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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS
GENEVA

TECHNICAL COMMITTEE

Forty-Fifth Session
Geneva, March 30 to April 1, 2009

MOLECULAR TECHNIQUES

Document prepared by the Office of the Union

1. The purpose of this document is to report on developments concerning the:

(a) UPOV Guidelines for DNA-profiling: molecular marker selection and database construction (BMT Guidelines);

(b) proposals for the utilization of biochemical and molecular techniques in the examination of Distinctness, Uniformity and Stability to be considered by the *Ad hoc* Subgroup of Technical and Legal Experts of Biochemical and Molecular Techniques (BMT Review Group):

(c) revision of documents TC/38/14-CAJ/45/5 and TC/38/14 Add.-CAJ/45/5 Add.;

(d) practical exercise in the development of an exchangeable database;

(e) international guidelines on molecular methodologies;

(f) statistical methods for data produced by biochemical and molecular techniques;

(g) *Ad Hoc* Crop Subgroups on Molecular Techniques (Crop Subgroups); and

(h) Working Group on Biochemical and Molecular Techniques, and DNA-Profiling in Particular (BMT).

2. An overview of the UPOV bodies involved in the consideration of biochemical and molecular techniques is provided on the first restricted area of the UPOV website at http://www.upov.int/restrict/en/upov_structure_index.html. That overview is also attached as Annex I to this document.

3. The following abbreviations are used in this document:

CAJ:	Administrative and Legal Committee
TC:	Technical Committee
TC-EDC:	Enlarged Editorial Committee
TWA:	Technical Working Party for Agricultural Crops
TWC:	Technical Working Party on Automation and Computer Programs
TWF:	Technical Working Party for Fruit Crops
TWO:	Technical Working Party for Ornamental Plants and Forest Trees
TWV:	Technical Working Party for Vegetables
TWP(s):	Technical Working Party(ies)
BMT:	Working Group on Biochemical and Molecular Techniques, and DNA-Profiling in Particular
BMT Review Group:	<i>Ad Hoc</i> Subgroup of Technical and Legal Experts on Biochemical and Molecular Techniques
Crop Subgroup:	<i>Ad Hoc</i> Crop Subgroup on Molecular Techniques

UPOV GUIDELINES FOR DNA-PROFILING: MOLECULAR MARKER SELECTION AND DATABASE CONSTRUCTION (BMT GUIDELINES)

4. At its eighth session held in Tsukuba, Japan, from September 3 to 5, 2003, the BMT concluded that there was an urgent need to harmonize methodologies for the generation of molecular data in order to ensure that the quality of the data produced would be universally acceptable for use in variety characterization. It was also noted that it would be useful to provide guidance on the planning of databases for molecular data based on different types of markers. On that basis, the BMT agreed that the Office of the Union should prepare a guidance document (BMT Guidelines).

5. Document BMT Guidelines (proj.9) was put forward for adoption by the Council at its forty-first ordinary session, held in Geneva on October 25, 2007.

6. At its seventy-fourth session, held in Geneva on October 24, 2007, the Consultative Committee made a preliminary examination of document BMT Guidelines (proj.9), proposed for adoption by the Council. The Consultative Committee made the following recommendations:

“[...]

“(b) consideration be given to the status of documents TC/38/14-CAJ/45/5 and TC/38/14 Add.-CAJ/45/5 Add. with regard to their reference in the introduction of document BMT Guidelines (proj.9); and

“(c) in response to the comments made by some delegations concerning the need for editorial improvements, the Consultative Committee agreed that a circular be sent to the Consultative Committee, the Technical Committee (TC) and the CAJ providing an opportunity to comment within four weeks on documents TGP/4/1 Draft 10, TGP/9/1 Draft 10 and BMT Guidelines (proj.9). Based on the comments received, new drafts of those documents would be prepared for consideration by the [Enlarged] Editorial Committee (TC-EDC) at its meeting on January 8, 2008. Relevant drafts incorporating the comments by the TC-EDC would subsequently be presented to the TC, the CAJ, the Consultative Committee and the Council in April 2008.”

7. In accordance with the recommendations of the Consultative Committee, Circular E-606 was issued, inviting comments on document BMT Guidelines (proj.9) to be sent to the Office of the Union.

8. The Office of the Union received comments from China, Ukraine and the United States of America on document BMT Guidelines (proj.9). Those comments were incorporated in document BMT Guidelines (proj.10), which was considered by the TC-EDC, at its meeting on January 8, 2008. The TC-EDC noted a number of the comments received concerned technical aspects of the BMT Guidelines and concluded that those were matters which would need to be addressed by the TC in conjunction with the BMT, as considered appropriate.

9. At its forty-fourth session, held in Geneva from April 7 to 9, 2008, the TC noted the comments from China, Ukraine and the United States of America incorporated in document BMT Guidelines (proj.11). It noted that a number of the comments concerned technical aspects of the BMT Guidelines and concluded that, in the first instance, those were matters which would need to be addressed by the BMT. The TC agreed that the BMT should be invited to consider those matters in the form of a new draft of the BMT Guidelines at its eleventh session, to be held in Madrid, from September 16 to 18, 2008.

10. The TC noted the request of the Consultative Committee that consideration be given to the status of documents TC/38/14-CAJ/45/5 and TC/38/14 Add.-CAJ/45/5 Add. with regard to their reference in the introduction of document BMT Guidelines (proj.11). The TC noted that documents TC/38/14-CAJ/45/5 and TC/38/14 Add.-CAJ/45/5 Add. would need to be reviewed in conjunction with discussions on the approach presented in documents BMT/10/14 and BMT-TWA/2/11, as explained in document TC/44/7, paragraph 30. On that basis, it agreed that it would be appropriate to submit a revised version of documents TC/38/14-CAJ/45/5 and TC/38/14 Add.-CAJ/45/5 Add. to the Council in conjunction with the BMT Guidelines.

11. At its eleventh session, held in Madrid, from September 16 to 18, 2008, the BMT considered document BMT Guidelines (proj.12), and made its recommendations. Those recommendations were incorporated in document BMT Guidelines (proj.13), which was considered by the TC-EDC at its meeting on January 8, 2009.

12. The TC-EDC made no proposals to amend document BMT Guidelines (proj.13), as agreed by the BMT at its eleventh session. With regard to the status of documents TC/38/14-CAJ/45/5 and TC/38/14 Add.-CAJ/45/5 Add., the TC-EDC agreed that a solution would be to delete the second paragraph of Section A. "Introduction" on the basis that documents TC/38/14-CAJ/45/5 and TC/38/14Add. CAJ/45/5Add. were planned to be revised. However, in its discussion on document TGP/12/1 Draft 6 (see documents TC/45/5 and CAJ/59/2, paragraph 9), the TC-EDC also noted a question as to whether documents TC/38/14-CAJ/45/5 and TC/38/14 Add.-CAJ/45/5 Add. might be considered to be approved by the Council when it "noted the work of the Technical Committee, the Technical Working Parties and the Working Group on Biochemical and Molecular Techniques, and DNA-Profiling in Particular, as given in document C/36/10 ["Progress report of the work of the Technical Committee, the Technical Working Parties and the Working Group on Biochemical and Molecular Techniques and DNA-Profiling in Particular"]" (see document C/36/13 "Report", paragraph 21). The TC-EDC agreed that it would be a matter for the Consultative Committee to consider that question.

13. The highlighted text in document BMT Guidelines (proj.14), to be considered by the TC, indicates text that has been amended with respect to the text presented to the Council at its forty first ordinary session, held in Geneva on October 25, 2007 (document BMT Guidelines (proj.9)).

14. A new draft of the BMT Guidelines (BMT Guidelines (proj.15)), to be prepared on the basis of the conclusions of the TC at its forty-fifth session, will be presented for consideration by the CAJ at its sixtieth session, to be held in Geneva on October 19 and 20, 2009. On the basis of the conclusions of the TC and CAJ at their sessions in 2009, a draft of the BMT Guidelines will be prepared for approval by the TC and CAJ in March 2010, in anticipation of adoption of the BMT Guidelines by the Council in 2010. That timetable also anticipates the submission of a revised version of documents TC/38/14-CAJ/45/5 and TC/38/14 Add.-CAJ/45/5 Add. to the Council for adoption in conjunction with the BMT Guidelines (see paragraph 10 above).

15. *The TC is invited to:*

(a) consider document BMT Guidelines(proj.14); and

(b) approve the timetable for the approval and adoption of the BMT Guidelines, as set out in paragraph 14.

PROPOSALS FOR THE UTILIZATION OF BIOCHEMICAL AND MOLECULAR TECHNIQUES IN THE EXAMINATION OF DUS TO BE CONSIDERED BY THE BMT REVIEW GROUP

16. At its forty-fourth session, the TC agreed to propose to the CAJ that the approach presented in documents BMT/10/14 and BMT-TWA/Maize/2/11 “Possible use of molecular techniques in DUS testing on maize: how to integrate a new tool to serve the effectiveness of protection offered under the UPOV system”, prepared by experts from France, be put forward for consideration at the BMT Review Group as a potential option for the use of molecular markers in DUS examination (see document TC/44/13 “Report”, paragraph 152(c)).

17. At its fifty-seventh session, held in Geneva on April 10, 2008, the CAJ agreed with the proposal of the TC, that the approach presented in documents BMT/10/14 and BMT-TWA/Maize/2/11 should be put forward for consideration at the BMT Review Group as a potential option for the use of molecular markers in DUS examination.

18. The TWA at its thirty-seventh session, held in Nelspruit, South Africa, from July 14 to 18, 2008, agreed that the proposed approach for the use of molecular techniques in DUS testing of maize, based on document BMT-TWA/Maize/2/11, should be put forward for consideration by the BMT Review Group. It agreed that the principles underlying GAIA, including in particular the weighting of differences, and the use of a reliable number of markers for establishing molecular distance, should be explained in that proposal.

19. A meeting of the BMT Review Group has been organized for April 1, 2009. The composition of the BMT Review Group is provided in Annex II to this document.

20. The assessment of the BMT Review Group will be presented for consideration by the CAJ at its sixtieth session, to be held in Geneva on October 19 and 20, 2009, and by the TC at its forty-sixth session, in 2010. In the meantime, an oral report of the BMT Review Group meeting will be made at the fifty-ninth session of the CAJ, to be held in Geneva on April 2, 2009, the report of the BMT Review Group will be posted on the first-restricted area of the UPOV website and a report on the conclusions will be made to the Technical Working Parties at their sessions in 2009.

21. The TC is invited to approve the program for consideration of the approach presented in documents BMT/10/14 and BMT-TWA/Maize/2/11 “Possible use of molecular techniques in DUS testing on maize: how to integrate a new tool to serve the effectiveness of protection offered under the UPOV system”, as set out in paragraph 20.

REVISION OF DOCUMENTS TC/38/14-CAJ/45/5 AND TC/38/14 ADD.-CAJ/45/5 ADD.

22. As noted in paragraph 10 above, at its forty-fourth session, the TC noted that documents TC/38/14-CAJ/45/5 and TC/38/14 Add.-CAJ/45/5 Add. would need to be reviewed in conjunction with discussions on the approach presented in documents BMT/10/14 and BMT-TWA/2/11, as explained in document TC/44/7, paragraph 30 (see document TC/44/13 “Report”, paragraph 150). On that basis, it agreed that it would be appropriate to submit a revised version of documents TC/38/14-CAJ/45/5 and TC/38/14 Add.-CAJ/45/5 Add. to the Council in conjunction with the BMT Guidelines.

23. With regard to the revision of documents TC/38/14-CAJ/45/5 and TC/38/14 Add.-CAJ/45/5 Add., it is recalled that the TC, at its forty-second session, held in Geneva, from April 3 to 5, 2006, “reaffirmed its support for the presentation of the situation, set out in documents TC/38/14-CAJ/45/5 and TC/38/14 Add.-CAJ/45/5 Add., which presented the proposals developed in the *Ad hoc* Crop Subgroups, the recommendations of the BMT Review Group concerning those proposals and the opinion of the TC and the CAJ regarding the recommendations of the BMT Review Group. [...]”. Therefore, it is not anticipated that major changes should be envisaged to the structure and form of the information provided in documents TC/38/14-CAJ/45/5 and TC/38/14 Add.-CAJ/45/5 Add. However, to assist the Office of the Union in the preparation of the revision of documents TC/38/14-CAJ/45/5 and TC/38/14 Add.-CAJ/45/5 Add., with the aim of developing a document for adoption by the Council, consideration of the following proposals and notes would be of assistance:

- (a) to consolidate document TC/38/14-CAJ/45/5, paragraphs 9 and 10 and the Annex, and document TC/38/14 Add.-CAJ/45/5 Add., paragraphs 3 to 7, into a single document;
- (b) to consider whether the consolidated document for adoption by the Council should present only those proposals (currently Proposals 1 to 4) that have received a positive endorsement by the BMT Review Group, the TC and the CAJ. With regard to the proposals put forward under Option 3 (Proposals 5 and 6), it could be explained that “Proposals under Option 3 were also put forward to the BMT Review Group in 2002.

However, for the proposals under Option 3, there was no consensus in the BMT Review Group on the acceptability of those proposals within the terms of the UPOV Convention and no consensus on whether they would undermine the effectiveness of protection offered under the UPOV system. Concerns were raised that, using this approach, it might be possible to use a limitless number of markers to find differences between varieties. The concern was also raised that differences would be found at the genetic level which were not reflected in morphological characteristics.”; and

(c) subject to a positive assessment by the BMT Review Group of the approach presented in documents BMT/10/14 and BMT-TWA/Maize/2/11 and endorsement by the TC and CAJ, to add a section concerning the approach presented in documents BMT/10/14 and BMT-TWA/Maize/2/11; and

(d) the BMT, at its eleventh session, noted that an approach under Option 1(a) was conditional on the assumptions set out in document TC/38/14-CAJ/45/5 being met. The BMT noted that it would be a matter for the relevant authority to consider if those assumptions had been met (see document BMT/11/29 “Report”, paragraph 93). Guidance is sought on whether it is appropriate and sufficiently clear that it would be a matter for the relevant authority to consider if the relevant assumptions set out in documents TC/38/14-CAJ/45/5 and TC/38/14 Add.-CAJ/45/5 Add. had been met.

24. Subject to a positive assessment by the BMT Review Group of the approach presented in documents BMT/10/14 and BMT-TWA/Maize/2/11 and an endorsement by the CAJ at its sixtieth session, it is proposed that a first draft of the revised version of documents TC/38/14-CAJ/45/5 and TC/38/14 Add.-CAJ/45/5 Add. would be prepared for consideration by the TC at its forty-sixth session and by the CAJ at its sixty-first session, both in March 2010. On that basis, a document could be presented for adoption by the Council in 2010, in conjunction with the BMT Guidelines (see paragraph 14).

25. *The TC is invited to consider the proposals and timetable for the revision of documents TC/38/14-CAJ/45/5 and TC/38/14 Add.-CAJ/45/5 Add., as set out in paragraphs 23 and 24.*

PRACTICAL EXERCISE IN THE DEVELOPMENT OF AN EXCHANGEABLE DATABASE

26. At its forty-second session, the TC agreed to investigate the possibility of a practical exercise, involving a small number of crops, in the development of an exchangeable database. It agreed that it would be necessary to set clear terms of reference for that work and agreed that such terms of reference should be considered at its forty-third session. In the meantime, it agreed to invite the BMT, at its tenth session, to suggest suitable crops where such a practical exercise might be appropriate. At its tenth session, the BMT agreed to suggest oilseed rape, potato and rose as suitable crops where a practical exercise in the development of an exchangeable database might be appropriate. It was agreed that the terms of reference to be established by the TC for that work should clarify what was meant by an exchangeable database and whether it referred to the structure of the database or the quality of the data and whether it would involve a test data set rather than the complete set of data which an authority

had for the crop concerned. At its forty-third session, the TC agreed that the Crop Subgroups for Rose, for Potato and for Oilseed Rape should be invited to consider how to take that matter forward. With respect to the terms of reference for such an exercise, the TC agreed that the exercise should consider both the quality and structure of the data.

27. There have been no substantial developments in relation to a practical exercise in the development of an exchangeable database beyond those reported in document TC/44/7. However, the following information from that document is recalled for information.

28. The Crop Subgroup for Potato, at its second session held in Quimper, France, on April 17, 2007 agreed that it would be useful for the experts working on the Community Plant Variety Office of the European Community (CPVO) project and at the French Federation of Potato Seed Growers (FNPPPT), to cooperate in order to investigate the compatibility of data obtained using different technologies.

29. At the thirty-sixth session of the TWA, held in Budapest, Hungary, from May 28 to June 1, 2007, an expert from the United Kingdom informed the TWA that NIAB was working on the use of molecular techniques for variety identification in potato. The TWA agreed that it would be useful for that expert to contact the coordinator of the CPVO project who was discussing with the *Institut national de la recherche agronomique* (INRA, France) the possibility to cooperate in order to investigate the compatibility of data obtained using different technologies.

30. At the twenty-fifth session of the TWC, held in Sibiu, Romania, from September 3 to 6, 2007, the expert from the Netherlands noted that the TC had agreed to investigate the possibility of a practical exercise, involving a small number of crops, in the development of an exchangeable database and observed that the TWC might be able to provide assistance on techniques for checking repeatability. An expert from the United Kingdom reported on a project on oilseed rape, financed by the CPVO. He explained that, in that project, the biggest problems in harmonization had been with morphological data rather than with molecular data. An expert from Germany considered that it was necessary to develop a harmonized structure for exchanging data as well as harmonizing the data itself, before developing any database. He added that the TWC could provide guidance in that process of harmonization. An expert from France reported that a database containing descriptions of maize varieties from France, Germany and Spain had been developed.

31. The TWC agreed to invite experts from France, Germany and Spain to make a presentation at the next session of the TWC on the development and operation of the maize database and the benefits which it offered for the participating partners. A report on that presentation is made under agenda item 5 “Matters arising from the Technical Working Parties” (see document TC/45/3, paragraph 10).

32. At its eleventh session, held in Madrid, from September 16 to 18, 2008, the BMT agreed that it would be more appropriate to change the title of this item to “Development of common database structure for molecular data”.

33. On the basis of paragraphs 31 and 32, there appears to be some commonality between the matters considered under this item, the matters reported under agenda item 5 “Matters arising from the Technical Working Parties” (see document TC/45/3 “Development of common databases for the management of variety collections”) and agenda item 10 “Publication of variety descriptions”.

34. The TC is invited to note that the possible commonality between the matters set out in paragraph 33 will be considered under agenda item 10 “Publication of variety descriptions”.

INTERNATIONAL GUIDELINES ON MOLECULAR METHODOLOGIES

35. At its tenth session, held in Seoul, Republic of Korea, from November 21 to 23, 2006, the BMT discussed the draft BMT Guidelines. In relation to Section B: 5.2 “Quality criteria”, the BMT was informed that ISO and Codex were developing guidelines. The BMT agreed that it would be useful to invite relevant experts to make a presentation on those guidelines at the eleventh session of the BMT.

36. At its forty-third session, held in Geneva, from March 26 to 28, 2007, the TC agreed that relevant experts be invited to make a presentation concerning the work of ISO and Codex, in relation to quality criteria in molecular techniques, at the eleventh session of the BMT.

37. At its second session, held in Angers, France, on April 18, 2007, the *Ad Hoc* Crop Subgroups on Molecular Techniques for Rose (Crop Subgroup for Rose) was informed that the ISTA Variety Committee would discuss a protocol for variety identification at its Congress in May 2007.

38. At the forty-fourth session of the TC, held in Geneva from April 7 to 9, 2008, Mrs. Katalin Ertsey (Hungary), President of the Executive Committee of ISTA, reported that ISTA and OECD were jointly working on harmonization in molecular markers for variety verification and confirmed that ISTA would be glad to make a presentation on that subject at the eleventh session of the BMT. The TC agreed to invite ISTA and OECD to make a presentation on their joint work on harmonization in the development of sets of markers which might be used for variety verification, at the eleventh session of the BMT.

39. At its eleventh session, the BMT was informed that ISTA was unable to attend the BMT session but had provided some information: there was no formal collaboration arrangements between the International Seed Testing Association (ISTA) and the Organization for Economic Co-operation and Development (OECD) regarding harmonization in the development of sets of markers to be used for variety verification. In 2007, the ISTA Variety Committee had established a Working Group on DNA-Based Methods, which had finalized its first comparative test with SSR markers to distinguish varieties of several species. First results had been reported at the ISTA Annual Meeting in June 2008.

40. At its eleventh session, the BMT received a presentation by ISO, based on document BMT/11/25. It was explained that a new subcommittee “TC34/SC16” had been established by the ISO Technical Management Board in April, 2008, for international harmonization and standardization of bio-molecular methods applied to foods and seeds. Among the three Working Groups of TC34/SC16, Working Group 2 (WG 2: Varietal identification) appeared to be relevant for the work of the BMT. WG 2 is envisioned as using biomolecular markers to determine organism identity. Such work might include:

(a) determination of performance and quality criteria for the use of microsatellites, SNPs and other DNA-and protein-based molecular markers for cultivar identification and germplasm screening; and

(b) determination and description of standard marker sets for regional and quality criteria for crop plants, fruits and vegetables.

41. The BMT also received a presentation by Ms. Selma Doyran, Senior Food Standard Officer, Food and Agriculture Organization of the United Nations (FAO), based on document BMT/11/26.

42. The TC is invited to note the developments concerning international guidelines on molecular methodologies, as set out in paragraphs 39 to 41.

STATISTICAL METHODS FOR DATA PRODUCED BY BIOCHEMICAL AND MOLECULAR TECHNIQUES

43. At the eleventh session of the BMT, no papers were presented for the item on statistical methods for data produced by biochemical and molecular techniques.

44. The BMT agreed that it would be more appropriate to replace the item with an item on methods for analysis of molecular data to cover, for example, calculation of distances. It noted that the TWC might wish to consider that matter.

45. The TC is invited to request the TWC to consider if the item on the BMT agenda for “statistical methods for data produced by biochemical and molecular techniques” should be replaced by an item “methods for analysis of molecular data” to cover, for example, calculation of distances.

AD HOC CROP SUBGROUPS ON MOLECULAR TECHNIQUES (CROP SUBGROUPS)

Crop Subgroup for Rose

46. The TC agreed to the holding of the third session of the Rose Crop Subgroup in association with the eleventh session of the BMT in order to receive the views of rose breeders on certain matters which had been raised at the second session of the Rose Crop Subgroup (see document TC/44/13 “Report”, paragraph 152(b)). However, in the absence of interest by rose breeders to participate in the third session, it was concluded that it would not be appropriate to proceed with that session and the session was cancelled.

Crop Subgroup for Oilseed Rape

47. At its eleventh session, the BMT heard that Ms. Françoise Blouet (France) was no longer in a position to act as Chairperson of the Crop Subgroup for Oilseed Rape. It was

anticipated that, if a meeting of the Crop Subgroup for Oilseed Rape became necessary, the TWA would be invited to propose a new Chairperson to the TC.

Program for Crop Subgroup meetings

48. At the thirty-seventh session of the TWA, it was reported that the Chairman of the Crop Subgroup for Ryegrass did not anticipate a need for a meeting in the near future.

49. At its eleventh session, the BMT noted the following plans for meetings of the existing Crop Subgroups:

Crop Subgroup for Maize: to hold a meeting in Autumn/Winter [November/December] 2009, tentatively in conjunction with the maize and sorghum breeders' meeting in the United States of America;

Crop Subgroup for Potato: to consider a future meeting according to developments in on-going projects reported at the eleventh session of the BMT;

Crop Subgroup for Soybean: Mr. Marcelo Labarta (Argentina), Chairman of the Crop Subgroup for Soybean, to discuss the need for a meeting with experts from Brazil; and

Crop Subgroup for Wheat and Barley: subject to sufficient papers, to consider a meeting in conjunction with the twelfth session of the BMT.

50. The BMT agreed that there were benefits in holding crop subgroup meetings in conjunction with the BMT session: such an arrangement was more cost- and time-efficient for participants and also provided the benefit that the participants in the crop subgroups were able to hear about developments in other crops.

51. *The TC is invited to:*

(a) note the cancellation of the third session of the Rose Crop Subgroup;

(b) invite the TWA to propose a new Chairperson of the Crop Subgroup for Oilseed Rape; and

(b) approve the program for Crop Subgroup meetings, as set out in paragraph 49.

WORKING GROUP ON BIOCHEMICAL AND MOLECULAR TECHNIQUES, AND
DNA-PROFILING IN PARTICULAR (BMT)

52. It is recalled that, in order to encourage the presentation of information in relation to the use of molecular techniques in the consideration of essential derivation and in variety identification, the BMT agreed at its tenth session that it would be appropriate to dedicate a specific day to the agenda items “The use of molecular techniques in the consideration of essential derivation” and “The use of molecular techniques in variety identification”, at the eleventh session of the BMT. In particular, breeders and other experts would be offered the possibility to attend for that specific day (the “Breeders’ Day”). At its eleventh session, the BMT agreed to continue that approach for its twelfth session.

53. The papers presented under each of the agenda items of the eleventh session of the BMT were as follows:

SEPTEMBER 16, 2008 (“BREEDERS DAY”)

The use of molecular techniques in examining essential derivation

Concepts of Dependence and Essential Derivation: The possible use of DNA markers
(document BMT/11/24, by Mr. Marcel Bruins (International Seed Federation (ISF))).

Essentially Derived Varieties (EDV) in the Area of Asexually Reproduced Ornamental and Fruit Varieties

(document BMT/11/22 and a presentation made by Mr. Edgar Krieger (International Community of Breeders of Asexually Reproduced Ornamental and Fruit-Tree Varieties (CIOPORA))).

The Use of Molecular Techniques When Infringement of PBR or Essential Derivation are Suspected

(document BMT/11/28, presented by Mrs. Hedwich Teunissen (Netherlands)).

Comparing Wheat Varieties With Their Offspring by Molecular Markers

(document BMT/11/7 and a presentation by Mr. Michael Gohn (Austria)
(document BMT/11/7 Add.)

The Assessment of Essential Derivation in Grapevine

(document BMT/11/16 and presentation by Mr. Javier Ibañez (Spain)
(document BMT/11/16 Add.).

Putting the EDV Concept Into Practice for Maize: SSRs Today and SNPs Tomorrow?

(document BMT/11/18 Rev. and a presentation by Ms. Elizabeth Jones (ISF))

The use of molecular techniques in variety identification

The Spanish Experience (GESLIVE-IRTA) on the Enforcement of Plant Variety Rights: DNA-Fingerprinting: Part I

(document BMT/11/13 and a presentation by Mr. Antonio Villarroel (GESLIVE, Spain),
(document BMT/11/13 Add.).

The Spanish Experience (GESLIVE-IRTA) on the Enforcement of Plant Variety Rights: DNA Fingerprinting: Part 2

(document BMT/11/12 and a presentation by Mr. Pere Arús (IRTA, Spain), (document BMT/11/12 Add.).

Development of SSR Markers and Their Application for Identification in Rose

(document BMT/11/14 and a presentation by Mr. Tetsuya Kimura (Japan) (document BMT/11/14 Add.).

Identification System for Soybean Based on the Most Frequent SSR Alleles

(document BMT/11/19 and a presentation by Ms. Ana Laura Vicario (Argentina) (document BMT/11/19 Add.).

Comparative Genomic Hybridization for Identifying Mutation Varieties

(document BMT/11/23 and a presentation by Mr. Manuel Talón (Spain) (document BMT/11/23 Add.).

Preparation of Guideline for Method Validation of DNA Identification for the Enforcement of Plant Breeder's Rights in Japan

(document BMT/11/15 and a presentation by Mr. Takeshi Sugisawa and Mr. Nobuyoshi Takahashi (Japan) (document BMT/11/15 Add.).

A Practical Example of the Possible Use of Molecular Techniques in Variety Identification

(document BMT/11/20 and a presentation by Mr. Carlos Godinho (European Community) (document BMT/11/20 Add.).

SEPTEMBER 17 AND 18, 2008

Report of work on molecular techniques on a crop-by-crop basis

(a) Vegetatively Propagated Crops

Use of a Microsatellite-Based System for the Construction of a Reference Collection in Grapevine

(document BMT/11/8 and a presentation by Mr. Javier Ibañez (Spain) (document BMT/11/8 Add.).

Construction of an Integrated Microsatellite and Key Morphological Characteristic Database of Potato Varieties on the EU Common Catalogue: Part 1: Discussion of Morphological and Molecular Data

(document BMT/11/9 Rev. and a presentation by Ms. Lysbeth Hof (Netherlands) (document BMT/11/9 Add.).

Construction of an Integrated Microsatellite and Key Morphological Characteristic Database of Potato Varieties on the EU Common Catalogue: Part 2: The Database

(document BMT/11/10 Rev. and a presentation by Mr. Alex Reid (United Kingdom) (document BMT/11/10 Add.).

Use of a Molecular Marker-Based System for Identification of Varieties Within the Genus Eucalyptus

(document BMT/11/27 and a presentation by Mrs. Gisele Ventura Garcia Grilli (Brazil))

(b) Self-pollinated crops

Development and Evaluation of Molecular Markers Linked to Disease Resistance Genes for Tomato DUS Testing (Option 1(a))

(document BMT/11/6 and a presentation by Mr. Ben Vosman (Netherlands) (document BMT/11/6 Add.).

Functional SNP Markers for the Vernalization Requirements in Barley: An Option 1 Approach

(document BMT/11/17 and a presentation by Ms. Carol Norris (United Kingdom) (document BMT/11/17 Add.).

Combining Molecular Distances to Morphological Characteristics for the Management of Field Comparisons in Spring Barley

(document BMT/11/21 and a presentation by Ms. Cécile Collonnier (GEVES) (document BMT/11/21 Add.).

(c) Crops with varieties of different propagation types

A Research Project Co-Financed by CPVO: Management of Winter Oilseed Rape Reference Collections

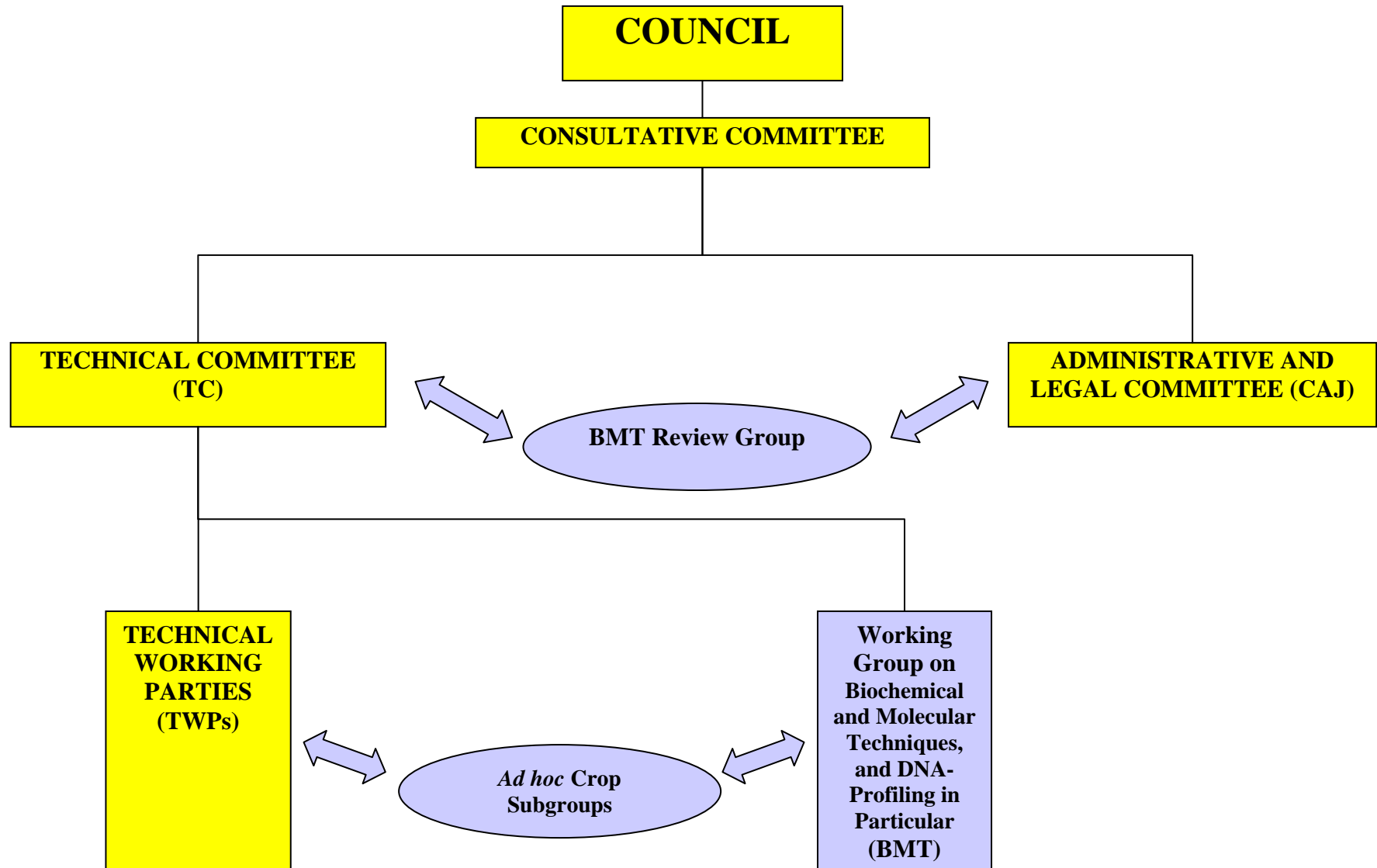
(document BMT/11/11 and a presentation by Ms. Carol Norris (United Kingdom) and Ms. Cécile Collonnier (France) (document BMT/11/11 Add.).

54. In response to the invitation received from the Government of Canada, the BMT agreed to hold its twelfth session in Ottawa, Canada from May 11 to 13, 2010, with the preparatory workshop to be held on May 10, 2010.

55. *The TC is invited to note the report on developments in the BMT, as set out in paragraphs 52 to 54.*

[Annex I follows]

UPOV Structure: Biochemical and Molecular Techniques



**ROLE OF THE
WORKING GROUP ON BIOCHEMICAL AND MOLECULAR TECHNIQUES, AND
DNA-PROFILING IN PARTICULAR (BMT)**

*(as agreed by the Technical Committee at its thirty-eighth session, held in Geneva,
from April 15 to 17, 2002 (see document TC/38/16, paragraph 204))*

The BMT is a group open to DUS experts, biochemical and molecular specialists and plant breeders, whose role is to:

- (i) Review general developments in biochemical and molecular techniques;
- (ii) Maintain an awareness of relevant applications of biochemical and molecular techniques in plant breeding;
- (iii) Consider the possible application of biochemical and molecular techniques in DUS testing and report its considerations to the TC;
- (iv) 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 be developed in conjunction with the Technical Working Parties;
- (v) Consider initiatives from TWPs, for the establishment of crop specific subgroups, taking into account available information and the need for biochemical and molecular methods;
- (vi) Develop guidelines regarding the management and harmonization of databases of biochemical and molecular information, in conjunction with the TWC;
- (vii) Receive reports from Crop Subgroups and the BMT Review Group;
- (viii) Provide a forum for discussion on the use of biochemical and molecular techniques in the consideration of essential derivation and variety identification.

**TERMS OF REFERENCE OF *AD HOC* SUBGROUP OF TECHNICAL AND LEGAL
EXPERTS ON BIOCHEMICAL AND MOLECULAR TECHNIQUES
("BMT REVIEW GROUP")**

*(as agreed by the Administrative and Legal Committee at its forty-third session,
held on April 5, 2001 (see document CAJ/43/8, paragraph 58))*

1. The BMT Review Group should assess possible application models proposed by the Technical Committee, on the basis of the work of the BMT and crop subgroups, for the utilization of biochemical and molecular techniques in the examination of Distinctness, Uniformity and Stability in relation to the following:

(a) conformity with the UPOV Convention, and

(b) potential impact on the strength of protection compared to that provided by current examination methods and advise if this could undermine the effectiveness of protection offered under the UPOV system.

2. In conducting its assessment, the BMT Review Group may refer specific aspects to the Administrative and Legal Committee or the Technical Committee for clarification or further information as considered appropriate.

3. The BMT Review Group will report its assessment, as set out in paragraph 1 above, to the Administrative and Legal Committee, but this assessment will not be binding for the position of the Administrative and Legal Committee.

AD HOC CROP SUBGROUPS ON MOLECULAR TECHNIQUES (CROP SUBGROUPS)

At its thirty-sixth session, held in Geneva, from April 3 to 5, 2000, the Technical Committee agreed to the creation of the *Ad hoc* Crop Subgroups proposed by the BMT at its sixth session, held in Angers, France from March 1 to 3, 2000 (see document TC/36/11, paragraph 123).

Extract from document TC/36/3 Add.

“23. [At its sixth session, held in Angers, France from March 1 to 3, 2000] The BMT agreed that real progress could not be expected without intensive discussion in small groups on specific species. It therefore decided to propose establishing *ad hoc* crop subgroups during the eighteen month interval until the next session to make real progress in discussions on possibilities and consequences of the introduction of molecular techniques in DUS testing, the management of reference collection and the judgement of essential derivation.

“24. The BMT discussed the role of *ad hoc* crop subgroups and its relationship with the Technical Working Parties. It agreed that testing experts in the Technical Working Party should be involved with the discussion in the *ad hoc* crop subgroups. It also agreed that the chairmen of the *ad hoc* crop subgroups should be chosen from experts in the Technical Working Party in question. The role of the *ad hoc* crop subgroups would not be to make any decisions, but to prepare documents that could be a basis of further discussions in the BMT, the Technical Working Parties and the Technical Committee. The BMT confirmed that the Technical Working Parties should be the decision-making bodies for the introduction of new characteristics into DUS testing for each species.

[...]

“26. The BMT discussed the selection of species for the subgroups. A majority of experts supported two criteria, (i) the need for the introduction of molecular techniques in DUS testing (species for which a limited number of characteristics are available and species which urgently need effective methods for the management of reference collection) and (ii) the availability of DNA profiling data and on-going studies.”

At its forty-third session, held in Geneva, from March 26 to 28, 2007, the Technical Committee agreed to invite the Crop Subgroups to develop proposals concerning the possible use of molecular tools for variety identification in relation to the enforcement of plant breeders' rights, technical verification and the consideration of essential derivation.

The list of Crop Subgroups established by the Technical Committee (TC) is as follows:

<u>Crop Subgroup for:</u>	<u>TWP</u>	<u>TC Session which established</u>
Maize	TWA	thirty-sixth session (2000)
Oilseed Rape	TWA	thirty-sixth session (2000)
Potato	TWA	thirty-eighth session (2002)
Rose	TWO	thirty-sixth session (2000)
Ryegrass	TWA	forty-second session (2006)
Soybean	TWA	thirty-eighth session (2002)
Sugarcane	TWA	thirty-eighth session (2002)
Tomato	TWV	thirty-sixth session (2000)
Wheat and Barley	TWA	thirty-sixth session (2000) / forty-second session (2006)

[Annex II follows]

ANNEX II

BMT REVIEW GROUP

Chairman: Mr. Rolf Jördens (Office)

Members: Ms. Carmen Gianni (AR and Chair of the CAJ)
Mr. Doug Waterhouse (AU and President of the Council)
Mr. Bart Kiewiet / Mr. Carlos Godinho (European Community)
Mr. Michael Köller (DE)
Ms. Nicole Bustin (FR)
Mr. Joël Guiard (FR)
Mr. Yasuhiro Kawai (JP)
Mr. Henk Bonthuis (NL) (ex-Chairman of the BMT)
Mr. Chris Barnaby (NZ) (Chairman of the TC)
Mr. Michael Camlin (GB)
Mr. Andy Mitchell (GB and Chairman of the BMT)
Mrs. Beate Rücker (DE) (Chairperson of the *Ad Hoc* Crop Subgroup on Molecular Techniques for Maize)

Observers: International Community of Breeders of Asexually Reproduced Ornamental and Fruit-Tree Varieties (CIOPORA)
International Seed Federation (ISF)

Office: Mr. Peter Button
Mr. Raimundo Lavignolle
Mr. Makoto Tabata
Mrs. Yolanda Huerta

[End of Annex II and of document]