

Technical Committee

TC/54/17

Fifty-Fourth Session
Geneva, October 29 and 30, 2018Original: English
Date: August 23, 2018**REVISION OF DOCUMENT TGP/8: PART II: SELECTED TECHNIQUES USED IN DUS EXAMINATION,
SECTION 9: THE COMBINED-OVER-YEARS UNIFORMITY CRITERION (COYU)***Document prepared by the Office of the Union**Disclaimer: this document does not represent UPOV policies or guidance*

EXECUTIVE SUMMARY

1. The purpose of this document is to report on developments concerning the improved method of calculation of the Combined-Over-Years Uniformity Criterion (COYU). The current method of calculation of the COYU criterion is described in document TGP/8 "Trial Design and Techniques Used in the Examination of Distinctness, Uniformity and Stability".

2. The COYU Criterion is used for the assessment of uniformity with quantitative characteristics, when observations are made on a plant basis over two or more cycles and when there is quantitative variation between plants of a variety.

3. The TC is invited to note that:

(a) the TWF, at its forty-eighth session, suggested to conduct a survey among members of the Union to assess the number of authorities using the COYU method for each crop sector, in order to assess how best to present information in relation to COYU to the TWPs;

(b) the TWC, at its thirty-fifth session, agreed to invite the expert from the United Kingdom to report on further improving the software using the new method of calculation of COYU, at its thirty-sixth session;

(c) the TWC noted the invitation by the United Kingdom for interested experts to get in contact for testing the new software containing the improved method of calculation of COYU;

(d) the TWC agreed to invite the expert from the United Kingdom to draft a replacement section for document TGP/8 on the method of calculation of the Combined-Over-Years Uniformity Criterion; and

(e) there were no developments at the thirty-sixth session of the TWC with regard to the request by the TC-EDC to formulate a proposal for consideration by the TC, at its fifty-fourth session, on a new method of calculation of COYU.

4. The following abbreviations are used in this document:

TC:	Technical Committee
TC-EDC:	Enlarged Editorial Committee
TWA:	Technical Working Party for Agricultural Crops
TWC:	Technical Working Party on Automation and Computer Programs
TWF:	Technical Working Party for Fruit Crops
TWO:	Technical Working Party for Ornamental Plants and Forest Trees
TWPs:	Technical Working Parties
TWV:	Technical Working Party for Vegetables

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BACKGROUND

6. The background to this matter is provided in document TC/53/16 “Revision of document TGP/8: Part II: Selected Techniques Used in DUS Examination, Section 9: The Combined-Over-Years Uniformity Criterion (COYU)”.

DEVELOPMENTS IN 2017

7. The TWA, TWV, TWO, TWF and TWC considered document TWP/1/13 “The combined-over-years uniformity criterion (COYU)”. The TWC also considered document TWC/35/6 “Method of calculation of COYU: practical exercise, probability levels, extrapolation and software” and received a presentation by the United Kingdom, a copy of which is provided in document TWC/35/6 Add. (see documents TWA/46/10 “Report”, paragraph 24; TWV/51/16, paragraph 34; TWO/50/14 “Report”, paragraph 32; TWF/48/13 “Report”, paragraphs 37 and 38; and TWC/35/21 “Report”, paragraphs 81 to 84).

8. The TWA, TWV, TWO and TWF noted the report on developments concerning the improved method of calculation of the Combined-Over-Years Uniformity Criterion (COYU), as set out in document TWP/1/13. The TWA noted that the expert from the United Kingdom would report on the progress of development of probability levels for the improved method of calculation of COYU to the TWC, at its thirty-fifth session.

9. The TWF agreed to suggest to the TC to conduct a survey among members of the Union to assess the number of authorities using the COYU method for each crop sector, in order to assess how best to present information in relation to COYU to the TWPs, especially when not relevant for the crop sector.

10. The TWC considered the report on developments concerning the new method of calculation of COYU, provided by an expert from the United Kingdom and noted that the statistical development of the method had been completed.

11. The TWC noted the results of the practical exercise and higher probability levels required by the new method to most closely match decisions using the current method for calculation of COYU

- probability levels 0.003 to match 0.001 for current COYU
- probability levels 0.02 to match 0.01 for current COYU

12. The TWC noted the following areas identified for further improving the software using the new method of calculation of COYU and agreed to invite the expert from the United Kingdom to report on developments at its thirty-sixth session:

- Improve installation with DUST
- Improve error messages
- Ensure that problematic data sets can be dealt with appropriately
- Produce extrapolation flags according to approach agreed by TWC
- Ensure that the algorithm works well for unbalanced data (for cyclic planting).

DEVELOPMENTS IN 2018

Enlarged Editorial Committee

13. The Council, at its thirty-fourth extraordinary session, held in Geneva on April 6, 2017, decided to organize a single set of sessions from 2018, in the period of October/November (see document C(Extr.)/34/6 "Report on the decisions", paragraphs 12 to 14). From 2018, the meetings of the TC will take place on October/November instead of March/April.

14. The Council decided to adopt the proposals of the TC, at its fifty-third session, to use contingency measures in the transitional period until the fifty-fourth session of the TC, to be held in October 2018; for TGP documents, the TC-EDC would consolidate comments made by the TWPs at their sessions in 2017 and, in the absence of consensus between the TWPs, to formulate proposals for further consideration by the TWPs at their sessions in 2018 (see document C(Extr.)/34/6 "Report on the decisions", paragraphs 12 to 14).

15. The Enlarged Editorial Committee (TC-EDC), at its March/April meeting in Geneva on March 26 and 27, 2018, considered document TC-EDC/Mar18/14 "The combined-over-years uniformity criterion (COYU)".

16. The TC-EDC noted that the TWF had suggested to conduct a survey among members of the Union to assess the number of authorities using the COYU method for each crop sector, in order to assess how best to present information in relation to COYU to the TWPs.

17. The TC-EDC noted that the TWC had agreed to invite the expert from the United Kingdom to report on further improving the software using the new method of calculation of COYU, at its thirty-sixth session.

18. The TC-EDC agreed to propose to the TWC to formulate a proposal for consideration by the TC, at its fifty-fourth session, on the new method of calculation of COYU.

19. The TC-EDC agreed that the improved method of calculation of COYU should only be discussed by the TWC and the TC, at their sessions in 2018.

Technical Working Party on Automation and Computer Programs

20. The TWC, at its thirty-sixth session, held in Hanover, Germany, from July 2 to 5, 2018, considered document TWC/36/4 "Method of calculation of the Combined-Over-Years Uniformity Criterion (COYU): an update on progress", a copy of which is provided in Annex to this report.

21. The TWC noted the invitation by the United Kingdom for interested experts to get in contact for testing the new software containing the improved method of calculation of COYU. The TWC noted the interest of experts to integrate the new method into software packages other than the software "R" (see document TWC/36/15 "Report", paragraphs 18 to 19).

22. The TWC agreed to invite the expert from the United Kingdom to draft a replacement section for document TGP/8 on the method of calculation of the Combined-Over-Years Uniformity Criterion.

23. With regard to the proposal of the TC-EDC for the TWC to formulate a proposal for consideration by the TC, at its fifty-fourth session, on a new method of calculation of COYU, there are no developments to report.

24. *The TC is invited to note that:*

(a) the TWF, at its forty-eighth session, suggested to conduct a survey among members of the Union to assess the number of authorities using the COYU method for each crop sector, in order to assess how best to present information in relation to COYU to the TWPs;

(b) the TWC, at its thirty-fifth session, agreed to invite the expert from the United Kingdom to report on further improving the software using the new method of calculation of COYU, at its thirty-sixth session;

(c) the TWC noted the invitation by the United Kingdom for interested experts to get in contact for testing the new software containing the improved method of calculation of COYU; and

(d) the TWC agreed to invite the expert from the United Kingdom to draft a replacement section for document TGP/8 on the method of calculation of the Combined-Over-Years Uniformity Criterion; and

(e) there were no developments at the thirty-sixth session of the TWC with regard to the request by the TC-EDC to formulate a proposal for consideration by the TC, at its fifty-fourth session, on a new method of calculation of COYU.

[Annex follows]

METHOD OF CALCULATION OF THE COMBINED-OVER-YEARS UNIFORMITY CRITERION (COYU): AN UPDATE ON PROGRESS

BACKGROUND

1. Following recommendations from experts from Denmark and the United Kingdom, it was agreed to undertake improvements to the methodology of COYU.

2. The Technical Working Party on Automation and Computer Programs (TWC), at its thirty-fifth session, noted progress (see document TWC/35/21 "report", paragraph 81 to 84):

"81. The TWC considered documents TWP/1/13 and TWC/35/6 "Method of calculation of COYU: practical exercise, probability levels, extrapolation and software" and received a presentation by the United Kingdom, a copy of which is provided in document TWC/35/6 Add.

82. The TWC considered the report on developments concerning the new method of calculation of COYU, provided by an expert from the United Kingdom and noted that the statistical development of the method had been completed.

83. The TWC noted the results of the practical exercise and higher probability levels required by the new method to most closely match decisions using the current method for calculation of COYU

- probability levels 0.003 to match 0.001 for current COYU
- probability levels 0.02 to match 0.01 for current COYU

84. The TWC noted the following areas identified for further improving the software using the new method of calculation of COYU and agreed to invite the expert from the United Kingdom to report on developments at its thirty-sixth session:

- Improve installation with DUST
- Improve error messages
- Ensure that problematic data sets can be dealt with appropriately
- Produce extrapolation flags according to approach agreed by TWC
- Ensure that the algorithm works well for unbalanced data (for cyclic planting)."

PROGRESS SINCE THE THIRTY-FIFTH SESSION OF THE TWC

3. Since the thirty-fifth session of the TWC, work has concentrated on improving the functionality of the software (in R). In particular, we have:

- Improved the plots showing the relationship between uniformity and level of expression by adding points for candidates;
- Added calculations of the level of extrapolation (method b using degree of inflation) for each candidate;
- Had initial discussions on improving error messages.

NEXT STEPS AND PROPOSALS

4. Over 2019, we intend to:

- Review error messages;
- Produce a new version of the COYU R package and test this internally;
- Address installation issues with the DUST installation including the new COYU module.

5. We propose that:

- The new software is sent out for testing by interested experts;
- The United Kingdom draft a replacement section of TGP/8 for COYU.