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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS
GENEVA

TECHNICAL COMMITTEE

Forty-Second Session
Geneva, April 3 to 5, 2006

MOLECULAR TECHNIQUES

Document prepared by the Office of the Union

1. The purpose of this document is to report on developments concerning:
 - (a) the document “Situation in UPOV concerning the possible use of molecular markers in DUS examination” (Annex to document TC/40/9 Add.);
 - (b) “Guidelines for molecular marker selection and database construction (BMT Guidelines)”;
 - (c) the proposal of the Technical Committee (TC) for matters 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 to be considered by the *Ad hoc* Subgroup of Technical and Legal Experts of Biochemical and Molecular Techniques (BMT Review Group); and
 - (d) proposals concerning the *Ad hoc* Crop Subgroups on Molecular Techniques (Crop Subgroups).

Document “Situation in UPOV Concerning the Possible Use of Molecular Markers in DUS Examination” (Annex to document TC/40/9 Add.)

2. At its forty-first session, held in Geneva, from April 4 to 6, 2005, the TC reconfirmed that the text of the Annex to document TC/40/9 Add. would be a suitable summary of the situation in UPOV concerning the possible use of molecular markers in DUS examination. That text was reproduced as the Annex to document CAJ/50/4, for consideration by the Administrative and Legal Committee (CAJ).

3. The Annex to document CAJ/50/4 (reproduction of the Annex to document TC/40/9 Add.), was considered by the CAJ at its fifty-first session, held in Geneva on April 7, 2005. At that session, some concerns were expressed regarding the Annex to document CAJ/50/4, and it was agreed that written comments should be sent to the Office of the Union (Office) by the end of April 2005. The CAJ agreed that, on the basis of those comments, a new draft would be prepared by the Office, in conjunction with the Chairperson of the TC, for consideration by the CAJ at its fifty-second session, held in Geneva on October 24 and 25, 2005.

4. Following the fifty-first session of the CAJ, the Chairperson of the TC and the Office agreed that it would be important that any redrafting of the text in the Annex to document CAJ/50/4 should involve the other persons involved in the drafting of the original text, namely: Mr. Michael Camlin, former Chairman of the TC, and Mr. Gerhard Deneken, Chairman of Working Group on Biochemical and Molecular Techniques, and DNA-Profiling in Particular (BMT). Both Mr. Camlin and Mr. Deneken agreed to work with Ms. Borys and the Office (the “TC Chairperson’s group”) in relation to any redrafting of the text.

5. The comments received by the Office on the Annex to document CAJ/50/4 indicated that clarification was needed on:

(a) whether the document was intended to consider molecular markers in the form of characteristics and/or the use of molecular methods in the examination of DUS using existing characteristics;

(b) whether the document was intended to provide general guidance or guidance on the possible use of molecular markers in specific UPOV Test Guidelines, e.g. the Test Guidelines for the crops and species mentioned in the proposals; and

(c) the relationship and difference between the “options” and the “proposals”.

6. It was clarified that the concerns expressed at the fifty-first session, with regard to the Annex to document CAJ/50/4, did not relate to 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.

7. The TC Chairperson’s group noted that the problems concerned the clarity of the explanation of the situation, rather than the situation as agreed by the TC and the CAJ in 2003. Having reviewed the comments received, the TC Chairperson’s group was of the view that those comments had identified important aspects where the text should be improved, but noted that it would not be possible to make the necessary improvements without a substantial

reworking of the text. The TC Chairperson's group also noted that there had been some important discussions at the ninth session of the BMT held in Washington, D.C., United States of America, from June 21 to 23, 2005, which could have a bearing on the situation in due course. In particular, it noted that there had been substantial progress in the drafting of the "Guidelines for molecular marker selection and database construction" (BMT Guidelines) and a good level of agreement on those at that BMT session, which could allow reference to that document in any new version of the Annex to document CAJ/50/4. In addition, it noted that new proposals concerning molecular markers might come forward for consideration and that, furthermore, some of those proposals might not fit completely within the framework of the three options previously discussed.

8. In conclusion, on the basis of the comments received and reflection on those comments, the TC Chairperson's group agreed that a substantial reworking of the Annex to document CAJ/50/4 was required. It concluded, after consultation with the Chairman of the CAJ, that such a reworking would have gone beyond the intention of the CAJ at its fifty-first session and agreed that a decision to undertake such a reworking should be first considered by the CAJ and the TC. Furthermore, the TC Chairperson's group noted the developments at the ninth session of the BMT and considered that those developments might be taken into account in any revision of the text.

9. At its fifty-second session, held in Geneva, on October 24 and 25, 2005, the CAJ reviewed the comments received by the Office following the fifty-first session of the CAJ and the conclusions of the TC Chairperson's group, as presented in document CAJ/52/2. Those comments and conclusions are set out in paragraphs 4 to 8, above. The CAJ noted that, on the basis of comments in the CAJ, the document on molecular techniques, contained in the Annex to document CAJ/50/4, required a substantial editorial reworking. It agreed that the comments of the CAJ should be reported to the TC, which could decide whether to undertake the reworking of the document (see document CAJ/52/5 Prov., paragraph 22).

10. The TC is invited to consider whether to undertake a reworking of the Annex to document TC/40/9 Add. (Annex to document CAJ/50/4), on the basis of the comments made in the CAJ (see paragraphs 4 to 9).

Guidelines for Molecular Marker Selection and Database Construction (BMT Guidelines)

11. At its fortieth session, the TC heard that the BMT had concluded, at its eighth session in Tsukuba, Japan, from September 3 to 5, 2003, 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 should prepare a guidance document (BMT Guidelines). In accordance with the request of the BMT, the Office produced a first draft of the BMT Guidelines (document BMT Guidelines (proj.1)) in May 2004 for consideration by a subgroup of interested experts. On the basis of the comments received from that subgroup, the Office prepared a second draft (document BMT Guidelines (proj.2)) which was considered by the Crop Subgroups for Potato, Sugarcane and Wheat at their sessions on June 28, 2004. The Crop Subgroup for Wheat (see document BMT-TWA/Wheat/2/3), supported by the Crop Subgroups for Potato

and Sugarcane (see documents BMT-TWA/Potato/1/7 and BMT-TWA/Sugarcane/2/4) agreed that that document should be redrafted by an expert/experts with suitable knowledge and experience of the use of molecular techniques. On that basis, it agreed that Mr. Robert Cooke (United Kingdom) should undertake the redrafting, with the assistance of Mrs. Françoise Blouet (France) in connection with Section 5 “Constructing the Database” (Section 6 in BMT Guidelines (proj.5)).

12. At its forty-first session, the TC noted that a new draft of the BMT Guidelines (BMT Guidelines (proj.3)) would be presented to the twenty-third session of the TWC to be held in Ottawa, Canada, from June 13 to 16, 2005, and to the ninth session of the BMT, to be held in Washington, D.C., United States of America, from June 21 to 23, 2005. It agreed that, on the basis of the comments received at the BMT and TWC sessions, a new draft (BMT Guidelines (proj.4)) would be prepared for consideration by the Enlarged Editorial Committee (TC-EDC) and by the forty-second session of the TC in April 2006.

13. Document BMT Guidelines (proj.5), prepared for consideration by the TC, reflects the comments made at the twenty-third session of the Technical Working Party on Automation and Computer Programs (TWC), the ninth session of the BMT and the Enlarged Editorial Committee (TC-EDC) meeting of January 10, 2006.

14. At the twenty-third session of the TWC and at the ninth session of the BMT, Mr. Sylvain Grégoire (France), drafter of Section 6 “Databases” of BMT Guidelines (proj.5), suggested that it would be useful to move forward with a practical exercise, involving a small number of crops, in the development of an exchangeable database. He noted that, from an IT perspective, such an exercise would be straightforward, but that it would require all participating partners to identify the markers to be used and to clarify and agree on the status of the information to be included in the database and the accessibility of that data, e.g. to contributing partners or to all interested experts from members of the Union. The representative of the International Seed Federation (ISF) considered that UPOV was the appropriate body to take the matter forward.

15. Mr. Michael Sussman, National Science Laboratory (NSL), United States Department of Agriculture, explained that NSL would be able to participate in ring tests and a pilot database project involving any crops of interest. The relevant experts from the Netherlands and the United Kingdom, involved in the projects presented in documents BMT/9/8 “Research project co-financed by the Community Plant Variety Office (CPVO): Management of winter oilseed rape reference collections”, BMT/9/12 “Analysis of a database of DNA profiles of 734 hybrid tea rose (*Rosa hybrida*) varieties” and involved in the project to characterize all the varieties in the Common Catalogue of the European Union by 2007 (see document BMT/9/14, paragraph 24), indicated their willingness to participate in a pilot database project. It was agreed that the matter should be considered by the relevant Crop Subgroups and the TC.

16. *The TC is invited to:*

(a) *comment on document BMT Guidelines (proj.5);*

(b) consider whether to invite the BMT to review a new draft of the BMT Guidelines, incorporating the comments of the TC, at the tenth session of the BMT, to be held in Seoul, Republic of Korea, from November 21 to 23, 2006; and

(c) consider the possibility of a practical exercise, involving a small number of crops, in the development of an exchangeable database, as set out in paragraphs 14 and 15; and

(d) subject to the TC agreeing to such a practical exercise, to consider which UPOV body would oversee that work and to which UPOV bodies the work would be reported.

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

17. At its fortieth session, with modification to the wording at its forty-first session, the TC agreed to propose to the CAJ that it consider 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. In that respect, it proposed that those might be matters relevant for consideration by the BMT Review Group.

18. At its fifty-first session (see document CAJ/51/6, paragraphs 24 to 28), the CAJ considered the TC proposal and agreed to invite the BMT Review Group to examine 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

19. In accordance with the agreement of the TC and the CAJ, a meeting of the BMT Review Group has been scheduled for the evening of April 6, 2006. It is proposed that the meeting on April 6, 2006, will be used to develop appropriate terms of reference / objectives for the work of the BMT Review Group in this area and to identify a suitable timetable for its work. Against that background, it was considered appropriate to invite the President of the Council to attend the meeting in order to help to ensure that the work of the BMT Review Group would be complementary to other initiatives within UPOV, in particular with regard to the considerations of the Consultative Committee concerning the enforcement of plant breeders' rights. A list of the participants of the BMT Review Group is attached as Annex I to this document. That list comprises the former BMT Review Group participants (see document TC/38/14-CAJ/45/5) and, in addition, Miss Enriqueta Molina Macías (President of the Council), Mr. Krieno Fikkert (CAJ Chairman) and Mr. Keiji Terazawa (Japan), who has expressed a wish to participate in the BMT Review Group.

20. It is anticipated that, in conjunction with the President of the Council and the Chairpersons of the TC and the CAJ, the Office will produce a brief document to aid the BMT Review Group in consideration of appropriate terms of reference / objectives. That

document will be made available to CAJ and TC members and observers on the UPOV website.

21. The TC is invited to note the developments above.

Ad Hoc Crop Subgroups on Molecular Techniques (Crop Subgroups)

22. At its thirty-ninth session held in Nitra, Slovakia, from June 6 to 10, 2005, the Technical Working Party for Vegetables (TWV) heard from the expert from Spain that biomolecular techniques were used at the national level for the testing of Tomato Spotted Wilt Virus (TSWV) resistance of pepper and from an expert from France that molecular markers were being used in melon for the management of reference collections. At the proposal of the Chairman, it was agreed that experts from France and Spain and any other authorities using such techniques, should be invited to present the use of molecular techniques in relation to DUS testing at the next session of the TWV. The TWV made no proposals concerning Crop Subgroups.

23. At its ninth session held in Washington, D.C., United States of America, from June 21 to 23, 2005, the BMT received the following reports of work on molecular techniques on a crop-by-crop basis:

(a) Repeatability and Discrimination Power of SSR Data in the Vegetatively Reproduced Potato Varieties: Impact of “Weak Alleles” (document BMT/9/4);

(b) Assessment of the uniformity of Chinese maize varieties by a set of SSR markers (document BMT/9/5);

(c) Identification of quince varieties using SSR markers developed from pear and apple (document BMT/9/6);

(d) Research project co-financed by the Community Plant Variety Office (CPVO): “Management of Winter Oilseed Rape Reference Collections” (document BMT/9/8);

(e) SNPs in barley: a potential “Option 1” approach (document BMT/9/9);

(f) A microsatellite-based system for the protection of grapevine varieties (document BMT/9/11);

(g) Analysis of a database of DNA profiles of 734 hybrid tea rose (*Rosa hybrida*) varieties (document BMT/9/12);

(h) The potential of SNP markers in expressed genes for identification of potato varieties and determination of distinctness (document BMT/9/13).

24. A report of the discussions of those reports can be found in the report of ninth session of the BMT, document BMT/9/14, paragraphs 27 to 52. As a result of those discussions (see document BMT/9/14, paragraph 61), the BMT invited the relevant Technical Working Parties (TWPs) and the TC to consider:

(a) *Crop Subgroup for Vegetatively Propagated Crops:*

the establishment of a crop subgroup for a range of vegetatively propagated crops which, in conjunction with all interested parties and breeders in particular, could formulate proposals for consideration by the TC and BMT Review Group;

(b) *Crop Subgroup for Wheat and Barley:*

the extension of the Crop Subgroup for Wheat to cover both wheat and barley;

(c) *Crop Subgroup for Grapevine:*

in relation to proposal (a), consideration should be given to the establishment of a specific Crop Subgroup for Grapevine.

25. With respect to the possible establishment of a crop subgroup for a range of vegetatively propagated crops, the TC may wish to note that the existing Crop Subgroups for Potato, Rose and Sugarcane concern vegetatively propagated crops.

26. At its thirty-sixth session, held in Kôfu, Japan, from September 5 to 9, 2005, the Technical Working Party for Fruit Crops (TWF) expressed its support for the proposal from the BMT, for the establishment of a crop subgroup for vegetatively propagated crops, on the basis that such a crop subgroup would include fruit species (see document TWF/36/8, paragraph 21).

27. At its thirty-eighth session, held in Seoul, Republic of Korea, from September 12 to 16, 2005, the Technical Working Party for Ornamental Plants and Forest Trees (TWO) expressed its support for the proposal from the BMT for the establishment of a crop subgroup for vegetatively propagated crops, on the basis that such a crop subgroup would then incorporate the Crop Subgroup for Rose (see document TWO/38/12, paragraph 24).

28. At its thirty-fourth session, held in Christchurch, New Zealand, from October 31 to November 4, 2005, the Technical Working Party for Agricultural Crops (TWA) heard that a meeting of the Crop Subgroup for Ryegrass, which had been planned to be held in conjunction with the thirty-fourth session of the TWA, had been cancelled due to a lack of papers (see document TWA/34/14, paragraphs 11 to 13). The TWA heard that a group in Denmark was working on a project to consider an Option 2 approach for ryegrass. Microsatellite data had been obtained and data on morphological distances would start to be generated at the beginning of 2006. The expert from France reported that further work was intended to be conducted on maize with a view to assist in the management of reference collections. It was possible that an initial report on that work could be made at the thirty-fifth session of the TWA.

29. A list of the current Crop Subgroups is presented in Annex II to this document.

30. The TC is invited, on the basis of paragraphs 24 to 27, to consider:

(a) the establishment of a crop subgroup for vegetatively propagated varieties;

(b) the extension of the Crop Subgroup for Wheat to cover both wheat and barley; and

(c) in the absence of the establishment of a crop subgroup for vegetatively propagated crops, the establishment of a Crop Subgroup for Grapevine.

[Annexes follow]

ANNEX I

BMT REVIEW GROUP

Chairman: Mr. Rolf Jördens (Office)

Members: Miss. Enriqueta Molina (Mexico (President of the Council))
Mr. Krieno Fikkert (Netherlands) (Chairman of the CAJ)
Ms. Julia Borys (Poland) (Chairperson of the TC)
Mr. Henk Bonthuis (Netherlands) (Chairman of the BMT)
Ms. Nicole Bustin (France)
Mr. Michael Camlin (United Kingdom)
Ms. Carmen Gianni (Argentina)
Mr. Joël Guiard (France)
Mr. Bart Kiewiet / Mr. José Elena (European Community)
Mr. Michael Köller (Germany)
Mr. Andy Mitchell (United Kingdom)
Mr. Keiji Terazawa (Japan)
Mr. Doug Waterhouse (Australia)

Observers: CIOPORA
ISF

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

[Annex II follows]

ANNEX II

AD HOC CROP SUBGROUPS ON MOLECULAR TECHNIQUES
(BMT CROP SUBGROUPS)

<i>Crop Subgroup for:</i>	<i>Chairperson</i>	<i>TWP</i>
Maize	Mrs. Beate Rücker (Germany)	TWA
Oilseed Rape	Mrs. Françoise Blouet (France)	TWA
Potato	Mrs. Beate Rücker (Germany)	TWA
Rose	Mr. Joost Barendrecht (Netherlands)	TWO
Ryegrass	Mr. Michael Camlin (United Kingdom)	TWA
Soybean	Mr. Marcelo Labarta (Argentina)	TWA
Sugarcane	Mr. Luis Salaices (Spain)	TWA
Tomato	Mr. Richard Brand (France)	TWV
Wheat	Mr. Robert Cooke (United Kingdom)	TWA

[End of Annex II and of document]