



**Inter-American Institute for Cooperation on Agriculture**

***Regional Biotechnology Activities***  
***Latin America and Caribbean, (LAC)***

**9<sup>th</sup> APEC Workshop on Agricultural Biotechnology**

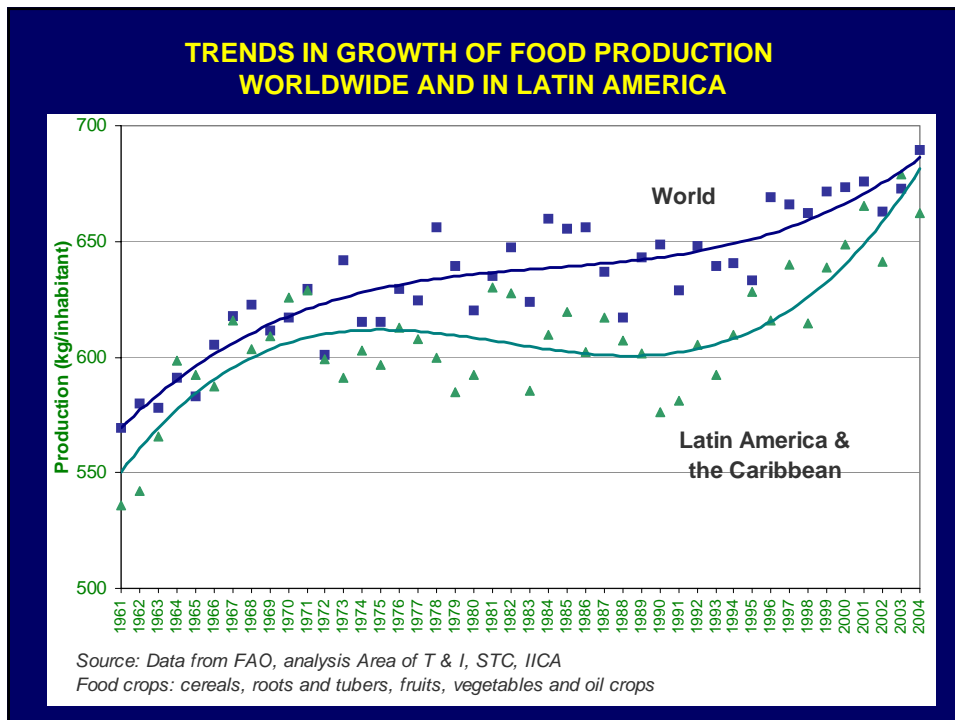
Enrique Alarcón, Ph.D  
Emilio Ruz, Ph.D  
Area of Technology & Innovation  
**IICA**

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**CONTENTS**

- I. IMPORTANCE OF BIOTECHNOLOGY IN AGRICULTURAL DEVELOPMENT
- II. PROFILE OF THE AGRO - BIOTECHNOLOGIES IN LAC
- III. STATE OF THE AGRO - BIOTECHNOLOGIES IN LAC
- IV. REGULATION AT THE INTERNATIONAL, REGIONAL AND NATIONAL LEVELS
- V. DEVELOPING A HEMISPHERIC AGENDA

## I. IMPORTANCE OF BIOTECHNOLOGY IN AGRICULTURAL DEVELOPMENT

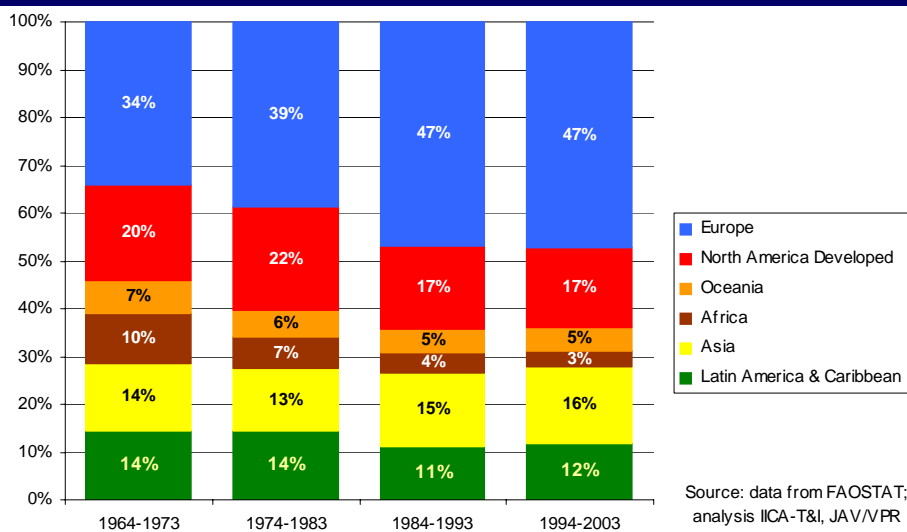


## Other regions growing faster than LAC

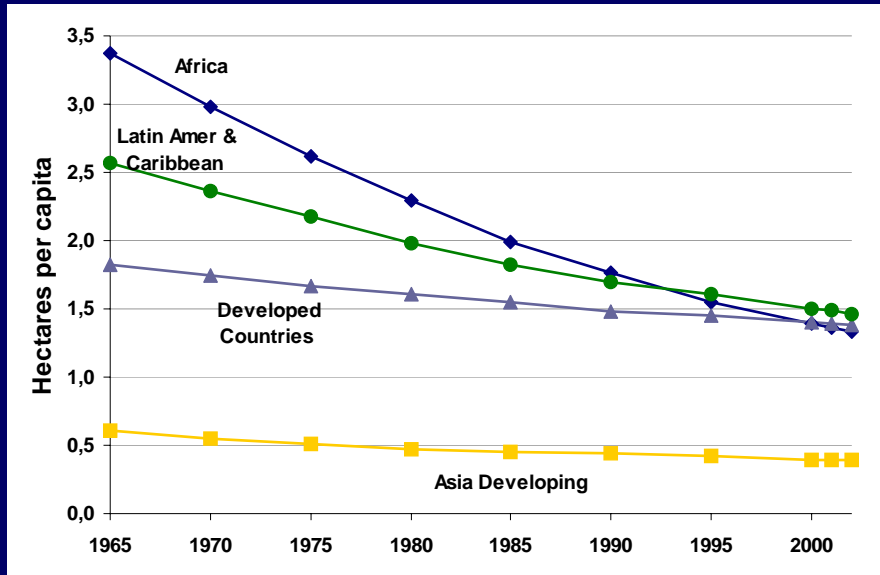
Between 1961 and 2002, **total agricultural** production grew by 2.9% in LAC

For the same period, the figure was 3.7% for developing countries as a whole.

## Agricultural Exports: share, by continent, for last 4 decades



## Agricultural land per inhabitant



Source: data from FAOSTAT, analysis by Area of Technology & Innovation, IICA

## Strategic Wealth of Plant Genetic Resources in the Americas

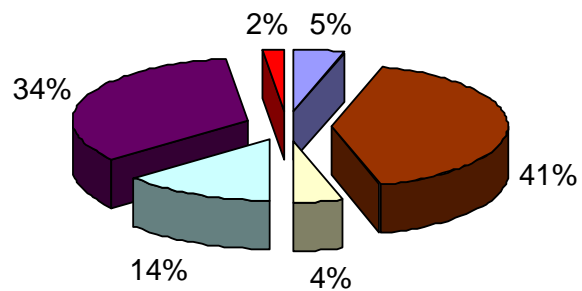


## SECTIONS OF THE STUDY

- I. IMPORTANCE OF BIOTECHNOLOGY IN AGRICULTURAL DEVELOPMENT
- II. PROFILE AND IMPACT OF THE AGRO-BIOTECHNOLOGIES IN LAC

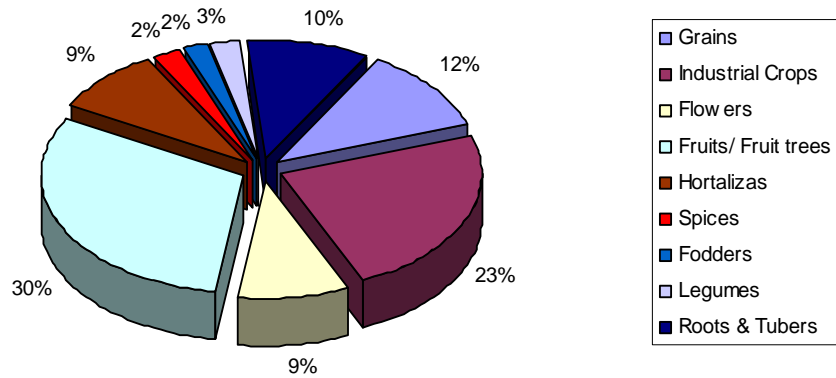
### Biotechnology: Thematic Areas of Research Covered by the Countries

- Cellular Biology
- Tissue culture & micropropagation
- Molecular characterization
- Molecular genetics
- Genetic engineering
- Structural and functional genomics



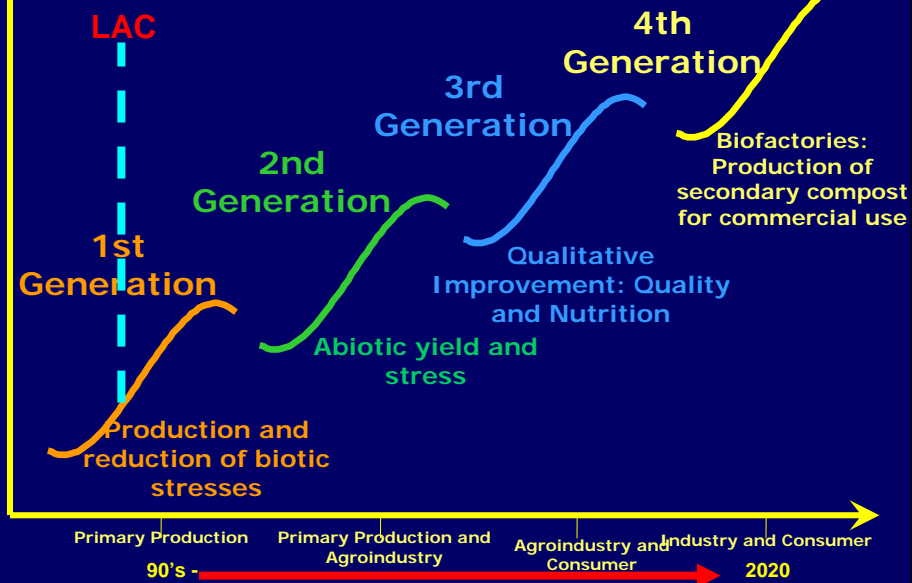
Source Muñoz, C/FORAGRO (2005); Adapted from AGBIOS 2005, Sasson, 2002

## Percentage/Share of Research in LAC by Crop



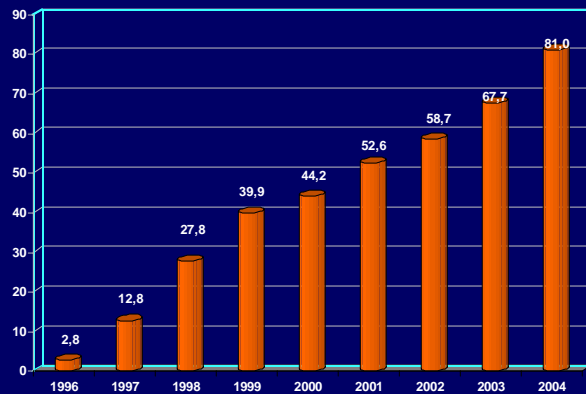
Source Muñoz, C/FORAGRO (2005); Adapted from AGBIOS 2005, Sasson, 2009

## Evolution of biotechnology innovations applied to Agriculture



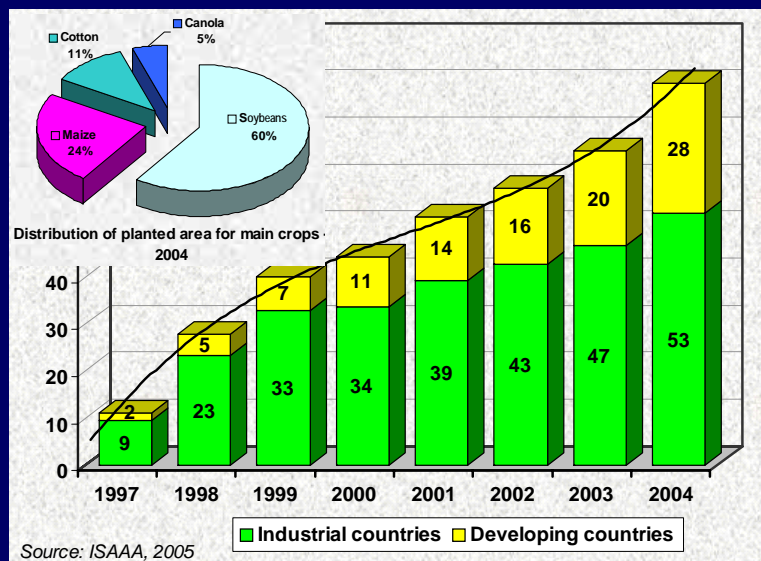
Source: Adapted from Nickson (2004). Technical Secretariat of FORAGRO

## SURFACE AREA WORLDWIDE PLANTED IN CROPS DERIVED FROM LMOs (Million has.)



Source: CLIVES, J. ISAAA 2005

## LMOs: total area under cultivation worldwide (millions of hectares)



## Examples of Investment in Agrobiotechnology Worldwide

Country	US\$ Millions
United States	5000
Australia	327
P.R. China	125
Chinese-Taipei	39
India	12
Brazil	8
Latin America & Caribbean	45-50

Sources: US Department of State (University of Minnesota study for the Council for Biotechnology Information), AusBiotech (Australia), Science Magazine Vol. 295 (China and Brazil), Netherlands Trade & Investment Office en Taiwan, National Biotechnology Development Strategy (India), Area of T&I IICA (LAC)

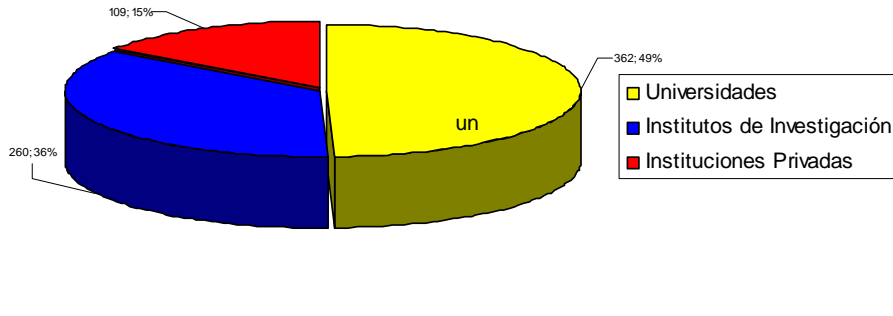
## Intensity of Investments in Research and Agrobiotechnology in LAC (as % of value of production)

In agricultural research	0.63 %
In agrobiotechnology (Only 6% of total investments in research)	0.04 %

SOURCES: IICA, REDBIO, ISNAR, IADB, AGBIOS, Trigo, et al., 2002, Alarcón et al 2005

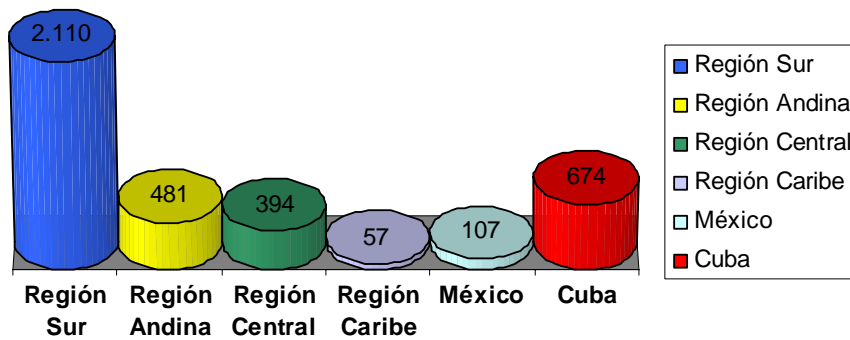


### Principal Types of Institutions engaged in Agrobiotechnology Activities in LAC



Source: FORAGRO and Muñoz (2005)

### Professionals in Biotechnology by Region, Mexico and Cuba



Source: RedBio (data up to date as of March 2005)

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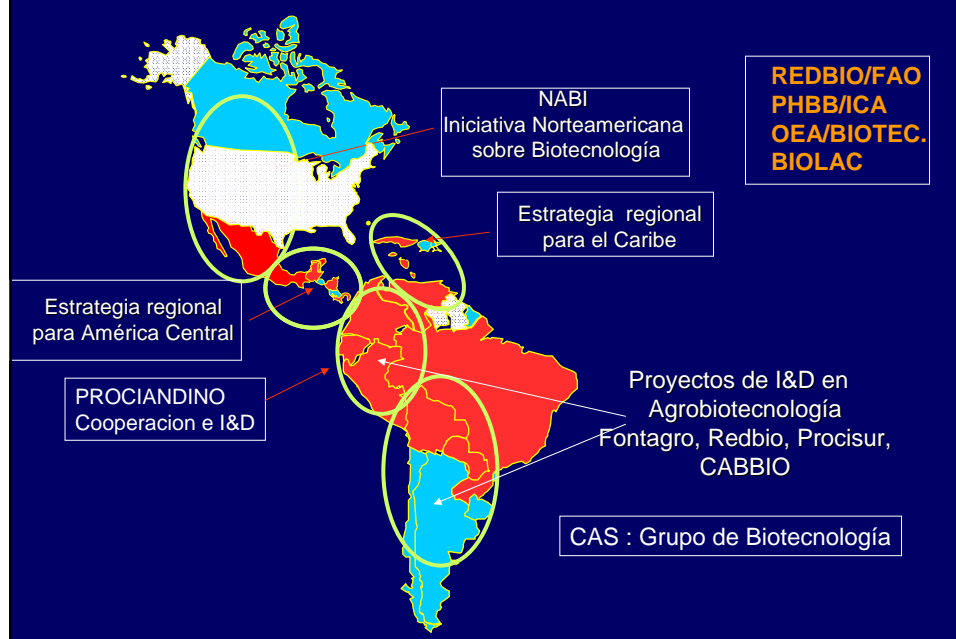
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### SOME REGIONAL COOPERATIVE PROGRAMS IN BIOTECHNOLOGY

Program	Funding/Administrative Agency	Coverage
<b>BIOLAC (1988- )</b>	United Nations University	All areas, emphasis on basic techniques
<b>REDBIO (1990- )</b>	FAO	Focus on plant biotechnology
<b>Biotechnology Program (1988- )</b>	OAS	All areas of science
<b>CamBioTec (1996- )</b>	IDRC, CIDA and national partners	All areas / Canada, Argentina, Chile, Colombia, Cuba and Mexico
<b>CABBIO (1985- )</b>	Independent Agency/Member Countries	All areas of science/ Argentina and Brazil; since 1993 all MERCOSUR countries (Chile requested membership in 2000)
<b>PROCISUR</b>	Member Countries of Southern Cone/IICA	Technological Advances in Competitiveness.: Argentina, Bolivia, Brazil, Chile, Paraguay, Uruguay.
<b>PROCIANDINO</b>	Member Countries of Andean Region/IICA	Institutional strengthening of NARIs: Bolivia, Colombia, Ecuador, Peru and Venezuela
<b>CARICOM Regional Biotechnology Agenda/ Grupos Consultivo</b>	To be defined/ Contributions from IICA, CARDI and UWI	All areas related to agriculture. Includes all CARICOM countries.
<b>FONTAGRO</b>	Countries-IICA/ IDB	Regional research projects using agrobiotechnologies tools
<b>FORAGRO</b>	Members /IICA	Priority: New agrobiotechnologies; policies, alliances, regional hemispheric agenda.
<b>CAC- SICTA-Central America Reg. Strategy Agrobiotechnology</b>	Council of Ministers and SICTA	Being formulated. Guatemala, Honduras, El Salvador, Nicaragua and Costa Rica.
<b>NABI (North American Biotechnology Initiative)</b>	Member countries	Areas of trade, research, information and compliance with CPB: Canada, USA, Mexico

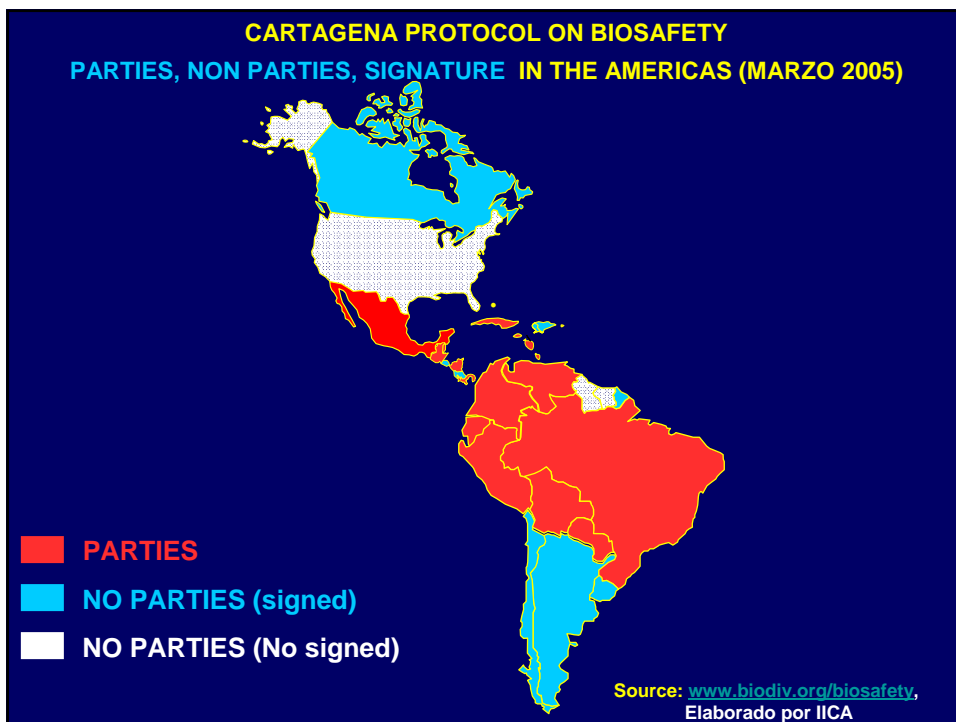
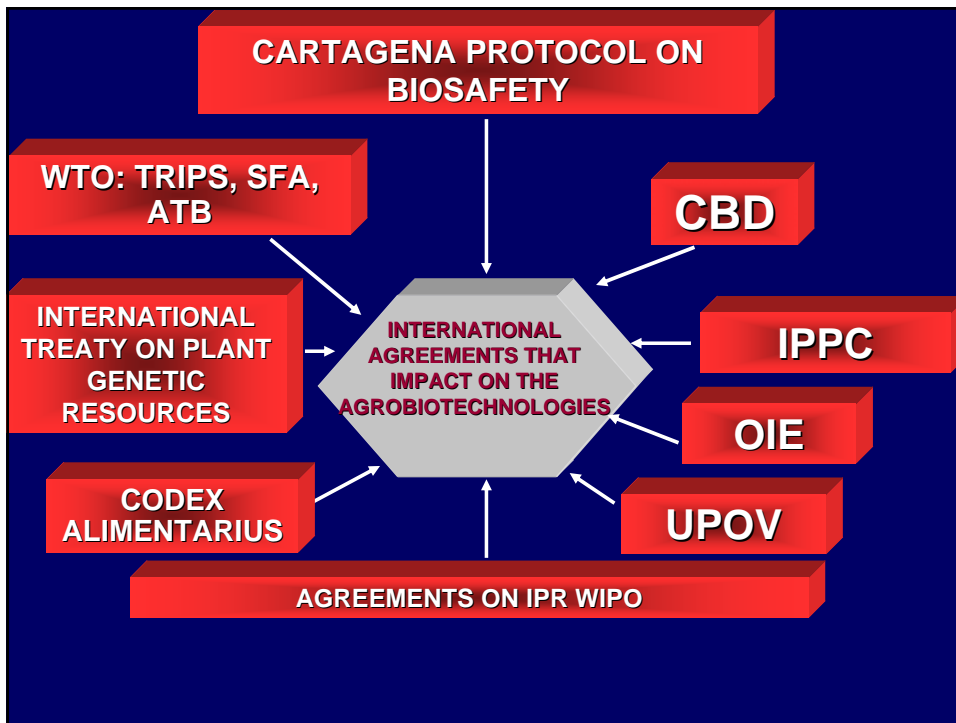
Source: IICA (2004) and Trigo et al. (2002).

## Regional Initiatives (Strategies) in Agrobiotechnology

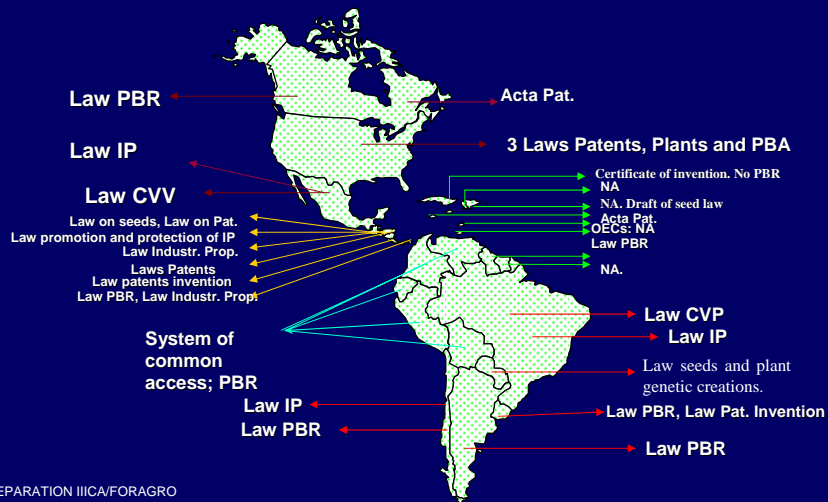


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## REGIONAL SITUATION REGARDING INTELLECTUAL PROPERTY RIGHTS FOR AGRICULTURE (Plant Breeders Rights and other systems)



## USE OF PRODUCTS OF BIOTECHNOLOGY BY NARS: LEVEL OF KNOWLEDGE REGARDING PROTECTION OF IPRs



Source: ISNAR: Salazar, S. C.Falconi, Jkomen, Cohen. 2001

## State of the agro- biotechnologies in LAC

### Policies:

- Few countries with policies defined;
- Technical and financial deficiencies in their implementation;
- Ambivalence of political will in several countries;
- Reduced participation of private sector and public-private partnerships;
- Linkages among research, agroindustry and trade

### Regulatory Aspects

- Progress on national biosafety regulations
- Heterogeneity of IPR regulations and less management capability
- Potential conflicts between Parties and non-Parties
- International agreements with topics not clearly defined
- Complexity of implementation
- Lack of evaluation of impacts of implementation of frameworks

### Thematic Areas

- From tissue cultures to genetic engineering and genomics
- Tissue culture and micropropagation dominate
- Research on genetic engineering is mostly public

## State of the agrobiotechnologies (continued)

### R&D

- Adequate operating capacity; concentrated in few countries
- Technical-scientific asymmetries between countries
- Greater development in plant biotechnology
- Low levels of investment in research

### Public perception

- Not fully formed (at times distorted)
- Misunderstanding of Biotechnology; Biotech = transgenic = hazards
- Misunderstanding of impacts and benefits
- Generalized ignorance and emotional issue

### Cooperation between countries

- Some existing regional efforts; greater coordination needed
- Lack of a regional (hemispheric) vision and agenda

### Trade and agroindustry

- 25 years of work in region, but few products marketed
- Few benefits for small-scale agriculture
- Conditions less than ideal for R&D and the marketing of LMOs
- Possible obstacles in the trade of some food crops

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**Inter-American Institute for Cooperation on Agriculture (IICA)**  
Technical Cooperation Secretariat

**Hemispheric Biotechnology and Biosafety  
Program (HBBP): Frame of reference for  
its formulation and implementation**  
(in preparation with the countries)

**“Uniting the countries of the Americas for the  
development and safe use of agrobiotechnologies”**

## Purpose of the HBBP

..... To contribute to the development, management and safe use of agrobiotechnologies and their products, by means of joint activities that the countries will carry out based on their common priorities and strategic efforts, to achieve a competitive and sustainable form of agriculture in the Americas.

## Objectives of the HBBP

1. Identify needs of the countries and assess impacts and benefits of agrobiotechnologies
2. Provide information useful for decision-making processes and to improve public perception
3. Support the design, harmonization and implementation of policies and regulatory frameworks, with emphasis on countries that do not have them
4. Promote an objective public perception of agrobiotechnologies and encourage that aspect in national policies and programs
5. Strengthen national capabilities by means of regional initiatives and reciprocal cooperation among countries





**THANK YOU**

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