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PHENOTYPIC DISTANCE

Document prepared by an expert from France

1. The drafts of TGP/9 “Examining Distinctness” and TGP/8 “Use of Statistical Procedures in DUS Testing” refer to “phenotypic distance” in the context of examining distinctness. The purpose of this document is to provide an explanation of phenotypic distance for inclusion in the relevant sections of the TGP documents.

2. The proposed explanation is as follows:

Phenotypic distance

3. The General Introduction (document TG/1/3) explains in Section 5.3.3 that “A variety may be considered to be clearly distinguishable if the difference in characteristics is consistent and clear”. Thus, the examination of distinctness can be based on a characteristic-by-characteristic approach, with a requirement that for two varieties to be considered distinct there should be a “minimum difference” for at least one characteristic. The “minimum difference” for a characteristic may either be set at a fixed level, determined by the DUS expert or on the basis of statistics, or may be based on the judgement of the DUS expert.

4. In the characteristic-by-characteristic / minimum difference approach, at least as a first step, differences between varieties which are less than the minimum difference for a characteristic are not considered: such differences may be considered in the DUS trial where very similar varieties can be compared on the basis of the sum of a number of small differences.
5. When judging distinctness between varieties in the DUS trial, DUS experts consider the overall level of difference.
6. The “phenotypic distance” approach is intended to reflect the observation of the DUS expert. As for distance measurement methods such as Mahalanbois and Gower, the phenotypic distance method combines the information for several characteristics for which there are differences. The result is a calculated value derived from all the differences observed. The distance measurement method could give more or less weighting to characteristics according to, for example, their genetic determination, their influence by the environment, the size of the difference and correlation between characteristics.
7. The appropriate parameters for the phenotypic distance are determined by DUS experts, with the aim of reflecting the overall level of difference and providing an objective basis for the decision on distinctness. Above a certain level, the phenotypic distance allows varieties which are very distinct to be excluded from the growing trial used for examination of distinctness. The phenotypic distance can also be used to organize the growing trial so that the most similar varieties are grouped together.
8. The benefit of phenotypic distance is that it provides an overall assessment of the difference between varieties and optimizes the ability of DUS experts to distinguish similar varieties.

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