

Intellectual Property Landscape for Agricultural Innovation

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WORKSHOP ON IPRS FOR INNOVATION IN INDUSTRIAL & AGRICULTURAL SECTORS IN SUPPORT OF
ECONOMIC DEVELOPMENT

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Session Outline

- ▶ Introduction
- ▶ IPRs & innovation
- ▶ International legislation for IPRs in agricultural innovation
 - ❖ International Union for the Protection of New Varieties of Plants (UPOV)
 - ❖ Trade Related Aspects of IPRs (TRIPS) Agreement
- ▶ Regulatory contexts for IP in agricultural innovation
- ▶ Technology transfer & public-private partnerships (PPPs) in biotechnology

Introduction

- ▶ In order to stimulate agrifood innovation & technology transfer, **many developing nations have made efforts to strengthen their IP management**
- ▶ It has been the case that **modifying genetic life forms through biotechnology has been a driving force for changes in IP management in developed countries**
- ▶ In particular, **the gradual growth of IPRs in biological innovations began in the 1980s**, first in patenting microorganisms and later, incorporating plants & animals

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- ▶ **R&D in biotechnology & genetics are essential for meeting the agricultural demands of a growing world population,** especially in the areas of climate change, social unrest & revolution
 - ▶ **This would help us in both public & private research institutions better understand the current situation of IPRs & how IP can be leveraged to support agricultural innovation & dissemination**

IPRs & Innovation

- By definition, **IPRs are legal protection and rights over new & useful products that originate as a result of efforts & ingenuity of human intellect**
- Granted by **governmental authorities** & protected under a mix of both **national & international legislation**
- **Time-limited exclusive rights**
- **Long-term protection** of an invention, **restrictions** for the use of the invention based on mandatory licensing
- **IPRs for existing, new & improved plant varieties provide breeders with compensation for risks & costs** incurred when they make a value-added innovation to a fundamental biological resource
- **IPRs are not the rights to make, use, offer for sale, sell or import;** rather, they are **defensive activities** to exclude others from making, using, offering for sale, selling or importing the invention

Intellectual Property Rights & Innovation

Innovation: knowledge-rich economic & social phenomena . . . (Rogers, 1962, 2003)

Innovation = invention + commercialization

Why does IP matter? whether IPRs enhance innovation and provide incentives for innovation & technological diffusion. **IPRs as a stimulator for innovation (biotechnology sector)** (Castle 2009)

Joseph Schumpeter (1934):

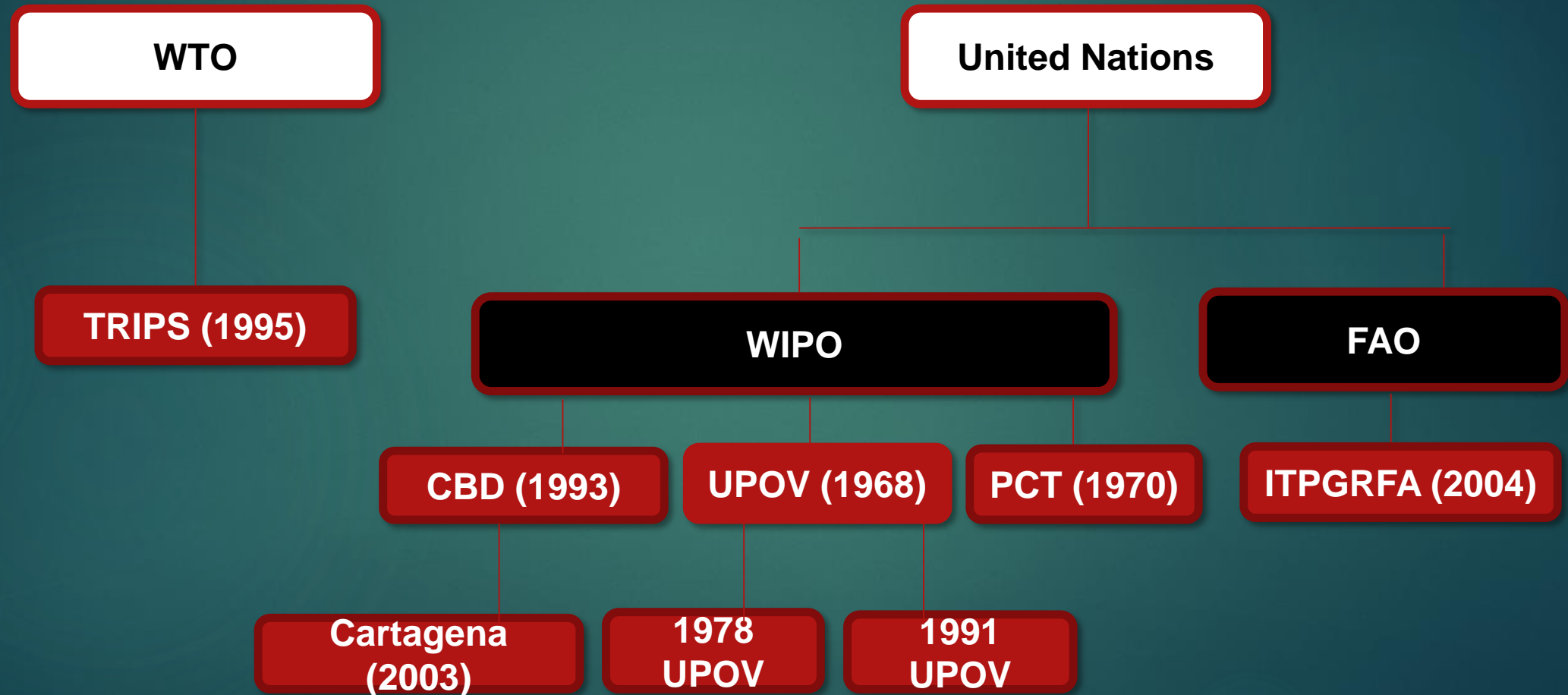
“**innovation**... the carrying out of new combinations... is the key to entrepreneurial profits... **[innovation]** is the only way to create new economic value over the long term”

J.A.Schumpeter, “The Theory of Economic Development”, 1934

- ▶ **Patents play an important role in spurring innovation and investment in innovation.** They contribute to the dissemination of information throughout an economy
(Granstrand 2005)
- ▶ Innovation and commercialization are causal relationship and **can be fostered or stymied by strong IPRs**

Policy Context & International Legislation for IPRs (UPOV & TRIPS)

Key International IP Treaties & Conventions





▶ UPOV

Requires each member to grant and protect breeders' rights in accordance with national legislation

▶ TRIPS Agreement of WTO

Requires all WTO member states to set out the minimum standards of protection of subject matter, grant a right & exception to this right, & the minimum duration of protection.

International Union for the Protection of New Varieties of Plants (UPOV)

▶ The requirements

The plant variety must be **a new, distinct, uniform, & stable (DUS)** & the variety must be designated with a suitable denomination



❖ Why UPOV is fundamental to IP management in agricultural R&D?

- 1) To satisfy the *sui generis* protection required by the WTO-TRIPS in order to include protection for new plant varieties as a part of their IP laws
- 2) Strong interests in providing incentives to protect plant breeders & the researcher exemption



Eligible for Protection

- ▶ Conventional varieties (traditional breeding)
- ▶ Hybrid varieties
- ▶ A variety which is the parent of hybrid variety
- ▶ Genetically modified varieties (genetic modification)

Possibly

- ▶ Landraces (if they fulfill the definition of variety & the criteria of protection)

Not Eligible

- ▶ Wild populations
- ▶ Genes
- ▶ Tissue culture
- ▶ Resistance to a plant disease

Filing Applications

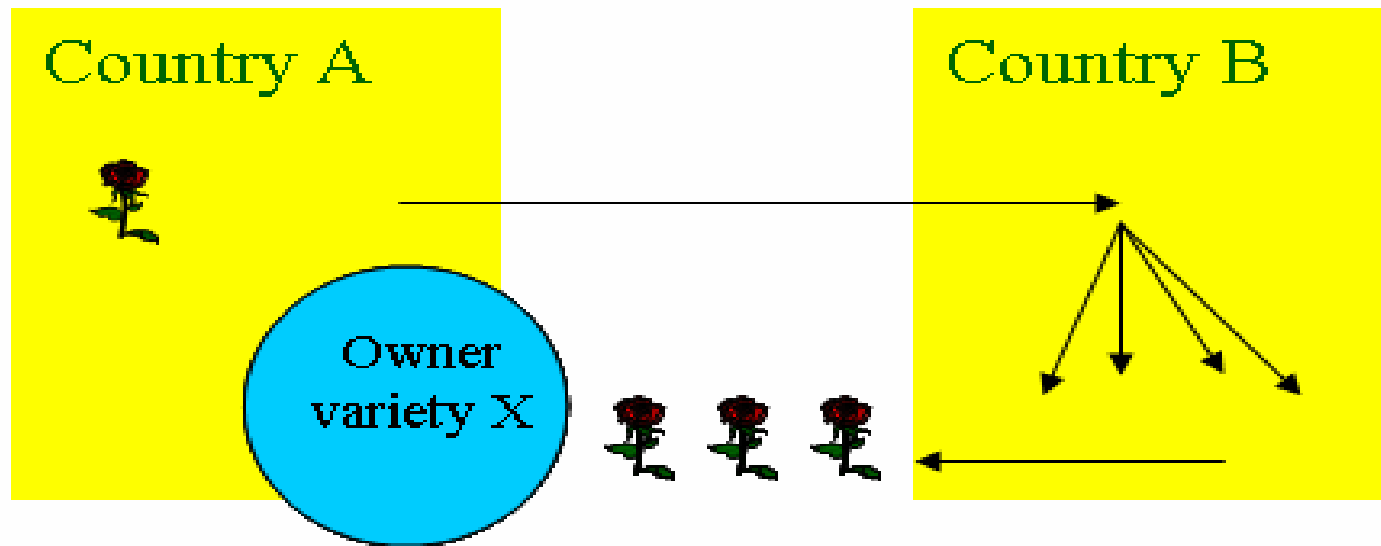
First application	The breeder can choose any UPOV member
Subsequent applications for the same variety	Can be filed without the need to wait for the granting of the breeder's right based on the 1 st application
Independence of protection	The PBR can not be granted or rejected by a UPOV member on the basis of the granting, rejection, or expiration of BR in another UPOV member

The nature of the “DUS” test

- ▶ The DUS test is based mainly on **growing tests**
- ▶ **The UPOV test guidelines** (each test should include a total of):
 - ❖ **Apple:** 10 trees
 - ❖ **Strawberry:** 20 plants
 - ❖ **Wheat:** 2,000 plants (should be divided between 2 or more replicates)

Plant Breeders' Rights	1991 UPOV Convention
Eligibility requirements	Novelty, Distinctness, Uniformity, & Stability.
Duration of protection	20 years (25 years for grapevines and trees).
Dual protection with patent	It is allowed to have dual protection.
Minimum exclusive rights in propagating variety (seed, bulb, tuber, cutting etc.) (require the authorization of the breeder)	Production or reproduction (multiplication); conditioning for the purposes of propagation; offering for sale; selling or other marketing; exporting; importing or stocking for any of these purposes.
Minimum exclusive rights in harvested material (require the authorization of the breeder)	Harvested material obtained through unauthorized use of propagating material of the protected variety unless the breeder has had reasonable opportunity to exercise the right in relation to the propagating material.
Breeders' exemption	Permissive, but breeding and exploitation of a new variety "essentially derived" from earlier variety require right holder's authorization.
Farmers' Privilege (allow farmers to use the harvested variety covered by PBRs for propagation on their own holdings)	It is allowed at the option of the member State (up to national laws) within reasonable limits and subject to safeguarding the legitimate interests of the right holder. (Farm-saved seed)

- Variety X material is obtained in Country A and, without the authorization of the title holder, exported to Country B



- Variety X is propagated in Country B
- Exported to Country A as harvested material (e.g. cut flowers)
- The owner of Variety X can exercise his rights on the imported harvested material

**VARIETY
A**
(non EDV)



EDV-1
(predominantly
derived from
variety A)

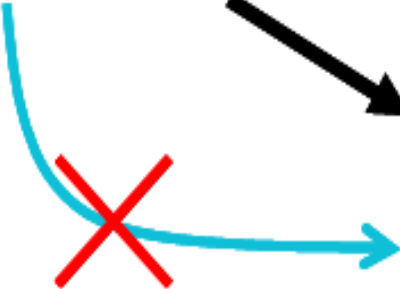


EDV-2
(predominantly
derived from
EDV-1)

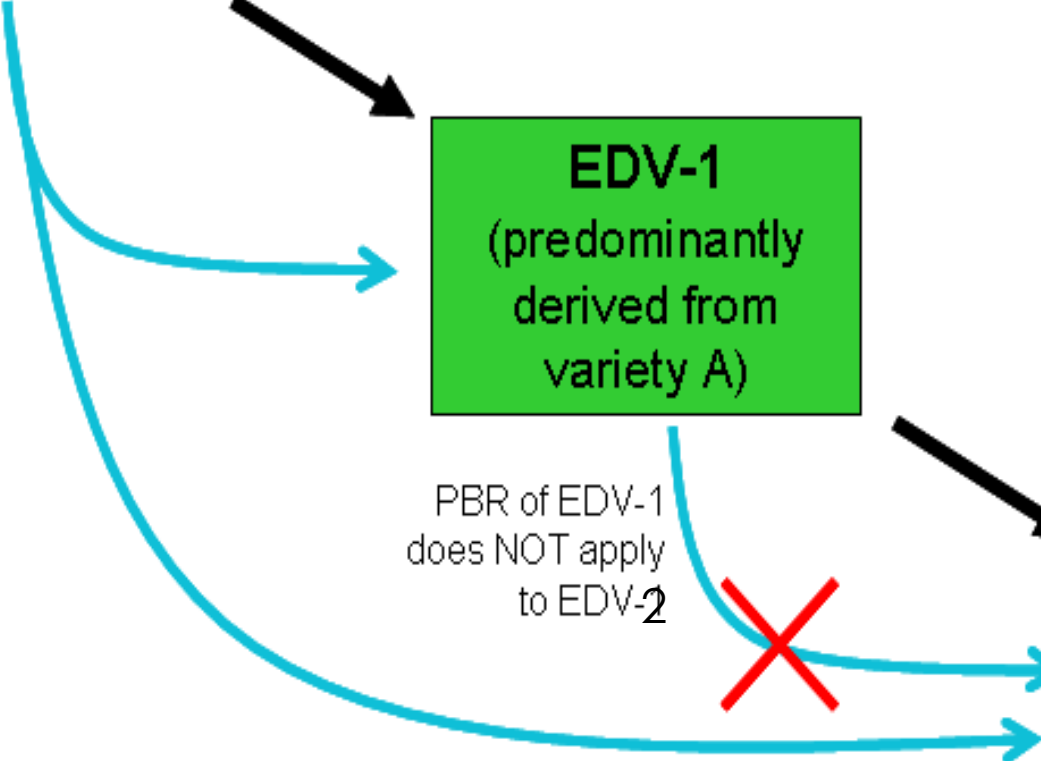
PBR of Variety A
applies to EDV-1



PBR of EDV-1
does NOT apply
to EDV-2



PBR of Variety A
applies to EDV-2




Authorization required to commercialize hybrid variety

		Parent variety A	
		Protected	Not protected
Hybrid variety C	Protected	Authorization of the breeder A & C	Authorization of the breeder C
	Not protected	Authorization of the breeder A	No authorization required

Trade Related Aspects of IPRs (TRIPS) Agreement

- ▶ A second critical trade legislation for agricultural innovation
- ▶ Came into force in 1995

- ▶ The most important regimes in the international IP laws preceded the TRIPS Agreement:
 - Paris Convention for the Protection of Industrial Property 1883
 - Berne Convention for the protection of Literacy and Artistic Works 1886

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- ▶ Of interest to crop biotechnology R&D, is the protection of new varieties of plants
 - ▶ **Article 27(1)** requires that “**patents shall be available** & patent rights enjoyable without discrimination as to the place of invention, the field of technology and whether products are imported or locally produced”
 - ▶ **Article 27(3)(b)** requires each member state to “provide for the protection of plant varieties **either by patents or by an effective *sui generis* system** or by any combination thereof”
 - ▶ **Relatively wealthier nations**, such as the United States and Canada, have engaged with the global legislation in quite different ways

Regulatory Contexts in USA & Canada for IP (Patent & PBRs)

Types of IPRs in agricultural R&D		
	U.S.A	Canada
Trademarks	Must be distinctive and should not be deceptive (USA & Canada have similar requirements for application)	
Trade secrets	Confidential business info, industrial & commercial secrets	
Plant patent	Asexually reproduced plants (except tubers & seeds) Up to 17 years	N/A
Plant variety protection or PBR	Sexually reproduced plants (except fungi, bacteria) Tubers & F1 hybrid 20 years 1991 UPOV Convention	Asexually & sexually reproduced plants (except algae, bacteria & fungi) 20 years 1991 UPOV Convention
Utility patent	Life forms & organisms (plants) are patentable A new, useful & non-obviousness to the prior art 20 years Diamond v. Chakrabarty 1980	High life forms (Plants & seeds) are not patentable A new, useful & non-obviousness to the prior art 20 years Harvard College v. Canada 2002

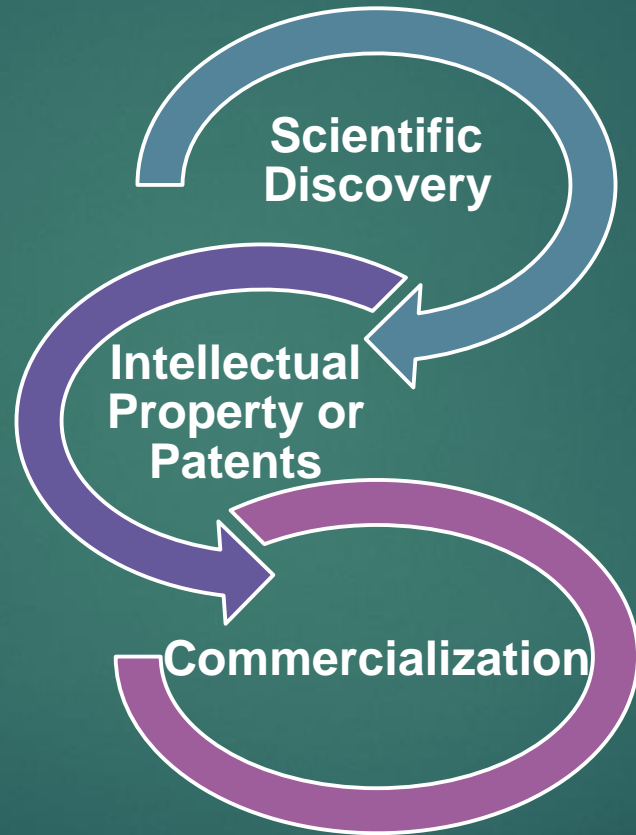
❖ **Fostering Agricultural Innovation**

- ▶ **Vigorous competition**
- ▶ **Strong R&D**

- ▶ **Strong education at all levels**
- ▶ **Sound policies promoting science and innovation**

- ▶ **Efficient and transparent regulatory systems**
IP laws, regulations and guidelines

Technology Commercialization: An Interdisciplinary Field



Technology Transfer & Public- Private Partnerships

The Bayh-Dole Act (USA)
1980: allowed private
industry to license &
develop products from
publicly funded research
(Nugent & Keusch, 2007)

The result was the first
generation of biotech hubs:
the San Francisco Bay area,
the greater Boston area,
Research Triangle Park in
North Carolina, and Oxford
and Cambridge in the UK

This model became clear in
the 1980s and 1990s, the
model spread to Europe and
Japan

❖ **Technology Transfer Routes**

- 1) Industry-University sponsored research dollar**
- 2) Licensing the technology to the private sector**
- 3) Spin-off company**
- 4) Open innovation (no more doing R&D alone, but partner with other companies)**

❖ FINAL MESSAGE

- **Governments need a mechanism to engage academic scientists in policy formulation**
- **Efforts are required to strengthen capacity development in the area of IP for agricultural innovation**
- **Universities need to be aware of the importance of a strong and clear IP policy and capacity within their institutions**



Thank You!

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