WIPO Regional Forum: Innovation and intellectual property as engine for competitive agribusiness: “Empowering women researchers and entrepreneurs

Promoting new varieties of plants to enhance agricultural productivity and food security

Plant Variety Protection System and UPOV membership on the development of agriculture

Ben Rivoire
Technical/Regional Officer, UPOV

November 16, 2017 (Casablanca, Morocco)
Overview

• Why was UPOV created?
• Impact of PVP and UPOV membership
• Benefit of UPOV membership for implementing PVP
Overview

• Why was UPOV created?
• Impact of PVP and UPOV membership
• Benefit of UPOV membership for implementing PVP
UPOV: INDEPENDENT INTERGOVERNMENTAL ORGANIZATION

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
MISSION STATEMENT

“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”
Food security

Climate change

Economy

Environment

Technology transfer

Better, cheaper food

Adapted crops

Export

Internationally competitive

Sustainable production

Usable technology (varieties)

Farmers: increased, sustainable income; high quality seed; incentive to innovate

Breeding new, improved varieties

Encouraging the development of new varieties of plants

Capture value of native plant genetic resources

Farmer benefits

Reduced high cost imports

Less inputs

Public-Private Partnerships

Rural employment

Benefit of Society

Capturing value of native plant genetic resources

Inward investment (including foreign varieties)
Overview

• Why was UPOV created?

• Impact of PVP and UPOV membership

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Has it worked?
Evolution of Wheat yield in France

FRANCE Wheat Yields (1815-2005)

Year

Yield (tha)

b = 0.00
1815-1945

b = 0.092
1855-2005

Bernard Le Buanec,
Second World Seed Conference (Rome, September 2009)
Disposition for selected diseases on varieties on summer barley
Pannonic (dry) climate zone of eastern Austria

Source: Austrian Agency for Health and Food Safety, 2015: Austrian descriptive list of varieties of agricultural crop species, Issue 21/2015, ISSN 1560-635X.
Mr. Clemens Flamm
Where is it working now?
The boundaries shown on this map do not imply the expression of any opinion whatsoever on the part of UPOV concerning the legal status of any country or territory.

Members of UPOV (74) covering 93 States
Initiating States (16) and Organization (1)
States (24) and Organization (1) in contact with the UPOV Office
The economic, social and environmental value of plant breeding in the European Union

2000-2013

– Results achieved so far* –

Steffen Noleppa
HFFA Research GmbH

* This research has been initiated and financially supported by ETP. The results of the study are the sole responsibility of the author and have never been influenced by the initiator and supporter of the study.
EU: 2000-2013

Additional agricultural GDP amounts to EUR 8.2 billion:

- Wheat: EUR 3.1 billion
- Corn (Maize): EUR 0.9 billion
- Pulses: EUR 0.2 billion

Without plant breeding:

EU would have moved from being net EXPORTER to net IMPORTER in all major agricultural crops (including wheat and barley)
EU: 2000-2013

Without plant breeding:

An additional 18 million ha of arable land outside the EU would be needed: equivalent to the arable land of...
High Level Study Tour (Japan, July 2016)

Koshihikari

Tsuyahime
Rice variety “Tsuyahime”

- High quality variety (good taste)
- Yamagata prefectural government holds the plant breeder’s right
- Royalty free for Yamagata farmers, royalty paid by other farmers
- Location and agronomy (less fertilizer and pesticide) controlled to maintain quality (= high market price)
- Increased farmers’ income
STUDY in VIET NAM*

Annual land productivity developments since Viet Nam joined UPOV in 2006 in Rice, Corn (maize) and Sweet Potatoes

• **1995-2005**: increase in yield mainly through increased level of inputs – no detectable increase due to plant breeding

• **2006-2016**: **annual** land productivity increase due to plant breeding
  - Rice 1.7 %
  - Corn 2.1 %
  - Sweet potatoes 3.1 %

* “The socio-economic benefits of UPOV membership in Viet Nam; An ex post assessment on plant breeding and agricultural productivity after 10 years” (Corresponding author: Steffen Noleppa) by HFFA Research GmbH
Without those developments since 2006, current annual yields in Viet Nam would be lower by:

- Rice 16 %
- Corn 19 %
- Sweet potatoes 27 %
INCOME of Vietnamese farmers has increased by 24% since 2006.
MISSION STATEMENT

“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”
STUDY in VIET NAM

Annual value added:

- Arable farming $2.3 billion
- Horticulture $1.0 billion
- Floriculture $0.2 billion

- GDP added upstream/downstream (value chains)
  $1.5 billion

TOTAL ADDED: $5 billion

(> 2.5% GDP)
Floriculture sector in COLOMBIA

Creates/provides **205,000 jobs**
- 111,000 direct and
- 94,000 indirect

In the last 10 years, the floriculture sector has accounted for **4.8% of the total of Colombian exports**, becoming the fourth most important sector generating foreign exchange for the country after oil, coffee and coal industries.

In 2006, the Association of Colombian Flower Producers, Asocolflores and the Colombian Government created the country trademark named “Colombia Tierra de flores” (Colombia, Land of Flowers)
Ornamental industry

KENYA

Impact of Plant Variety Protection in Kenya

Cut Flower Exports 1999 - 2013
Cut-flower exports (2014) ($8.5 billion)

93% of exports of cut-flowers are from UPOV members

List of exporters for the selected product
Product: 0603 Cut flowers and flower buds of a kind suitable for bouquets or for ornamental purposes, fresh, dried, dyed, bleached, impregnated or otherwise prepared

Source: ITC calculations based on UN COMTRADE and ITC statistics (see http://www.trademap.org/tradestat/Country_SelProduct_TS.aspx)
Using the UPOV System to benefit custodians of native wild germplasm in Argentina

“The royalties derived from commercialization of the variety are shared between the breeder and the provinces that contributed the native plant genetic resource.”
Using the UPOV System to benefit custodians of native wild germplasm in Argentina

“A large part of the profits, basically, 50 per cent, that are generated from the commercialization return to those provinces.”
Using the UPOV System to benefit custodians of native wild germplasm in Argentina

“the erosion/loss from their natural habitat is reduced and this is therefore our own contribution, working together with INTA, for the conservation of our native natural resources.”
the plant variety protection system, using property titles, under the seed law, which conforms to the UPOV Convention, and systems for access to plant genetic resources.
UPOV MISSION STATEMENT

“To provide and promote an effective system of plant variety protection (PVP), [...]”

Plant Breeder’s Right (PBR)
There are no restrictions on who can be considered to be a breeder under the UPOV system: a breeder might be an individual, a farmer, a researcher, a public institute, a private company etc.
What are the practical challenges for technology transfer and commercialization?

or...

How to:
• identify important variety performance characteristics for farmers
• breed varieties with those characteristics
• deliver good quality seed/propagating material in a timely way
What are the practical challenges for technology transfer and commercialization?

or...

How to:

- identify important variety performance characteristics for farmers,
- **breed varieties with those characteristics**
- deliver good quality seed/propagating material in a timely way
What are the practical challenges for technology transfer and commercialization?

or...

How to:

• identify important variety performance characteristics for farmers,
• breed varieties with those characteristics
• deliver good quality seed/propagating material in a timely way
International Breeding (Institute)  National Breeding Institute  Large enterprises (e.g. companies, cooperatives)  SME’s  Individuals (e.g. farmers)

SEED PRODUCERS / PLANT PROPAGATORS  PBR LICENCES  DISTRIBUTORS

PUBLIC SECTOR  PRIVATE SECTOR

BREEDERS  PRODUCTION & DISTRIBUTION  FARMERS

SEED INFORMATION
How can PVP be used to achieve maximum “public good”?

PUBLIC (GOVT.)

PRIVATE
Changing Licensing Models of Public Breeding Institutes:
panel discussion

CIOPORA AGM Week – Toronto – April 27, 2017

Plant Variety Licensing at UC Davis

Michael D. Carriere, Ph.D.
UC Davis Innovation Access
Plant variety licensing at UC Davis

» Fair value for public asset

» California advantage
  – 1st access to new varieties
  – Preferential royalty rates
  – Preferential (broader) sales territories

» Transfer of know-how

» Licensing - reactive to breeding outcomes
Symposium on the Benefits of Plant Variety Protection for Farmers and Growers

The role of the Agricultural Research Council in delivering high performance varieties to subsistence or smallholder farmers

Vuyisile Phehane

- Local licensing agreement with a South African company
  - for the commercialization of some of the ARC’s citrus varieties.
  - A condition of the license: ensure the participation of smallholder citrus producers in the commercialization value-chain.
- Facilitated partnership with the Citrus Growers’ Association to access ARC
Domestic

BREEDERS

NEW VARIETIES

FARMERS, GROWERS

CONSUMERS

Foreign

CONSUMERS
HOW TO BECOME A MEMBER OF UPOV

State/Intergovernmental Organization must:

- Have a **law which conforms to the UPOV Convention**
- Ask **advice of the Council** of UPOV
- If **advice positive**: deposit instrument of accession
NEW VARIETIES

FARMERS, GROWERS

CONSUMERS

BREEDERS

CONSUMERS

Domestic

Foreign

BREEDERS
Latin America Countries acceding to UPOV between 1994 & 2000

- Applications (non-resident)
- Applications (residents)
Impact of Plant Variety Protection in Kenya

CUT FLOWER EXPORTS 1995 - 2013

Source: HCDA
Successes/Impact Resulting from PVP cont’

Employment creation

- It is estimated that over 500,000 people (including over 90,000 flower farm employees) depend on the floriculture industry.

Source: KEPHIS
NEW VARIETIES

BREEDERS

FARMERS, GROWERS

CONSUMERS

Domestic

Breeder’s Exemption

Foreign

NEW VARIETIES

BREEDERS

FARMERS, GROWERS

CONSUMERS
Application Ratio of Residents/Non Res.

Dr. CHO, Il Ho (Symposium on Plant Variety Protection - Future Strategy for Enhancing the Effectiveness of the PVP System, Seoul July 13, 2011)
Korean Rose Breeding Converts a Royalty Payer into a Receiver

Charlie Jeong/wonwoo trading

Becoming Royalty Receiver

1. Korean pay rose royalty abroad about 1,040,000 plants in year 2014
2. GARES rose varieties are sold about million in year 2014
3. Korea change from royalty payer to royalty receiver
Overview

• Why was UPOV created?
• Impact of PVP and UPOV membership
• Benefit of UPOV membership for implementing PVP
## Harmonization and Cooperation

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<th>Cooperation</th>
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<td>• UPOV Lex</td>
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<td>• Explanatory Notes</td>
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<td>• Model Application Form</td>
<td>• PBR Application tool (EAF)</td>
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<td><strong>Variety Denomination</strong></td>
<td>• INF/12: “Explanatory Notes on Variety Denominations”</td>
<td>• PLUTO database</td>
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<td>• UPOV Code</td>
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<td><strong>DUS Testing</strong></td>
<td>• General Introduction</td>
<td>• GENIE Database</td>
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<td>• TGP Documents</td>
<td>• Exchangeable software</td>
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<td>• Test Guidelines</td>
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</table>

- Distance Learning course
- UPOV events & activities
- Assistance by individual UPOV members
DEVELOPING GUIDANCE TO FACILITATE HARMONIZATION AND COOPERATION
UPOV Structure

Publication

Adoption

COUNCIL

CONSULTATIVE COMMITTEE

TECHNICAL COMMITTEE

ADMINISTRATIVE AND LEGAL COMMITTEE

Proposals (e.g. TGP documents, molecular techniques, variety denominations classes etc.)

Technical Working Party on Automation and Computer Programs

Technical Working Party for Agricultural Crops

Technical Working Party for Fruit Crops

Technical Working Party for Ornamental Plants and Forest Trees

Technical Working Party for Vegetables

Working Group on Biochemical and Molecular Techniques
Test Guidelines

Publication

Work program

COUNCIL

CONSULTATIVE COMMITTEE

TECHNICAL COMMITTEE

ADMINISTRATIVE AND LEGAL COMMITTEE

Test Guidelines

Technical Working Party on Automation and Computer Programs

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Technical Working Party for Fruit Crops

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Technical Working Party for Vegetables

Working Group on Biochemical and Molecular Techniques
COOPERATION

Cooperation between members of the Union is a key benefit of UPOV membership

Number of genera/species for which varieties protected by members of the Union: > 3,500

(>15,000 titles granted /annum)

Practical DUS experience offered for >3,320 genera and species

Agreements for cooperation between members of the Union: > 1,950
Genera and Species

- **>3,500 genera and species** with varieties examined for PBR

- **>3,320 genera and species** for which UPOV members have practical DUS experience

- **321 Test Guidelines** adopted

321 Test Guidelines estimated to cover 91% of PBR-related varieties in UPOV Plant Variety Database
COOPERATION

HARMONIZATION

UPOV Members
Role of UPOV in Harmonization

The only binding obligations on members of the Union are those contained in the text of the UPOV Convention itself.

UPOV provides **guidance**
- Explanatory Notes, Information documents
- Guidance on DUS examination
- Associated “TGP” Documents
- “Test Guidelines”
- Species/Crop - specific recommendations developed by crop experts

UPOV **promotes, encourages and facilitates** Cooperation between users/members
- Exchange of data under same format (UPOV Code, EAF…)
- Common platform/database (PLUTO..)

International recognized variety descriptions (effective protection)
INFORMATION TO FACILITATE COOPERATION

• DUS Examination (GENIE database)
• Variety Denominations (PLUTO database)
• Exchangeable Software
• Plant Variety Protection Statistics

See UPOV/INF/15/2_Part IV
Arrangements & Cooperation in DUS testing

Article 12 of the 1991 Act requires that a variety be examined for compliance with the distinctness, uniformity and stability criteria.

“In the course of the examination, the authority may grow the variety or carry out other necessary tests, cause the growing of the variety or the carrying out of other necessary tests, or take into account the results of growing tests or other trials which have already been carried out.”

The examination, or “DUS Test,” is based mainly on growing tests, carried out by the authority competent for granting plant breeders’ rights or by separate institutions, such as public research institutes, acting on behalf of that authority or, in some cases, on the basis of growing tests carried out by the breeder (TG1/3).
GENIE Database

Information on GENera and specIEs (hence GENIE) in relation to protection offered by UPOV members

DUS information

- UPOV Test Guidelines
- practical experience (UPOV members)
- cooperation in DUS examination
PLUTO Database

(PLUTO = PLant varieties in the UPOV system: The Omnibus)

New Video Tutorial
World-wide support systems for breeders
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 Convention), which was adopted in Paris in 1961 and was revised in 1978, 1991, 2002, 2008, and 2017. 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.

Expansion of UPOV’s PBR Application Tool (EAF)

Stakeholder features
- Breeders

NEW PBR Application Tool (EAF)

GENIE Database

UPOV Lex

Plant Variety Database (PLUTO)

Distance Learning Courses
- Seminars & Symposia
- FAQs
UPOV’s
PBR
Application Tool

Quick and easy transmission of application data for Plant Breeders’ Rights

www.upov.int
UPOV- PBR Application Tool (Electronic Application Form (EAF))

- Easy way to transfer and re-use your PBR application data, using an efficient multi-lingual e-system available online for all participating countries worldwide
## PBR Application Tool (EAF)

What are the features of the EAF? *More details*

- An online PBR application tool that can be used to provide application data to all platform users.
- Application forms can be displayed in a range of languages (note: answers must be provided in the language in which they are displayed).
- Information can be automatically re-used in subsequent application data.
- Different user roles can be specified (e.g., drafter, signatory, translator, agent, processor).
- Controlled access to all PBR application data.
- Secure and confidential.

### UPOV members and crops currently covered by EAF

<table>
<thead>
<tr>
<th>AUTHORITY</th>
<th>APPLE FRUIT VARIETIES</th>
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UPOV members (16) and crops (5) currently covered by PBR Application Tool (EAF)

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<th>AUTHORITY</th>
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UPOV - PBR Application Tool

Key benefits

• Online PBR application tool to provide application data to participating PVP Offices in required format (hard copy, e-mail notification, system-to-system)

• Application forms can be displayed in range of languages (answers must be provided in an acceptable language for the PVP Office)

• Variety data can be re-used in subsequent applications

• Different user roles can be specified (e.g. drafter, signatory, translator, agent, procedural representative)

• Controlled access to all PBR application data

• Secure and confidential

• Easy access to PVP application forms

• Track your applications...
Next developments
PBR Tool- EAF Version 2.0 (January 2018)

• Expansion
  – members
  – languages
  – crops/species
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