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# POSITION

## ON THE USE OF DNA-BASED MARKERS IN TESTING FOR DISTINCTNESS, UNIFORMITY AND STABILITY (DUS)

ESA considers that, rather than the possible use of DNA-based markers in testing for DUS the current system based on phenotypical assessment, as implemented in most UPOV Member States, is the most appropriate method to determine whether a new variety fulfils the technical criteria for the granting of PBR.

DUS decisions based on the use of DNA-based markers alone in DUS testing, as a replacement for the assessment of the phenotype, are not yet considered to be acceptable for the following reasons:

Except for some specific cases, DNA-based markers are not predictive of the expression of phenotypic characteristics used in DUS testing and examination due to the relatively complex genetic control of many phenotypic characteristics.

The use of DNA-based markers in assessing distinctness, if based only on one band of difference in a molecular pattern, could lead to a decrease of minimum distance between varieties and by this would jeopardise the value of Plant Breeder's Rights.

DUS testing based on DNA-based markers cannot be restricted to distinctness but by necessity would have to be used for uniformity and stability as well and might also be used for checking the hybrid parental formula. This could have important consequences for the whole concept of plant breeding.

DNA-based markers or the methods to detect them may not be publicly available.

ESA considers that UPOV should focus on the approach of DNA-based markers for predicting phenotypic characteristics only in the situation where DNA-based markers are fully predictive of the expressions of the phenotypic DUS characteristics.

This might be useful for the examination of phenotypic characteristics that cannot be consistently seen in the field or which require additional special procedures (e.g. disease resistance).

ESA considers however, that in its work the UPOV BMT should address the effect of rapidly changing DNA-based marker techniques on the use of DNA-based markers in the DUS examination.

ESA acknowledges that the use of DNA-based markers could improve the handling of reference collections under normal growing conditions and practice to limit the costs of DUS testing provided that the technical knowledge specific to each species will be taken into account. In this respect, ESA supports the use of DNA-based markers based data in addition to the phenotypic descriptions for grouping or pre-screening and for the organisation of reference collections in the field, subject to sufficient phenotypic distance. As to improving the handling of reference collections, ESA also proposes additional mechanisms such as closer cooperation between Plant Variety Offices and further cooperation with breeders.

Furthermore ESA considers that DNA-based markers could be used in areas other than DUS testing, for instance as a tool in the assessment of essential derivation as well as for variety identification.

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ESA is the voice of the European seed sector. ESA's members are national associations and individual companies active in research, breeding, production and marketing of seeds of agricultural and ornamental plant species. ESA represents more than 7000 seed businesses in the EU and beyond.

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