered non uniform. - If the total of off-type plants is <5, the variety is considered uniform. - If the total number of off-type plants is 5, a third test with 75 plants is required. If in the third trial the number of off-types is >2, the variety is considered non uniform. If the number of off-types is <3, the variety is considered uniform.

Country/Organization:	Spain/ *Centro de evaluación de variedades de INIA en Valencia*
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[Annex V follows]

ANNEX V

Replies to the Questionnaire "Population standards used for assessing uniformity by off-types on the basis of more than one sample" for

CHINESE CABBAGE

Reply from: Singapore

Crop/Species: Chinese cabbage - Xiao Bai Cai (*Brassica chinensis* L.) Test Guidelines: TG// (TG Draft still under development)
Explanation of the methodology for assessing uniformity by off-types on the basis of more than one sample or sub-samples Sample size: 100 plants Population standard: 1% Acceptance probability: 95% Uniformity standard: The number of off-type plants or parts of plants should not exceed 2 in 50 plants.
Decision rule: A variety is considered uniform if the total number of off-types at the end of the one growing cycles does not exceed 2 in 50 plants

Country/Organization:	Singapore/ Agri-Food & veterinary Authority of Singapore
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[Annex VI follows]

ANNEX VI

Replies to the Questionnaire "Population standards used for assessing uniformity by off-types on the basis of more than one sample" for

LETTUCE

Reply from: New Zealand

Crop/Species: Lettuce Test Guidelines: TG/13/10
Explanation of the methodology for assessing uniformity by off-types on the basis of more than one sample or sub-samples Sample size: 60 plants per trial. Two independent growing cycles of 60 plants each. Population standard: 1% Acceptance probability: 95% Uniformity standard: the number of off types plants or parts of plants should not exceed 2 from 60
Decision rule: A variety is considered uniform if it is within the uniformity standard in both of the two growing cycles A variety is considered non-uniform if it fails to meet the uniformity standard in both of the two growing cycles If at the end of the two growing cycles the variety is within the uniformity standard in one growing cycle but is not within the uniformity standard in the other growing cycle, then uniformity is assessed in a third growing cycle. If in the third growing cycle the variety is within the uniformity standard, the variety is considered uniform. If at the end of the third growing cycle the variety fails to meet the uniformity standard, the variety is considered non-uniform

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[End of Annex VI and of document]