UPOV

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

> Eleventh Session Madrid, September 16 to 18, 2008

### PREPARATORY WORKSHOP

September 15, 2008

UPOV

### **UPOV**

The International Convention for the Protection of New Varieties of Plants established in 1961

The International Union for the Protection of New Varieties of Plants

Union internationale pour la protection des obtentions végétales

PROGRAM

1. Introduction to UPOV

2. Overview of the Technical Working Parties (TWPs)

3. Guidance for DUS Examination
- General Introduction (document TG/1/3)
- TGP documents
- Test Guidelines and characteristics
- Cooperation

4. Role of the TWPs and BMT

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

6. The Concept of Essentially Derived Varieties

7. The Role of UPOV in Variety Identification

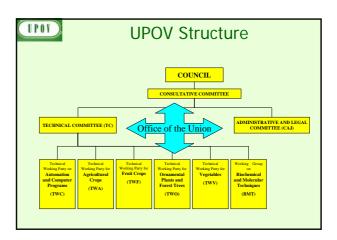
8. The UPOV website

9. Agenda for the BMT session

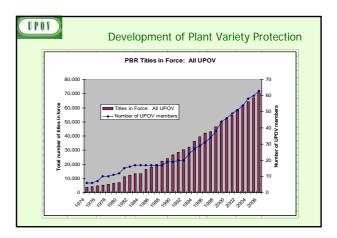
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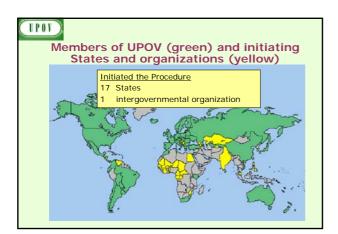
- Members of the Union
  - -States
  - -Intergovernmental Organization(s)
- Organs established by the Convention
  - -Council
  - -Office of the Union
- Other Bodies

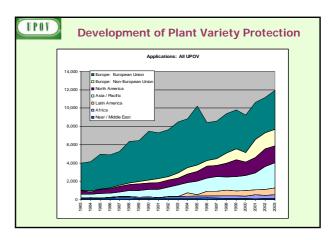
1. INTRODUCTION TO UPOV

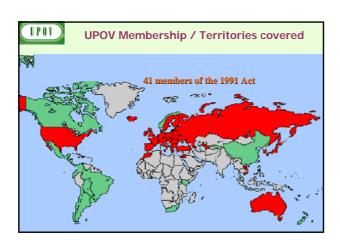




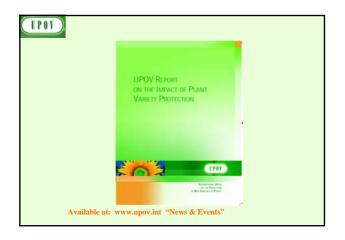




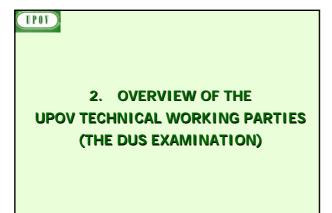


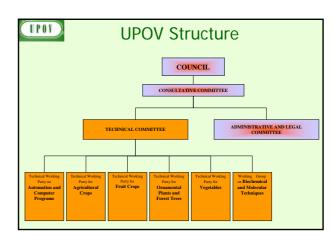


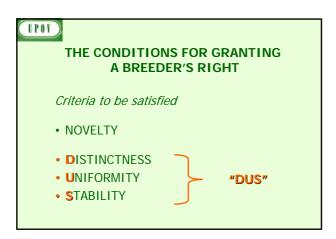
"To provide and promote an effective system of plant variety protection, with the aim of encouraging the development of new varieties of plants, for the benefit of society"

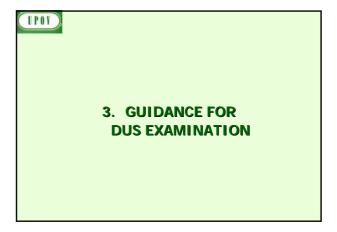


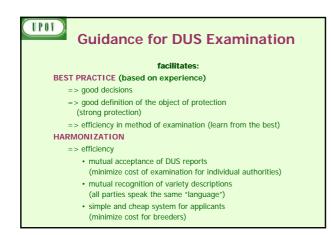


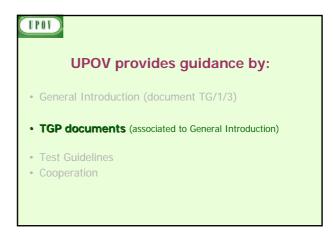












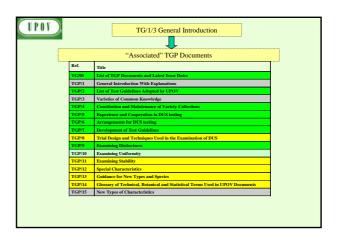
UPOV provides guidance by:

• General Introduction (document TG/1/3)

• TGP documents

• Test Guidelines

• Cooperation



UPOV provides guidance by:

• General Introduction (document TG/1/3)

("General Introduction to the Examination of Distinctness, Uniformity and Stability and the Development of Harmonized Descriptions of New Varieties of Plants")

• TGP documents

• Test Guidelines

• Cooperation

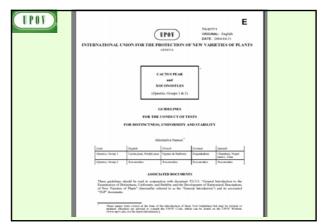
UPOV provides guidance by:

General Introduction (document TG/1/3)
TGP documents

Test Guidelines

Cooperation





Test Guidelines

• 249 Test Guidelines adopted

• Further 62 to be discussed in 2008
(19 revisions / 43 new Test Guidelines)

1. Subject of the Test Guidelines

1. Subject of the Test Guidelines

2. Material Required

3. Methods of Examination

4. Assessment of Distinctness, Uniformity and Stability

5. Grouping of Varieties and Organization of the Growing Trial

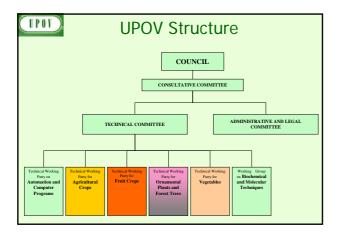
6. Introduction to the Table of Characteristics

7. Table of Characteristics

8. Explanation on the Table of Characteristics

9. Literature

10. Technical Questionnaire



"CHARACTERISTICS"

- may have direct commercial relevance
 - Flower color (ornamental)
 - Fruit color

- but commercial relevance NOT required
 - Leaf shape

# The basic requirements that a characteristic should fulfill before it is used for DUS testing or producing a variety description are that its expression (TG/1/3: Section 4.2.1): (a) results from a given genotype or combination of genotypes; (b) is sufficiently consistent and repeatable in a particular environment; (c) exhibits sufficient variation between varieties to be able to establish distinctness; (d) is capable of precise definition and recognition; (e) allows uniformity requirements to be fulfilled; (f) allows stability requirements to be fulfilled, meaning that it produces consistent and repeatable results after repeated propagation or, where appropriate, at the end of each cycle of propagation.

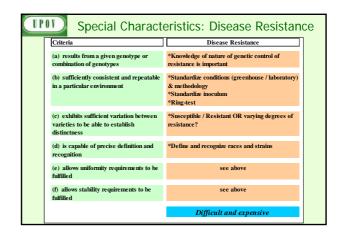
Criteria	Fruit: color	Leaf: shape	Yield	Straw strength
(a) results from a given genotype or combination of genotypes	Yes	Yes	Yes	Yes
(b) sufficiently consistent and repeatable in a particular environment	Yes	Yes	(No)	(No)
(c) exhibits sufficient variation between varieties to be able to establish distinctness	Yes	Yes	???	???
(d) is capable of precise definition and recognition	Yes	Yes	(No)	???
(e) allows uniformity requirements to be fulfilled	Yes	Yes	???	???
(f) allows stability requirements to be fulfilled	Yes	Yes	???	???
Commercial value	Yes	No	Yes	Yes

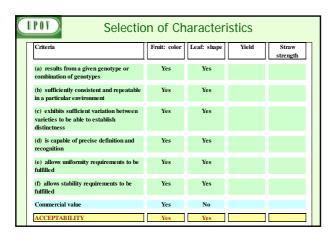
Selection of Characteristics

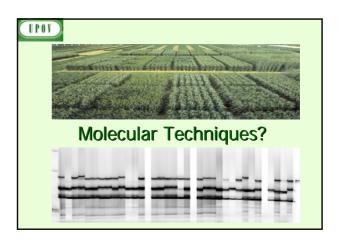
• Yield ???

• Straw strength ???

Etc.







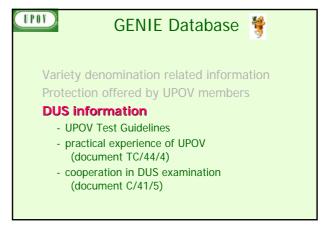
UPOV provides guidance by:

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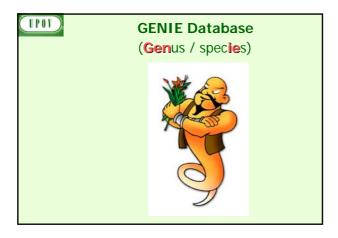
Test Guidelines

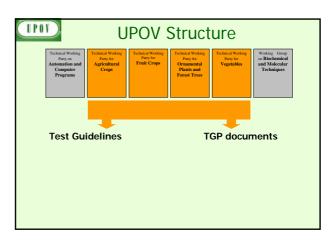
• 249 Test Guidelines adopted

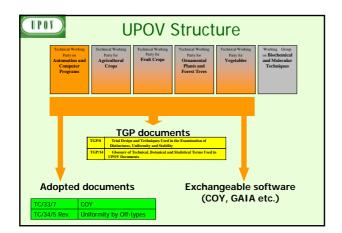
but...

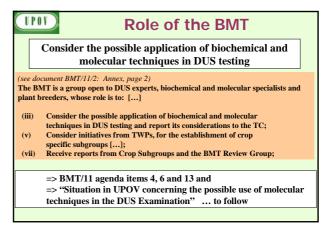
• >2,500 genera and species with varieties examined for PBR

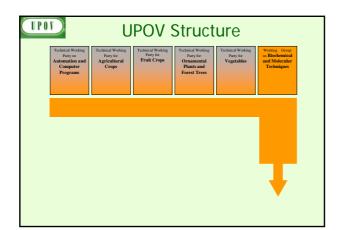
4. ROLE OF THE
TECHNICAL WORKING PARTIES
AND THE BMT

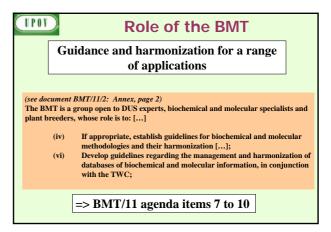


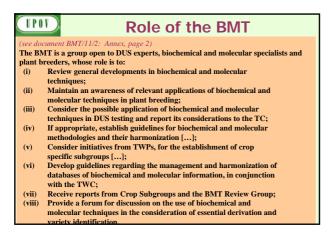


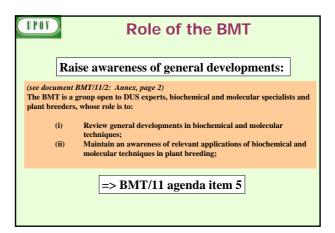


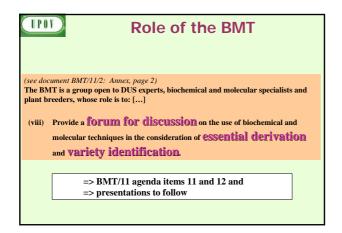














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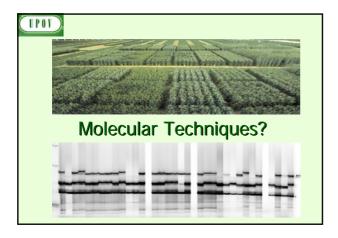
5. Situation in UPOV concerning the possible use of molecular techniques in the DUS Examination

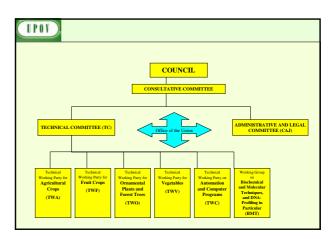


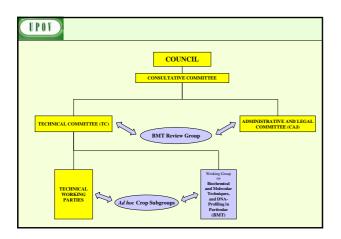
### Harmonized approach

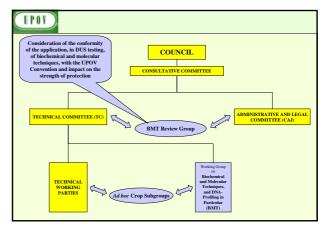
### Harmonization

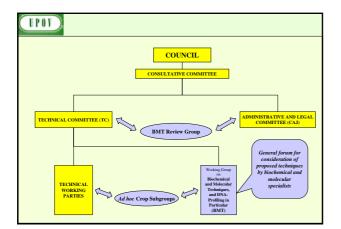
- ⇒ facilitates cooperation in DUS testing e.g. purchase of DUS reports
- ⇒ internationally recognized variety descriptions (effective protection)



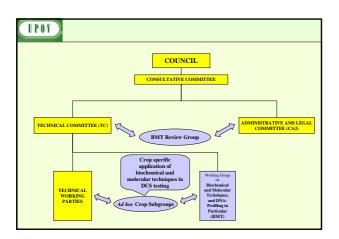


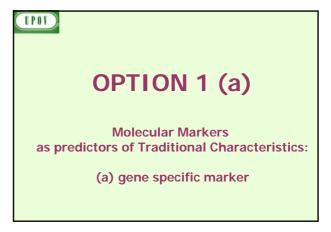










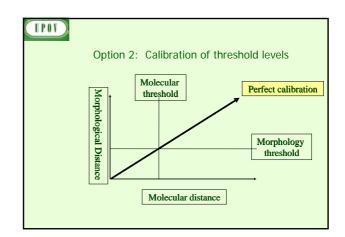


View of the BMT Review Group, Technical Committee, Administrative and Legal Committee

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.



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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)

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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.

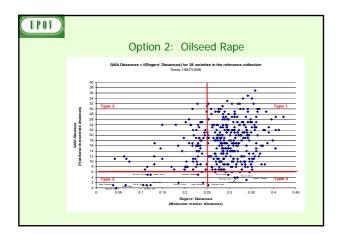
UPOV

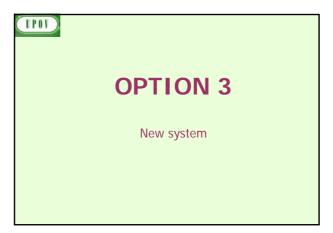
### **OPTION 2**

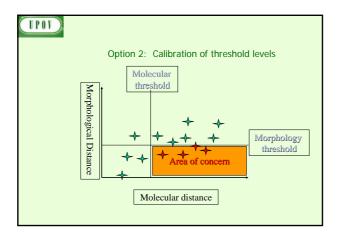
Calibration of Molecular Markers against Traditional Characteristics in the management of Reference collections UPOV

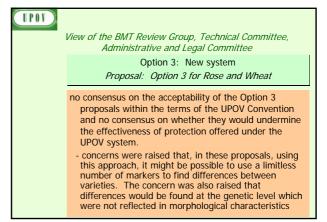
Assumptions for calibration of threshold levels :

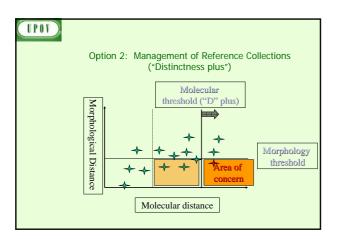
- (a) Uniformity and Stability:
  - (i) [molecular] differences calculated between varieties take into account the variation within varieties;
  - (ii) suitable **uniformity standards** could be developed for molecular markers **without requiring varieties**, in general, **to be more uniform**
- (b) 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**.













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## 6. THE CONCEPT OF ESSENTIALLY DERIVED VARIETIES

UPOV

### **Essentially Derived Varieties (EDV's)**

Article 14(5):

- (a) The provisions of paragraphs (1) to (4) shall also apply in relation to
- (i) varieties which are essentially derived from the protected variety, where the protected variety is not itself an essentially derived variety,

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"OTHER" VARIETIES COVERED BY THE BREEDER'S RIGHT (1991 Act: Article 14(5))

### **VARIETIES:**

- not clearly distinguishable
- whose production requires the repeated use of the protected variety
- which are essentially derived from the protected variety

UPOV

### **Essentially Derived Varieties**

- ...a variety shall be deemed to be essentially derived from another variety ("the initial variety") when
  - (i) it is **predominantly derived from the initial variety**, or from a variety that is itself predominantly derived from the initial variety, while retaining the expression of the essential characteristics that result from the genotype or combination of genotypes of the initial variety,
  - (ii) it is clearly distinguishable from the initial variety and
- (iii) except for the differences which result from the act of derivation, it conforms to the initial variety in the expression of the essential characteristics that result from the genotype or combination of genotypes of the initial variety.

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### **ESSENTIAL DERIVATION**

### PURPOSE:

To ensure sustainable plant breeding development by:

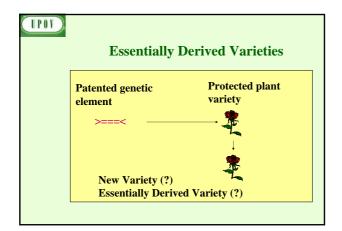
- providing effective protection for the classical breeder and
- encouraging cooperation between classical breeders and developers of new technologies such as genetic modification

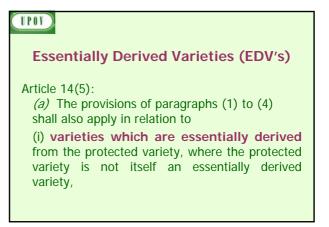
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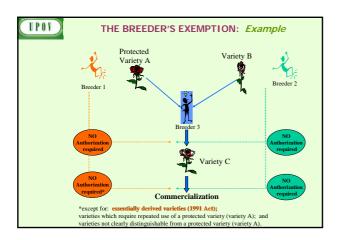
### **Essentially Derived Varieties (EDV's)**

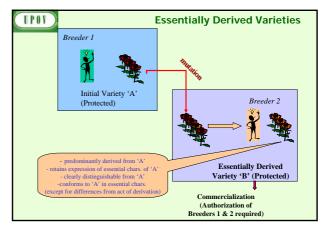
May be obtained for example by:

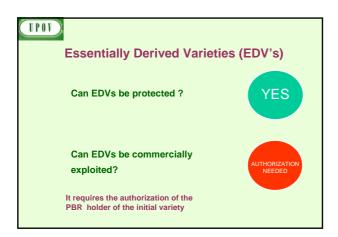
- · selection of a natural or induced mutant
- · selection of a somaclonal variant
- selection of a variant individual from plants of the initial variety
- · back-crossing
- · transformation by genetic engineering

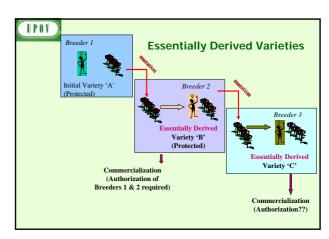




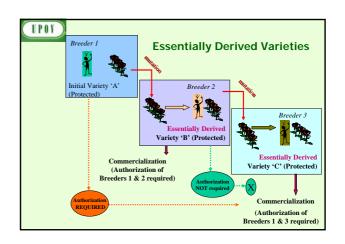


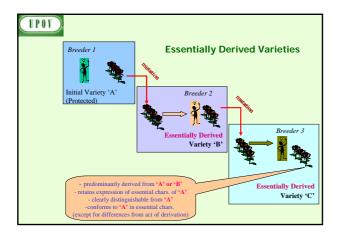


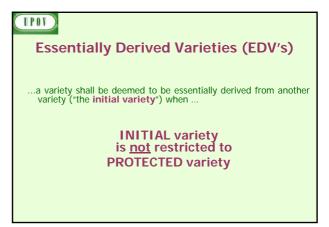




## ...a variety shall be deemed to be essentially derived from another variety ("the initial variety") when (i) it is predominantly derived from the initial variety, or from a variety that is itself predominantly derived from the initial variety, while retaining the expression of the essential characteristics that result from the genotype or combination of genotypes of the initial variety, (ii) it is clearly distinguishable from the INITIAL variety and (iii) except for the differences which result from the act of derivation, it conforms to the INITIAL variety in the expression of the essential characteristics that result from the genotype or combination of genotypes of the initial variety.





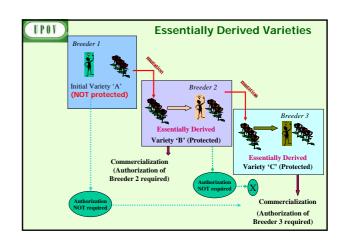


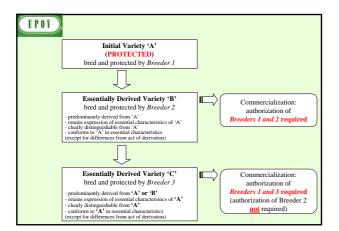
Essentially Derived Varieties (EDV's)

Article 14(5):

(a) The provisions of paragraphs (1) to (4) shall also apply in relation to

(i) varieties which are essentially derived from the protected variety, where the protected variety is not itself an essentially derived variety,

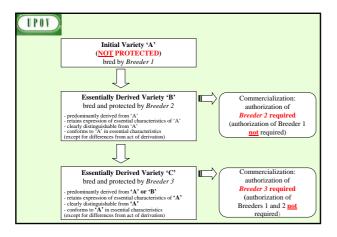




### UPOV

### **Essentially Derived Varieties**

- with regard to establishing whether a variety is an essentially derived variety, a common view expressed by members of the UPOV is that the existence of a relationship of essential derivation between protected varieties is a matter for the holders of plant breeders' rights in the varieties concerned.
- UPOV has established a section on its website where case law relevant to plant breeders' rights, including case law concerning essentially derived varieties, is published.





- "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."

### UPOV

### **Essentially Derived Varieties**

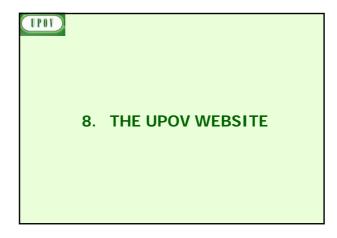
- decision on whether to grant protection to a variety does not take into account whether the variety is essentially derived or not: provided the conditions for protection are fulfilled (novelty, DUS, variety denomination, compliance with formalities and payment of fees) the variety will be granted protection.
- if it is subsequently concluded that the variety is an EDV, the breeder of that EDV still has all the rights conferred by the UPOV Convention. However, the breeder of the INITIAL VARIETY will also have rights in that variety. Thus, in the case of an essentially derived variety, the authorization of both the breeder of the essentially derived variety and the breeder of the initial variety is required for its commercialization.



7. THE ROLE OF UPOV IN VARIETY IDENTIFICATION

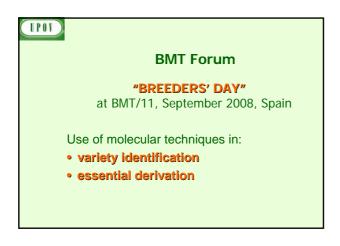
## VARIETY IDENTIFICATION "The BMT is a group open to DUS experts, biochemical and molecular specialists and plant breeders, whose role is to: - [...] "(viii) Provide a forum for discussion on the use of biochemical and molecular techniques in the consideration of essential derivation and variety

identification."























(IPOY)

## 9. AGENDA FOR THE BMT SESSION

UPOY

**THANK YOU**