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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

ADMINISTRATIVE AND LEGAL COMMITTEE**Seventy-First Session
Geneva, March 26, 2015**

MOLECULAR TECHNIQUES

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EXECUTIVE SUMMARY

1. The purpose of this document is to report on developments concerning molecular techniques since the seventieth session of the Administrative and Legal Committee (CAJ) in relation to the:

- (a) Working Group on Biochemical and Molecular Techniques, and DNA-Profiling in Particular (BMT)
- (b) OECD/UPOV/ISTA Joint Workshop on Molecular Techniques
- (c) Discussion on molecular techniques at the fiftieth session of the Technical Committee (TC)
- (d) Presentation of information on the situation in UPOV with regard to the use of molecular techniques

2. The CAJ will be invited to:

- (a) note the report on developments in the BMT¹, as set out in paragraphs 6 to 9 of this document;

- (b) note that the OECD/UPOV/ISTA Joint Workshop on Molecular Techniques² agreed that it would be useful to repeat the joint workshop at relevant meetings of the OECD and ISTA and, in that regard, that the Technical Working Group Meeting of the OECD Seed Schemes, agreed that another OECD/UPOV/ISTA Joint Workshop on Molecular Techniques should be organized either back-to-back with the Annual Meeting of the OECD Seed Schemes, to be held in Paris, in June, 2015, or in conjunction with the Technical Working Group Meeting to be held in January, 2016;

- (c) note that the TC, at its fifty-third session, to be held in 2017, will:

- (i) be invited to approve the program for the fifteenth session of the BMT, to be held in 2016, including the dedication of a particular date ("Breeders' Day"), for the items on the use of molecular techniques in the consideration of essential derivation and variety identification;

- (ii) consider whether to seek to develop a joint document explaining the principal features of the systems of OECD, UPOV and ISTA;

¹ held in Seoul, Republic of Korea, from November 10 to 13.

² held in Seoul, Republic of Korea, on November 12, 2014.

(iii) consider whether to develop an inventory on the use of molecular marker techniques, by crop, with a view to developing a joint OECD/UPOV/ISTA document containing that information, in a similar format to UPOV document UPOV/INF/16 “Exchangeable Software”;

(iv) consider the proposal for the BMT, at its fifteenth session, to develop lists of possible joint initiatives with OECD and ISTA in relation to molecular techniques;

(v) consider whether to base the discussion on molecular techniques on the presentation of highlights from the fourteenth session of the BMT, held in Seoul, Republic of Korea, from November 10 to 13, 2014, and the OECD/UPOV/ISTA Joint Workshop on Molecular Techniques held in Seoul, Republic of Korea, on November 12, 2014; and

(vi) prepare a draft question and answer concerning the information on the situation in UPOV with regard to the use of molecular techniques for a wider audience, including the public in general.

3. The following abbreviations are used in this document:

BMT:	Working Group on Biochemical and Molecular Techniques, and DNA-Profiling in Particular
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
TWPs:	Technical Working Parties
TWV:	Technical Working Party for Vegetables
OECD	Organization for Economic Co-operation and Development
ISTA	International Seed Testing Association

4. The structure of this document is as follows:

EXECUTIVE SUMMARY	1
PURPOSE	3
FOURTEENTH SESSION OF THE WORKING GROUP ON BIOCHEMICAL AND MOLECULAR TECHNIQUES, AND DNA-PROFILING IN PARTICULAR.....	3
OECD/UPOV/ISTA JOINT WORKSHOP ON MOLECULAR TECHNIQUES	5
DISCUSSION ON MOLECULAR TECHNIQUES AT THE FIFTIETH SESSION OF THE TECHNICAL COMMITTEE	6
PRESENTATION OF INFORMATION ON THE SITUATION IN UPOV WITH REGARD TO THE USE OF MOLECULAR TECHNIQUES.....	6

PURPOSE

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- (a) Working Group on Biochemical and Molecular Techniques, and DNA-Profiling in Particular
- (b) OECD/UPOV/ISTA Joint Workshop on Molecular Techniques
- (c) Discussion on molecular techniques at the fiftieth session of the TC
- (d) Presentation of information on the situation in UPOV with regard to the use of molecular techniques

FOURTEENTH SESSION OF THE WORKING GROUP ON BIOCHEMICAL AND MOLECULAR TECHNIQUES, AND DNA-PROFILING IN PARTICULAR

6. The role of the BMT is reproduced in Annex I to this document.

7. The fourteenth session of the BMT was held in Seoul, Republic of Korea, from November 10 to 13, 2014, with the preparatory workshop on November 9, 2014 and OECD/UPOV/ISTA Joint Workshop on Molecular Techniques on November 12, 2014. The specific day for the agenda items "Report of work on molecular techniques in relation to DUS examination" and "The use of molecular techniques in variety identification" (the "Breeders' Day") was November 12, 2014.

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

Reports on Developments in UPOV Concerning Biochemical and Molecular Techniques (document BMT/14/2 Rev.)

Short presentations on new developments in biochemical and molecular techniques by DUS experts, biochemical and molecular specialists, plant breeders and relevant international organizations (document BMT/14/15 Annex I: France, Annex II: United States of America (the), Annex III: Iran (Islamic Republic of))

Report of Work on Molecular Techniques in Relation to DUS Examination

The Use of Reference Varieties in Varietal Distinctness: An Approach under Investigation in the United States of America for Potential Application in Plant Variety Protection (document BMT/14/5 and BMT/14/5 Add.)

Identification of Rice Varieties Using Genic Markers for Three DUS Characteristics (document BMT/14/8 and BMT/14/8 Add.)

The Use of Molecular markers (SNP) for Maize DUS Testing (document BMT/14/10 and BMT/14/10 Add.)

Potential Uses of Molecular Markers in Management of Rose Varieties for the PVP System (document BMT/14/12 and BMT/14/12 Add.)

Development of EST-SSR Markers of Lettuce and Variety Identification Using EST-SSR Markers (document BMT/14/13 Rev.)

Construction of DNA Profile Database of Strawberry Varieties Using SSR Markers (document BMT/14/14 Rev.)

Use of Molecular Marker Techniques for Selection of 'Similar Variety' about 'Candidate Variety' (document BMT/14/16 Rev2.)

Improving Efficiency of DUS Testing of Perennial Ryegrass by Combining Morphological and Molecular Variety Distances (document BMT/14/17 and BMT/14/17 Add.)

*A European Potato Database as Centralized Collection of Varieties of Common Knowledge
(document BMT/14/18 and BMT/14/18 Add.)*

Molecular Markers as Predictors for 'Traditional' Characteristics (document BMT/14/19 Rev.)

International Guidelines on Molecular Methodologies (document BMT/14/3)

Variety Description Databases (document BMT/14/4)

*Ownership and Use of DUS Samples and of DNA and DNA Data During and After the DUS Tests
(document BMT/14/11)*

The Use of Molecular Techniques in Examining Essential Derivation³

*Identification of SNP Markers to aid Assessment of Essential Derivation in Maize
(document BMT/14/7 Rev.)*

The Use of Molecular Techniques in Variety Identification¹

*Use of DNA Variety Identification Technique for Measures Against the Infringement of Plant Breeders'
Rights in Japan (document BMT/14/6 and BMT/14/6 Add. Rev.)*

*Determining a Threshold for Genetic Conformity in Potato Seedlings
(document BMT/14/9 and BMT/14/9 Add.)*

9. The BMT agreed to an invitation from the Russian Federation to hold its fifteenth session in Moscow in May 2016, with a preparatory workshop in May 2016. The BMT planned to discuss the following items:

1. Opening of the session
2. Adoption of the agenda
3. Reports on developments in UPOV concerning biochemical and molecular techniques
4. Short presentations on new developments in biochemical and molecular techniques by DUS experts, biochemical and molecular specialists, plant breeders and relevant international organizations
5. Report of work on molecular techniques in relation to DUS examination
6. International guidelines on molecular methodologies
7. Variety description databases
8. Methods for analysis of molecular data
9. The use of molecular techniques in examining essential derivation⁴
10. The use of molecular techniques in variety identification²
11. Cooperation between OECD, UPOV, ISTA and ISO
12. Date and place of next session
13. Future program
14. Report of the session (if time permits)
15. Closing of the session

³ These agenda items were discussed on Wednesday, November 12, 2014 ("Breeders' Day").

⁴ Breeders' Day

OECD/UPOV/ISTA JOINT WORKSHOP ON MOLECULAR TECHNIQUES

10. The OECD/UPOV/ISTA Joint Workshop on Molecular Techniques was held in Seoul, Republic of Korea⁵, in conjunction with the fourteenth session of the BMT, held in Seoul, Republic of Korea⁶.

11. The papers presented under each of the agenda items of the OECD/UPOV/ISTA Joint Workshop were as follows:

Introduction to the OECD Seed Schemes and the Situation with Regard to Molecular Techniques
(document BMT/14/Joint/6)

Introduction to UPOV and the Situation with Regard to Molecular Techniques
(document BMT/14/Joint/4 Rev.)

Introduction to ISTA and the Situation with Regard to Molecular Techniques
(document/BMT/14/Joint/3 Rev.)

Introduction to ISO and the Situation with Regard to Molecular Techniques (document BMT/14/Joint/2)

Existing Areas of Cooperation between OECD, UPOV and ISTA (document/BMT/14/Joint/5)

12. The Workshop agreed that it would be useful to develop a joint document explaining the principal features (e.g. DUS, variety identification, variety purity, etc.) of the systems of OECD, UPOV and ISTA. It was also agreed that it would be useful for mutual understanding, to repeat the joint workshop at relevant meetings of the OECD and ISTA (see document BMT/14/20 "Report", paragraph 54).

13. The Workshop agreed to propose an inventory by UPOV, OECD and ISTA of the use of molecular marker techniques, by crop, with a view to developing a document containing that information, in a similar format to UPOV document UPOV/INF/16 "Exchangeable Software". It was noted that OECD had already collected some information regarding the use of molecular techniques by its designated authorities (see document BMT/14/20 "Report", paragraph 55).

14. The Workshop further agreed to propose to invite UPOV, OECD and ISTA to develop lists of possible joint initiatives in relation to molecular techniques. It was noted that, in the case of UPOV, the list could be drafted by the BMT at its fifteenth session, subject to approval by the Technical Committee (see document BMT/14/20 "Report", paragraph 56).

15. The Technical Working Group Meeting of the OECD Seed Schemes, held in Paris, France, on January 28 and 29, 2015, received an oral report by Mr. Gerry Hall (United Kingdom), Chairperson of the OECD Seed Schemes *Ad hoc* Working Group on Biochemical and Molecular Techniques (AHWG), on the OECD/UPOV/ISTA Joint Workshop on Molecular Techniques, held on November 13, 2014, during the fourteenth session of the BMT.

16. The Technical Working Group agreed that another OECD/UPOV/ISTA Joint Workshop on Molecular Techniques should be organized either back-to-back with the Annual Meeting of the OECD Seed Schemes, to be held in Paris, in June, 2015, or in conjunction with the Technical Working Group Meeting to be held in January, 2016.

⁵ held on November 12, 2014.

⁶ held from November 10 to 13, 2014.

DISCUSSION ON MOLECULAR TECHNIQUES AT THE FIFTIETH SESSION OF THE TECHNICAL COMMITTEE

17. The TC, at its fiftieth session, held in Geneva⁷, agreed that the draft agenda for the fifty-first session of the TC should include an item for a discussion of molecular techniques (see document TC/50/36 "Report on the Conclusions", paragraph 164).

18. The meeting of the TWP and TC chairpersons, held in Geneva, on January 9, 2015, proposed that the basis for the discussion could be the presentation of highlights from the fourteenth session of the BMT, held in Seoul, Republic of Korea, from November 10 to 13, 2014, and the OECD/UPOV/ISTA Joint Workshop on Molecular Techniques held in Seoul, Republic of Korea, on November 12, 2014.

19. In that regard, it was proposed to arrange presentations on the following items for the discussion on molecular techniques at the fifty-first session of the TC as follows:

Reports on developments in UPOV Concerning Biochemical and Molecular Techniques (see also document BMT/14/2 Rev2.)

Use of Molecular Marker Techniques for Selection of 'Similar Variety' about 'Candidate Variety' (see also document BMT/14/16 Rev2.)

The Use of Reference Varieties in Varietal Distinctness : An Approach under Investigation in the United States of America for Potential Application in Plant Variety Protection (see also documents BMT/14/5 and BMT/14/5 Add.)

A European Potato Database as Centralized Collection of Varieties of Common Knowledge (see also documents BMT/14/18 and BMT/14/18 Add)

Development of EST-SSR Markers of Lettuce and Variety Identification Using EST-SSR Markers (see also document BMT/14/13 Rev.)

Ownership and Use of DUS Samples and of DNA and DNA Data During and After the DUS Tests (see also document BMT/14/11 Rev.)

Opportunities for Cooperation between OECD, UPOV, ISO and ISTA with Regard to Molecular Techniques (see also document BMT/14/Joint/5)

20. Subject to approval by the TC, a draft program for the discussion is provided as Annex II to this document, including an indication of how this discussion would be coordinated with the agenda item "Molecular Techniques".

PRESENTATION OF INFORMATION ON THE SITUATION IN UPOV WITH REGARD TO THE USE OF MOLECULAR TECHNIQUES

21. The TC, at its forty-ninth session, held in Geneva⁸, agreed that there was a need to provide suitable information on the situation in UPOV with regard to the use of molecular techniques to a wider audience, including breeders and the public in general (see document TC/49/41 "Report on the Conclusions", paragraph 136).

22. The TC, at its fiftieth session⁹, and the CAJ, at its sixty-ninth session¹⁰, agreed the proposed explanation of the situation in UPOV with regard to the use of molecular techniques for breeders and persons with knowledge of DUS testing. With regard to a wider audience, the TC agreed that the question was not framed in an appropriate way and, therefore, it would not be appropriate to seek to develop an answer to that question (see document CAJ/69/13 "Report on the Conclusions", paragraph 72).

⁷ held from April 7 to 9, 2014.

⁸ held from March 18 to 20, 2013.

⁹ held in Geneva from April 7 to 9, 2014.

¹⁰ held in Geneva on April 10, 2014.

23. The Council, at its thirty-first extraordinary session¹¹, adopted the answers to the frequently asked questions including the FAQ on “Does UPOV allow molecular techniques (DNA profiles) in the DUS examination?” (see document C(Extr.)/31/5 “Report on the Decisions”, paragraph 15).

24. The answers to Frequently Asked Questions are published on the website at <http://www.upov.int/about/en/faq/>.

25. The Consultative Committee, at its eighty-eighth session, held in Geneva, on October 15, 2014, agreed that the draft FAQ concerning information on the situation in UPOV with regard to the use of molecular techniques for a wider audience, including the public in general, should be referred to the Technical Committee for consideration (see document C/48/19 “Report by the President on the work of the eighty-sixth session of the Consultative Committee; adoption of recommendations, if any, prepared by that Committee”, paragraph 48).

26. *The CAJ is invited to:*

(a) note the report on developments in the BMT, as set out in paragraphs 6 to 9 of this document;

(b) note that the OECD/UPOV/ISTA Joint Workshop on Molecular Techniques¹² agreed that it would be useful to repeat the joint workshop at relevant meetings of the OECD and ISTA and, in that regard, that the Technical Working Group Meeting of the OECD Seed Schemes, agreed that another OECD/UPOV/ISTA Joint Workshop on Molecular Techniques should be organized either back-to-back with the Annual Meeting of the OECD Seed Schemes, to be held in Paris, in June, 2015, or in conjunction with the Technical Working Group Meeting to be held in January, 2016;

(c) note that the TC, at its fifty-third session, to be held in 2017, will:

(i) be invited to approve the program for the fifteenth session of the BMT, to be held in 2016, including the dedication of a particular date (“Breeders’ Day”), for the items on the use of molecular techniques in the consideration of essential derivation and variety identification;

(ii) consider whether to seek to develop a joint document explaining the principal features of the systems of OECD, UPOV and ISTA;

(iii) consider whether to develop an inventory on the use of molecular marker techniques, by crop, with a view to developing a joint OECD/UPOV/ISTA document containing that information, in a similar format to UPOV document UPOV/INF/16 “Exchangeable Software”;

(iv) consider the proposal for the BMT, at its fifteenth session, to develop lists of possible joint initiatives with OECD and ISTA in relation to molecular techniques;

¹¹ held in Geneva on April 12, 2014.

¹² held in Seoul, Republic of Korea, on November 12, 2014.

(v) consider whether to base the discussion on molecular techniques on the presentation of highlights from the fourteenth session of the BMT, held in Seoul, Republic of Korea, from November 10 to 13, 2014, and the OECD/UPOV/ISTA Joint Workshop on Molecular Techniques held in Seoul, Republic of Korea, on November 12, 2014; and

(vi) prepare a draft question and answer concerning the information on the situation in UPOV with regard to the use of molecular techniques for a wider audience, including the public in general.

[Annexes follow]

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.

[Annex II follows]

DISCUSSION ON MOLECULAR TECHNIQUES
AT THE FIFTY-FIRST SESSION OF THE TECHNICAL COMMITTEE (MARCH 24)

DRAFT PROGRAM

Highlights of the Fourteenth Session of the BMT

- 11:15 Reports on developments in UPOV Concerning Biochemical and Molecular Techniques (Office of the Union, see also document BMT/14/2 Rev2.)
- 11:30 Use of Molecular Marker Techniques for Selection of 'Similar Variety' about 'Candidate Variety'
- 12:00 The Use of Reference Varieties in Varietal Distinctness: An Approach under Investigation in the United States of America for Potential Application in Plant Variety Protection
- 12:30 *Lunch Break*
- 14:30 A European Potato Database as Centralized Collection of Varieties of Common Knowledge
- 14:50 Development of EST-SSR Markers of Lettuce and Variety Identification Using EST-SSR Markers
- 15:10 Ownership and Use of DUS Samples and of DNA and DNA Data During and After the DUS Tests

OECD/UPOV/ISTA Joint Workshop on Molecular Techniques

- 15:30 Opportunities for Cooperation between OECD, UPOV, ISO and ISTA with Regard to Molecular Techniques
- 15:50 General discussion (25 minutes)

Technical Committee Agenda Item 8 "Molecular Techniques"

- 16:15 Agenda Item 8 "Molecular Techniques"

[End of Annex II and of document]