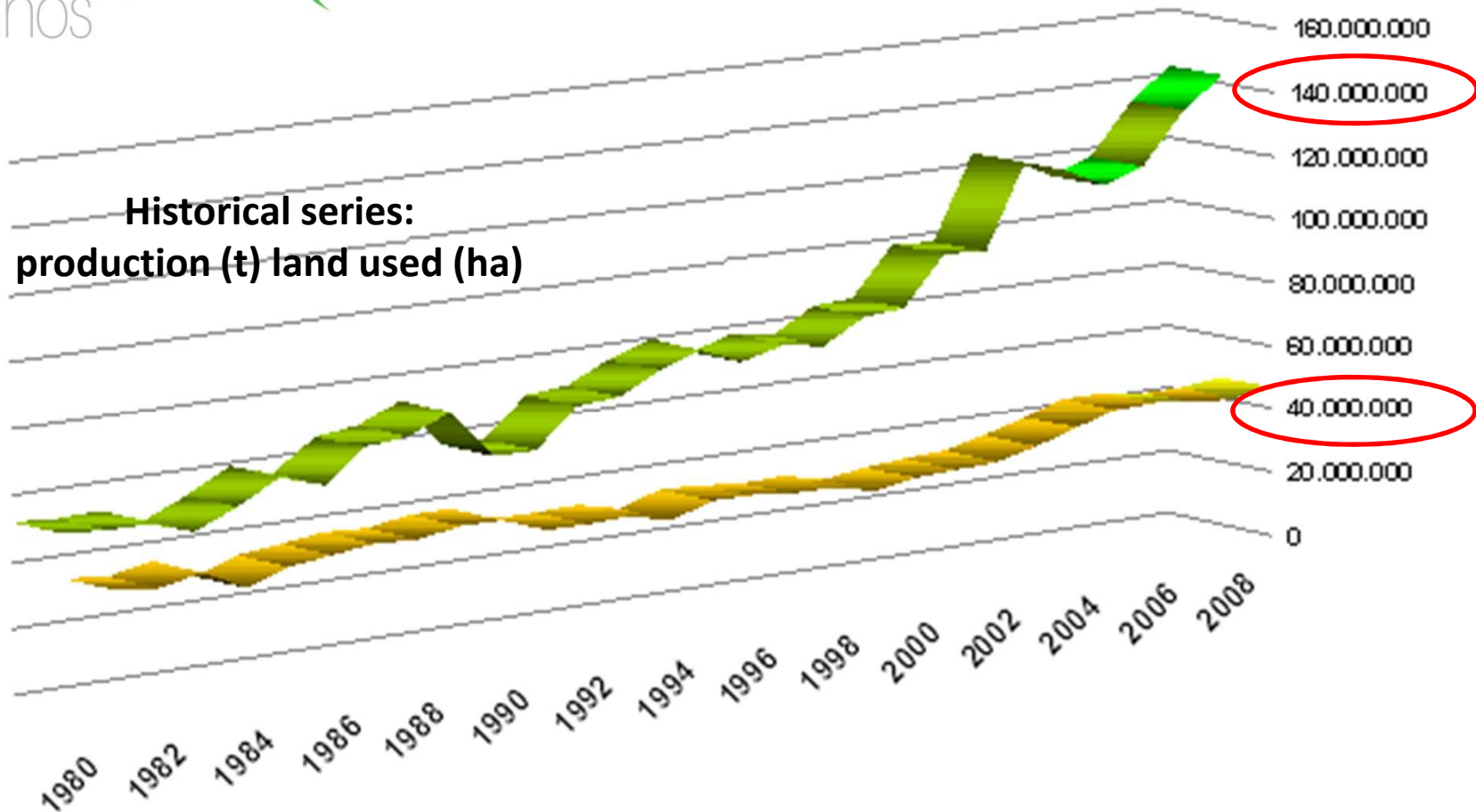




# How biotechnology is making Brazilian agriculture more sustainable

**Adriana Brondani – PhD in Biological Sciences**  
**Executive Director, Brazilian Council for Biotechnology Information (CIB)**

# Agriculture Overview



- Over the last 20 years Brazil have increased agriculture production by 176%, however; its land used increased only by 37%
- That means that we have saved 53 million hectares through productivity

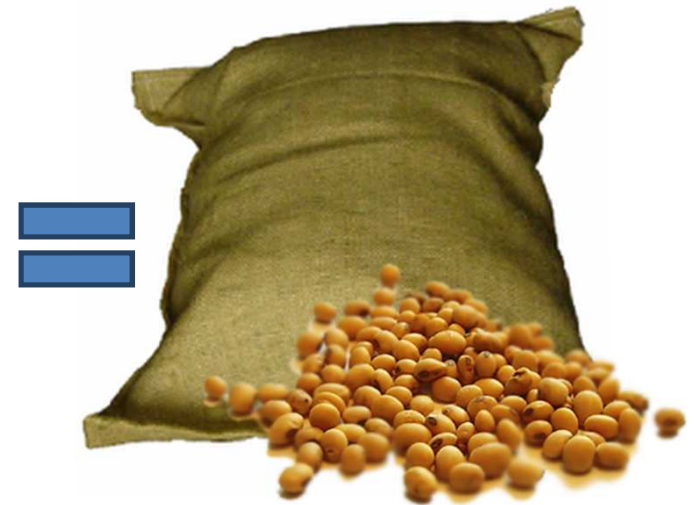
Brazil's Institute of Geography and Statistics, 2008

# Agriculture Overview

## Land needed to produce 1 bushel of soybeans

•• 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011

240m<sup>2</sup>



## How will we reach it?

Research

Crop Protection

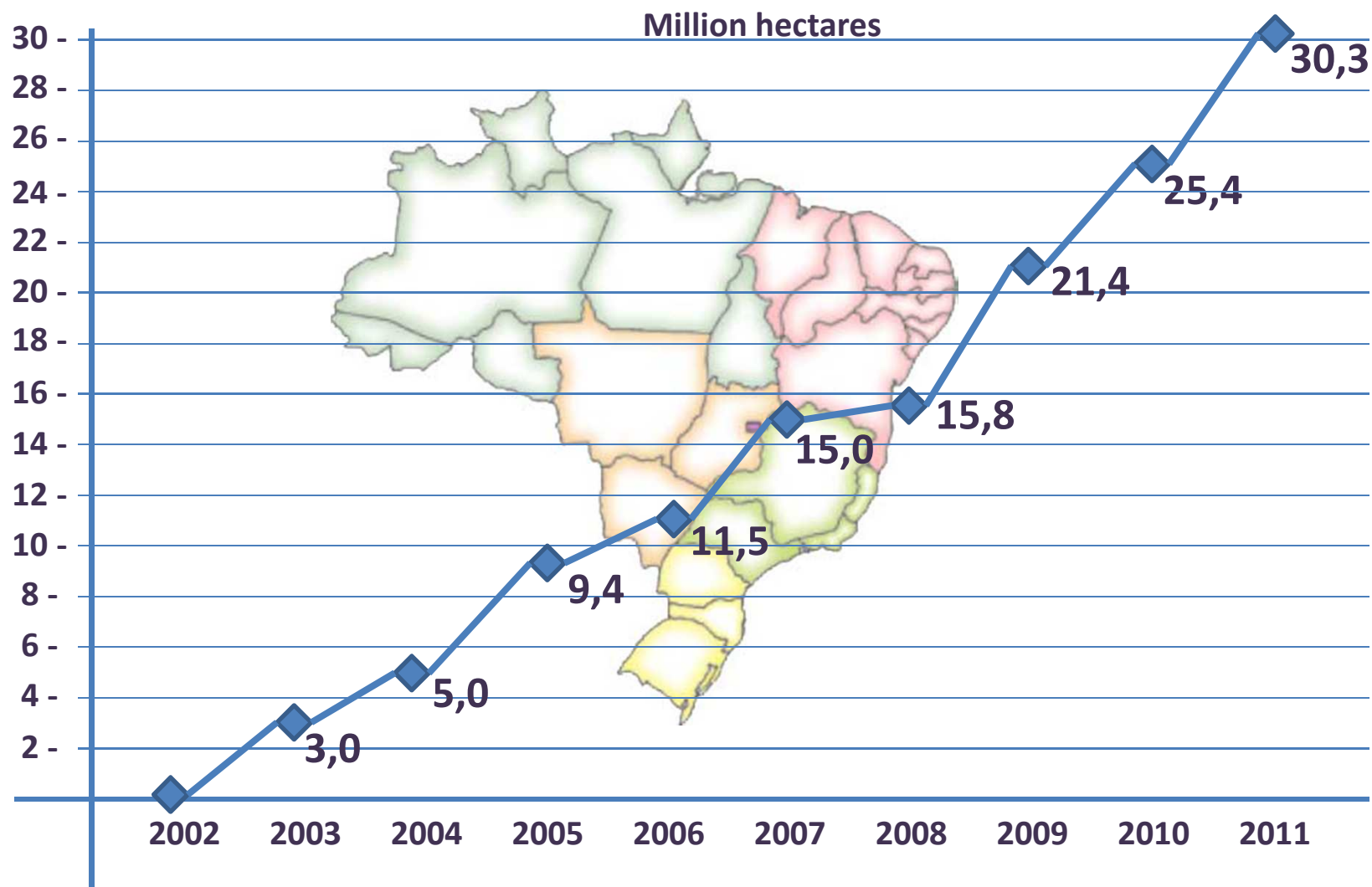
Qualified farmers

Biotechnology

Management

Mechanization

# Biotechnology Adoption



# Regulatory Framework

1995 - 2004

8974/95 law – Biosafety Law

- Each GMO should be analyzed separately

Environment law

- All GMOs are potentially pollute the environment

2004

TRF (Regional Federal Court)

- Decided that a specific law is overlaps a general law

Environment law

Environment law

2005

11.105/05 law – New Biosafety Law

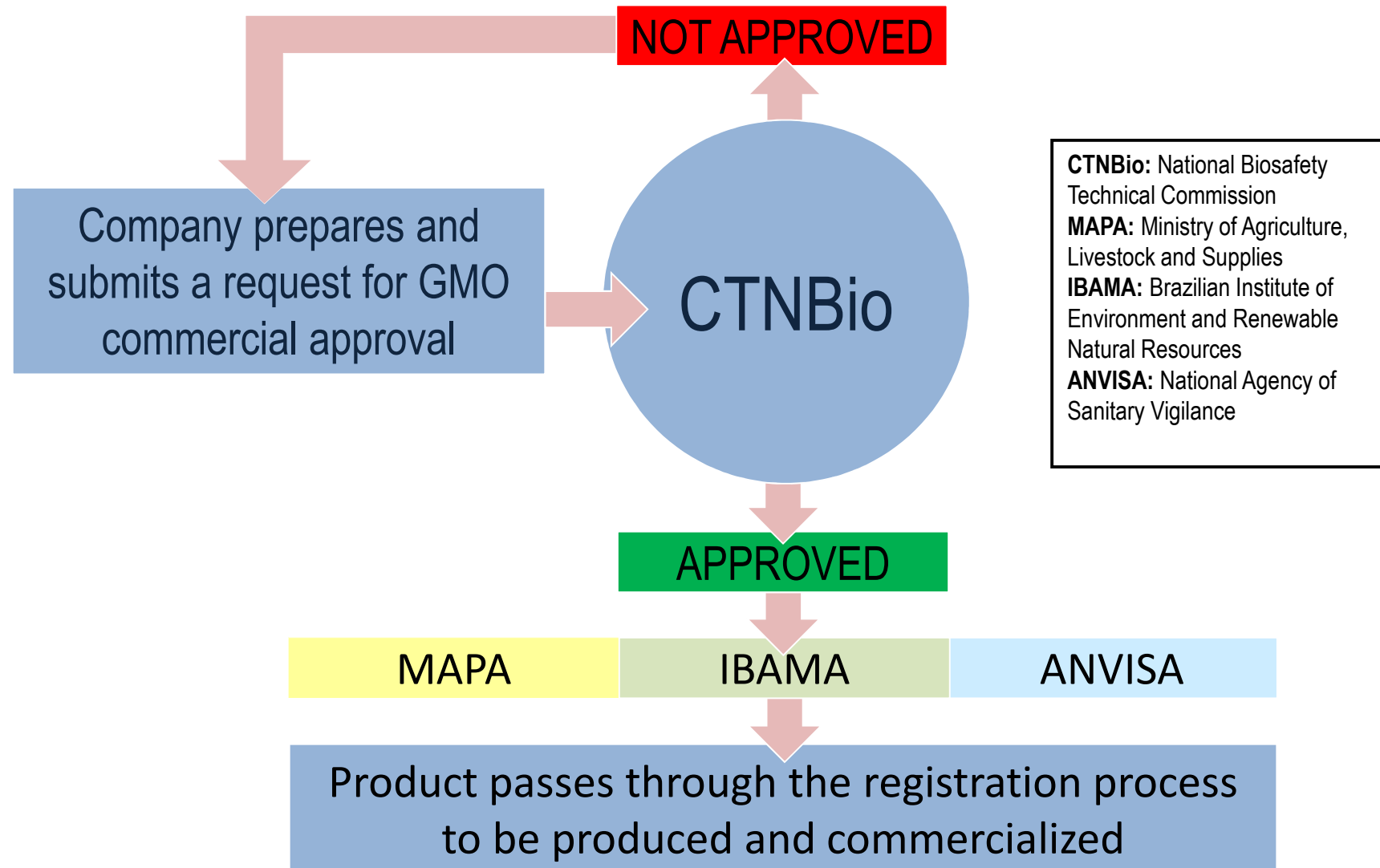
- Harmonized our Regulatory Framework
- Establishes safety standards and mechanisms for activities with GMOs



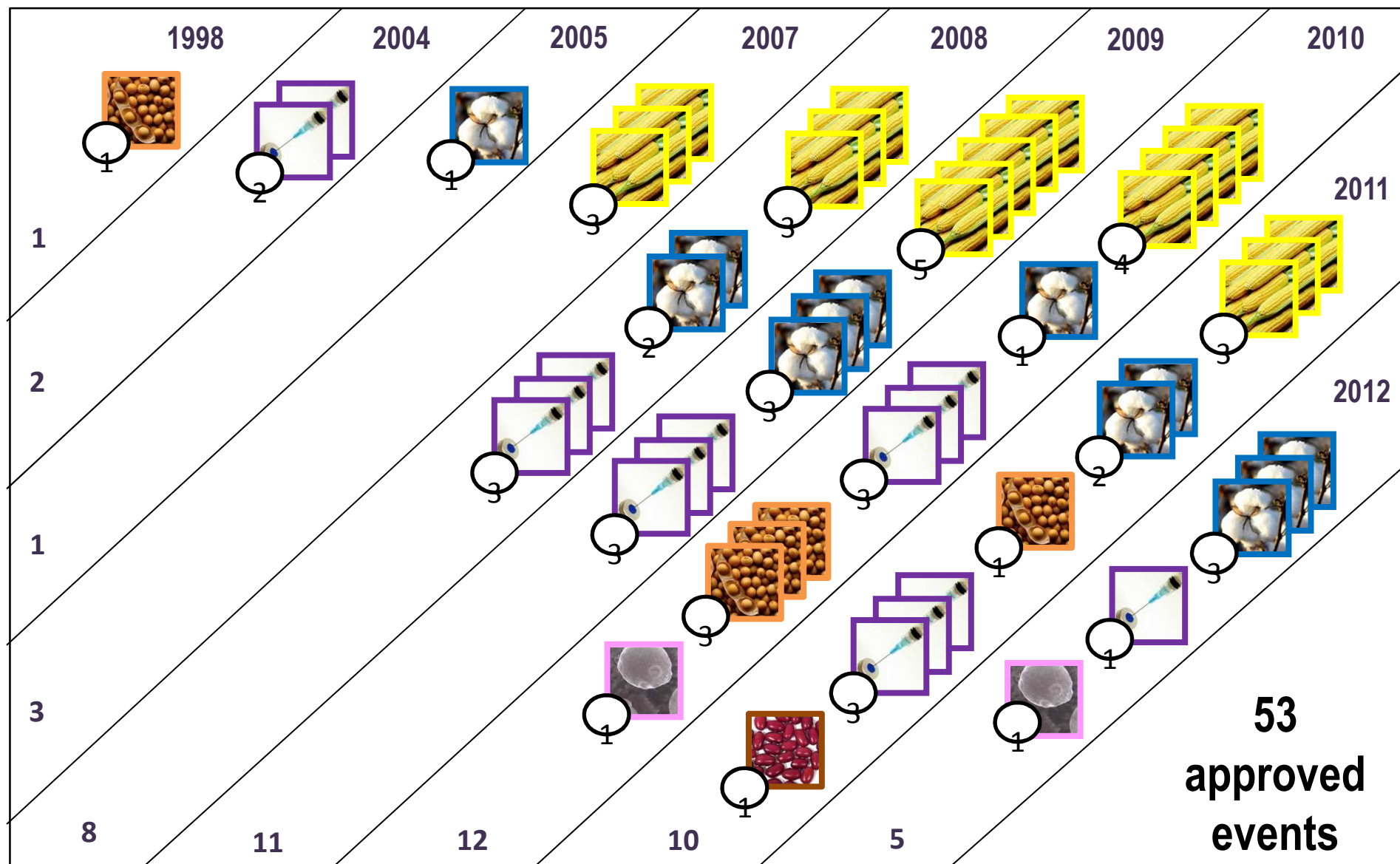


# Regulatory Framework

Since 1995 CTNBio is responsible for GMOs approvals in Brazil  
In 2005 CTNBio obtained legitimacy to legislate on GMOs



# CTNBio Approvals



# Environmental Benefits

Benefits in the next 10 years, considering GMOs approved  
in Brazil until 2010/11 harvest



1,2 billion liters of diesel will be saved,  
enough to fuel 465 thousand cars



22 millions of trees  
will be preserved



134 billions liters of water will be reduced. That's  
enough to provide water to 3 million people



3 millions of tons of CO<sub>2</sub> will not be thrown in the  
atmosphere



197 thousand tons of chemical products  
reduced

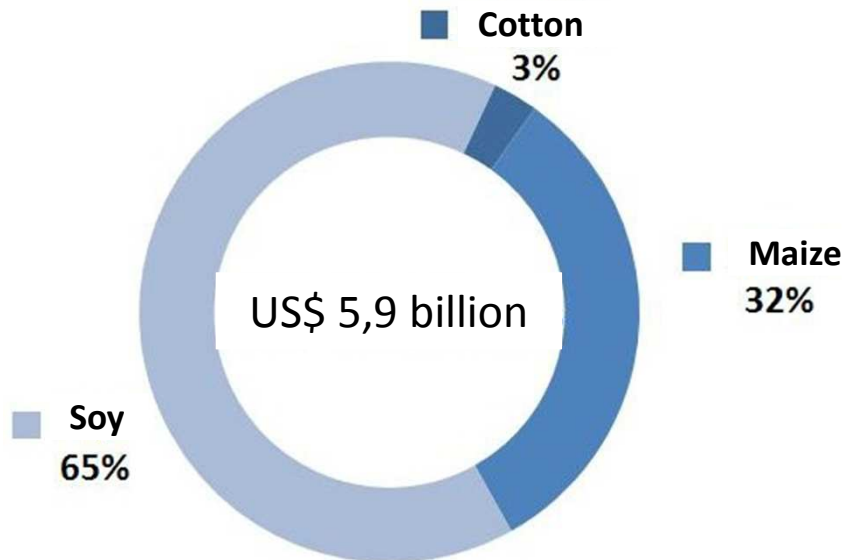


# Social Economical Benefits

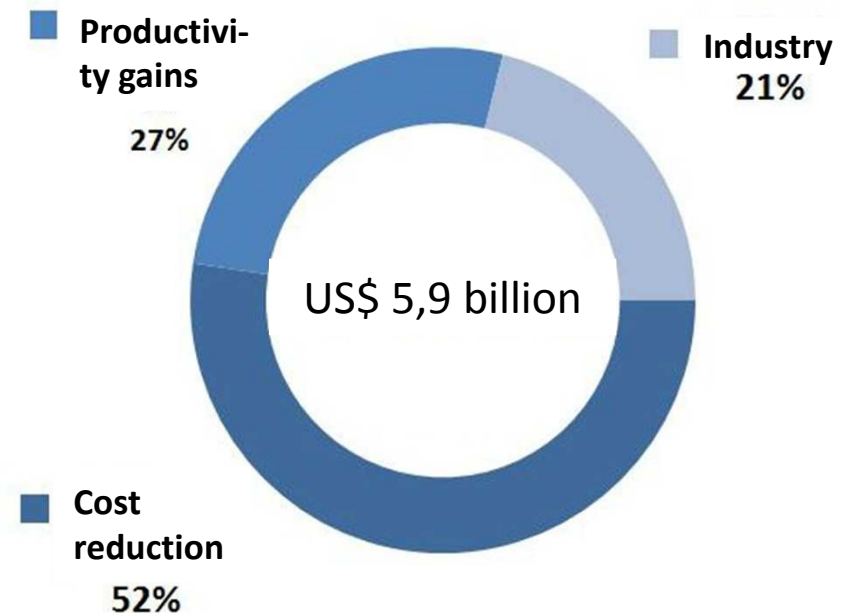
On the last 14 harvests, it generated \$ 5,9 billion by the adoption of biotechnology, before leaving the farm

Direct benefits from biotechnology adoption in Brazil, from 1996/97 – 2009/10

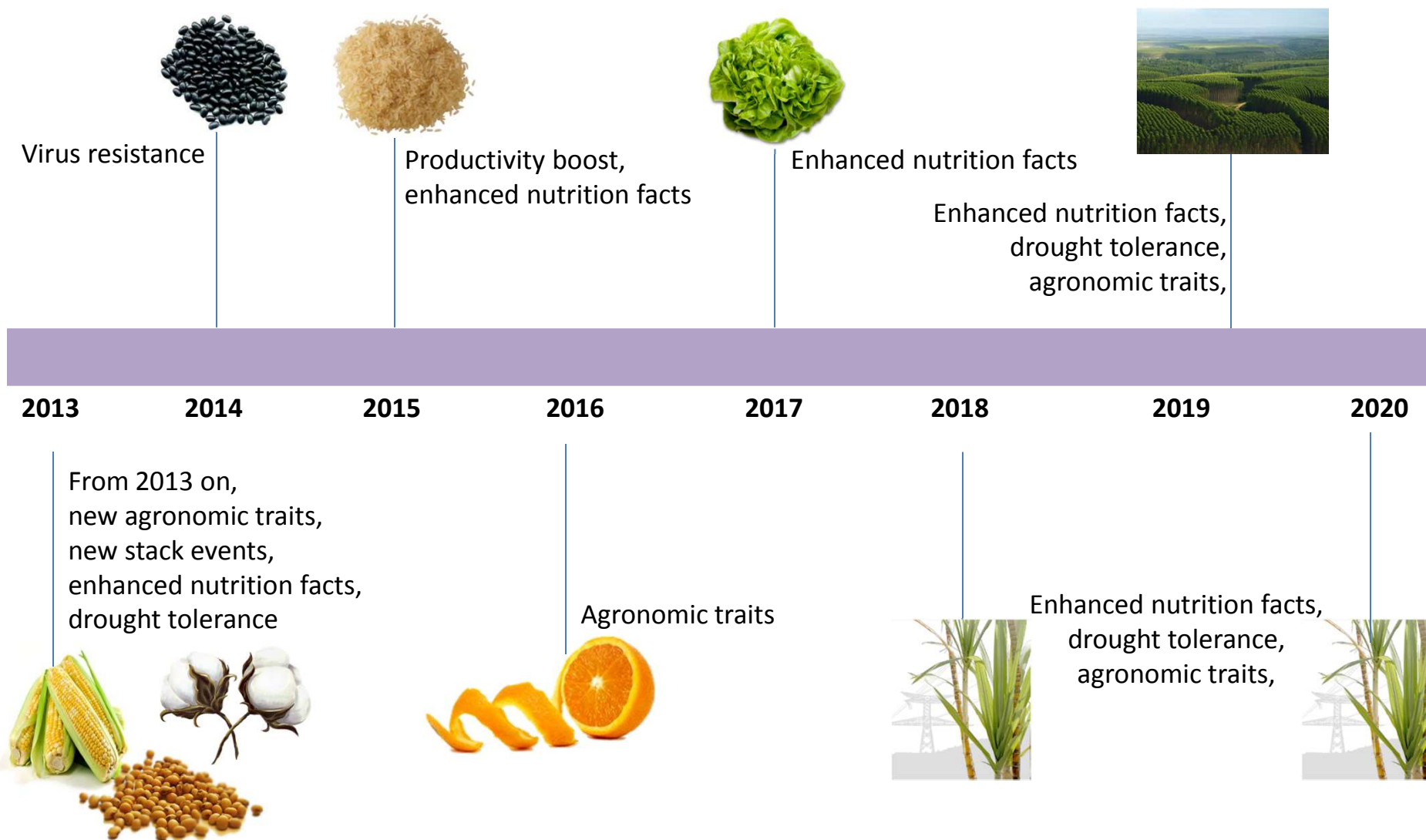
- Economical benefit, by crop



- Economical benefit, by segment

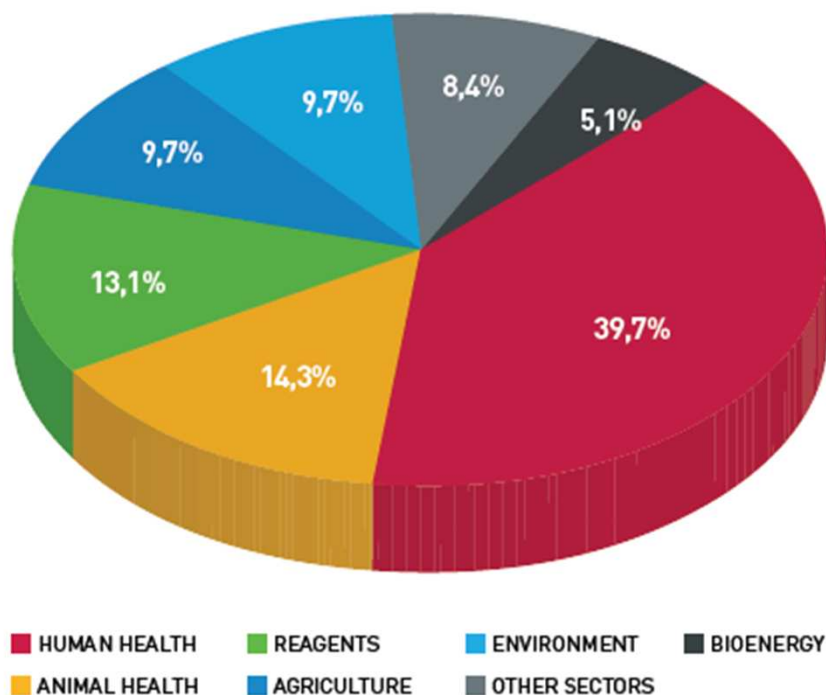


# Research and Perspectives



# Brazilian Biotech Companies

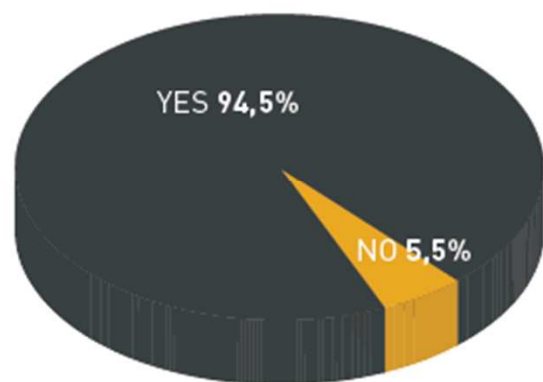
GRAPH 2 **Biotechnology companies by area of activity.**



Source: BRBIOTEC Brasil / Cebrap, "Brazil Biotech Map 2011" (n=237).

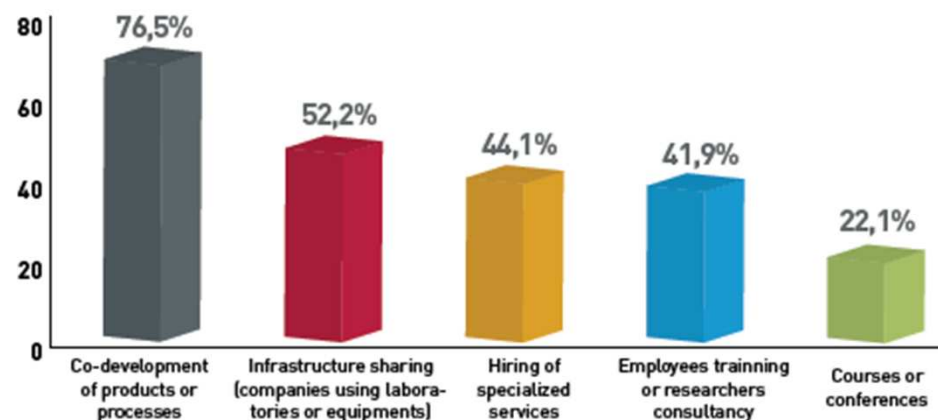
# Brazilian Biotech Companies

**GRAPH 11 Does the company has a relationship with universities or research intitutes?**



Source: BRBIOTEC Brasil/Cebrap, "Brazil Biotech Map 2011". (n=145).

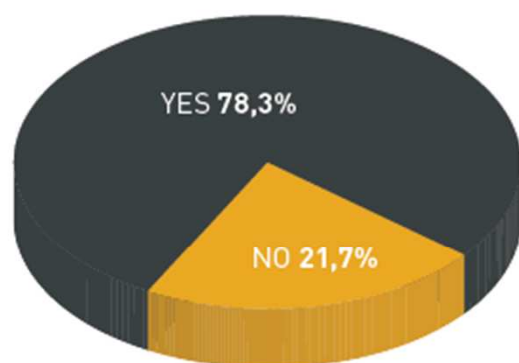
**GRAPH 12 What is the aim of this partnership?**



Source: BRBIOTEC Brasil/Cebrap, "Brazil Biotech Map 2011". (n=136).

# Brazilian Biotech Companies

GRAPH 13 Does the firm use public resources for R&D&I?

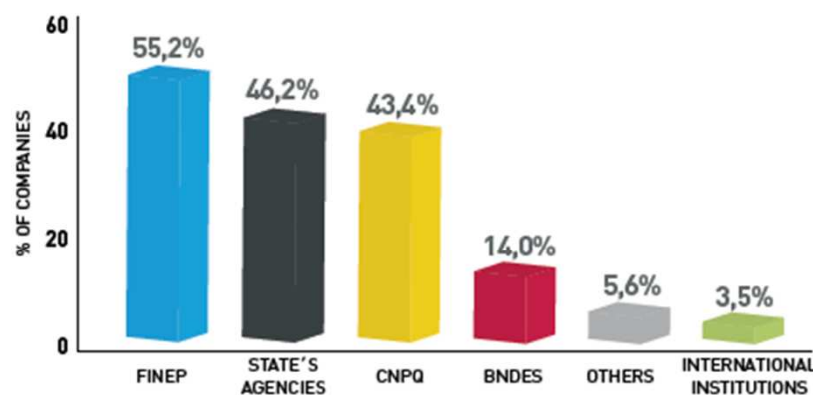


Source: BRBIOTEC Brasil/Cebrap, "Brazil Biotech Map 2011". (n= 143).

<sup>22</sup>Financiadora de estudos e projetos (Finep).

<sup>23</sup>Fundação de Amparo à Pesquisa do Estado de São Paulo (Fapesp) e Fundação de Amparo à Pesquisa do Estado de Minas Gerais (Fapemig).

GRAPH 14 Companies (%) that use public funding per institution



Source: BRBIOTEC Brasil/Cebrap, "Brazil Biotech Map 2011". (n=143).



# Brazilian Biotech Scenario

## Opportunities x Challenges

Innovation Technology Centers

Intellectual property

Solid regulatory framework

R&D

Global leader in GMO production

Investment

Developer and user of new  
technologies



# Thank You

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