PLANT VARIETY PROTECTION AND DUS EXAMINATION


* MPOB  ** FELDA  *** GUTHRIE
INTRODUCTION

Basis:
UPOV Convention

Mission:
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

Objective:
- Provide rights for breeders to exploit /develop new plant varieties
- Allow Access to foreign varieties - widen gene pool
- Promote intensive breeding activities
- Prevent unauthorized varieties exploitation
UPOV CONVENTION: ARTICLES Related to Breeders

1. Article 14

Propagation of protected varieties is subjected to breeders authorization including:

(i) Production or reproduction (multiplication)
(ii) Conditioning for the purpose of propagation
(iii) Offering for sale
(iv) Selling or marketing
(v) Exporting
(vi) Importing
(vii) Stocking for any of the above purposes Additional acts (optional)
2. Article 14(5)

Essentially Derived Varieties (EDV’s)

(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

Can EDVs be protected? YES

Can EDVs be commercially exploited? AUTHORIZATION NEEDED

It requires the authorization of the PBR holder of the initial variety
UPOV CONVENTION : Exceptions to Breeder’s Right

3. Article 15

Compulsory Exceptions

(a) Acts Done :

   (i) Privately and for non-commercial purposes
   (ii) For experimental purposes
   (iii) For the purpose of breeding other varieties, acts referred to in Article 14(1) to (4) [multiplication; conditioning; offering; marketing, etc.] in respect of such other varieties (“Breeders’ exemption”)

(b) Optional Exceptions :

   (i) Saving of seed by farmers for own use (“Farmers’ privilege”)
**Article 15(5) : Essentially Derived Varieties : Case 1**

**Breeder X**

- predominately derived from ‘A’
- retains expression of essential chars. of ‘A’
- clearly distinguishable from ‘A’
- conforms to ‘A’ in essential chars. (except for differences from act of derivation)

**Initial Variety ‘A’**
(Protected)

**clone**

**Essentially Derived Variety ‘B’**

**Breeder Y**
Essentially Derived Varieties: Case 1 ... (continue)

Breeder X

Initial Variety ‘A’
(Protected)

Essentially Derived Variety ‘B’

Authorization REQUIRED

Commercialization

clone
**Essentially Derived Varieties: Case 2**

**Breeder X**

Initial Variety ‘A’ (NOT protected)

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**Breeder Y**

Essentially Derived Variety ‘B’ (Protected)

Authorization NOT required

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**Breeder Z**

Essentially Derived Variety ‘C’

Commercialization
Essentially Derived Varieties: Case 3

Breeder X

Initial Variety ‘A’
(Protected)

Essentially Derived
Variety ‘B’

Breeder Y

- predominantly derived from ‘A’ or ‘B’
- retains expression of essential chars. of ‘A’
- clearly distinguishable from ‘A’
- conforms to ‘A’ in essential chars.
(except for differences from act of derivation)

Breeder Z

Essentially Derived
Variety ‘C’
Essentially Derived Varieties: Case 3 ... (continue)

Breeder X

Initial Variety ‘A’ (Protected)

Authorization REQUIRED

Breeder Y

Essentially Derived Variety ‘B’

Essentially Derived Varieties:
Case 3 ...

Authorization NOT required

Breeder Z

Essentially Derived Variety ‘C’

Commercialization
Essentially Derived Varieties: Case 4

**Breeder X**

Initial Variety ‘A’ (NOT protected)

**Breeder Y**

Essentially Derived Variety ‘B’ (Protected)

**Breeder Z**

Essentially Derived Variety ‘C’

Authorization NOT required

Commercialization
**Essentially Derived Varieties: Summary of cases**

**Initial Variety ‘A’**
(PROTECTED)
breed and protected by Breeder 1

**Essentially Derived Variety ‘B’**
bred and protected by Breeder 2
- predominantly derived from ‘A’
- retains expression of essential characteristics of ‘A’
- clearly distinguishable from ‘A’
- conforms to ‘A’ in essential characteristics (except for differences from act of derivation)

**Commercialization:**
authorization of Breeder 1 and 2 required

**Essentially Derived Variety ‘C’**
bred and protected by Breeder 3
- predominantly derived from ‘A’ or ‘B’
- retains expression of essential characteristics of ‘A’
- clearly distinguishable from ‘A’
- conforms to ‘A’ in essential characteristics (except for differences from act of derivation)

**Commercialization:**
authorization of Breeder 1 and 3 required (authorization of Breeder 2 not required)
**Essentially Derived Varieties:**

**Initial Variety ‘A’**
- (NOT PROTECTED)
- bred by Breeder 1

**Essentially Derived Variety ‘B’**
- bred and protected by Breeder 2
- predominantly derived from ‘A’
- retains expression of essential characteristics of ‘A’
- clearly distinguishable from ‘A’
- conforms to ‘A’ in essential characteristics (except for differences from act of derivation)

**Commercialization:**
- authorization of Breeder 2 required
- (authorization of Breeder 1 not required)

**Essentially Derived Variety ‘C’**
- bred and protected by Breeder 3
- predominantly derived from ‘A’ or ‘B’
- retains expression of essential characteristics of ‘A’
- clearly distinguishable from ‘A’
- conforms to ‘A’ in essential characteristics (except for differences from act of derivation)

**Commercialization:**
- authorization of Breeder 3 required
- (authorization of Breeders 1 and 2 not required)
Article 15: THE BREEDER’S EXEMPTION:

Case 1

Protected Variety A

Breeder 1

NO Authorization required

NO Authorization required

NO Authorization required *

Commercialization

Variety B

Breeder 2

Variety C

Breeder 3

NO Authorization required

NO Authorization required

*except for: essentially derived varieties (1991 Act); varieties which require repeated use of a protected variety (variety A); and varieties not clearly distinguishable from a protected variety (variety A).
# PATENTS VS PBR

<table>
<thead>
<tr>
<th>Descriptions</th>
<th>Patents</th>
<th>PBR</th>
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</thead>
<tbody>
<tr>
<td>Exclusive rights to holders</td>
<td>☑ Yes</td>
<td>☑ Yes</td>
</tr>
<tr>
<td>Free Access to protected variety for further breeding</td>
<td>Not Allowed</td>
<td>Allowed by UPOV</td>
</tr>
<tr>
<td>Farmers’ Privilege</td>
<td>Not Allowed</td>
<td>Allowed by UPOV</td>
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<tr>
<td>Breeding Improvement</td>
<td>Slower</td>
<td>Faster</td>
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CONDITIONS FOR GRANTING BREEDER’S RIGHT

**Technical Conditions**
- Distinctness
- Uniformity
- Stability

**Non-Technical Conditions**
- Novelty
- Denomination

**Other Conditions**
- Formalities
- Fees

“DUS”
REQUIREMENT FOR PVP

**Technical Conditions**
- Distinctness
- Uniformity
- Stability

**Non-Technical Conditions**
- Novelty
- Denomination

**Other Conditions**
- Formalities
- Fees

“DUS”
Required variety examined to comply with DUS criteria


Test Guidelines as a Basis for DUS Testing

- UPOV TG’s or Conduct DUS Testing in the Absent of Test Guidelines (TG1/3 chap.9)

Design of the DUS Test

- Design of growing trial or other test such as layout (TGP/7)

Characteristics as the basis for Examining of DUS

- UPOV Convention 1991 Act Article 1(vi)
- All acts in UPOV Convention stated that variety is defined by its characteristics and that those characteristics are therefore the basis on which a variety can be examined for DUS

Requirement of Material for DUS Testing

- Materials supplied should be representative of the candidate variety
- Healthy Materials and not affected by any pests or diseases
COOPERATION IN DUS EXAMINATION

- **Cooperation Between Testing Authorities**
  - Cooperation with other members of the unions (TGP/5)
  - Form centralized testing system on regional or global basis

- **Cooperation with breeders**
  - Official authority administered variety testing
  - Breeders participate in growing test
  - UPOV promote close cooperation with breeders
  - Some cases: Breeders performed whole test verified by member of the union
DUS PRINCIPLES

- Distinctness:
  - Must be clearly distinguishable from any other variety whose existence is a matter of common knowledge.

- Uniformity:
  - Must be sufficiently uniform in its relevant characteristics, subject to the variation that may be expected from the particular features of its propagation.

- Stability:
  - Relevant characteristics must remain unchanged after repeated propagation.
Distinctness – Minimum distance

- If the distance is too small:
  - The variety is open for plagiaristic approaches

- If the distance is too large:
  - Part of species spectrum is monopolized
  - It is not possible to allow new varieties to be protected
  - Progress in Breeding is hampered
Must be **clearly distinguishable** from any other variety whose existence is a matter of **common knowledge**

- **Clearly Distinguishable** – Consistent, Clear

>>> **CHARACTERISTICS** <<<

- Which *may* have direct **commercial relevance**
  - e.g. Flower color (ornamental); Fruit color *but commercial relevance* NOT required - often no commercial value e.g. Leaf shape
Two independent occasions:

- Different sowing/plantings into different seasons (annual, perennial e.g. rice)
- Two different seasons after a single planting (perennial, e.g. guave, asparagus)

Rarely one occasion:

- Controlled growing conditions (greenhouse)
- When differences are very clear
- (e.g. veg. prop. Orchids in greenhouse)
Clear

Depends on:
- Type of characteristics
- Method of observation
DISTINCTNESS (D)

Oil Palm – Inflorescence Color?
DISTINCT ??

Dura × Pisifera

DxP (NPM)  DxP (AVROS)  DxP (La Me)
DxP (NIFOR)  DxP (Yangambi)
DISTINCTNESS (D)

Oil Palm – Bunch Type?

Heart-shape (1)
Obovate (2)
Globular (3)
EXAMINING UNIFORMITY

UPOV Requirement

Must be sufficiently uniform in its relevant characteristics, subject to the variation that may be expected from the particulars features of its propagation.
At least all characteristics used for DUS or included in the description

-> any obvious characteristics

Particular features = method of propagation
- Vegetative propagated varieties
- Inbred lines
- Cross-Pollinated varieties
- Hybrid varieties
- Etc.
Method of Examination (U)

- Counting the number of off-types
  - Vegetatively propagated, self-pollinated, some types of hybrids

- Use of relative uniformity
  - Cross-pollinated, other hybrids
Counting number of off-types

Assessment on a basis of the number of off-types recorded in tests

-> How many off-types should we accept?

-> The individual UPOV guidelines fix for each crop:

i) Population standard
   - Percentage of off-types to be accepted if all individuals of the variety could be examined

ii) Acceptance probability
   - Probability of correctly accepting that a variety is uniform
Use of relative uniformity

- Assessment on the basis of relative uniformity
  - There is wider variation
  - It is difficult to distinguish off-types = comparison to the standard uniformity of varieties commercialized in the species of question
Uniformity

A uniform variety

UNIFORM

OFF-TYPES
Uniformity

Wheat: (Self – Pollinated)
Uniformity

Oil Palm: Cross Pollinated
Examining Stability

- UPOV requirement

“Must be stable in its essential characteristics, that is to say, it must remain true to its description after repeated reproduction or propagation”
Essential Characteristics

- At least all characteristics used for DUS or included in the description
- Any obvious characteristic
Stability

- Linked with uniformity
- Generally not tested in DUS, but derived
- Subject of control by inspect/certification services
In practice, it is not usual to perform tests of stability that produce results as certain as those of the testing of distinctness and uniformity.

However, for many types of variety, when a variety has been shown to be uniform, it can also be considered to be stable.
Furthermore, if the variety is not stable, material produced will not conform to the characteristics of the variety, and where the breeder is unable to provide material conforming to the characteristics of the variety, the breeder’s right may be cancelled.

Where appropriate, or in cases of doubt, stability may be tested, either by growing a further generation, or by testing a new seed or plant stock to ensure that it exhibits the same characteristics as those shown by the previous material supplied.
Stability is difficult to test in 2 to 3 years

- If a variety is uniform and no special indications on lack of stability are given, it is considered stable.

- If problems are found, the test is prolonged and new material for comparison with the existing material.
Nature of the DUS Examination

The “DUS Test for stability” (field trial)
Oil Palm ??
DUS Test Guide Lines (TGs)

- Varieties for protection - *E. guineensis* and/or *oleifera*
- No of samples - Oil Palm: 30 (Malaysian) per planting block regardless of rep
  - Durian & Rambutan: 5
- No of off-type allowed - 1% or 5%?
- Age of Plants at Testing - Fixed Years suggested
DUS Test Guide Lines (TGs)

- Method of Evaluation - Visuals & Measurements
- Visual preferred in DUS
- Characteristics - Yield Component - Not recommended ???
  - Fruit & Bunch Component - Direct measurement preferred
  - To Differentiate between characters for Breeding & DUS
  - Certain characters might not be relevant in breeding but may be used in DUS eg leaflets colour etc…
Breeders

- **Protected Plant Varieties:**
  - Free access for further breeding - not essentially derived such as T(FELDA)(protected) X T(Guthrie)
  - Essentially derived eg cloning of protected materials - not allowed

- **Reference Varieties:**
  - Currently not identified
  - How to Decide - By origin or by registration?
Variety Denomination:
- Code, name or both.
- Standardized Nationally / Internationally ??

Registration of new varieties:
- Nationally: Within 1 year
- Internationally: Within 4 years or 6 years for trees
Brainstorming on selection criteria
- *March 2006 (Main Committee)*

Selection of potential characteristics
- *May 2006 (Main Committee)*

Field observation of selected characteristics
- *May 2006 (Sub-Committee)*

Presentation of field observations
- *June 2006 (Main Committee)*

1st draft of DUS-OP
- *July 2006 (Sub-Committee)*

Evaluation of 1st draft
- *September 2006 (Main Committee)*

Revision of draft
- *October 2006 (Main & Sub Committee)*

Draft guidelines for DUS-OP tabled at 7th ART Meeting
Comments highlighted at 7th ART Meeting by UPOV representative:

1. To identify different types of varieties which could be the subject of an application and to identify the appropriate quantities of material required for examination and appropriate uniformity standards according to the method of propagation.

2. To consider the requirements for reference varieties in a breeder-based testing approach.
Comments highlighted at 7th ART Meeting by UPOV representative:

3. To ensure that characteristics satisfy the basic requirements that a characteristic needs to fulfill before their use for DUS testing or producing a variety description, as set out in the General Introduction (document TG/1/3), Chapter 4.2.1

4. To consider characteristics in relation to their usefulness for the DUS examination, irrespective of their commercial value
Comments highlighted at 7th ART Meeting by UPOV representative:

5. To avoid characteristics which would extend the period and cost of the DUS examination where such characteristics are not necessary for the examination of DUS

6. The use of states and notes according to the principles set out in document TGP/7 "Development of Test Guidelines" for the purposes of DUS examination
Comments highlighted at 7th ART Meeting by UPOV representative:

7. The presentation of states of expression on an objective scale according to increasing degrees of expression, rather than according to scales based on perceived increasing commercial value,

8. The existence of practical experience in DUS testing within UPOV members, as set out in document TC/42/4
ACKNOWLEDGEMENT

- DOA Malayi
ACKNOWLEDGEMENT

DOA Malaysia

- Thank You -