E

BMT-TWA/Potato/2/3 Add.
ORIGINAL: English
DATE: April 5, 2007

UPOV

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

AD HOC CROP SUBGROUP ON MOLECULAR TECHNIQUES FOR POTATO

Second Session
Quimper, France, April 17, 2007

ADDENDUM TO DOCUMENT BMT-TWA/POTATO/2/3

DEVELOPMENTS IN UPOV CONCERNING BIOCHEMICAL AND MOLECULAR TECHNIQUES

Document prepared by the Office of the Union

This document is an addendum to document BMT-TWA/Potato/2/3 "Developments in UPOV Concerning Biochemical and Molecular Techniques" and contains a copy of the presentation made by the Office of the Union at the second session of the *Ad Hoc* Crop Subgroup on Molecular Techniques for Potato.

AD HOC CROP SUBGROUP ON MOLECULAR TECHNIQUES FOR POTATO

Second Session

DEVELOPMENTS IN UPOV CONCERNING BIOCHEMICAL AND MOLECULAR TECHNIQUES

Peter Button, Technical Director, UPOV

Quimper, France, April 17, 2007

PREVIEW

PART I: DUS Examination

PART II: Variety identification

in relation to:

» *enforcement of plant breeders' rights;*

» *technical verification; and*

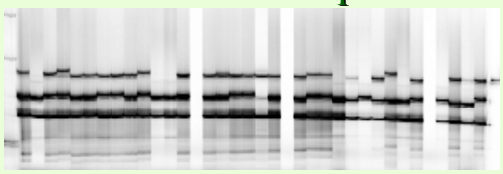
» *consideration of essential derivation*

PART III: BMT Guidelines

Part I

Situation in UPOV concerning the possible use of molecular techniques in the **DUS Examination**

Molecular Techniques?

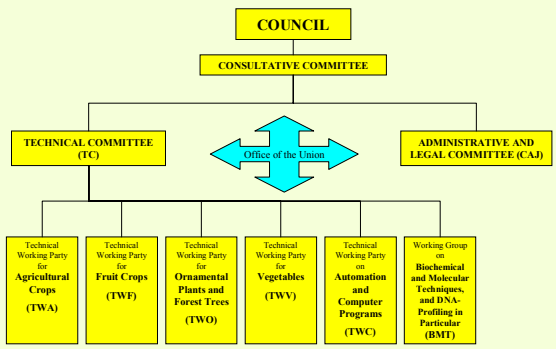


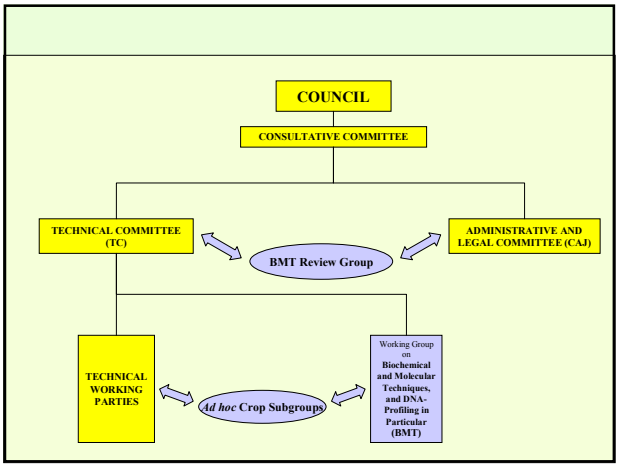
Legal and other considerations

- **Conformity with the UPOV Convention**
- **Potential impact on the strength of protection**

Technical considerations

- **Reliability and robustness of techniques**
- **Accessibility of the technology**
- **Harmonization of methodologies**
- **Cost of examination**
- **Implications for breeders (e.g. cost and time involved for new uniformity requirements)**





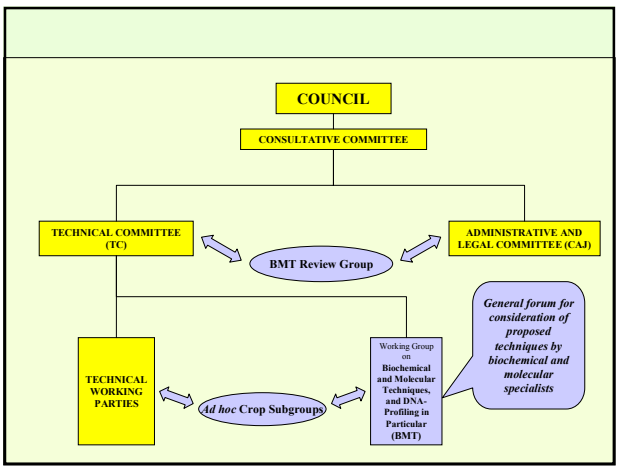
Harmonized approach

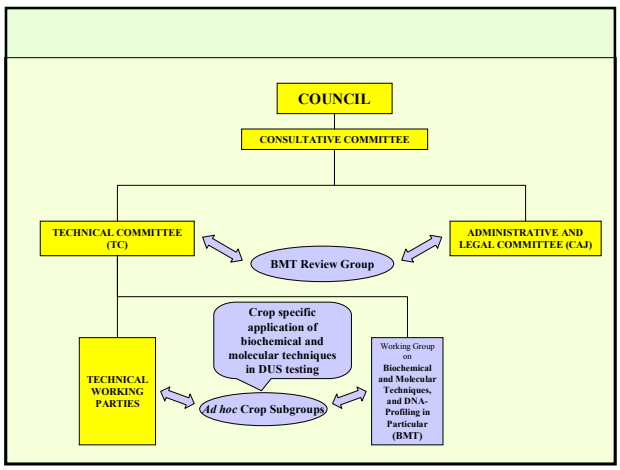
Harmonization

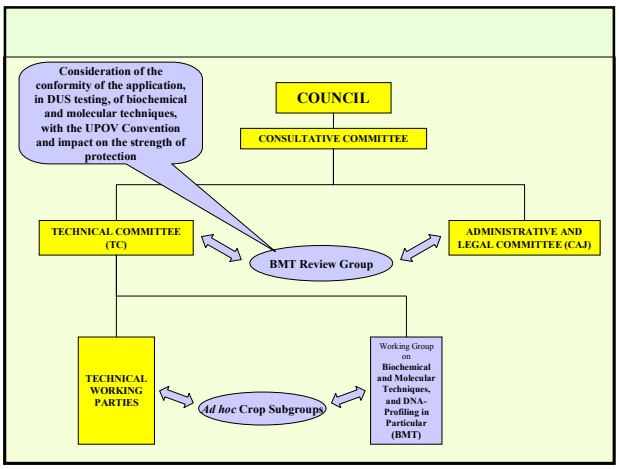
⇒ facilitates cooperation in DUS testing

e.g. purchase of DUS reports

⇒ internationally recognized variety descriptions (effective protection)







The options:

- ***Option 1:***

  Molecular Markers as predictors of Traditional Characteristics:
  (a) gene specific marker

- ***Option 2:***

  Calibration of Molecular Markers against Traditional Characteristics in the management of Reference collections

- ***Option 3:***

  New system

View of the BMT Review Group, Technical Committee, Administrative and Legal Committee

Option 1(a) for a gene specific marker of a phenotypic characteristic:

Proposal: gene specific marker for herbicide tolerance introduced by genetic modification

was, on the basis of the assumptions in the proposal, acceptable within the terms of the UPOV Convention and would not undermine the effectiveness of protection offered under the UPOV system.

Assumptions for a gene specific marker:

(a) **DUS examination**: same no. of plants, growing cycles, DUS criteria;

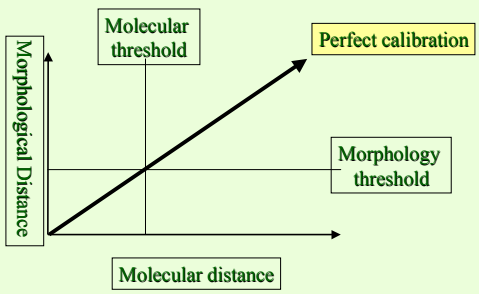
(b) **Linkage**: ensure that the marker is a reliable predictor;

(c) **Different markers** for same gene would be treated as different methods for examining the **same characteristic**;

(d) **Different genes** would be treated as different methods for examining the **same characteristic**;

(e) **Different markers** linked to **different regulatory elements** for the **same gene** would all be treated as different methods for examining the **same characteristic**. (further consideration would be given to this matter at a later stage)

Option 2: Calibration of threshold levels



View of the BMT Review Group, Technical Committee, Administrative and Legal Committee

Option 2: Calibration of threshold levels for molecular characteristics against the minimum distance in traditional characteristics

Proposal: Option 2 for Maize, Oilseed Rape and Rose

where used for the management of reference collections was, on the basis of the assumptions in the proposals, acceptable within the terms of the UPOV Convention and would not undermine the effectiveness of protection offered under the UPOV system

- whilst recognizing the need to improve the relationship between morphological and molecular distances.

Assumptions for calibration of threshold levels :

(a) **Uniformity and Stability**:

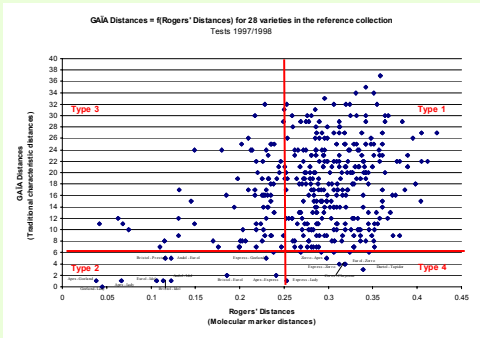
(i) [molecular] **differences** calculated between varieties **take into account the variation within varieties**;

(ii) suitable **uniformity standards** could be developed for molecular markers **without requiring varieties**, in general, **to be more uniform**

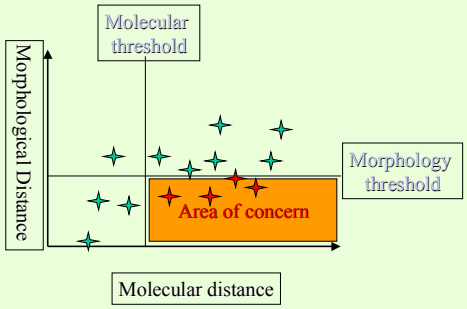
(b) would only be used for the establishment of a **"Distinctness plus"** threshold in the **management of reference collections**;

(c) would meet all the **normal requirements for any characteristic** to be used in the DUS examination and, in particular, would be checked to ensure they are **sufficiently consistent and repeatable**.

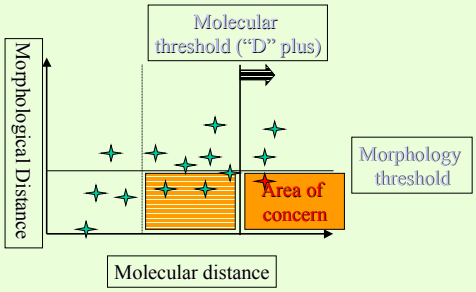
Option 2: Oilseed Rape



Option 2: Calibration of threshold levels



Option 2: Management of Reference Collections ("Distinctness plus")



View of the BMT Review Group, Technical Committee, Administrative and Legal Committee

Option 3: New system

Proposal: Option 3 for Rose and Wheat

no consensus on the acceptability of the Option 3 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, in these proposals, 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

Harmonized approach

Harmonization

⇒ facilitates cooperation in DUS testing

e.g. purchase of DUS reports

⇒ internationally recognized variety descriptions (effective protection)

Part II

variety identification in relation to:

- enforcement of plant breeders' rights
- technical verification
- consideration of essential derivation

VARIETY IDENTIFICATION

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

– […]

"(viii) Provide a **forum for discussion on the use of biochemical and molecular techniques in the consideration of essential derivation and variety identification**."

BMT Forum

"BREEDERS' DAY"
at BMT/11, May 2008, Spain

Use of molecular techniques in:

- **variety identification**
- **essential derivation**

VARIETY IDENTIFICATION

(March 2007)

- The Technical Committee invited the **BMT 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.

Part III

BMT Guidelines

BMT Guidelines

(September 2003)

- BMT concluded that:
  - 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
  - useful to provide **guidance on the planning of databases for molecular data** based on different types of markers

BMT Guidelines

(Technical Committee: March 2007)

BMT Guidelines to be put forward for adoption by the Council in October 2007

Exchangeable database

practical exercise, involving a small number of crops, in the development of an exchangeable database

- BMT: proposed oilseed rape, potato and rose
- TC:
  - **BMT Crop Subgroups for Oilseed Rape, Potato & Rose** to consider how to take forward.
  - exercise to consider both the quality and structure of the data

THANK YOU