

# National Awareness Raising Seminar for Myanmar

## Impact of PVP and UPOV membership on the development of agriculture

*Tomochika (Tom) Motomura  
Technical/Regional Officer (Asia), UPOV*

*September 12, 2017 (Nay Pyi Taw, Myanmar)*



# Overview

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

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# 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 **ob**tentions **v**égétales



## 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”**

# Benefit of Society

Food security

Climate change

Economy

Environment

Technology transfer

Better, cheaper food

Adapted crops

Export  
International competitiveness  
Reduce high cost imports

Sustainable production  
Less inputs

Usable technology (varieties)

Public Private Partnerships

## Farmer benefits

Rural employment

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

encouraging the development of breeding new, improved varieties

## new varieties of plants

Capture value of native plant genetic resources

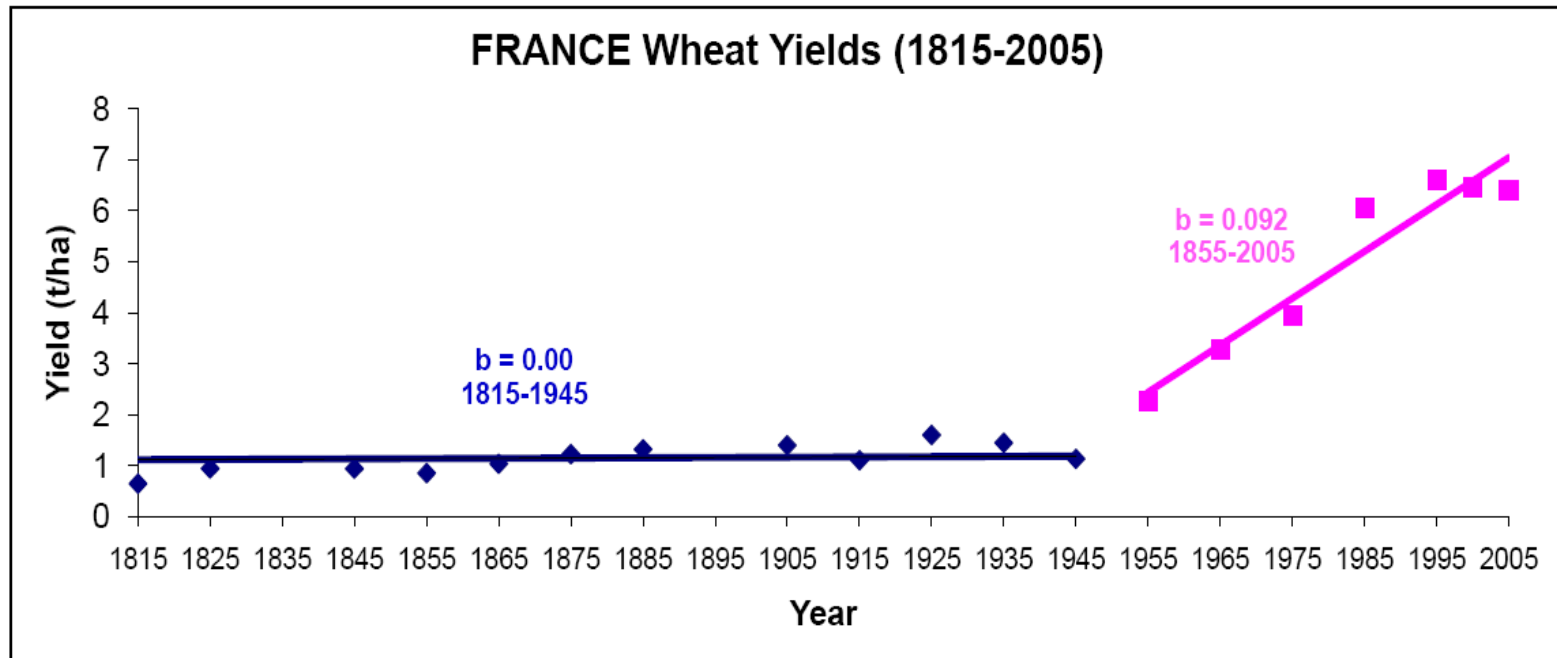
# Overview

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

Has it worked?

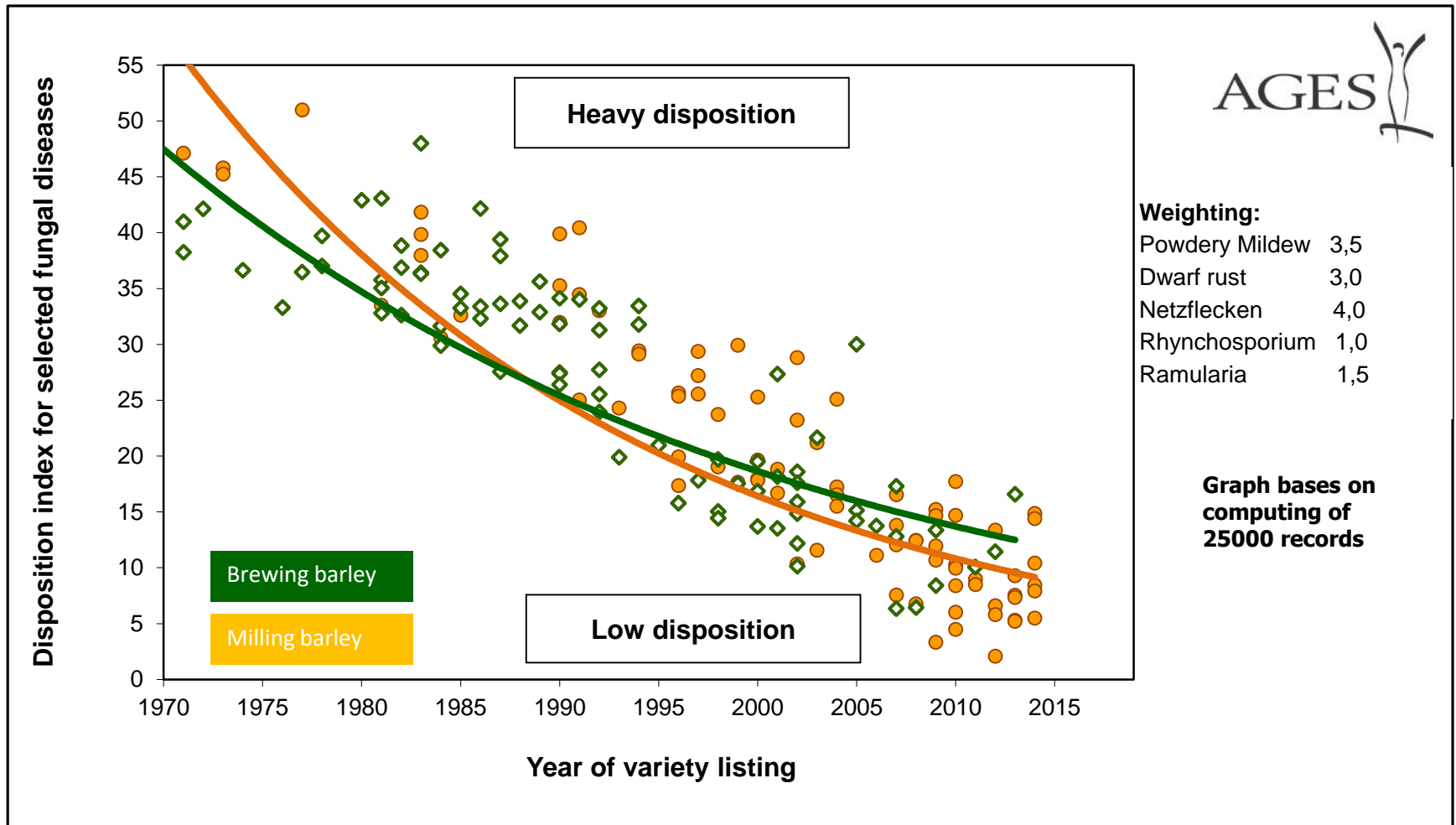


# Evolution of Wheat yield in France



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

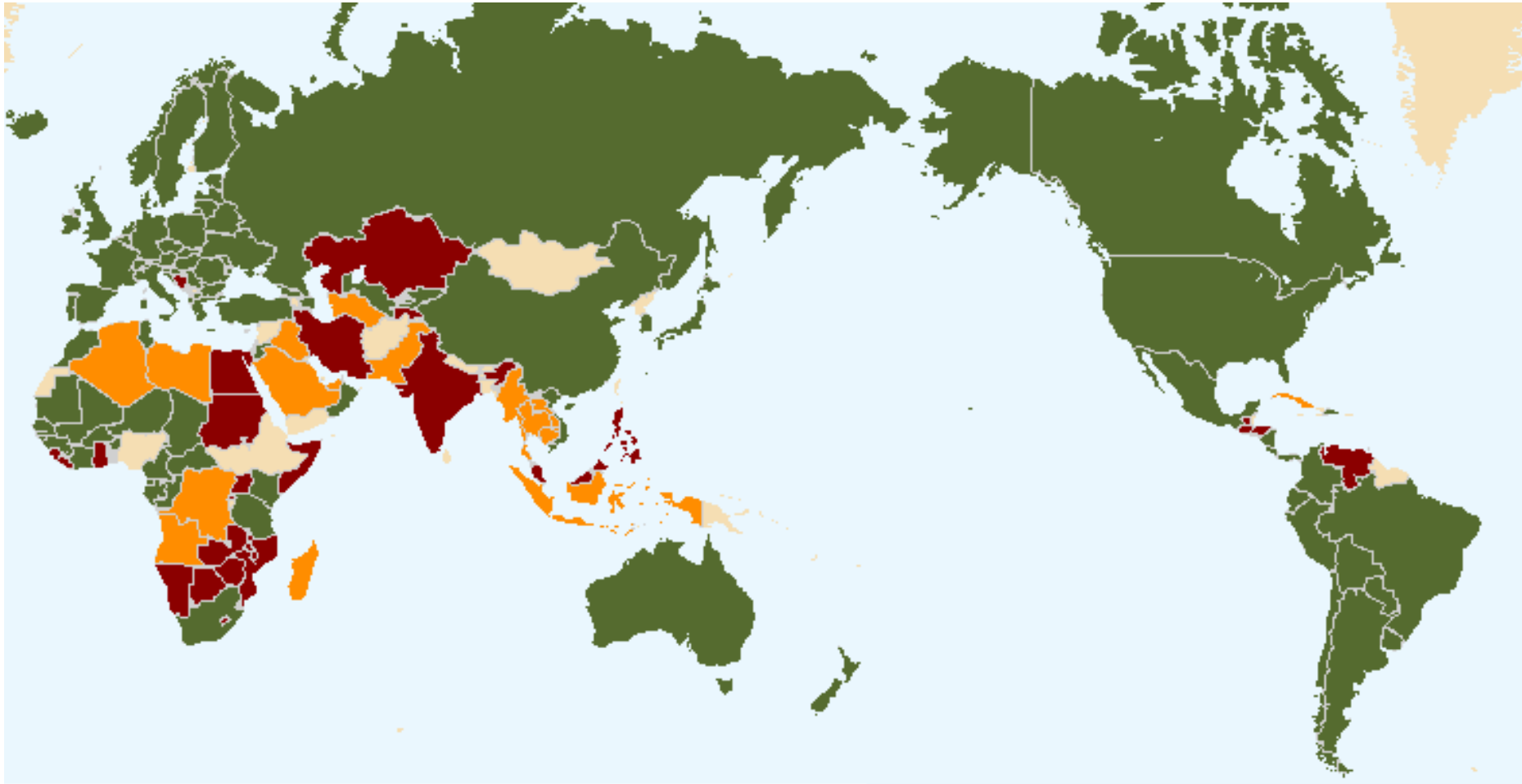


Source: Austrian Agency for Health and Food Safety, 2015: Austrian descriptive list of varieties of agricultural crop species, Issue 21/2015, ISSN 1560-635X.

Mr. Clemens Flamm

Where is it working  
now?

# UPOV status



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.*

October 13<sup>th</sup>, 2015, Vienna

## 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)

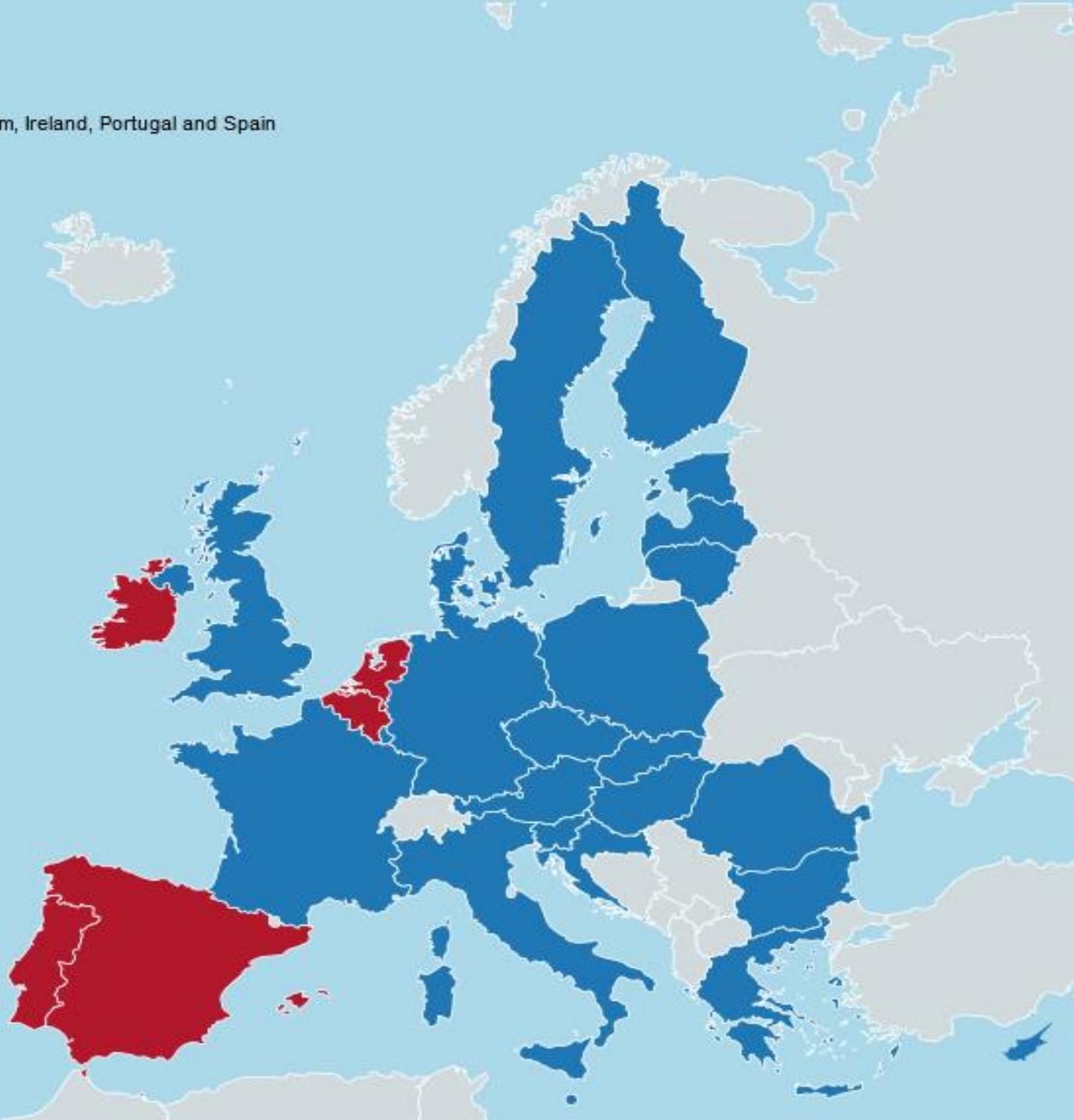
# EU: 2000-2013

Without plant breeding:

An additional 18 million ha of arable land outside the EU would be needed: equivalent to the arable land of...

## European Union

-  EU Members
-  Netherlands, Belgium, Ireland, Portugal and Spain







UPOV

# 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



UPOV

# STUDY in VIET NAM\*

Annual land productivity developments since Viet Nam joined  
UPOV in 2006 in

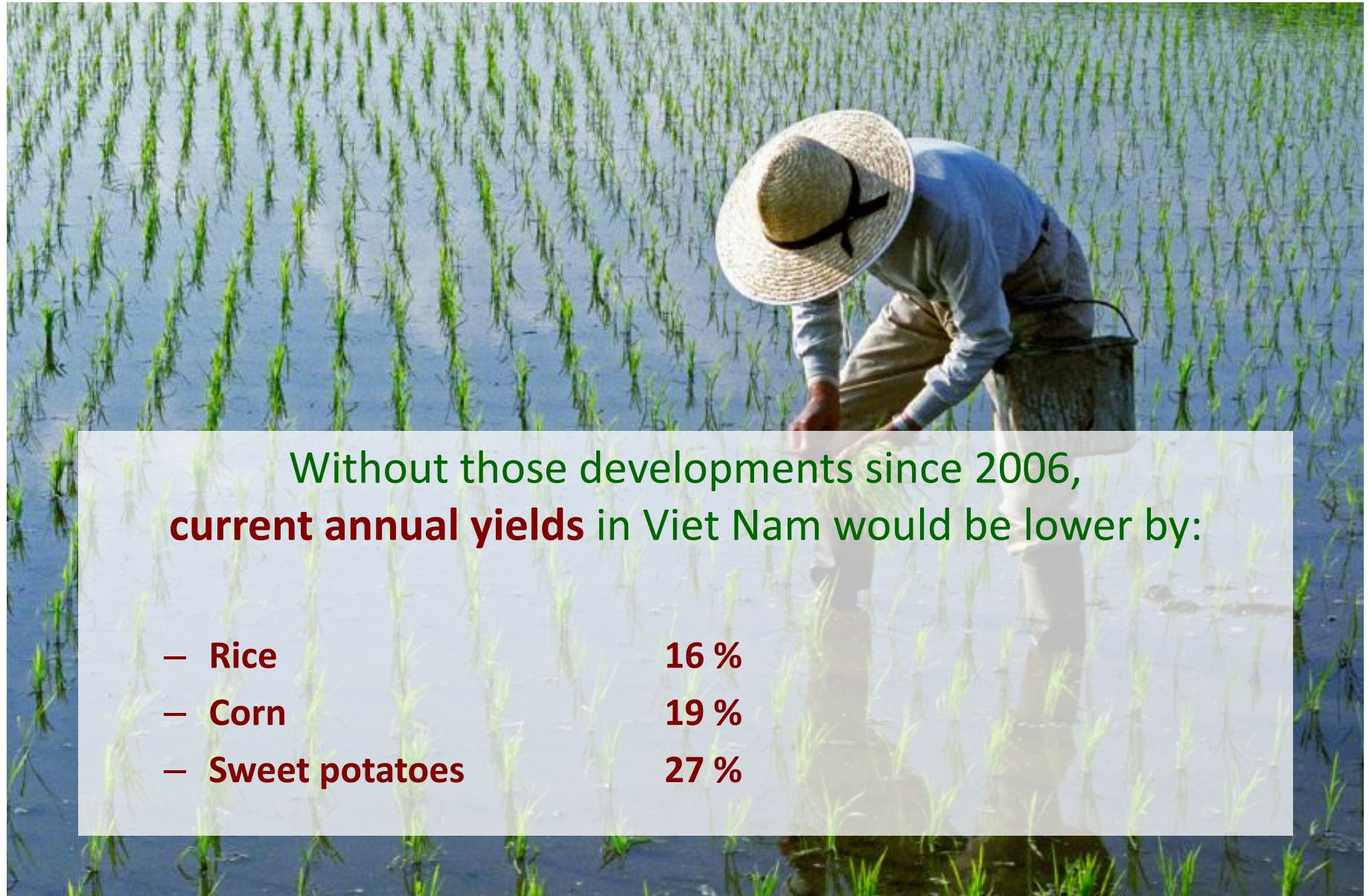
Rice, Corn (maize) and Sweet Potatoes

- **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



# STUDY in VIET NAM



Without those developments since 2006,  
**current annual yields** in Viet Nam would be lower by:

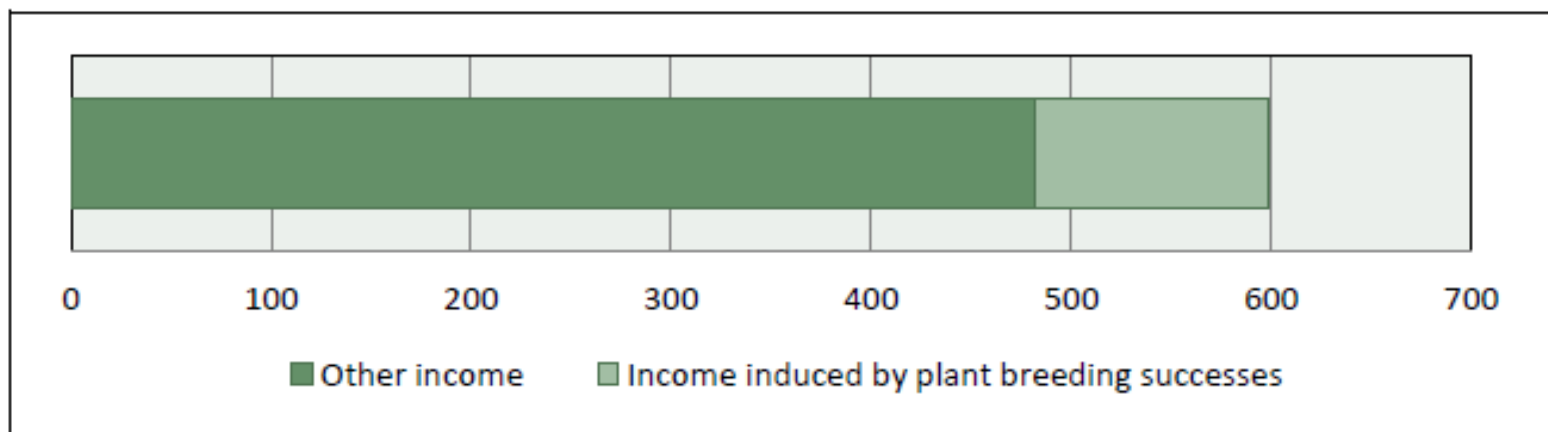
- **Rice** **16 %**
- **Corn** **19 %**
- **Sweet potatoes** **27 %**



# STUDY in VIET NAM

**INCOME of Vietnamese farmers has increased by 24% since 2006**

**Figure 4.6: Income of a Vietnamese farmer induced by plant breeding successes for major arable crops since UPOV membership vs. other income in arable farming (in USD)**



Source: Own figure and calculations.



## MISSION STATEMENT

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# 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)**



UPOV

# 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.*

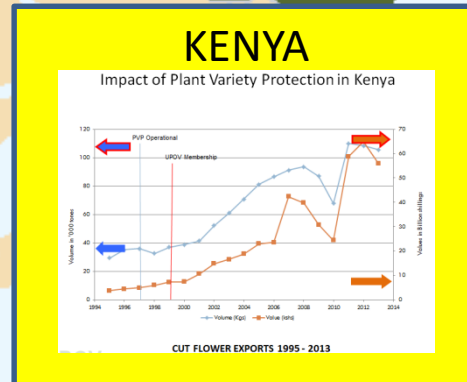
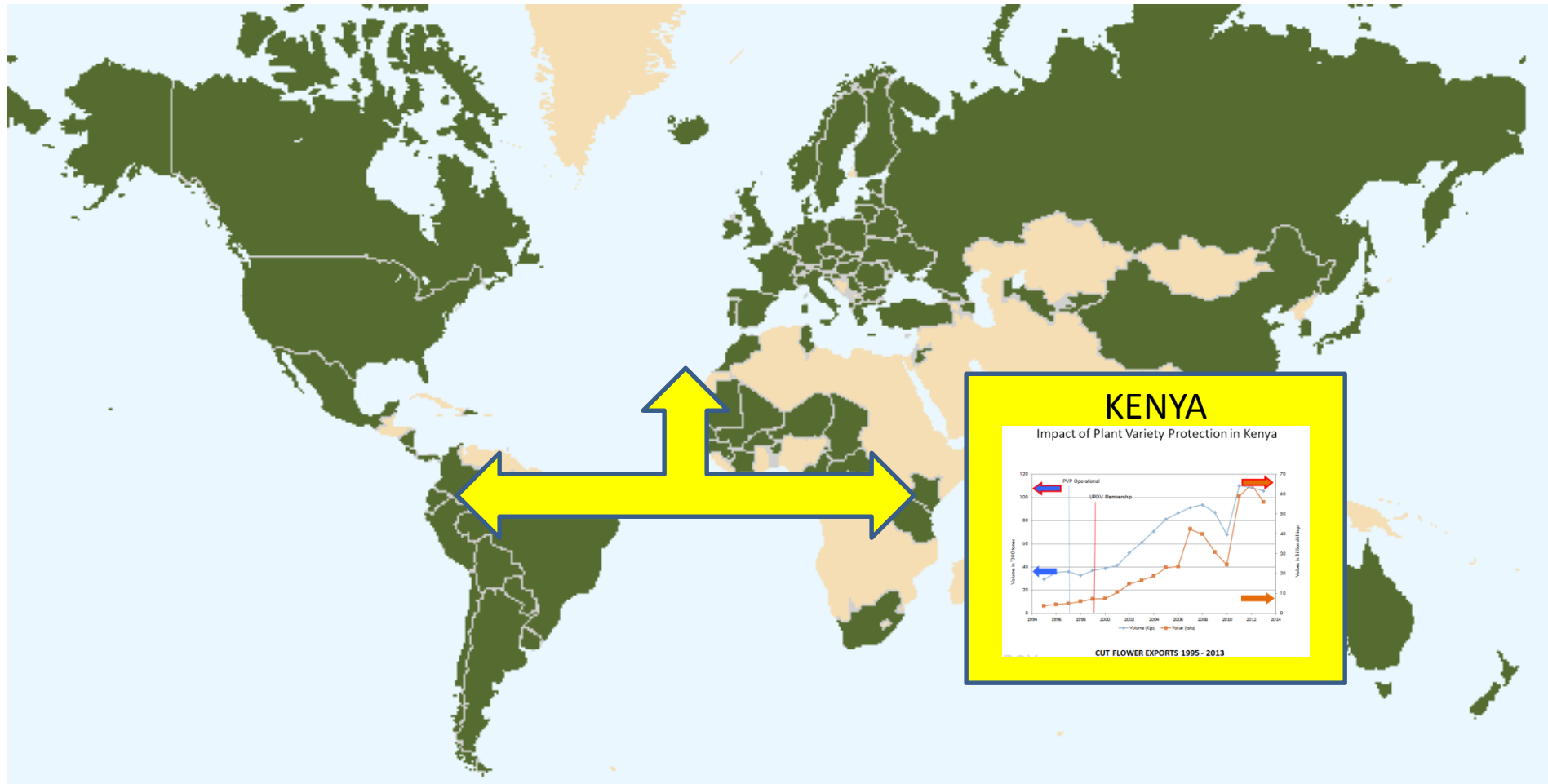


Picture: Asocolflores

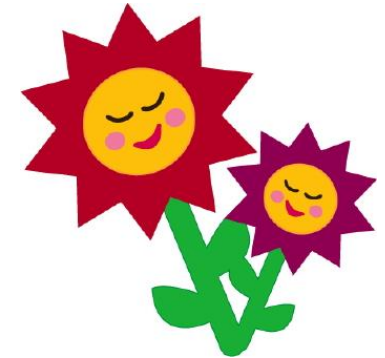
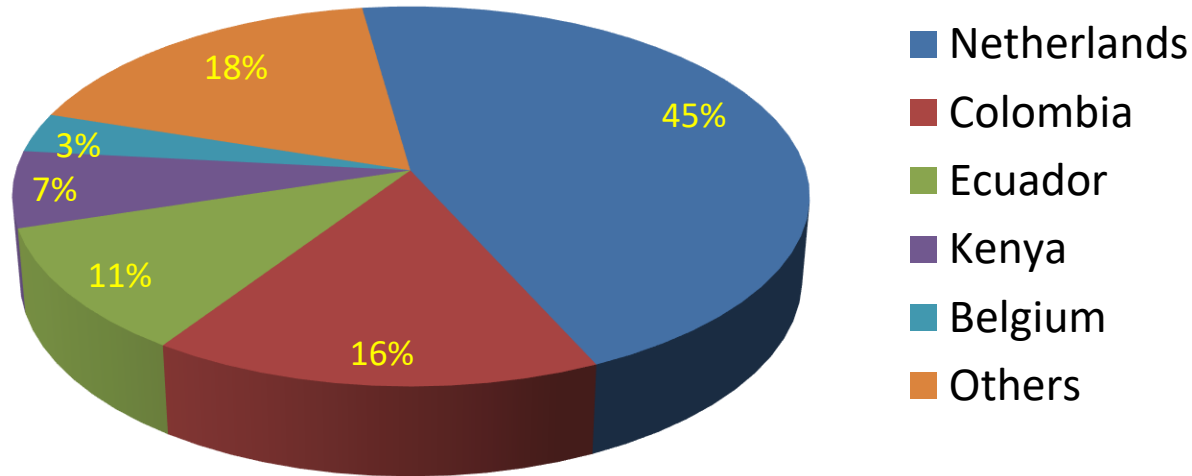


*In 2006, the Association of Colombian Flower Producers, Asocolflores and the Colombian Government created the country trademark named **“Colombia Tierra de flores”** (Colombia, Land of Flowers)*

# Ornamental industry



# Cut-flower exports (2014) (\$8.5 billion)

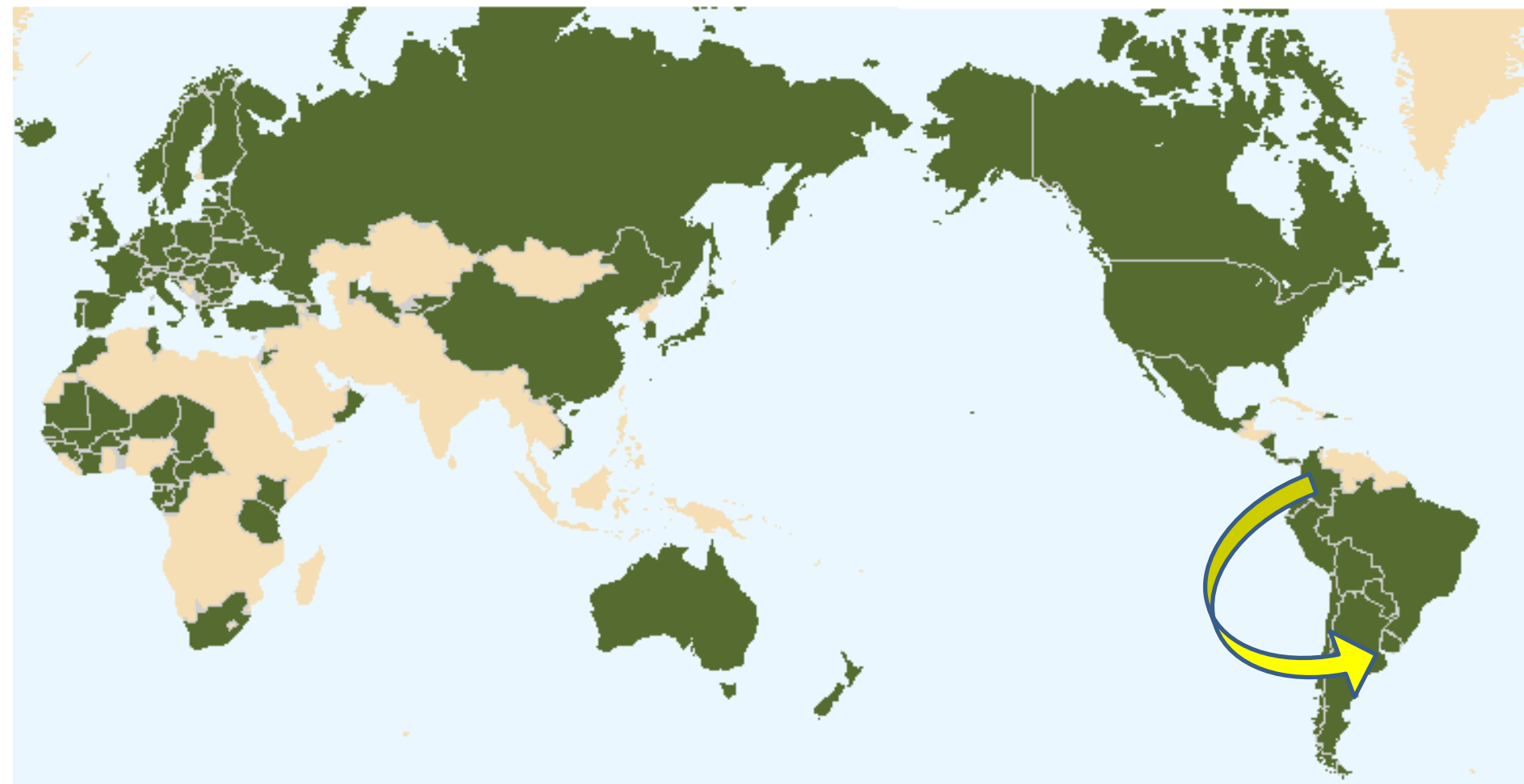


93% of exports of cut-flowers are from  
UPOV members

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](http://www.trademap.org/tradestat/Country_SelProduct_TS.aspx))



UPOV

# Using the UPOV System to benefit custodians of native wild germplasm in Argentina



Coming soon  
on UPOV website!

Raimundo Lavignolle  
President, National Seed Institute (INASE)

This is a clear example of how access to plant genetic resources  
and benefit sharing can be made compatible.

“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

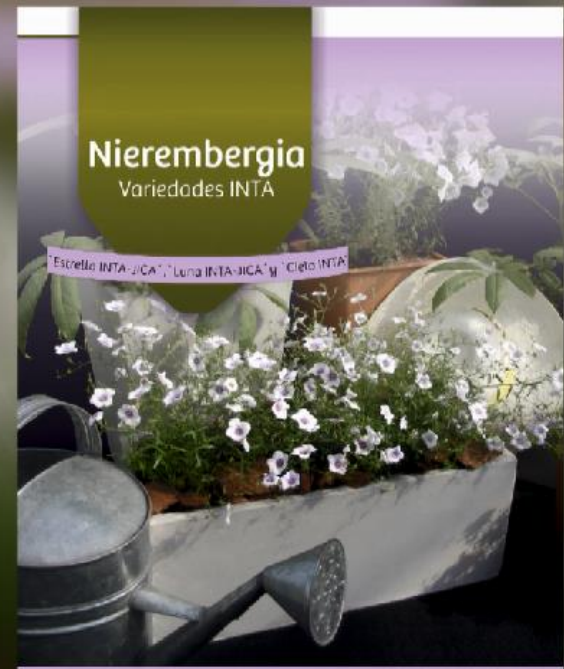


**“the erosion/loss from their natural habitat is reduced and this is therefore our own contribution, working together with INTA, for the conservation of our native natural resources.”**”



the plant variety protection system, using property titles, under the seed law, which conforms to the UPOV Convention,

UPOV



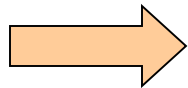
and systems for access to plant genetic resources





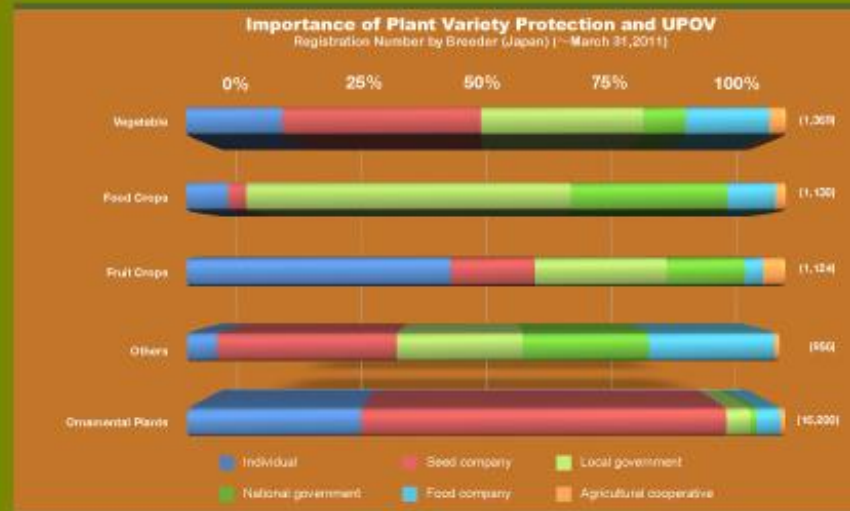
## UPOV MISSION STATEMENT

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



## Who can protect a plant variety?

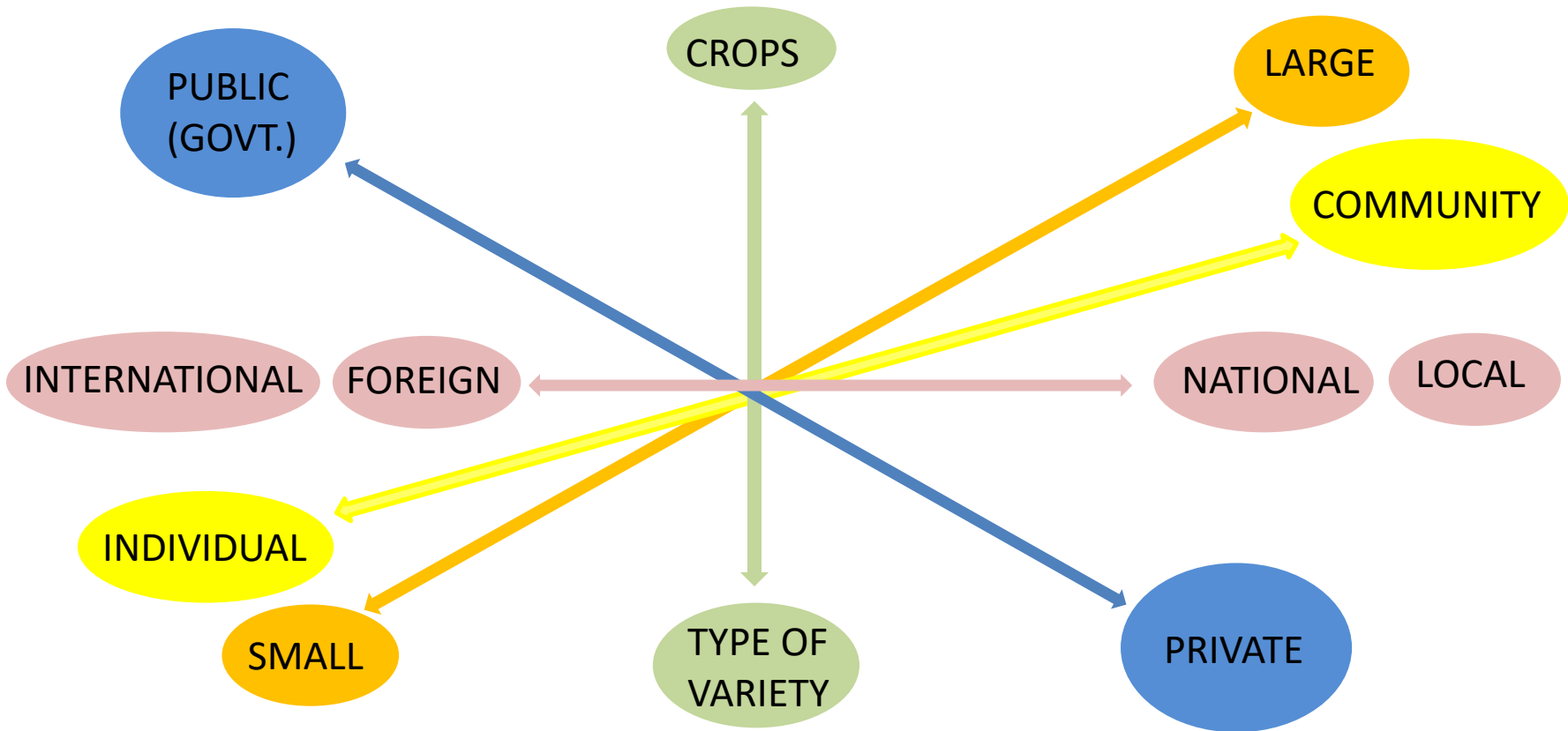
There are no restrictions on who can be considered to be a breeder under the UPOV system: a breeder might be an individual, a farmer, a researcher, a public institute, a private company etc.



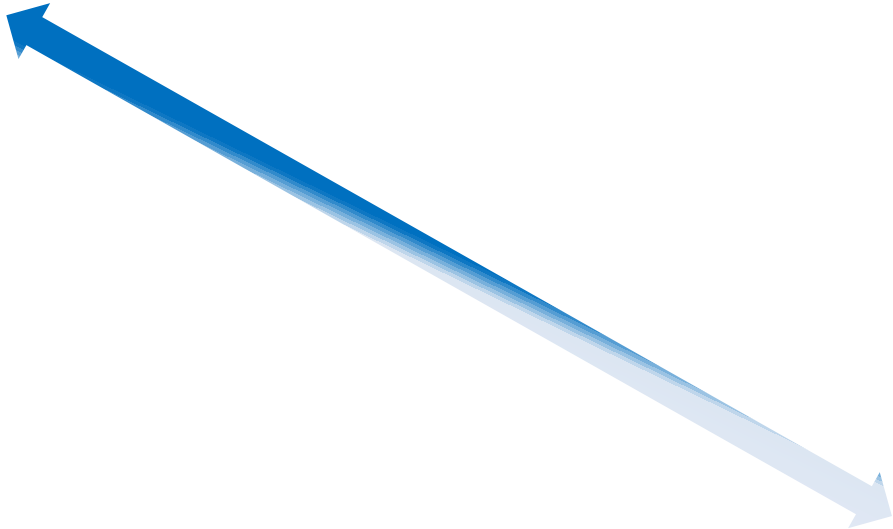
### Japan Registration Case Study

(click to see full view)





PUBLIC  
(GOVT.)



PRIVATE





**UPOV**  
(Photo: iStockphoto.com/VladTeodor)



(Photo: iStockphoto.com/luoman)

# 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



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or...

## How to:

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- **breed varieties with those characteristics**
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# 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

**PUBLIC SECTOR**

**PRIVATE SECTOR**

BREEDERS

International Breeding (Institute)

National Breeding Institute

Large enterprises (e.g. companies, cooperatives)

SME's

Individuals (e.g. farmers)

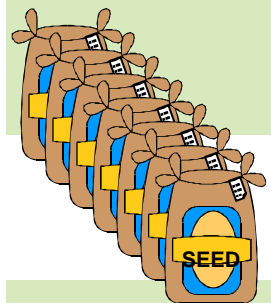


PRODUCTION & DISTRIBUTION

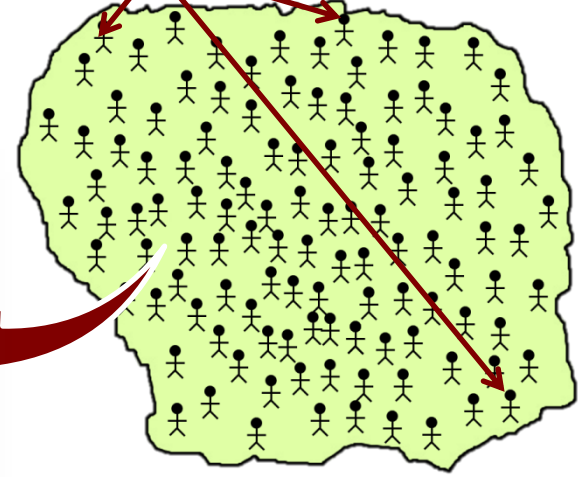
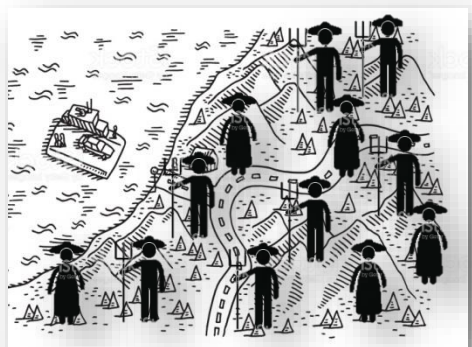
**PBR LICENCES**

SEED PRODUCERS / PLANT PROPAGATORS

DISTRIBUTORS



FARMERS



SEED

INFORMATION





UPOV

(Photo: BSPB)

(Illustration: iStockphoto.com/Cory Thoman)

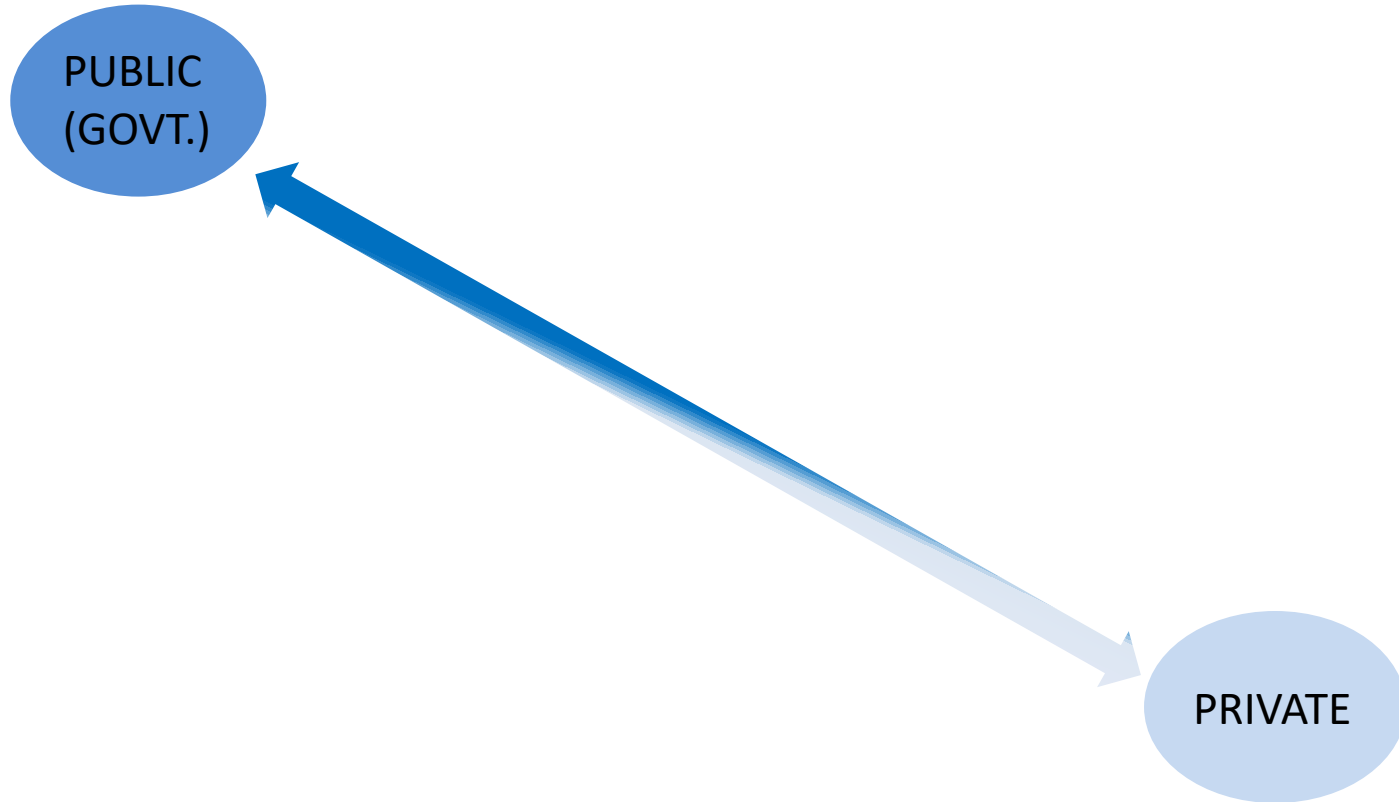




# Breeder Performance Test Trials



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



# 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 InnovationAccess





# Plant variety licensing at UC Davis

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- » **Fair value for public asset**
- » **California advantage**
  - 1<sup>st</sup> access to new varieties
  - Preferential royalty rates
  - Preferential (broader) sales territories
- » **Transfer of know-how**
- » **Licensing - reactive to breeding outcomes**

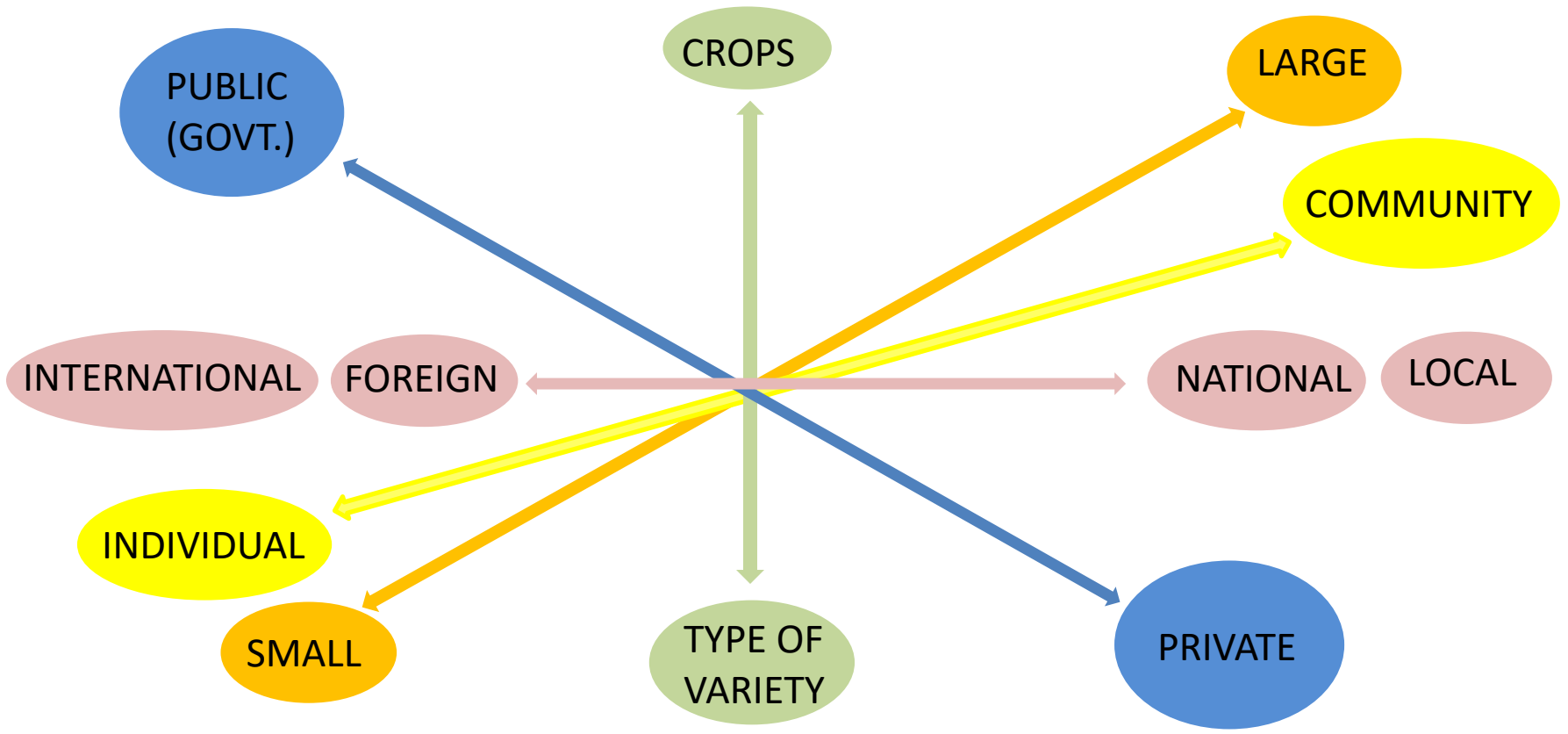


**The role of the Agricultural Research Council in delivering high performance varieties to subsistence or smallholder farmers**

## Vuyisile Phehane

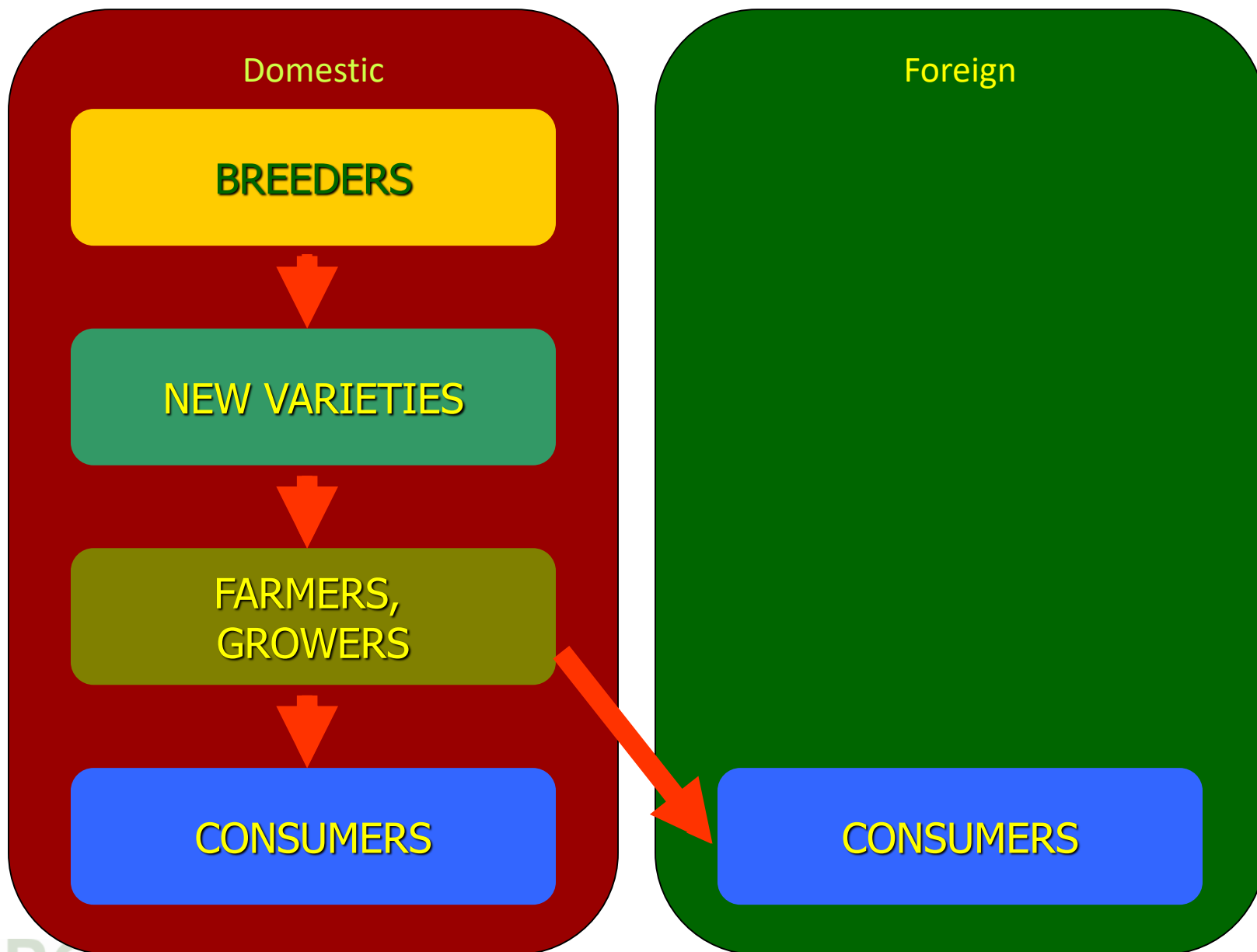


- Local licensing agreement with a South African company
  - for the commercialization of some of the ARC's citrus varieties.
  - A condition of the license: ensure the participation of smallholder citrus producers in the commercialization value-chain.
- Facilitated partnership with the Citrus Growers'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





UPOV



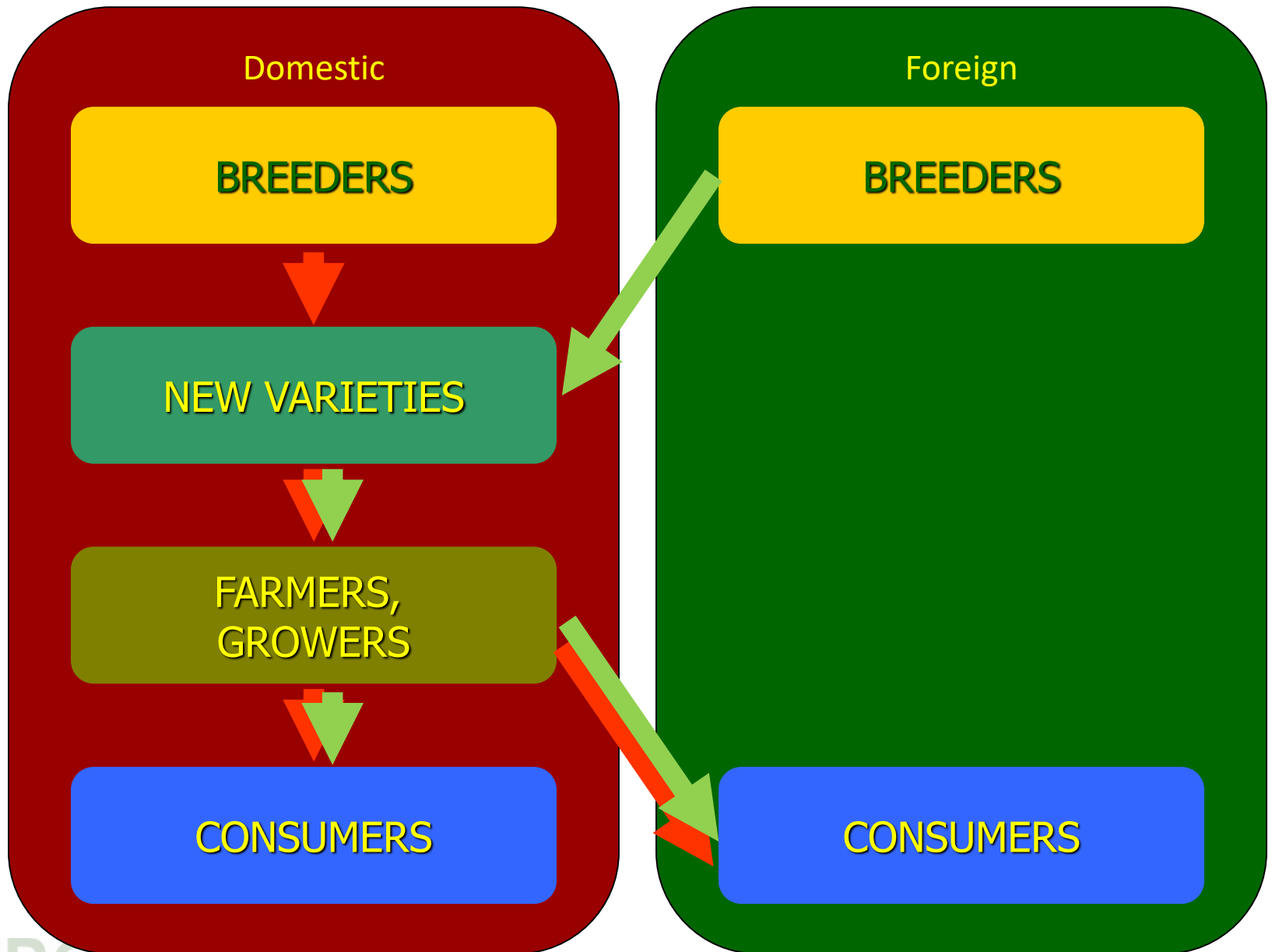


UPOV

# HOW TO BECOME A MEMBER OF UPOV

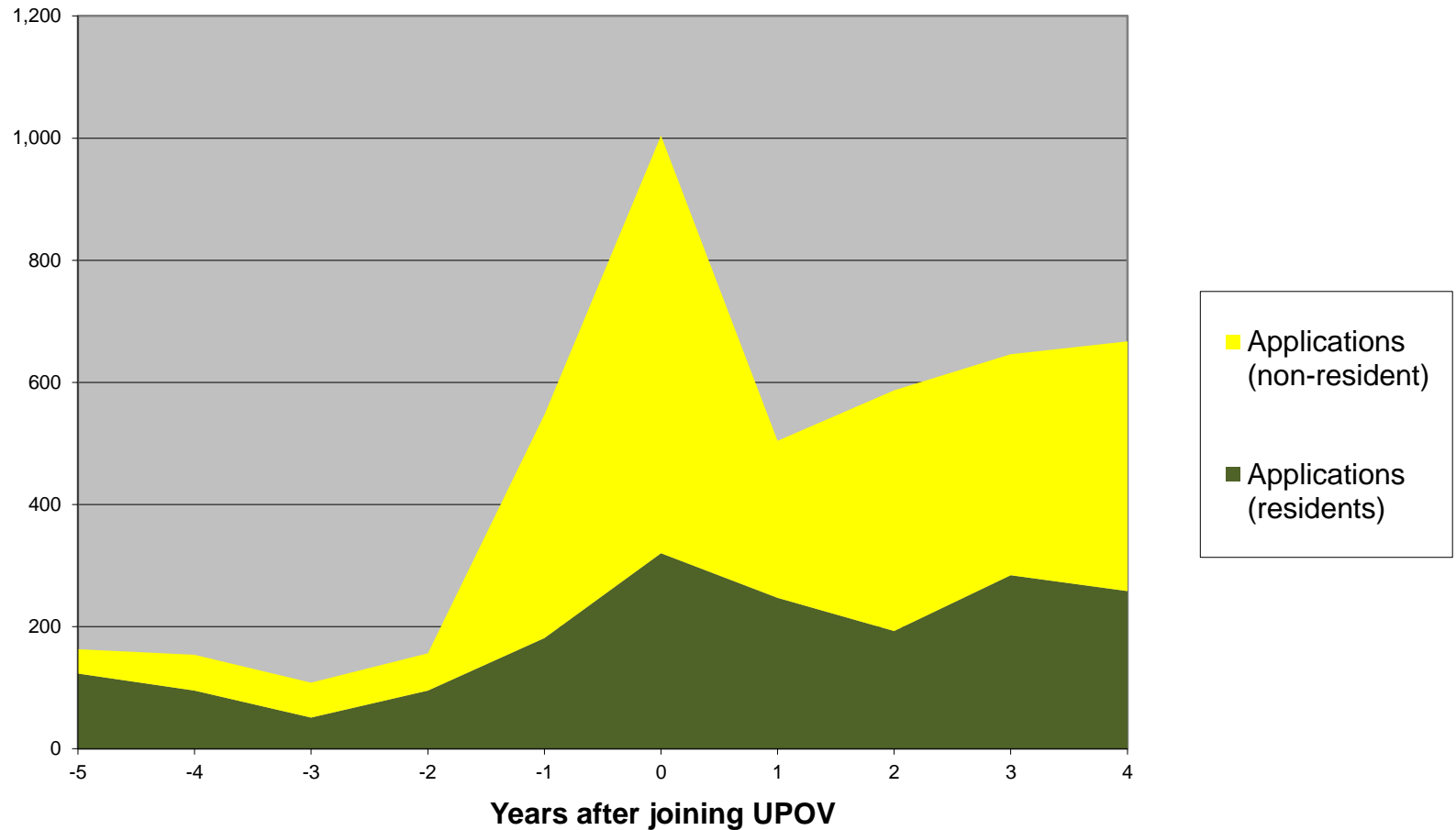
State/Intergovernmental Organization must:

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

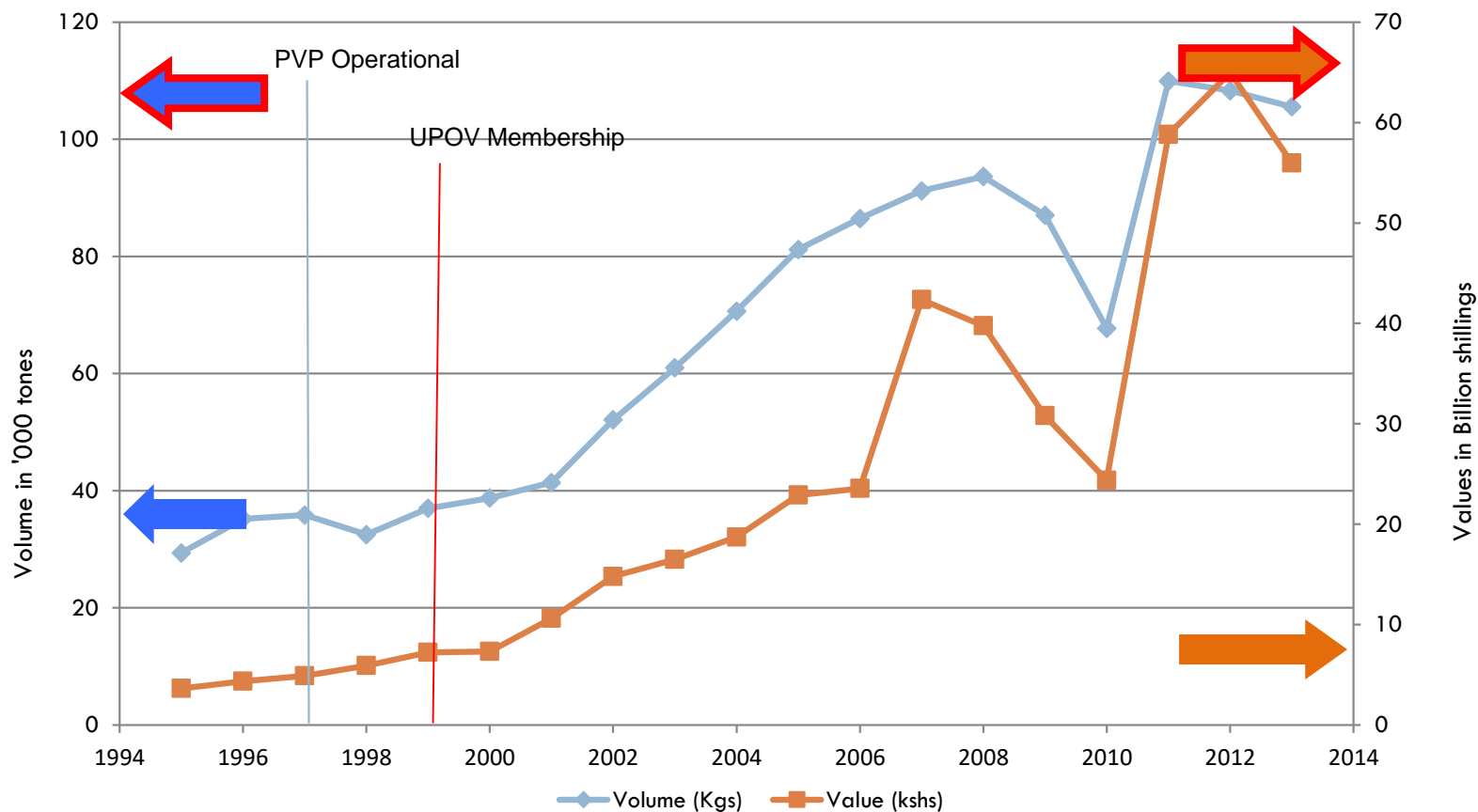




# Latin America Countries acceding to UPOV between 1994 & 2000



# Impact of Plant Variety Protection in Kenya



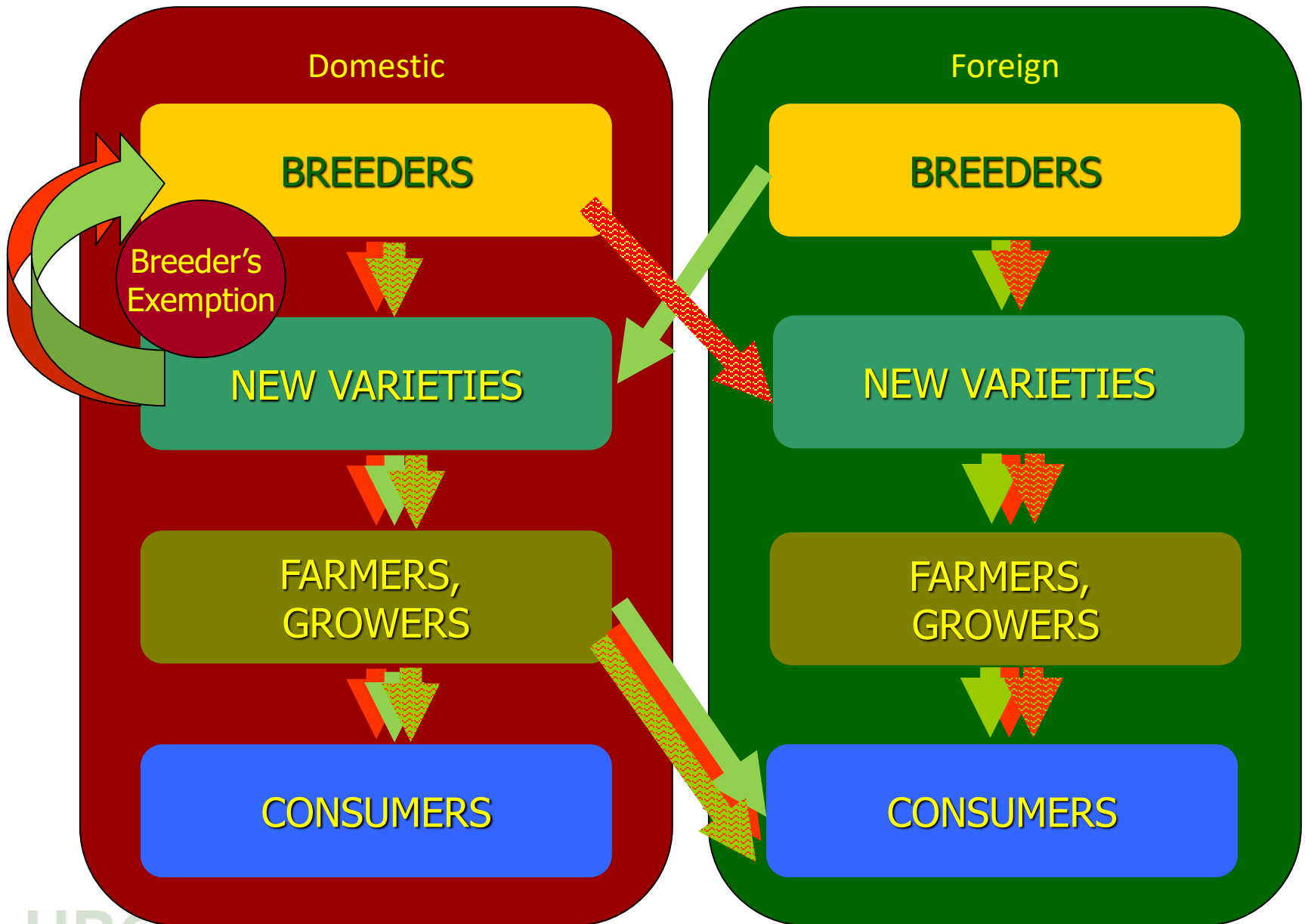
**CUT FLOWER EXPORTS 1995 - 2013**

# Successes/Impact Resulting from PVP cont'

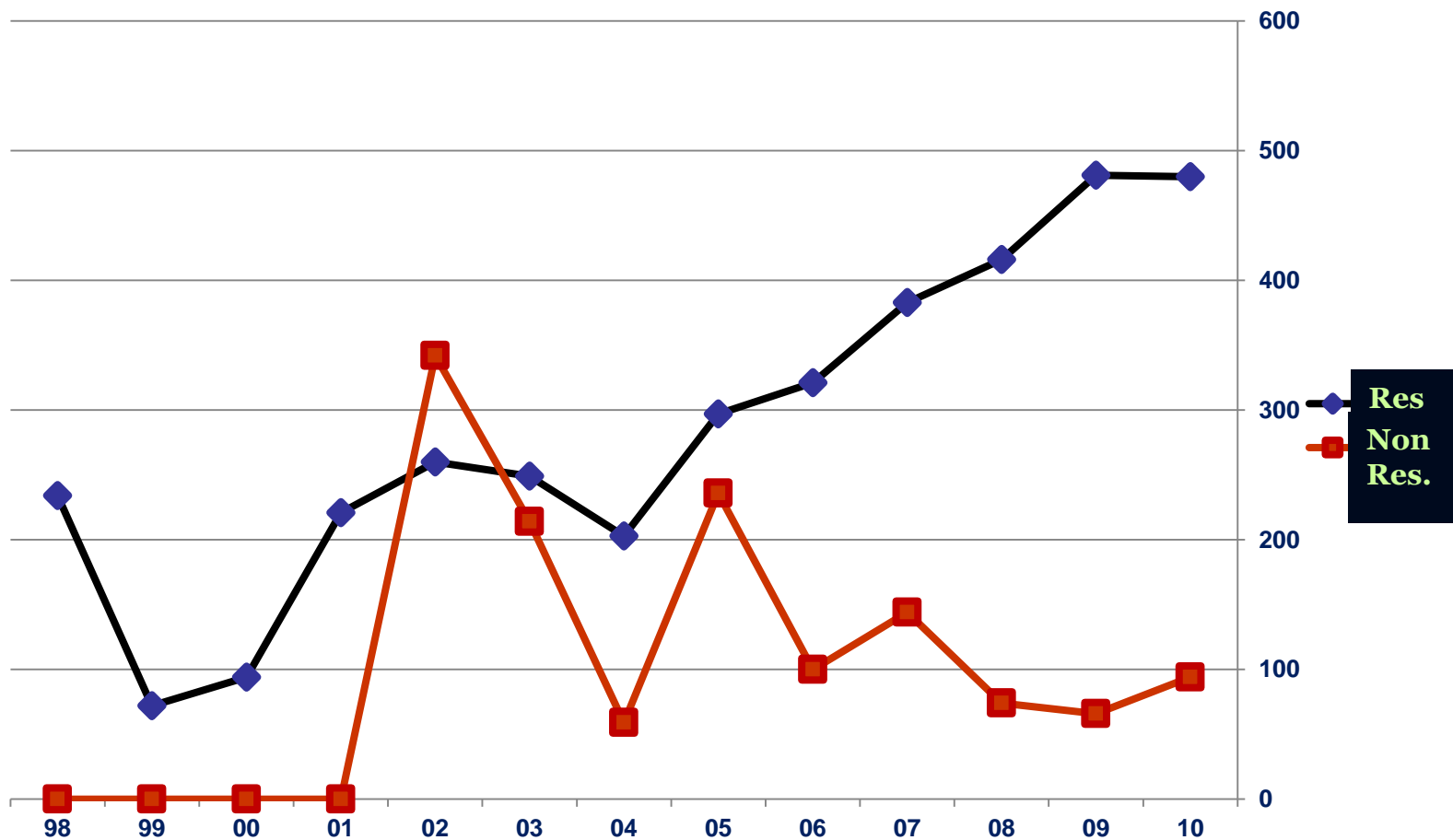
## Employment creation

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





## 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)

# KSVS Symposium on Plant Variety Protection Seoul, Republic of Korea (September 3, 2015)

## Korean Rose Breeding Converts a Royalty Payer into a Receiver

Charlie Jeong/wonwoo trading

## Becoming Royalty Receiver

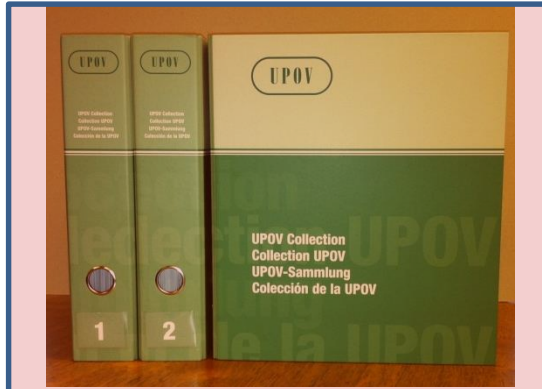
1. Korean pay rose royalty abroad about 1,040,000 plants in year 2014
2. GARES rose varieties are sold about million in year 2014
3. Korea change from royalty payer to royalty receiver

# Overview

- Why was UPOV created?
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- Benefit of UPOV membership for implementing PVP



# Harmonization and Cooperation



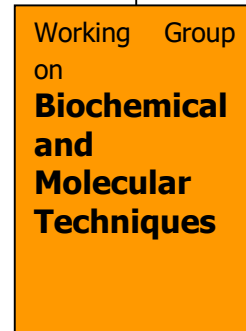
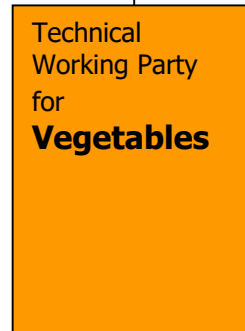
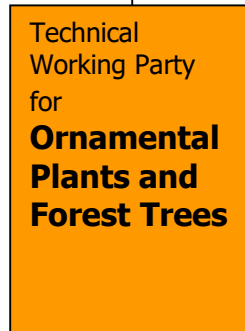
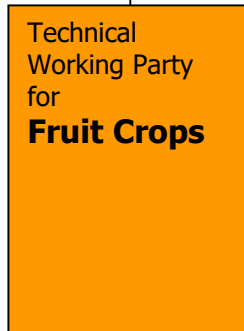
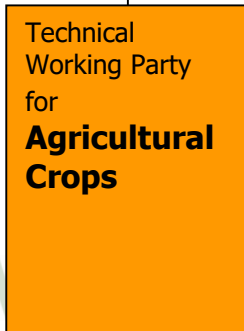
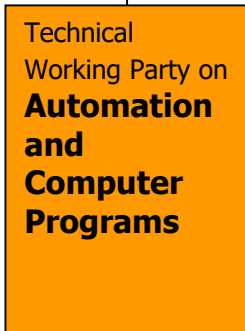
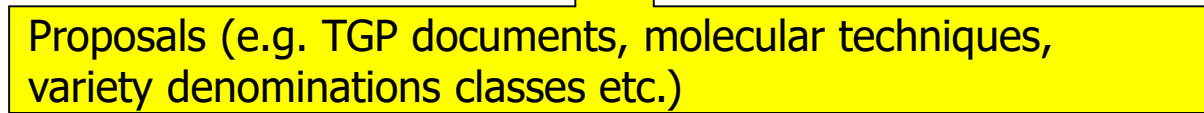
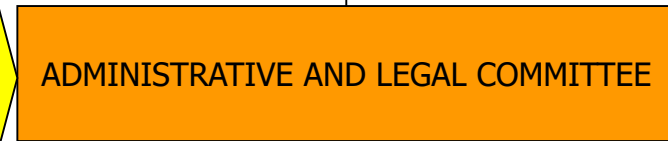
		Harmonization	Cooperation	
<b>PVP Law</b>		<ul style="list-style-type: none"> <li>• UPOV Convention</li> <li>• Explanatory Notes</li> </ul>	<ul style="list-style-type: none"> <li>• UPOV Lex</li> </ul>	<ul style="list-style-type: none"> <li>• Distance Learning course</li> <li>• UPOV events &amp; activities</li> <li>• Assistance by individual UPOV members</li> </ul>
<b>IMPLEMENTATION</b>	➤ Application	<ul style="list-style-type: none"> <li>• Model Application Form</li> </ul>	<ul style="list-style-type: none"> <li>• PBR Application tool (EAF)</li> </ul>	
	➤ Variety Denomination	<ul style="list-style-type: none"> <li>• INF/12: “Explanatory Notes on Variety Denominations”</li> <li>• UPOV Code</li> </ul>	<ul style="list-style-type: none"> <li>• PLUTO database</li> </ul>	
	➤ DUS Testing	<ul style="list-style-type: none"> <li>• General Introduction</li> <li>• TGP Documents</li> <li>• Test Guidelines</li> </ul>	<ul style="list-style-type: none"> <li>• GENIE Database</li> <li>• Exchangeable software</li> </ul>	

**DEVELOPING GUIDANCE  
TO FACILITATE  
HARMONIZATION AND COOPERATION**

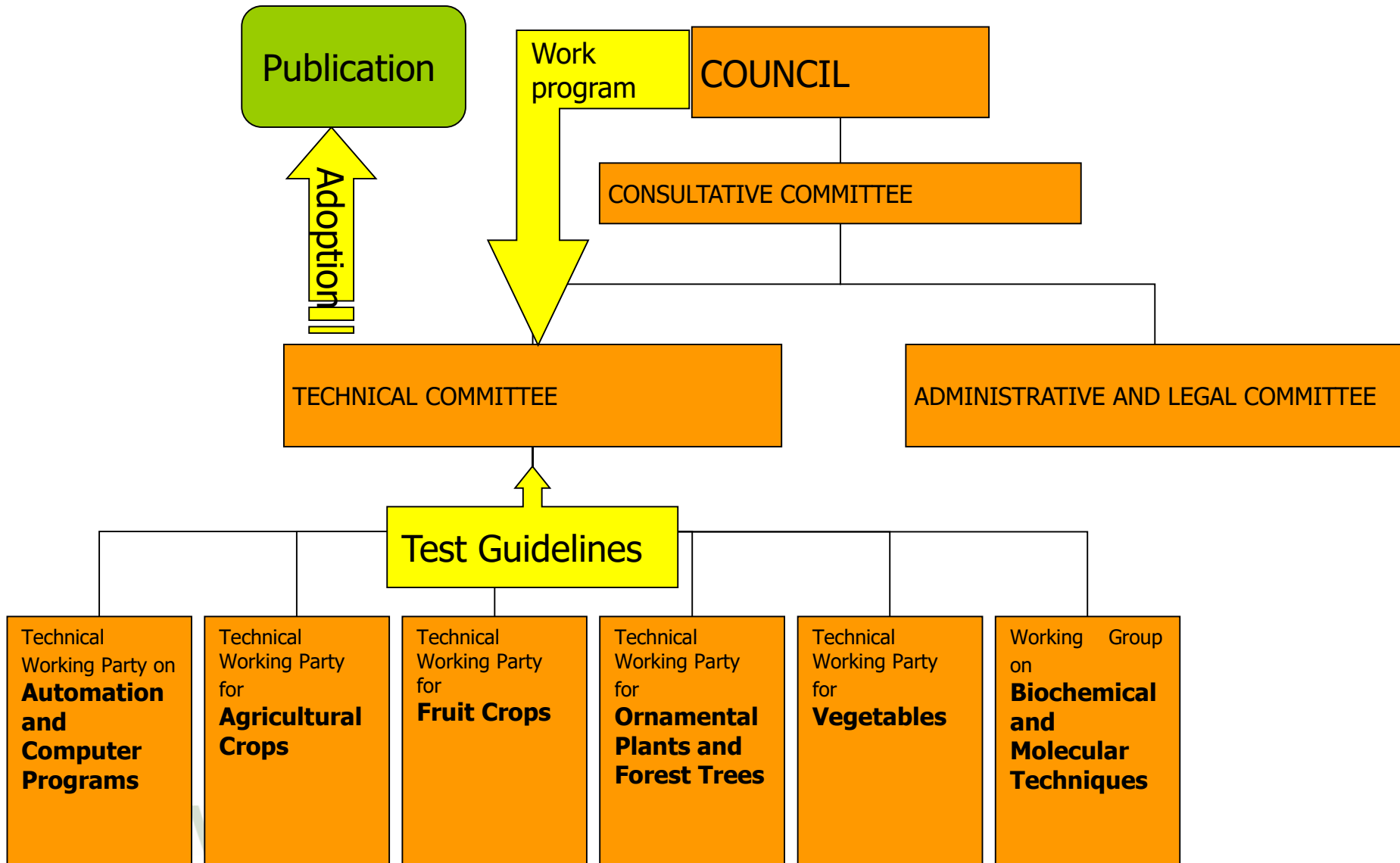


International Union for the Protection of New Varieties of Plants

# UPOV Structure



# Test Guidelines



# COOPERATION

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



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

*Number of  
genera/species for  
which varieties  
protected by members  
of the Union: > 3,500  
(>15,000 titles granted  
/annum)*

*Agreements for  
cooperation between  
members of the  
Union: > 1,950*

UPOV

# 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

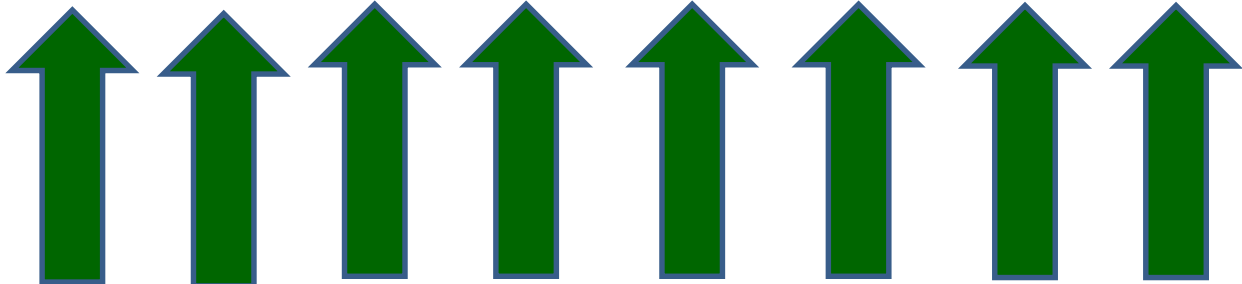
**321 Test Guidelines estimated to cover 91% of PBR-related varieties in UPOV Plant Variety Database**



COOPERATION



HARMONIZATION



UPOV Members

UPOV



# 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

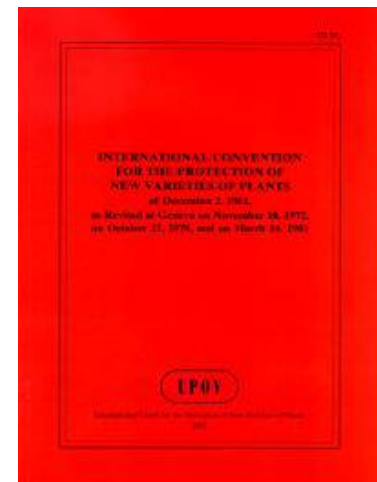
- DUS Examination (GENIE database)
- Variety Denominations (PLUTO database)
- Exchangeable Software
- Plant Variety Protection Statistics

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)



HOME » PVP DATA & STATISTICS

searches

PLUTO: Plant Variety Database

New: Video Tutorial

The data currently in PLUTO is the data in version 201303 of the UPOV-ROM Plant Variety Database. A subscription service will also shortly be introduced for PLUTO, which will allow us to inform users of future updates of the data.

Term Search Denomination Search

## SEARCH BY

+ UPOV Code ▼ = [input] [lookup]

+ Denomination ▼ = [input]

+ Record type ▼ = [input]

+ Application Date ▼ = [input]

+ Botanical name ▼ = [input]

? search

## FILTER BY

Source Type Status End Type Grant Date End Date

List	Count - desc
FR	161,618
ES	131,334
CZ	121,597
HR	116,016
SI	112,848
EE	111,363
MT	109,506
Q7	109,506
NL	157,074
PL	130,890
SK	120,526
SE	114,289
PT	112,799
LV	110,638
LU	109,506
OM	55,525
GB	142,725
IT	126,298
HU	118,922
BE	113,602
RO	112,685
IE	110,445
GR	109,506
IIS	36,930
DE	139,750
DK	122,713
AT	116,582
BG	113,505
LT	111,618
FI	110,367
CY	109,506
JP	26,971

filter +



# UPOV

World-wide support systems for breeders

UPOV



## Expansion of UPOV's PBR Application Tool (EAF)

### Stakeholder features

- Breeders

### Welcome

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

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 1991.

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.

**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](http://www.upov.int)

**UPOV**



# 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



## UPOV EAF

- Home
- Go to EAF
- How to Access EAF
- Terms of Use
- Testimonials
- Tutorials
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- PVP-XML
- Payment of fees
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## 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 p system to system communication)
- Application forms can be displayed in a **range of languages** (note: answers must be
- **Information can be automatically re-used in subsequent application data**
- Different **user roles can be specified** (e.g. drafter, signatory, translator, agent, proc
- **Controlled access to all PBR application data**
- Secure and confidential

### UPOV members and crops currently covered by EAF

AUTHORITY	APPLE FRUIT VARIETIES				
Argentina	✓				
Australia	✓				
Chile	✓				
China		✓		✓	
Colombia				✓	
France	✓	✓	✓	✓	✓
Kenya	✓	✓	✓	✓	✓
Netherlands	✓	✓	✓	✓	✓
New Zealand	✓	✓	✓	✓	
...					

English  
 French  
 German  
 Spanish  
 Chinese  
 ...?

## UPOV members (16) and crops (5) currently covered by PBR Application Tool (EAF)

AUTHORITY	APPLE FRUIT VARIETIES	LETTUCE	POTATO	ROSE	SOYBEAN
Argentina	√		√	√	√
Australia	√	√	√	√	√
Chile	√	√	√	√	√
China		√		√	
Colombia				√	
France	√	√	√	√	√
Kenya	√	√	√	√	√
Netherlands	√	√	√	√	√
New Zealand	√	√	√	√	
Norway	√	√	√	√	√
Republic of Moldova	√	√	√	√	√
Switzerland	√	√	√	√	√
Tunisia	√	√	√	√	√
Turkey	√	√	√	√	√
United States of America		√	√		√
Uruguay	√		√		√

# UPOV - PBR Application Tool

## Key benefits

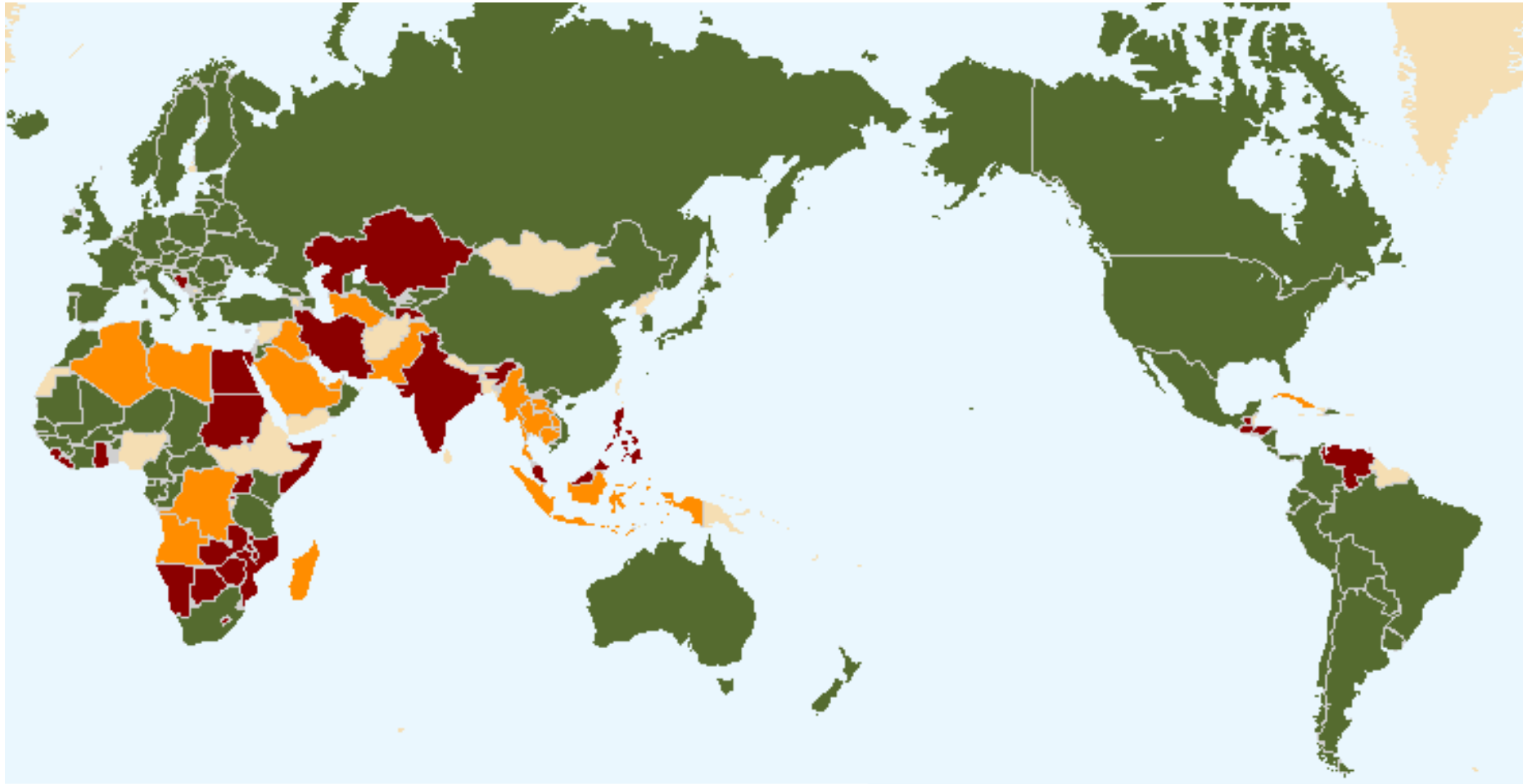
- **Online PBR application tool** to provide application data to participating PVP Offices in required format (hard copy, e-mail notification, system-to-system)
- Application forms can be displayed in **range of languages** (answers must be provided in an acceptable language for the PVP Office)
- Variety 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**

# UPOV status



Members of UPOV (74) covering 93 States

Initiating States (16) and Organization (1)

States (24) and Organization (1) in contact with the UPOV Office

# 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**