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AN ADJUSTMENT TO THE COYD METHOD
WHEN VARIETIES ARE GROUPED WITHIN THE DUS TRIAL; PROPOSAL FOR
TEXT TO BE ADDED TO TGP/8

Document prepared by experts from the United Kingdom

Background

1.   In some crops, it is possible to use grouping characteristics to define groups of varieties such that all the varieties within a group will be distinct from all the varieties of any other group ("distinct groups"). This grouping may be preserved in trial layouts so that, within a replicate, varieties in the same group are adjacent. (See TG/1/3, section 4.8 "Functional Categorization of Characteristics).

2.   In TWC/23/8, TWC/26/14 and TWC/27/18, an adjustment to the COYD method was described that takes into account group. This is both effective and relatively simple to implement. The benefits of the method were demonstrated by reference to data from UK pea and French tall fescue trials.

3.   Here text is proposed for insertion in TGP/8. This would be inserted in the COYD section in Part II, subsection 3.6 "Adapting COYD to special circumstances".

Proposed text

3.6.4 Crops with grouping characteristics

3.6.4.1   In some crops, it is possible to use grouping characteristics to define groups of varieties such that all the varieties within a group will be distinct from all the varieties of any other group ("distinct groups"). This grouping may be preserved in trial layouts so that, within a replicate, varieties in the same group are in the same vicinity. (See TG/1/3, section 4.8 "Functional Categorization of Characteristics).

3.6.4.2   When grouping is possible, such that all the varieties within a group will be distinct from all varieties of any other group, comparisons are only necessary between varieties in the same group. Since varieties within groups tend to be more similar to each other, it is possible to tailor the COYD method by accounting for the groups. If there are sufficient varieties in each group, COYD can be applied separately for each group. However, in practice some groups will generally have too few varieties. In such cases, the over-years analysis of variance (COYD) can be adjusted to take into account the grouping. This method is known as COYD for grouping (COYDG).

3.6.4.3   Whereas the standard COYD analysis of variance has terms for 'year' and 'variety', COYDG has terms for 'year', 'group', 'variety-within-group' and 'group-by-year'. The LSD is then calculated for comparisons between pairs of varieties within the same group. It is assumed that the same standard error is applicable within all groups. Note that a larger LSD will apply for comparisons between pairs of varieties from different groups.

3.6.4.4   So the LSD for COYDG is given by $LSD_p = t_p \text{ x } SED_G$

where SED_G is the standard error for the difference between two varieties within the same group and calculated as:

$$SED_G = \frac{\sqrt{2 \times \text{varieties} - \text{within} - \text{group - by- years mean square}}}{\text{number of test years}}$$

Note that the varieties-within group-by-years mean square is the same as the residual mean square from the COYDG analysis of variance.

3.6.4.5   The COYDG LSD is used in place of the COYD LSD as a distinctness criterion. Usually it should be smaller. However it is sensible to verify whether this is true on historical data sets.

3.6.4.6   The COYDG method can be applied using GTVRP module of the DUST package for the statistical analysis of DUS data, which is available from Dr. Sally Watson (Email: *info@afbini.gov.uk*) or from *http://www.afbini.gov.uk/dustnt.htm.*

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