

**Working Group on Biochemical and Molecular Techniques
and DNA-Profiling in Particular**

BMT/20/10

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CURRENT STATUS OF BMT UNDER THE OECD SEED SCHEMES

Document prepared by an expert from the Organisation for Economic Co-operation and Development (OECD)

Disclaimer: this document does not represent UPOV policies or guidance

The annex to this document contains a copy of a presentation on “Current status of BMT under the OECD Seed Schemes”, prepared by an expert from the Organisation for Economic Co-operation and Development (OECD), to be made at the twentieth session of the BMT.

[Annex follows]



CURRENT STATUS OF BMT UNDER THE OECD SEED SCHEMES

Csaba Gaspar
programme manager
OECD Seed Schemes

UPOV Working Group on Biochemical and Molecular
Techniques and DNA-Profiling in Particular (BMT)
22-24 September 2021

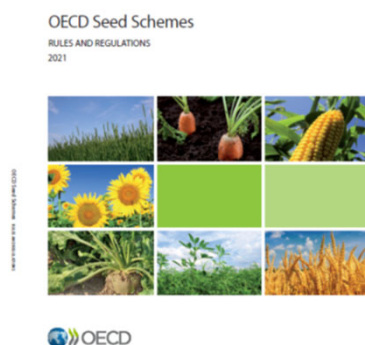


Content

- Updated Rules and Regulations related to BMT (2020)
- Guidelines related to the use of BMT under the OECD Seed Schemes (2020)
- Approved list of internationally recognised BMTs used in OECD seed varietal certification system (2020)
- Procedure for registration of a new BMT on the OECD List of BMTs (2021)



Rules and Regulations of the OECD Seed Schemes related to BMT



<https://www.oecd.org/agriculture/seeds/documents/oecd-seed-schemes-rules-and-regulations.pdf>

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Rules and Regulations of the OECD Seed Schemes related to BMT

- The Rules and Regulations of the OECD Seed Schemes related to BMT was revised in 2019 and published in 2020:
 - BMT remained **supplementary** tool in the OECD seed varietal certification system: NDAs cannot establish the certification status of a seed lot just on the basis of a BMT alone without field inspection /plot tests.
 - OECD Seed Schemes approved a **List of Internationally Recognised BMT Commonly Used by NDAs**. Only BMTs which are on this list can be applied.
 - Currently **BMT can only be applied for varietal identity evaluation**. Their use for varietal purity evaluation will be considered at a later stage
 - These approved BMTs can be carried out by **official and authorized non-official laboratories**

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Rules and Regulations of the OECD Seed Schemes related to BMT

7.4.5 Other Controls as appropriate

Where field inspection and control plot testing have been fully implemented and still left some doubt as to the varietal identity of a seed lot, the National Designated Authority is entitled to make any other supplementary tests as recorded in the Annex to Part III of the Guidelines for control plot tests and field inspection of seed crops, as being appropriate to the variety concerned and to obtain any supplementary information in support of the certification decision for the seed lot concerned including internationally recognised biochemical and molecular techniques performed by a laboratory as referred to in Rule 7.4.2.1

7.4.5.1 The National Designated Authority may authorize non-official laboratories to carry out the analysis. If the National Designated Authority decides to use this procedure, it must define its scope (activities, species, categories and persons concerned). The National Designated Authority shall satisfy itself of verifications and other requirements, and take all measures, which guarantee equivalent operations by an authorised laboratory or by an official laboratory.

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Guidelines for Control Plot Tests and Field Inspection of Seed Crops



<https://www.oecd.org/agriculture/seeds/documents/guidelines-control-plot-and-field-inspection.pdf>

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Guidelines for Control Plot Tests and Field Inspection of Seed Crops

- Part III of the Guidelines: Biochemical and Molecular Techniques to Assist with Determining Varietal Identity
- Annex A – Internationally Recognised Methods Currently Commonly used by the NDAs. This list is approved by the Annual Meeting (governing body of the Seed Schemes)
- All characteristics that are included on the Official Description of the variety (field or laboratory characters) can be used by NDAs to determine varietal identity and issue an OECD Seed Varietal Certificate
- The BMT methods listed can be used at the discretion of the NDA and can be applied to any category of seed.
- **Rejection of a seed lot** based on a BMT: the rejection should be undertaken in agreement with the rejecting and certifying NDAs.



Guidelines for Control Plot Tests and Field Inspection of Seed Crops

SPECIES	NAME OF TEST	DOCUMENTED BY	REFERENCE
<i>Avena sativa</i> (Oats)	A-PAGE (Acid-Polyacrylamide Gel Electrophoresis)	ISTA	ISTA Rule 8.8.6
<i>Brassica napus</i> (Rapeseed)	Isozymes in starch gels	CPVO	Annex II.2 "Description of the SGE Method (Starch Gel Electrophoreses) for the Analysis of Isoenzymes from Brassica napus" of CPVO-TP/036/2 Final "protocol for Distinctness, Uniformity and Stability tests"
	GMO detection and identification	ISTA	Internal methods validated with reference to EURL validation studies and to the standards ISO 21569 and ISO 21571
<i>Glycine max</i> (soyabean)	Seed: coloration due to peroxidase activity in seed coat	UPOV	Ad. 16: "Seed: coloration due to peroxidase activity in seed coat" to the UPOV IG/80/6 guidelines for the conduct of tests for Distinctness, Uniformity and Stability
	GMO Detection, Identification and Quantification	ISTA/ EURL	Internal methods validated with reference to EURL validation studies and to the standards ISO 21569, ISO 21570 and ISO 21571
<i>Helianthus annuus</i> (Sunflower)	SGE Method for the Analysis of Isoenzymes (Starch Gel Electrophoreses)	UPOV	Part III "SGE Method (Starch Gel Electrophoreses) for the Analysis of Isoenzymes" of the UPOV IG/81/6 guidelines for the conduct of tests for Distinctness, Uniformity and Stability
	Aleurone colour	UPOV	Ad. 28 "Kernel: color of aleuron layer" of the UPOV IG/19/10 guidelines for the conduct of tests for Distinctness, Uniformity and Stability



Procedure for registration/deletion of BMTs on the OECD List

- The 2021 Annual Meeting approved a two-step method for the registration of a BMT under the OECD Seed Schemes :
 - 1) Firstly the BMT is required to adhere to a set of principles;
 - 2) Secondly methods meet these principles will be approved as “internationally recognised” by NDAs based on a predefined process.



Procedure for registration/deletion of BMTs on the OECD List Principles

The OECD BMT Principles are the following:

- a) **Suitability of methods:** The methods should be appropriate and specific for achieving the objective.
- b) **Reproducibility of results between laboratories and detection platforms:** The methodology must be replicable across laboratories worldwide, in different conditions and economic situations and must deliver the same results.
- c) **Repeatability over time:** Methods must be able to be used in a reproducible way over time.
- d) **Discrimination power:** Methods must be described with precision and set clearly defined limits for classification of results.
- e) **Accessibility of methodology:** The methodologies must be clear, easy to understand and able to be obtained and applied by national designated authorities.



Procedure for registration/deletion of BMTs on the OECD List Categories of BMT

Category 1: The new BMT has been used to assess a specific characteristic of the variety in the official variety description of a variety registered under the OECD Seed Schemes - Those BMTs used to assess DUS and to establish the official variety description will be regarded as adhering to the principles, unless evidence to the contrary becomes available, and no further evidence will need to be submitted to the OECD Secretariat.

Category 2: The new BMT is recognised by a relevant International Organisation - BMTs which are recognised by UPOV, ISTA, AOSA, CPVO, ISO will be automatically regarded as adhering to the OECD principles and no further evidence need be submitted to the OECD Secretariat.

Category 3: Nationally recognised BMT - BMTs that are

- 1) not part of the official variety description and
- 2) not recognized by a relevant international organisation,

can only be registered on the list if they comply with the established OECD Principles for BMT. NDA's that wish to include a nationally recognised method will be required to provide evidence to prove that the method adheres to the principles set out above.

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Procedure for registration/deletion of BMTs on the OECD List Category 3 – Nationally recognised BMT

the NDA is required to provide evidence to prove that the method adheres to the OECD principles:

- **Rationale** – The NDA must explain why this BMT should be added to the OECD List of BMT. (advantage especially if a comparable BMTs are already registered on the list).

and

- **Full description of the technique** - The BMT must be described in sufficient detail to permit other laboratories or test organisations to replicate the procedure and obtain the same results. Each BMT method description must include quantity parameters, quality criteria, concentrations and specific limits for interpretation of results with provable and verifiable classification.

and

- **Endorsement by at least two other member NDAs** – the BMT must be supported by at least two other member NDAs that have experience of applying the method successfully.

or

- **Endorsement by an international organisation** - The NDA might propose to an International organisation (e.g. ISTA) to validate a nationally recognised BMT method, which once validated would then fall under Category 2.

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Thank You!

Csaba Gaspar:
csaba.gaspar@oecd.org

<https://www.oecd.org/agriculture/seeds/>