UPOV
International Union for the Protection of New Varieties of Plants

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Technical Working Party on Testing Methods and Techniques **TWM/2/3**

Second Session
Virtual meeting, April 8 to 11, 2024

Original: English
Date: March 12, 2024

THE COMBINED-OVER-YEARS UNIFORMITY CRITERION (COYU)

Document prepared by experts from the United Kingdom

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INTRODUCTION

1. The Combined-Over-Years Uniformity (COYU) criterion is a method used to assess uniformity on the basis of measured quantitative characteristics (see document TGP/8 “Trial Design and Techniques Used in the Examination of Distinctness, Uniformity and Stability”).

2. This document gives an update on developments related to the improved version of the Combined Over Years Uniformity (COYU) criterion. The improved version uses splines for adjustment, rather than the moving average method as currently used.

3. The update covers software development and the issue of extrapolation.

4. Progress has been delayed due to wider improvements to the “DUSTNT” software, which will include a module for the new COYU.

Extrapolation

5. In COYU, uniformity is assessed from the variability in a characteristic between plants within a plot. The variability is adjusted for any relationship with the mean score using splines (or moving averages for the current method).

6. Extrapolation is when a candidate variety has a mean score outside the range of scores expressed by the reference varieties in a particular year. In such cases, the adjustment is less reliable. An extrapolation index has been developed that reflects the degree of reliability of the adjustment. When this index is sufficiently high, indicating unreliable adjustment, the crop expert must review the results carefully and make a judgement. It is here where guidance is needed. For further information, see document TWM/1/7.

7. The United Kingdom held workshops for its DUS centers during 2022 and 2023 to discuss the issue of extrapolation and the drafting of guidance. Several examples from DUS trials were considered, representing a range of situations. It was also noted that the proportion of cases of extrapolation varied markedly between crops, with perennial ryegrass having a higher level.

8. At the workshops, it was concluded that better graphical output from the COYU module would facilitate evaluation of cases of extrapolation. Further drafting of the guidance would be delayed until the software had been updated with the suggested improvements.

Software

9. The United Kingdom has developed software to facilitate the introduction of the improved version of COYU. It will be available as a new module in the “DUSTNT” software and as a package in the statistical programming language “R”.

10. During the last year, improvements have been made to the software, especially in regard of the graphical output, as suggested at the United Kingdom workshops. For example, it is now possible to see the identifiers for the candidates on the graphs, and the plots can include all candidates or just one at a time (to facilitate communication with applicants).

11. During a previous round of evaluation, organized by UPOV, it was identified that installation of DUSTNT can be an issue, particularly in governmental computing environments with high levels of security. So the installation process for DUSTNT has now been modernized, in particular to respect Windows system norms. This development is a key reason for delay in implementation. However, the software should be available for evaluation at the time of this meeting.

12. While the new DUST installer should be better behaved, there will be an ongoing need for users to update local security policies, application whitelists and anti-malware tools to allow DUST and its various sub-components to run correctly. While there is some guidance in the manual on what may need to be done, this is highly dependent on the particular configuration of the deployment environment. As such, the United Kingdom partners can only provide limited troubleshooting support for deployment issues.

Looking ahead

12. The United Kingdom would appreciate involvement of UPOV members that use COYU in the evaluation exercise for the new DUSTNT software.

13. After this evaluation process, a new version of DUSTNT will be released, which includes the new COYU module.

14. The United Kingdom will finalize the draft guidance on extrapolation and propose this at the next TWM session. Once the software is ready, the United Kingdom intends to implement the improved method of COYU.

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