

**Working Group on Biochemical and Molecular Techniques
and DNA-Profiling in Particular****BMT/17/20****Seventeenth Session
Montevideo, Uruguay, September 10 to 13, 2018****Original:** English
Date: August 31, 2018**USE OF DNA-BASED MARKERS IN TESTING FOR DISTINCTNESS, UNIFORMITY AND STABILITY
(DUS) AND ENFORCEMENT OF PLANT BREEDERS RIGHTS (PBR)***Document prepared by experts from the Seed Association of the Americas (SAA)**Disclaimer: this document does not represent UPOV policies or guidance***SAA POSITIONS:**

- › SAA supports changes to improve efficiency and optimize resources required for DUS testing while maintaining or improving PBR/PVP protection.
- › SAA supports expansion of DNA-based marker use in DUS with morphology continuing to serve as the foundation.
- › More precise characterization is needed in some crops, as many morphological DUS traits have little commercial value and are not selected for variation among varieties.
- › SAA strongly supports the use of DNA-based markers for enforcement of varieties with PBR, including to determine genetic similarity between varieties for use in disputes on essential derivation.
- › SAA encourages stakeholders to engage in the UPOV BMT Working Group.
- › SAA supports the use of DNA-based markers as surrogates for morphological traits and management of reference collections in the DUS process.
- › This statement focusses on the use of MM for PBR/PVP, nonetheless, the SAA acknowledges many applications for DNA-molecular markers techniques such as those applied to Plant Breeding Programs, Seed Quality Assurance, Purity test and Certification processes.
- › SAA encourages collaboration and harmonization between countries on protocols.
- › SAA considers important to build capacity in this area by promoting cooperation and interaction amongst research institutions, academia, regulatory bodies and the seed industry. SAA is committed to contribute and promote these cooperation activities.

The Seed Association of the Americas (SAA) supports changes that increase efficiency and manage costs of the current DUS procedures while maintaining or improving current levels of protection afforded by Plant Variety Protection (PVP).

SAA currently understands that morphological characteristics should continue to provide the foundation for DUS determination due the familiarity and experience with morphological traits. SAA also supports the expansion of DNA-based marker use in DUS and encourages further planning and exploration of marker use in combination with morphology or with comparable standing to morphological data.

For certain crops, especially field crops where yield and agronomics are the critical objectives of breeding, the number of useful morphological traits may be insufficient because most DUS traits are not selected for variation. Therefore, new varieties that have traits with improved commercial value, may express similar DUS traits compared to other varieties, which in-turn increases the difficulty and subsequent resources needed for DUS testing.

Increased precision among variety characterization techniques should be considered, that in many cases may easily distinguish varieties.

The use of DNA-based markers in plant breeding, variety identification, quality assurance and seed certification has become the norm in many crop species.

SAA strongly endorses the use of DNA-based markers for variety identification purposes, such as for determining distinctness, for enforcement of intellectual property rights or for deciding genetic conformity for resolution of essentially derived variety (EDV) disputes. DNA-based marker technologies and public molecular markers (such as Single Nucleotide Polymorphisms (SNPS)) per se, are abundant across many key field crop species.

Therefore, plant variety protection authorities of the different countries where SAA operates should proactively consider how DNA-based marker data can be effectively incorporated into the DUS system. In this regard, PVP offices should engage in and stay informed of the work that is done and reported under the auspices of the Biochemical and Molecular Techniques (BMT) Working Group of the International Union for the Protection of New Varieties of Plants (UPOV).

SAA supports DNA-based marker use in the DUS testing and examination process as follows:

- › When individual DNA-based markers are perfect surrogates for the expression of phenotypic DUS characteristics*
- › When used for the management of DUS reference collections[†] where the use of phenotypic descriptors together with DNA-based data can be acceptable for focusing DUS field trials on only those varieties that are similar by a combination of morphology and DNA-based data, provided that no phenotypically similar varieties are omitted.

SAA supports the expansion of DNA-based marker use in DUS and encourages further planning and exploration of marker use in combination with morphology or with comparable standing to morphological data. To facilitate harmonization between PVP authorities, SAA encourages collaboration between countries as DNA-based marker protocols are developed for the same crop species where possible. Planning may require exploration of opportunities and issues for each individual crop species related to:

- › Informative DNA-based marker panel(s) that are availability to public,
- › Access to the technology and expertise for all breeders
- › Legal access to existing inbred lines and varieties, and the confidential nature of their DNA-based profile and analysis.
- › Establishing agreed upon decision rules based on crop/public marker set in combination with morphology or founded upon already morphologically distinct varieties.

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* See Option 1a as outlined in UPOV documents TC/38/14-CAJ/45/5 and TC/38/14 Add.-CAJ/45/5 Add. TGP/15. UPOV/INF/18.

[†] See Option 2 as outlined in UPOV documents TC/38/14-CAJ/45/5 and TC/38/14 Add.-CAJ/45/5 Add. TGP/15. UPOV/INF/18.