

International Union for the Protection of New Varieties of Plants

Technical Working Party on Automation and Computer Programs TWC/38/2 - BMT/19/2

Thirty-Eighth Session Alexandria, United States of America, September 21 to 23, 2020

Working Group on Biochemical and Molecular Techniques and DNA-Profiling in Particular

Nineteenth Session Original: English

Alexandria, United States of America, September 23 to 25, 2020 Date: September 22, 2020

#### REPORT ON DEVELOPMENTS IN UPOV

Document prepared by the Office of the Union

Disclaimer: this document does not represent UPOV policies or guidance

The annex to this document contains a copy of a presentation on "Reports on Developments within UPOV" made by the Office of the Union at the thirty-eighth session of the Technical Working Party on Automation and Computer Programs (TWC) and at the nineteenth session of the Working Group on Biochemical and Molecular Techniques and DNA-Profiling in Particular (BMT) .

[Annex follows]

Technical Working Party on Automation and Computer Programs
Thirty-Eighth Session

Working Group on Biochemical and Molecular Techniques, and DNA-Profiling in Particular Nineteenth Session

# REPORT ON DEVELOPMENTS IN UPOV

Office of the Union

Hosted by the United States of America, September 21 to 25, 2020

#### **UP@V**

International Union for the Protection of New Varieties of Plants

# Preview

#### General

- COVID-19 measures
- Membership & statistics
- Report on regular activities of UPOV
- Communicating the benefits of UPOV
- UPOV PRISMA
- Biochemical and molecular techniques
  - Current guidance
  - Developments since BMT/18 in 2019
  - The Concept of Essentially Derived Varieties
  - The Role of UPOV in Variety Identification

# **COVID-19** measures

# **Technical Working Parties**

In order to continue the work of UPOV's Technical Working Parties (TWP) in the context of the COVID-19 situation, the following TWP sessions were successfully organized by electronic means:

- Technical Working Party for Vegetables (TWV), hosted by Brazil, from May 11 to 15;
- Technical Working Party for Ornamental Plants and Forest Trees (TWO), hosted by the Netherlands, from June 8 to 12;
- Technical Working Party for Agricultural Crops (TWA), hosted by Canada, from June 22 to 26;
- Technical Working Party for Fruit Crops (TWF), hosted by France, from July 6 to 10, 2020

#### **COVID-19** measures

 Measures for Breeders ->dedicated webpage on the UPOV Website

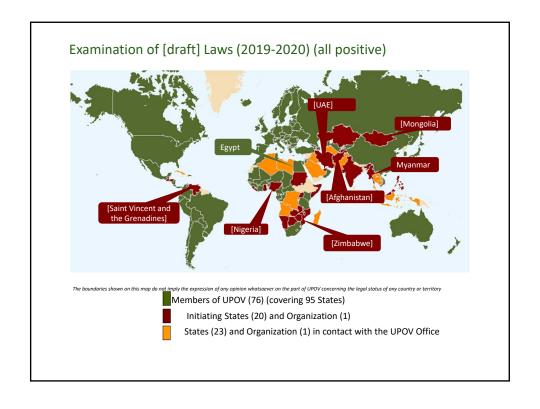


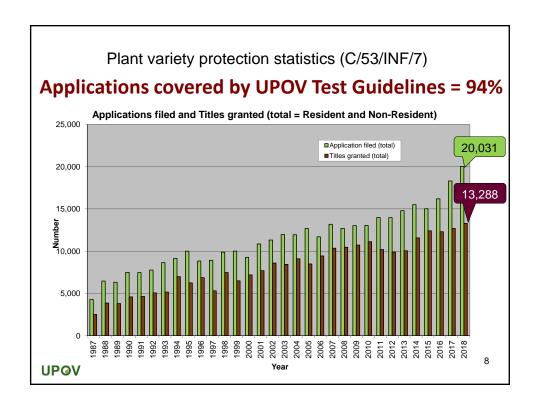


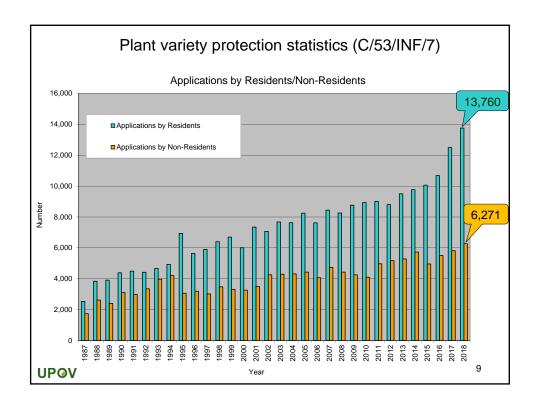
# Preview

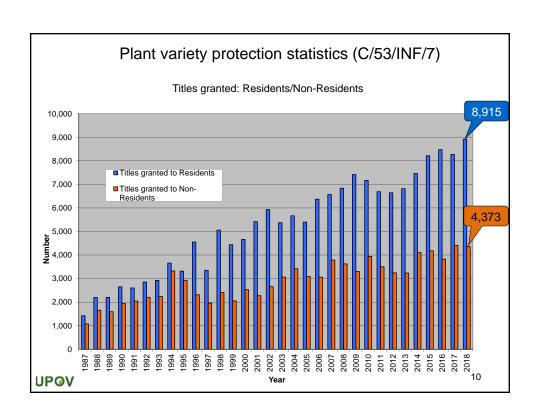
#### General

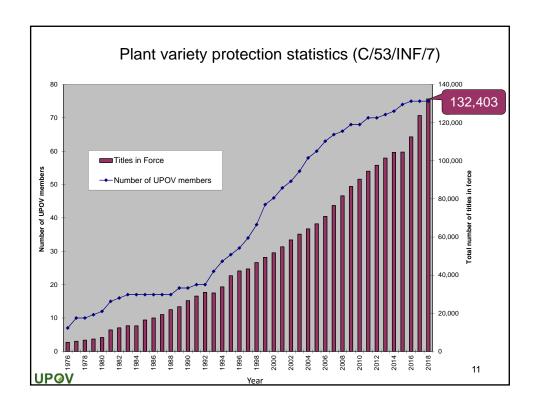
- COVID-19 measures
- Membership & statistics
- Report on regular activities of UPOV
- Communicating the benefits of UPOV
- UPOV PRISMA
- Biochemical and molecular techniques
  - Current guidance
  - Developments since BMT/18 in 2019
  - The Concept of Essentially Derived Varieties
  - The Role of UPOV in Variety Identification

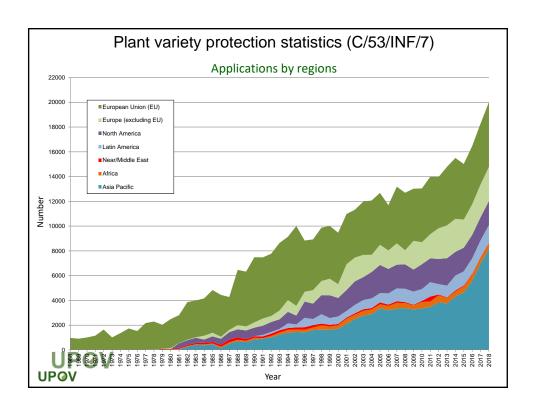


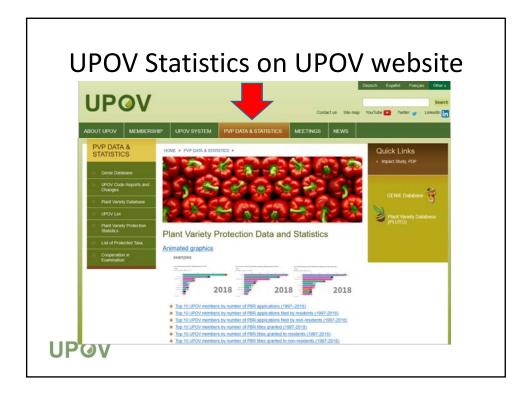












**UPOV** welcomes Mr. Manabu Suzuki
Technical/Regional Officer (Asia)
<a href="mailto:manabu.suzuki@upov.int">manabu.suzuki@upov.int</a>



# Preview

#### General

- COVID-19 measures
- Membership & statistics
- Report on regular activities of UPOV
- Communicating the benefits of UPOV
- UPOV PRISMA
- Biochemical and molecular techniques
  - Current guidance
  - Developments since BMT/18 in 2019
  - The Concept of Essentially Derived Varieties
  - The Role of UPOV in Variety Identification

Contact us Site PVP DATA & STATISTICS Stakeholder features UPOV update on COVID-19: UPOV services continuing; remote work prioritized The International Union for the Protection of New Varieties of Plants (UPOV) is an intergovernmental organization with headquarters in Geneva (Switzerland) Quick Links UPOV was established by the International Convention for the Protection of New Varieties of Plants. The Convention was adopted in Paris in 1961 and it was revised in 1972, 1978 and 1991. ■ Introduction to UPOV ■ Benefits of UPOV UPOV's mission is 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 Collection ■ UPOV PRISMA (Information) UPOV 16

#### **DL-205**

# Introduction to the UPOV System of Plant Variety Protection under the UPOV Convention

# **DL-305**Advanced Distance Learning Courses

#### Registrations can be made in three different categories:

#### Category 1:

Government officials of members of the Union nominated by the relevant representative to the UPOV Council No fee

#### Category 2

Officials of observer States / intergovernmental organizations nominated by the relevant representative to the UPOV Council (One non-fee paying student per State / intergovernmental organization; Additional students: CHF1,000 per student)

Category 3: Others Fee: CHF1,000



17

#### JPOV Distance Learning Courses

Code	Course	Session	Study period	Registration period
<u>DL-205</u>	Introduction to the UPOV System of Plant Variety Protection under the UPOV Convention	Session 1	02-Mar to 05-Apr 2020	13-Jan to 16-Feb 2020
		Session 2	12-Oct to 15-Nov 2020	03-Aug to 13-Sep 2020
DL-305A	Administration of Plant Breeders' Rights	Session 1	02-Mar to 05-Apr 2020	13-Jan to 16-Feb 2020
	(Part A of DL-305 course: Examination of applications for plant breeders' rights)	Session 2	12-Oct to 15-Nov 2020	03-Aug to 13-Sep 2020
DL-305B	DUS Examination (Part B of DL-305 course: Examination of applications for plant breeders' rights)	Session 1	02-Mar to 05-Apr 2020	13-Jan to 16-Feb 2020
		Session 2	12-Oct to 15-Nov 2020	03-Aug to 13-Sep 2020
DL-305	Examination of applications for plant breeders' rights	Session 1	02-Mar to 05-Apr 2020	13-Jan to 16-Feb 2020
		Session 2	12-Oct to 15-Nov 2020	03-Aug to 13-Sep 2020

The UPOV Courses are hosted on the WIPO eLearning Center.



+ Special Session of UPOV DL-205 course during COVID-19 situation (May 4 to June 7, 2020)

at a discounted rate for students under the Category 3 (breeders, IP managers, IP agents, lawyers, academics)



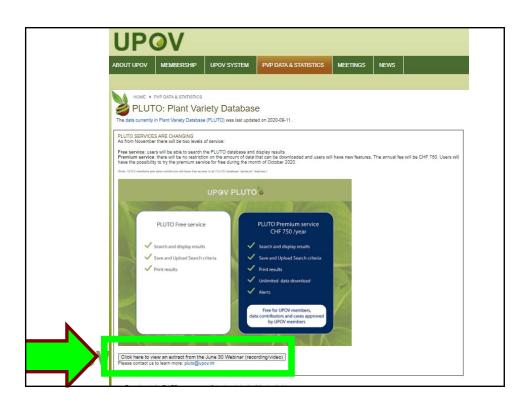
# PLUTO Plant Variety Database services are changing

From November, the PLUTO database will provide two levels of service:

- Free service: users will be able to search the PLUTO database and display results
- **Premium service**: there will be no restriction on the amount of data that can be downloaded and users will have new features. The annual fee will be CHF 750. Users will have the possibility to try the premium service for free during the month of October 2020.

(Note: UPOV members and data contributors will have free access to all PLUTO database "premium" features.)

information Webinar organized on June 30, 2020



# Preview

#### General

- COVID-19 measures
- Membership & statistics
- Report on regular activities of UPOV
- Communicating the benefits of UPOV
- UPOV PRISMA
- Biochemical and molecular techniques
  - Current guidance
  - Developments since BMT/18 in 2019
  - The Concept of Essentially Derived Varieties
  - The Role of UPOV in Variety Identification

UPOV Distance Learning Courses:
Registration open

Welcome

The international Union for the Protection of New Varieties of Plants (UPOV) is an intergovernmental organization with headquarters in Geneva (Switzerland)

UPOV was established by the International Convention for the Protection of New Varieties of Plants (UPOV) is an intergovernmental organization with headquarters in Geneva (Switzerland)

UPOV was established by the International Convention for the Protection of New Varieties

UPOV was established by the International Convention for the Protection of New Varieties

UPOV was established by the International Convention for the Protection of New Varieties

UPOV Was established by the International Convention for the Protection of New Varieties

UPOV Plants Variety Database (PLUTO)

Quick Links

Introduction to UPOV

Denerfis of UPOV

Denerfis of UPOV

UPOV Collection

UPOV PRISMA (Information)

Test Guidelines

Distance Learning Courses

Seminars & Symposia

FACES



# **UPOV Social Media**



Follow us to find out more about how the UPOV system benefits farmers, growers and breeders worldwide and news on events, videos, reports and more.

#### UPOV@UPOVint

# PeterButton@vsgupov



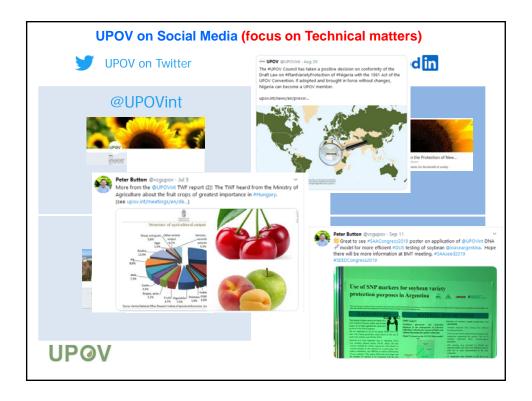






International Union for the Protection of New Varieties of Plants



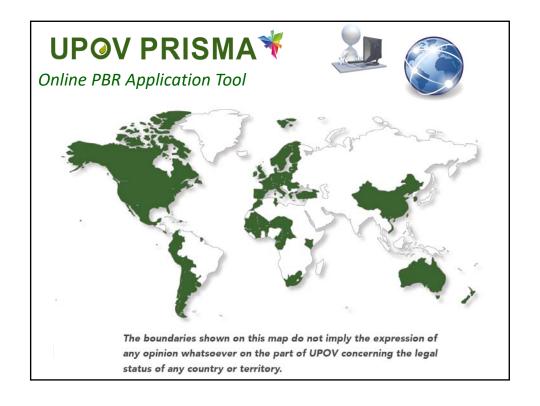


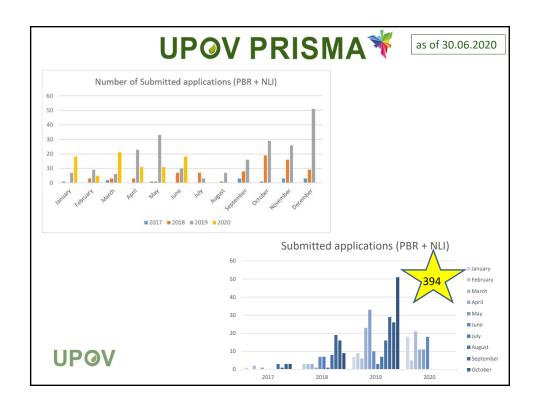
# **Preview**

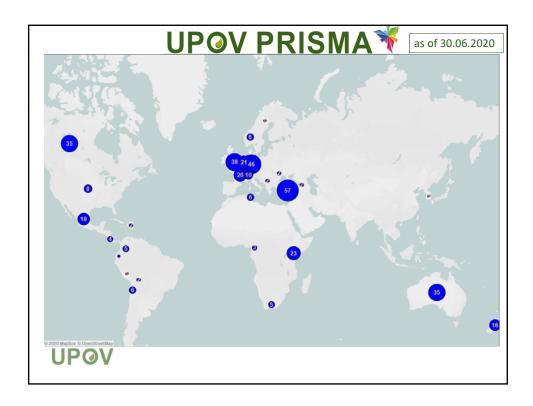
#### General

- COVID-19 measures
- Membership & statistics
- Report on regular activities of UPOV
- Communicating the benefits of UPOV
- UPOV PRISMA
- Biochemical and molecular techniques
  - Current guidance
  - Developments since BMT/18 in 2019
  - The Concept of Essentially Derived Varieties
  - The Role of UPOV in Variety Identification

Overview of all Online service for PVP submissions applications Find all PVP 70 + countries application procedures covered **UPOV PRISMA** Language choice to read forms Reminders for lovelty & Priority Copy data to Translation of predefined responses other applications www.upov.int/upovprisma **UPOV** 









# Questions

#### **UPOV**

# **Preview**

#### General

- COVID-19 measures
- Membership & statistics
- Report on regular activities of UPOV
- Communicating the benefits of UPOV
- UPOV PRISMA
- Biochemical and molecular techniques
  - Current guidance
  - Developments since BMT/18 in 2019
  - The Concept of Essentially Derived Varieties
  - The Role of UPOV in Variety Identification

# STATUS OF UPOV DOCUMENTS CONCERNING MOLECULAR TECHNIQUES

Document reference	Title
UPOV/INF/17/1	Guidelines for DNA Profiling: Molecular Marker Selection and Database Construction ("BMT Guidelines") (2010)

Document reference	Title
TGP/15	Guidance on the Use of Biochemical and Molecular Markers in the Examination of Distinctness, Uniformity and Stability (DUS) (2013)
UPOV/INF/18/1	Possible Use of Molecular Markers in the Examination of Distinctness, Uniformity and Stability (2011)

#### UPOV/INF/17/1 (INFormation document)

"Guidelines for DNA Profiling: Molecular Marker Selection and Database Construction ("BMT Guidelines")"

The purpose of this document (BMT Guidelines) is to provide guidance for developing harmonized methodologies with the aim of generating high quality molecular data for a range of applications. The BMT Guidelines are also intended to address the construction of databases containing molecular profiles of plant varieties [...]

#### FAQ

FAQ: Does UPOV allow molecular techniques (DNA profiles) in the DUS examination?

- It is important to note that, in some cases, varieties may have a different DNA profile but be phenotypically identical, whilst, in other cases, varieties which have a large phenotypic difference may have the same DNA profile for a particular set of molecular markers (e.g. some mutations).
- In relation to the use of molecular markers that are not related to phenotypic differences, the concern is that it might be possible to use a limitless number of markers to find differences between varieties at the genetic level that are not reflected in phenotypic characteristics.

On the above basis, UPOV has agreed the following uses in relation to DUS examination:



37

FAQ: Does UPOV allow molecular techniques (DNA profiles) in the DUS examination? (cont.)

- (a) Molecular markers can be used as a method of examining DUS characteristics that satisfy the criteria for characteristics set out in the General Introduction if there is a reliable link between the marker and the characteristic.
- (b) A combination of phenotypic differences and molecular distances can be used to improve the selection of varieties to be compared in the growing trial if the molecular distances are sufficiently related to phenotypic differences and the method does not create an increased risk of not selecting a variety in the variety collection which should be compared to candidate varieties in the DUS growing trial.



TGP/15/1 (Technical Guidelines Protocol)

"Guidance on the Use of Biochemical and Molecular Markers in the Examination of Distinctness, Uniformity and Stability (DUS)"

The purpose of this document is to provide guidance on the use of biochemical and molecular markers in the examination of Distinctness, Uniformity and Stability (DUS) on the basis of the models in document UPOV/INF/18 that have received a positive assessment and for which accepted examples have been provided.

# Model 1: Characteristic-specific molecular markers

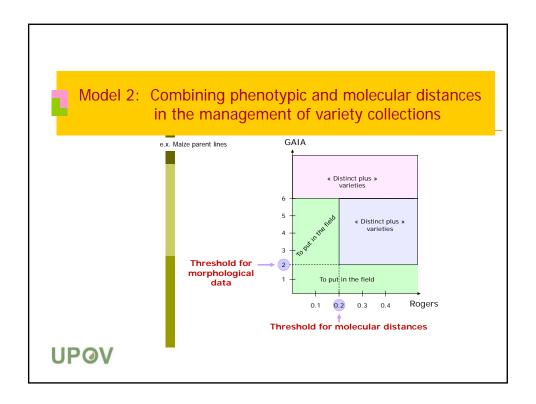
Example: gene specific marker for herbicide tolerance introduced by genetic modification

On the basis that:

[...]

- there is <u>verification of the reliability</u> of the link between the marker and the characteristic;
- <u>different markers for the same characteristic</u> are different methods for examining the same characteristic;

[...]



# **Preview**

#### General

- COVID-19 measures
- Membership & statistics
- Report on regular activities of UPOV
- Communicating the benefits of UPOV
- UPOV PRISMA
- Biochemical and molecular techniques
  - Current guidance
  - Developments since BMT/18 in 2019
  - The Concept of Essentially Derived Varieties
  - The Role of UPOV in Variety Identification

# **Review of BMT Guidelines**

 UPOV/INF/17 "Guidelines for DNA-Profiling: Molecular Marker Selection and Database Construction ('BMT Guidelines')"

 Revisions were proposed on basis of joint comments provided by EU, France and the Netherlands

- a number of deletions, additions and editorial changes

 $\Rightarrow$  To be considered

IIP ander the agenda item 6: Review of document UPOV/INF/17

# Revision of document TGP/15

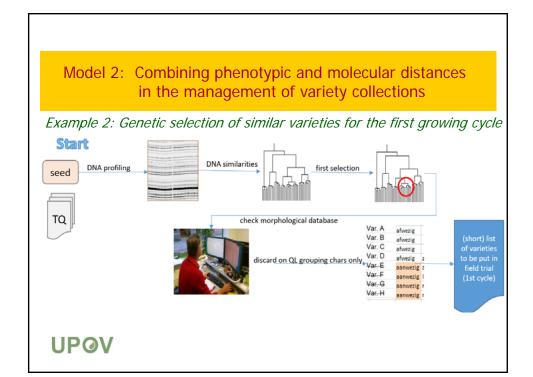
"Guidance on the Use of Biochemical and Molecular Markers in the Examination of Distinctness, Uniformity and Stability (DUS)

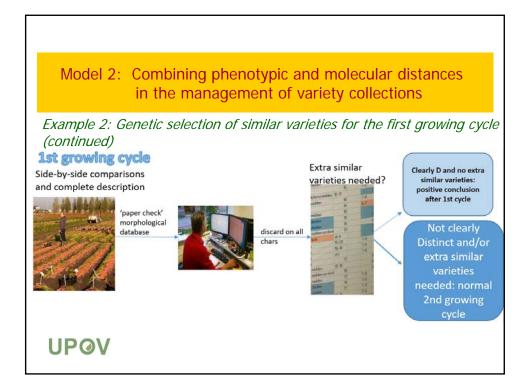
# Inclusion of a new example to model "Combining phenotypic and molecular distances in the management of variety collections"

Example 2: "Genetic selection of similar varieties for the first growing cycle"

The Council, at its fifty-third session, adopted a revision of document TGP/15 incorporating a new model "Genetic selection of similar varieties for the first growing cycle: example French Bean" on the basis of the proposal by the Netherlands [...]

The TC, at its fifty-fifth session, agreed that model "Genetic selection of similar varieties for the first growing cycle" should be presented in document TGP/15 as a second example of model "Combining phenotypic and molecular distances in the management of variety collections". [...] Subject to agreement by the CAJ at its seventy-sixth session, a draft of document TGP/15/2 will be presented for adoption by the Council, at its fifty third ordinary session





#### Inclusion of a new example to model "Characteristicspecific molecular markers"

Example 2: "Characteristic-specific molecular marker with incomplete information on state of expression"

**The TC,** at its fifty-fifth session, agreed a new example to be added to document TGP/15 to illustrate a situation where the characteristic-specific marker did not provide complete information on the state of expression of a characteristic [...]

Subject to agreement by the CAJ at its seventy-sixth session, a draft of document TGP/15/3 will be presented for adoption by the Council, at its fifty-fourth ordinary session

# Model 1: Characteristic-specific molecular markers



New Example 2: Characteristic-specific molecular marker with incomplete information on state of expression

"Table 1: Schematic overview of resistance to Tomato mosaic virus and resistance alleles:

	tm2/tm2	Tm2/Tm2 or Tm2²/Tm2² or Tm2²/Tm2 or Tm2/tm2 or Tm2²/tm2	tm2/tm2
Genetic background	and		and
background	tm1/tm1	and	Tm1/Tm1 or Tm1/tm1
		Tm1/Tm1 or Tm1/tm1 or tm1/tm1	11111/41111
Marker Tm2/2 <sup>2</sup>	susceptible allele	resistant allele	susceptible allele
Resistance to ToMV - Strain 0	absent	present	present

- "5. If a variety is claimed to be resistant to ToMV Strain 0, the DNA marker test may be performed. In cases where the resistance is based on the presence of the allele *Tm2* or *Tm2*<sup>2</sup>, the DNA marker test could replace the traditional bioassay.
- "6. If the DNA marker test does not confirm the resistance claim or if the variety is claimed to be susceptible, a bioassay must be performed."

#### Session to facilitate cooperation

At the BMT/18, **Discussion groups** had been formed for: maize and soybeans; other agricultural crops; fruit crops and forest trees; ornamental plants; and vegetables, for BMT participants to exchange information on their work and **explore areas for cooperation**.

⇒ To be considered under the agenda item 12 "Session to facilitate cooperation"

# Questions

#### **UPOV**

# **Preview**

#### General

- COVID-19 measures
- Membership & statistics
- Report on regular activities of UPOV
- Communicating the benefits of UPOV
- UPOV PRISMA
- Biochemical and molecular techniques
  - Current guidance
  - Developments since BMT/18 in 2019
  - The Concept of Essentially Derived Varieties
  - The Role of UPOV in Variety Identification

- Purpose and concept
- Protection of EDVs
- Protection of Initial Variety
- Implementation
- UPOV guidance

UPOV

53

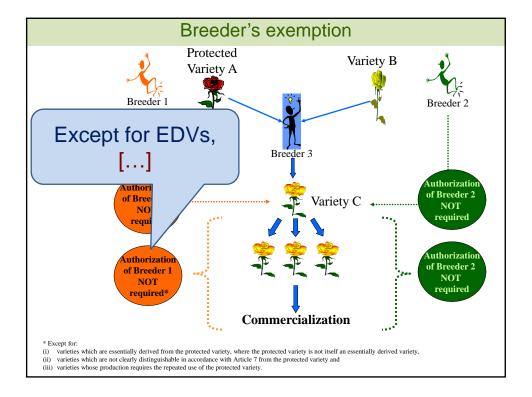
#### **ESSENTIALLY DERIVED VARIETIES**

#### **PURPOSE:**

to ensure sustainable progress in plant breeding development by:

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

**UPOV** 



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,

\* = COMMERCIALIZATION

- ...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.

UPOV

57

#### **ESSENTIALLY DERIVED VARIETIES**

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

- Purpose and concept
- Protection of EDVs
- Protection of Initial Variety
- Implementation
- UPOV guidance

**UPOV** 

59

# **ESSENTIALLY DERIVED VARIETIES**

Can EDVs be protected?

same conditions (novelty, DUS)



Can EDVs be commercialized?

authorization of the PBR holder of the INITIAL VARIETY and

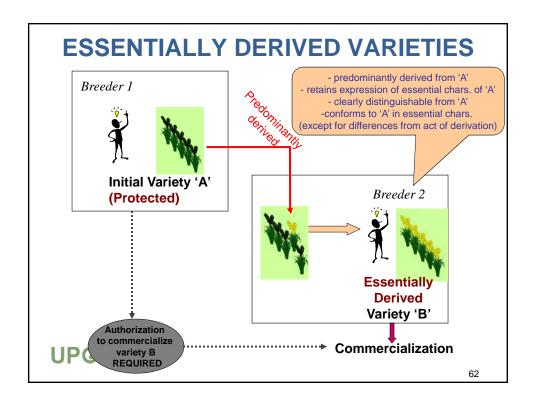


PBR holder of **EDV** required

UPOV

- Purpose and concept
- Protection of EDVs
- Protection of Initial Variety
- Implementation
- UPOV guidance

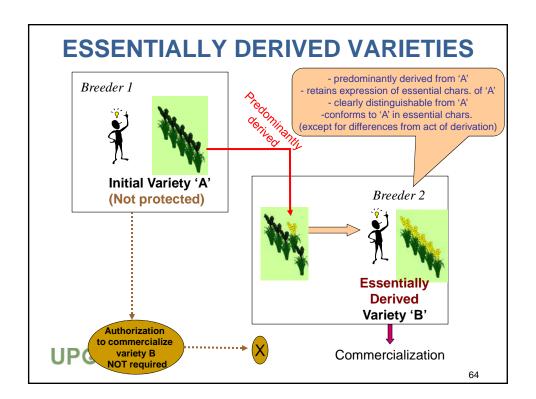
**UPOV** 



...a variety shall be deemed to be essentially derived from another variety ("the **initial variety**") ......

INITIAL variety is <u>not</u> restricted to PROTECTED variety

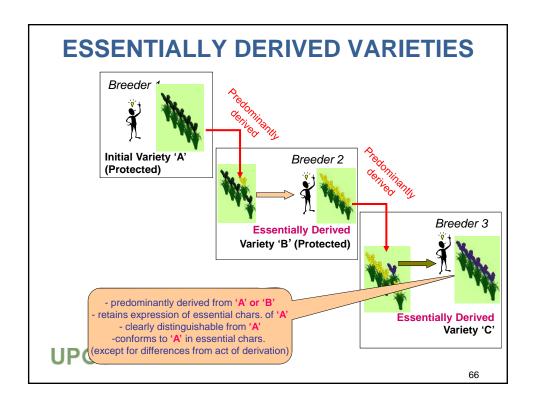
**UPOV** 

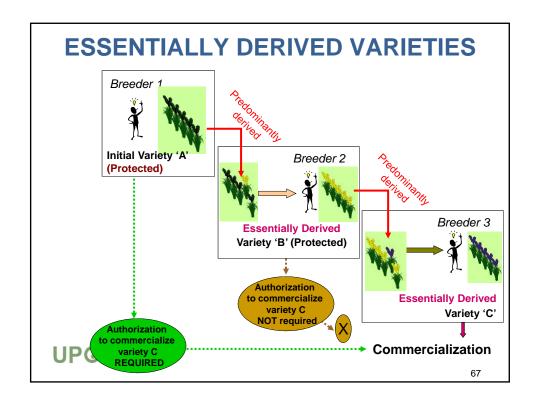


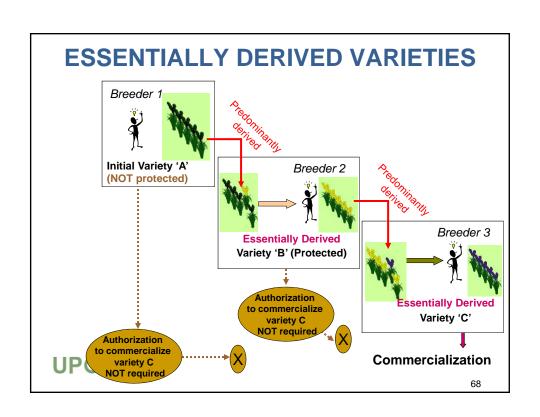
Article 14(5):

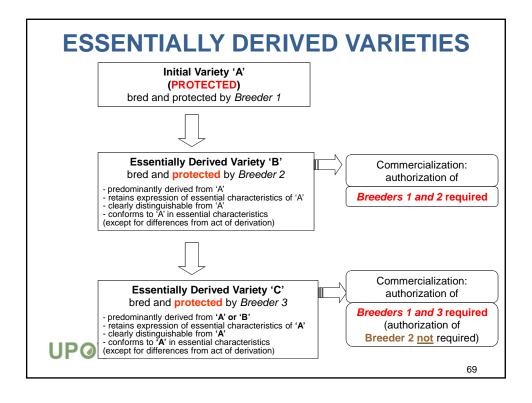
- (a) The provisions of paragraphs (1) to (4) shall also apply in relation to
- (i) varieties which are essentially derived from the protected variety, where the protected variety is not itself an essentially derived variety

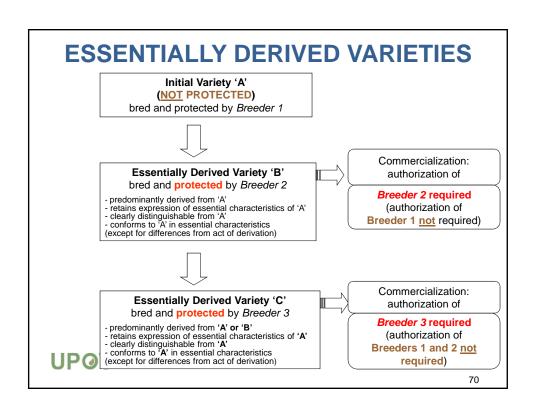
**UPOV** 











- Purpose and concept
- Protection of EDVs
- Protection of Initial Variety
- Implementation
  - 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 guidance





71

#### **ESSENTIALLY DERIVED VARIETIES**

- Purpose and concept
- Protection of EDVs
- Protection of Initial Variety
- Implementation
- UPOV guidance

# UPOV/EXN/EDV/2 ESSENTIALLY DERIVED VARIETY?

















(Photo: istockphoto/valentinarr)

UPOV

73

# Seminar on the impact of policy on essentially derived varieties (EDVs) on breeding strategy

Held in Geneva, on the morning of October 30, 2019

Watch the full video! Available at:

https://www.upov.int/meetings/en/details.jsp?meeting\_id=50787

#### SESSION I: TO AN EDV CONCEPT FOR THE PRESENT AND THE FUTURE

- Plant breeding and the EDV concept: challenges of the past, opportunities for the future?
- UPOV guidance on EDV

#### SESSION II: IMPACT OF EDV CONCEPT ON PLANT BREEDING

- Outlook for agricultural crops
- Outlook for ornamental plants
- Outlook for vegetables
- Outlook for fruit
- Panel discussion and questions

Closing remarks

**Administrative and Legal Committee** 

CAJ/77/4

Seventy-Seventh Session Geneva, October 28, 2020 Original: English
Date: August 18, 2020

to be considered by correspondence

#### **ESSENTIALLY DERIVED VARIETIES**

The CAJ is invited to:

- (a) establish the WG-EDV and approve the terms of reference for the WG-EDV, [...];
  - (b) approve the composition of the WG-EDV, [...];
- (c) approve the tentative date for the first meeting of the WG-EDV, [...]; and
- (d) request the WG-EDV to propose a timeline for its work at its first meeting, for consideration by the CAJ at its session in

Questions

#### Preview

#### General

- COVID-19 measures
- Membership & statistics
- Report on regular activities of UPOV
- Communicating the benefits of UPOV
- UPOV PRISMA
- Biochemical and molecular techniques
  - Current guidance
  - Developments since BMT/18 in 2019
  - The Concept of Essentially Derived Varieties
  - The Role of UPOV in Variety Identification

77

#### **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."

#### **VARIETY IDENTIFICATION**

- UPOV does not directly address variety identification - it is concerned with distinctness (related but not the same);
- The variety description can play a role in variety identification

#### UPOV

Variety description developed at the time of the grant of the breeder's right (original variety

Purposes: description)

- (a) to describe the characteristics of the variety; and
- (b) to identify and list similar varieties and differences from these varieties;

combined with the information on the basis for (a) and (b), namely:

# Variety description developed at the time of the grant of the breeder's right (Continued)

(original variety description)

#### Purposes:

- (a) to describe the characteristics of the variety; and
- (b) to identify and list similar varieties and differences from these varieties;

combined with the information on the basis for (a) and (b), namely:

- Date and document number of UPOV Test Guidelines;
- Date and/or document number of Reporting Authority's test guidelines;
- · Reporting Authority;
- Testing station(s) and place(s);
- · Period of testing;
- · Date and place of issue of document;
- Group: (Table: Characteristics; States of Expression; Note; Remarks);
- Additional Information:
  - (a) Additional Data
  - (b) Photograph (if appropriate)
  - (c) RHS Colour Chart version used (if appropriate)



Domarks

# Variety description developed at the time of the grant of the breeder's right (Continued)

(original variety description)

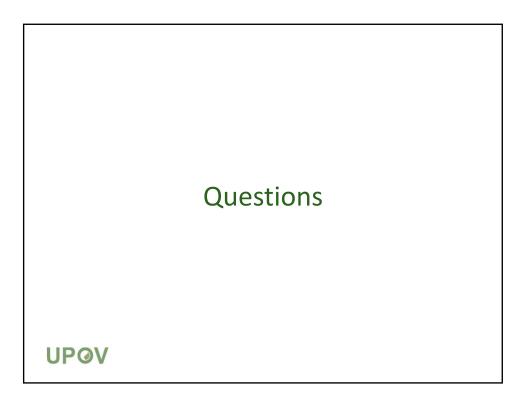
Status in relation to the verification of the conformity of plant material to a protected variety for enforcement of the breeder's right:

"While the UPOV Convention requires members of the Union to provide for appropriate legal remedies for the effective enforcement of breeders' rights, it is a **matter for breeders** to enforce their rights." (UPOV/EXN/ENF/1)

the **description** of the variety characteristics **and** the basis for **distinctness from** the **most similar** variety are **linked** to the circumstances of the DUS examination, namely:

- Date and document number of UPOV Test Guidelines;
- Date and/or document number of Reporting Authority's test guidelines;
- Reporting Authority;
- Testing station(s) and place(s);
- Period of testing;
- Date and place of issue of document;
- Group: (Table: Characteristics; States of Expression; Note; Remarks);
- Additional Information:
  - (a) Additional Data
  - (b) Photograph (if appropriate)
  - (c) RHS Colour Chart version used (if appropriate)





[End of Annex and of document]