

**BMT/7/18****ORIGINAL:** English**DATE:** November 30, 2001**INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS**  
GENEVA**WORKING GROUP ON BIOCHEMICAL AND MOLECULAR  
TECHNIQUES AND DNA-PROFILING IN PARTICULAR****Seventh Session****Hanover, Germany, November 21 to 23, 2001****REPORT OF CONCLUSIONS***prepared by the Office of the Union*

1. The Working Group on Biochemical and Molecular Techniques and DNA-Profiling in Particular (hereinafter referred as “BMT”) held its seventh session in Hanover, Germany from November 21 to 23, 2001, under the chairmanship of Mr. Michael Camlin, United Kingdom.

New Developments in Biochemical and Molecular Techniques

2. The BMT noted that Single Nucleotide Polymorphisms (SNP’s) were being investigated by some molecular experts. However, it was generally recognized that microsatellite markers were now the most widely used technique in the characterization of plant varieties and this was likely to remain the situation for the foreseeable future.

Stability of Molecular Markers

3. Some experts considered that, at least in some crops such as some fruit trees, there could be some degree of instability as measured by molecular markers. Other experts considered that this was not the case and that the data suggesting such instability was probably due to methodological problems. It was concluded that this should be investigated further to clarify the situation.

### *Ad hoc* Crop Subgroups

4. The BMT considered that it was important for the *Ad hoc* subgroup, of Technical Committee and Administrative and Legal Committee members (hereinafter referred as “Review Subgroup”), to consider models for the use of biochemical and molecular techniques in DUS testing and make recommendations on the acceptability of these models, before the *Ad hoc* crop sub-groups (hereinafter referred as “Crop Subgroups”) take their work further. ASSINSEL advised that it would like to be invited to participate in this subgroup as an observer.

5. The BMT proposed that recommendations be sought on the basis of selected proposals developed in the Crop Subgroups, as reported in document BMT/7/3, Annex III. In particular it suggested that the models should be proposed for:

#### *Option 1: “Molecular Characteristics as Predictors of Traditional Characteristics”*

(a) Gene specific markers: the Review Subgroup would be asked to consider the acceptability of gene specific markers for predicting individual phenotypic characteristics. The characteristic of herbicide tolerance, introduced by genetic modification, is to be given as the example. The recommendation would need to be on the basis that there was reliable linkage between the marker and the expression of the characteristic. In considering this proposal, the Review Subgroup would be requested to make a recommendation on the acceptability of differences arising from different markers developed for the same expression of a characteristic.

(b) The use of a set of molecular characteristics to estimate a traditional characteristic: a model based on this approach would not be proposed at this time but it was emphasized that work on this approach was on-going.

#### *Option 2: “Calibration of Molecular Characteristics against Traditional Characteristics”*

A model would be presented on the basis of information from oilseed rape, maize and rose. This option would be proposed on the basis of a genetic distance assessment, rather than a characteristic by characteristic approach, and would be presented for use in the management of reference collections.

#### *Option 3: “Development of a New System”*

This option would be presented on the basis of the model proposed in the Rose Crop Subgroup and a model that will be developed on the basis of the information available from wheat. This option will be based on the use of molecular characteristics in the same way as existing non-molecular characteristics.

6. It was clarified that the three options developed by the Crop Subgroups related to the options for distinctness, including management of reference collections, and that it was equally important for the Review Subgroup to consider the uniformity and stability issues outlined in document BMT/7/3, Annex III.

7. The Review Subgroup would be asked to consider these models on the basis of certain assumptions, which would need to be made, regarding information which is not yet available for the crops used in the illustrations.

8. The BMT emphasized that the use of biochemical and molecular techniques in any of these proposals should not be interpreted as the complete replacement of non-molecular characteristics and that these methods should be considered in conjunction with non-molecular characteristics, for example, in the management of reference collections.

9. The following general schedule was then envisaged:

(a) The Review Subgroup to make recommendations to the Technical Committee and Administrative and Legal Committee, on the models outlined above.

(b) The Office of the Union to produce a document, containing these recommendations and the considerations of the Technical Committee, for circulation to the Technical Working Parties (TWPs).

(c) The TWPs to consider this document and to consider detailed reports of the work of Crop Subgroups.

(d) Where possible, the Crop Subgroups to meet after the next meeting of the relevant TWP to enable the views of the relevant TWP to be presented at the meeting.

10. The BMT recommended that the Crop Subgroup meetings should, in general, be held in association with meetings of relevant TWPs.

11. The BMT suggested the following approach for the existing Crop Subgroups:

(a) Maize: no future meeting planned at this stage, subject to consideration by the Technical Working Party for Agricultural Crops (TWA);

(b) Oilseed Rape: to meet sometime before the next TWA meeting, not necessarily at the same time as the TWA meeting;

(c) Rose: to meet before the next Technical Working Party for Ornamental Plants and Forest Trees (TWO) meeting;

(d) Tomato: no future meeting planned at this stage, subject to consideration by the Technical Working Party for Vegetables (TWV);

(e) Wheat: to meet immediately after, and in association with, the next TWA meeting.

12. The BMT suggested the establishment of new Crop Subgroups as follows:

(a) Sugarcane: to hold its first meeting immediately after, and in association with, the next TWA meeting;

(b) Potato: to hold its first meeting immediately after, and in association with, the next TWA meeting;

- (c) Mushroom: to hold its first meeting immediately after, and in association with, the next TWV meeting;
- (d) Soybean: to hold its first meeting immediately after, and in association with, the next TWA meeting, if there is sufficient interest amongst experts.

13. The BMT noted that its proposals, regarding existing and new Crop Subgroups, would be considered by the Technical Committee in April 2002. It also noted the large number of Crop Subgroups associated with the TWA and recognized the time pressures this would place on this Technical Working Party.

14. The proposed Chairman of a Peach/Citrus Crop Subgroup (Mr. Schulte, Germany), concluded that, on the basis of presentations at the session, there was insufficient basis for the creation of such a Crop Subgroup at this time. However, he would report on the BMT session to the next Technical Working Party for Fruit Crops (TWF) to ensure that it was fully informed of the current situation, since the TWF wished to be involved in this work.

#### Future Role of the BMT

15. In response to developments in UPOV, regarding biochemical and molecular techniques, and in particular the establishment of the Review Subgroup and Crop Subgroups, the BMT clarified its understanding of the role it should perform. This proposal is set out in the Annex to this document.

#### Development of Guidelines on the Suitability and Application of Different Biochemical and Molecular Methods

16. It was agreed that Mr. Vosman (Netherlands), in conjunction with Mr. Reeves (United Kingdom), would prepare draft guidelines on the suitability and application of different biochemical and molecular methods for variety characterization. The first draft would be circulated for comment by the BMT, by December 2002 and a revised document produced for discussion at the next session of the BMT.

#### Development of Guidelines on Statistical Methods for Data Produced by Biochemical and Molecular Methods

17. It was agreed that Mr. Grégoire (France) and Mr. Law (United Kingdom) should coordinate the development of papers on statistical methods for data produced by biochemical and molecular techniques. The topics addressed should include, in particular, band scoring, calculation of distances between varieties, uniformity assessment and the development of databases of variety information. Members of the Technical Working Party on Automation and Computer Programs (TWC) could contribute to the development of these papers.

Discussions on Phenotype

18. During discussions on the draft report of the conclusions, regarding models to be presented to the Review Group (see paragraphs 4-8), there were suggestions that the term “traditional characteristics” should be replaced with “phenotypic characteristics”, since the current UPOV characteristics are phenotypic. However, the Office of the Union noted that the titles of the options, including the term traditional characteristic, were taken from document BMT/7/3, Annex III and BMT/7/2, and it would, therefore, be inappropriate to seek to change the use of the term in these titles. It also noted that ploidy level, which is an existing UPOV characteristic, is not a truly phenotypic characteristic. Nevertheless, the delegations which expressed an opinion agreed that the existing UPOV characteristics should be recognized as phenotypic characteristics. To reflect this agreement it was decided that the first sentence of Option 1 (a) “Gene specific markers” should be reported as: “The Review Subgroup would be asked to consider the acceptability of gene specific markers for individual phenotypic characteristics.”

Future Program, Date and Place of Next Session

19. At the invitation of Japan, the BMT agreed to hold its eighth session in Tsukuba, Japan, in 2003. The BMT noted that Japan had already invited the TWA to hold its thirty-second session in Japan. It was anticipated that these two sessions could be held in consecutive weeks to facilitate the attendance of the members of the TWA if the TWA meeting was scheduled for May or June.

20. The following provisional program was agreed:

1. Opening of the Session
2. Adoption of the agenda
3. Short presentations, by: DUS experts; biochemical and molecular specialists; and plant breeders, on new developments in biochemical and molecular techniques
4. Reports from the Review Group, Technical Committee and Crop Subgroups
5. Report of work on molecular techniques on a crop by crop basis, including methods to assess the potential impact on the strength of variety protection
6. Development of guidelines on the availability and suitability of different biochemical and molecular methods for variety characterization
7. Review of the costs of molecular techniques
8. Construction and standardization of databases of molecular characteristics of plant varieties
9. Statistical methods for data produced by biochemical and molecular techniques
10. The use of molecular techniques in examining essential derivation
11. Future program, date and place of the next session
12. Report of the conclusions of the session

[Annex follows]

ANNEX

PROPOSED ROLE OF THE BMT

The BMT is a group open to DUS experts, biochemical and molecular specialists and plant breeders, which considers its role to be to:

- Review general developments in biochemical and molecular techniques;
- Maintain an awareness of relevant applications of biochemical and molecular techniques in plant breeding;
- Consider the possible application of biochemical and molecular techniques in DUS testing and report its considerations to the Technical Committee;
- If appropriate, establish guidelines for biochemical and molecular methodologies and their harmonization and, in particular, contribute to the preparation of document TGP/15, “New Types of Characteristics”. These guidelines to include methods for analysis of data resulting from such methods, to be developed in conjunction with the Technical Working Party on Automation and Computer Programs (TWC);
- Consider initiatives from Technical Working Parties, for the establishment of crop specific subgroups, taking into account available information and the need for biochemical and molecular methods;
- Develop guidelines regarding the management and harmonization of databases of biochemical and molecular information, in conjunction with the TWC;
- Receive reports from Crop Subgroups and the Review Subgroup;
- Provide a forum for discussion on the use of biochemical and molecular techniques in the consideration of essential derivation and variety identification.

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