Sharing information with Latin-American & Caribbean Countries

Global Status of Genetic Modified (GM) Crops: 2010

Inter-American Institute for Cooperation in Agriculture

Directorate of Technical Cooperation

Program of Innovation for Productivity and Competitiveness

Area of Biotechnology and Biosafety

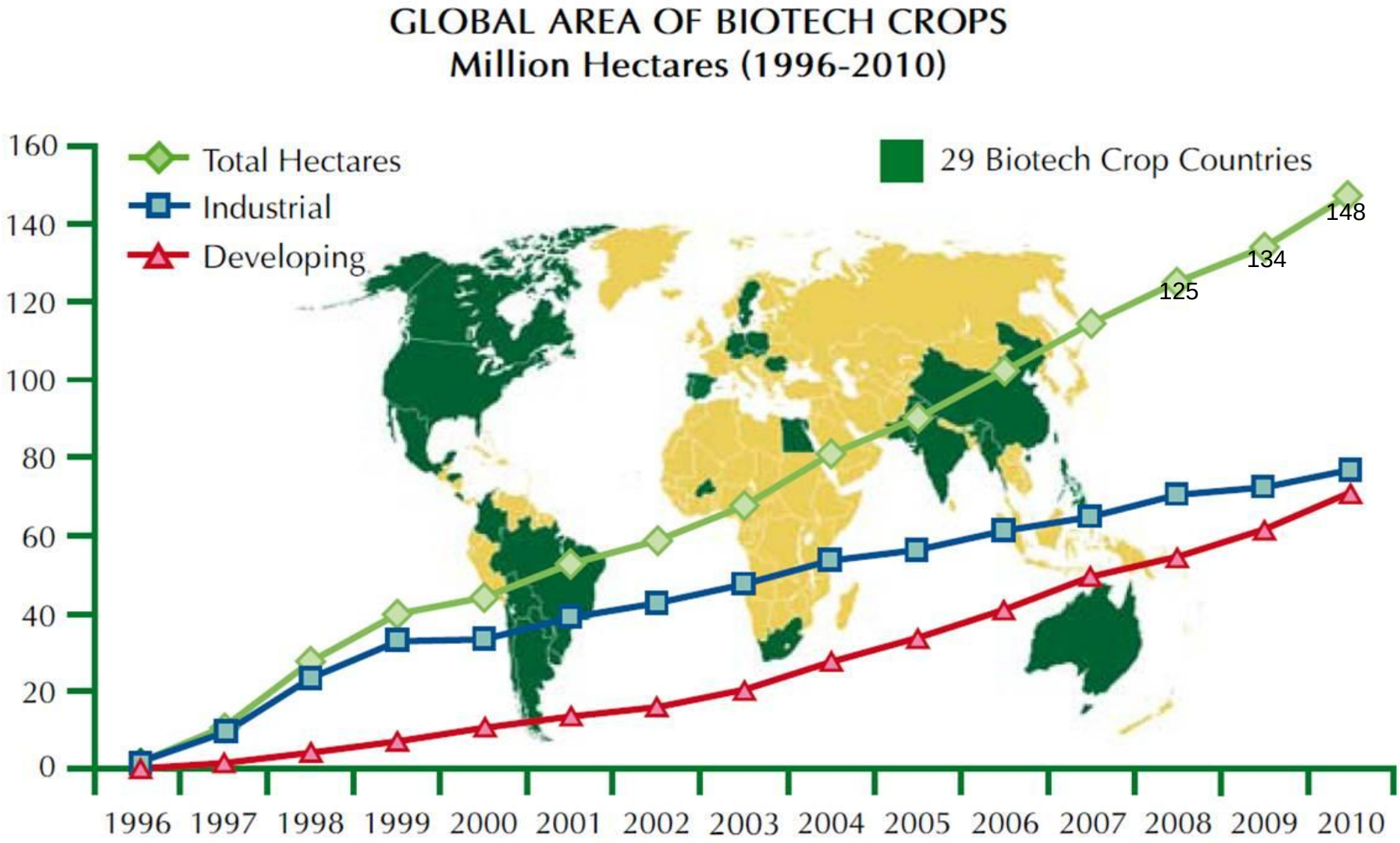
21 June 2011

Source of Information

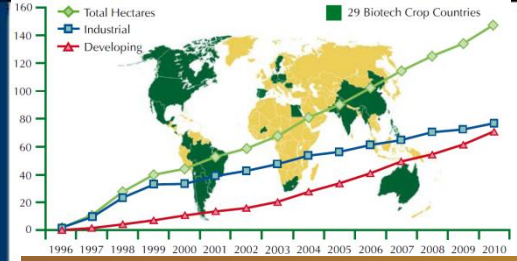
ISAAA: International Service for the Acquisition of Agri-biotech Applications

www.isaaa.org

In alignment with the focus of the Area of Biotechnology and Biosafety on "dissemination of technical and scientifically verifiable information"



Source: Clive James, 2010.

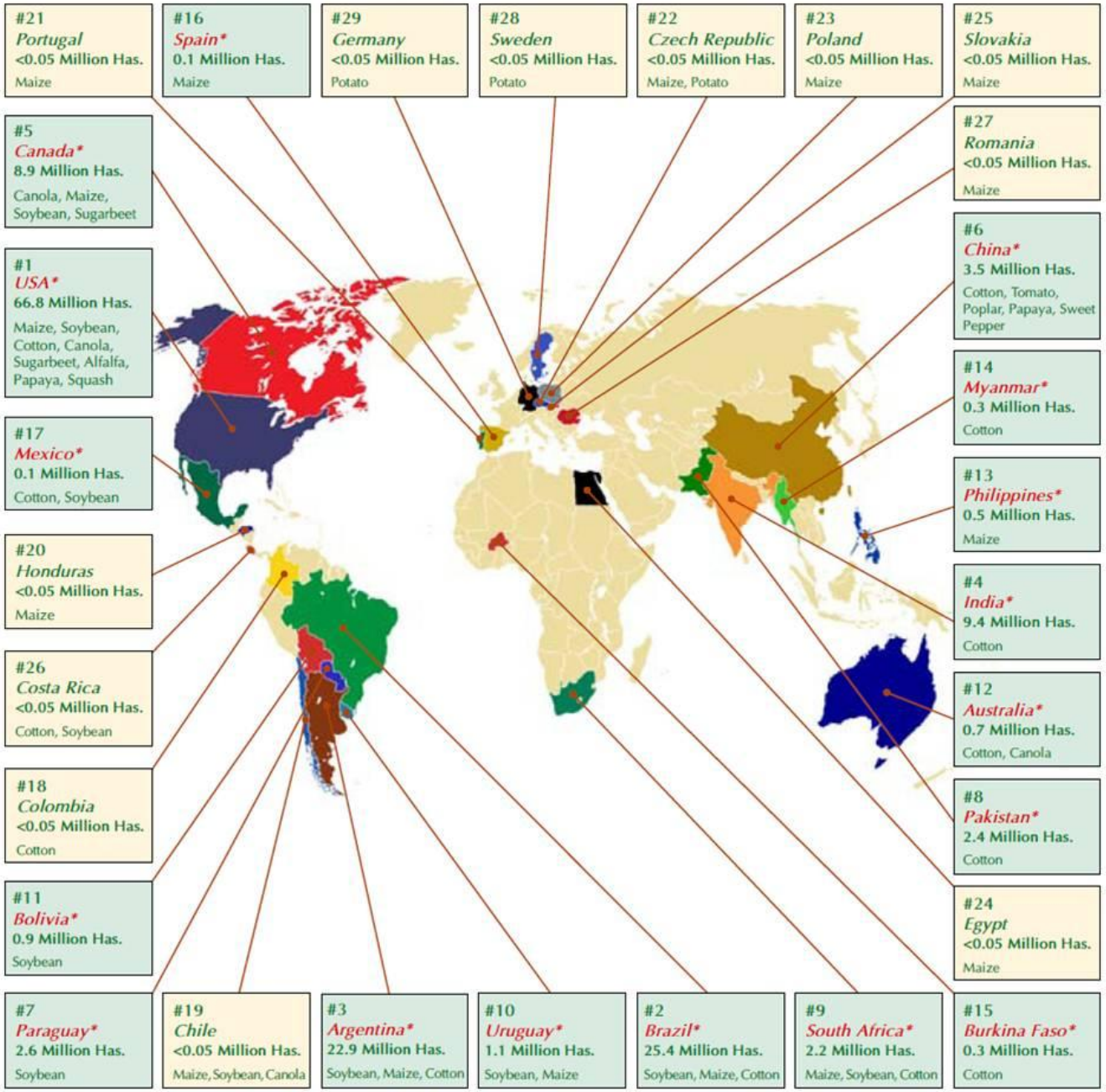


Highlights 2010

- 2010 is the 15th anniversary of commercialization of GM crops (1996).
- 148 million ha planted in 2010.
  - 10% increase.
  - ~10% of all 1.5 billion ha of cropland in the world.
- 29 countries planted GM crops.
  - 30 additional countries have granted approval to GM crops (29+30=59).
  - 19 were developing countries.
  - 59% of world´s population lived in the 29 countries.

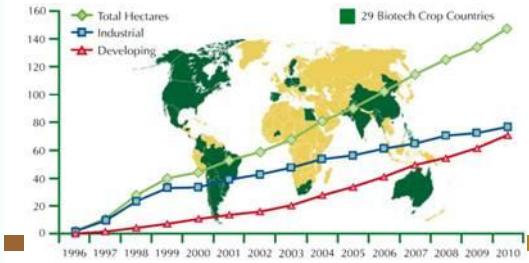
Source: Clive James, 2010

Biotech Crop Countries and Mega-Countries*, 2010



* 17 biotech mega-countries growing 50,000 hectares, or more, of biotech crops.

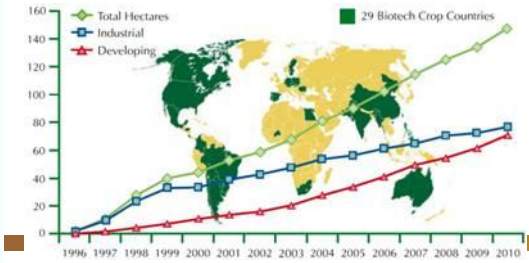
Source: Clive James, 2010



Highlights 2010

- The top ten countries each grew more than 1 M ha.
- Three countries planted GM crops for the first time
  - Pakistan (Bt cotton), Myanmar (Bt cotton), and Sweeden (Amflora potato).
- Brasil increased in 4 M ha area of GM crops.
- Germany resumed adoption and planted GM potato (Amflora).

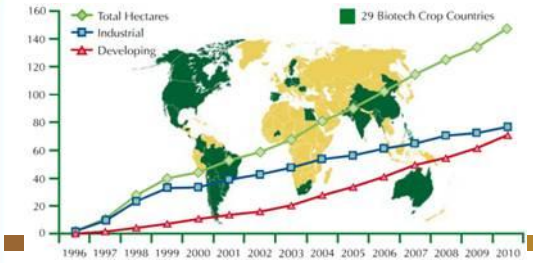
Source: Clive James, 2010



Highlights 2010

- Mexico, the center of origin of maize, conducted the first field trials of Bt and herbicide tolerant maize.
  - 11 year moratorium.
  - Trials will generate valuable information regarding use of adequate biosafety measures.
  - It will determine key aspects of co-existence of GM and conventional maize.

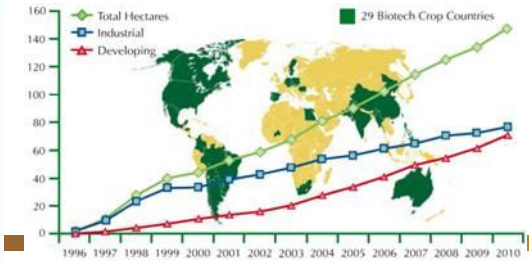
Source: Clive James, 2010



Highlights 2010

- 15.4 million farmers grew GM crops.
- 14.4 million were small resource-poor farmers in developing countries.
  - On average, farmers with less than 0.6 ha.
  - China (6.5 M), India (6.3 M), Pakistan (0.6 M), Myanmar (0.4 M), Phillipins (0.25 M), Burkina Faso (0.1 M), other developing countries (0.2 M).
- The fastest adopted crop technology in modern agriculture.

Source: Clive James, 2011

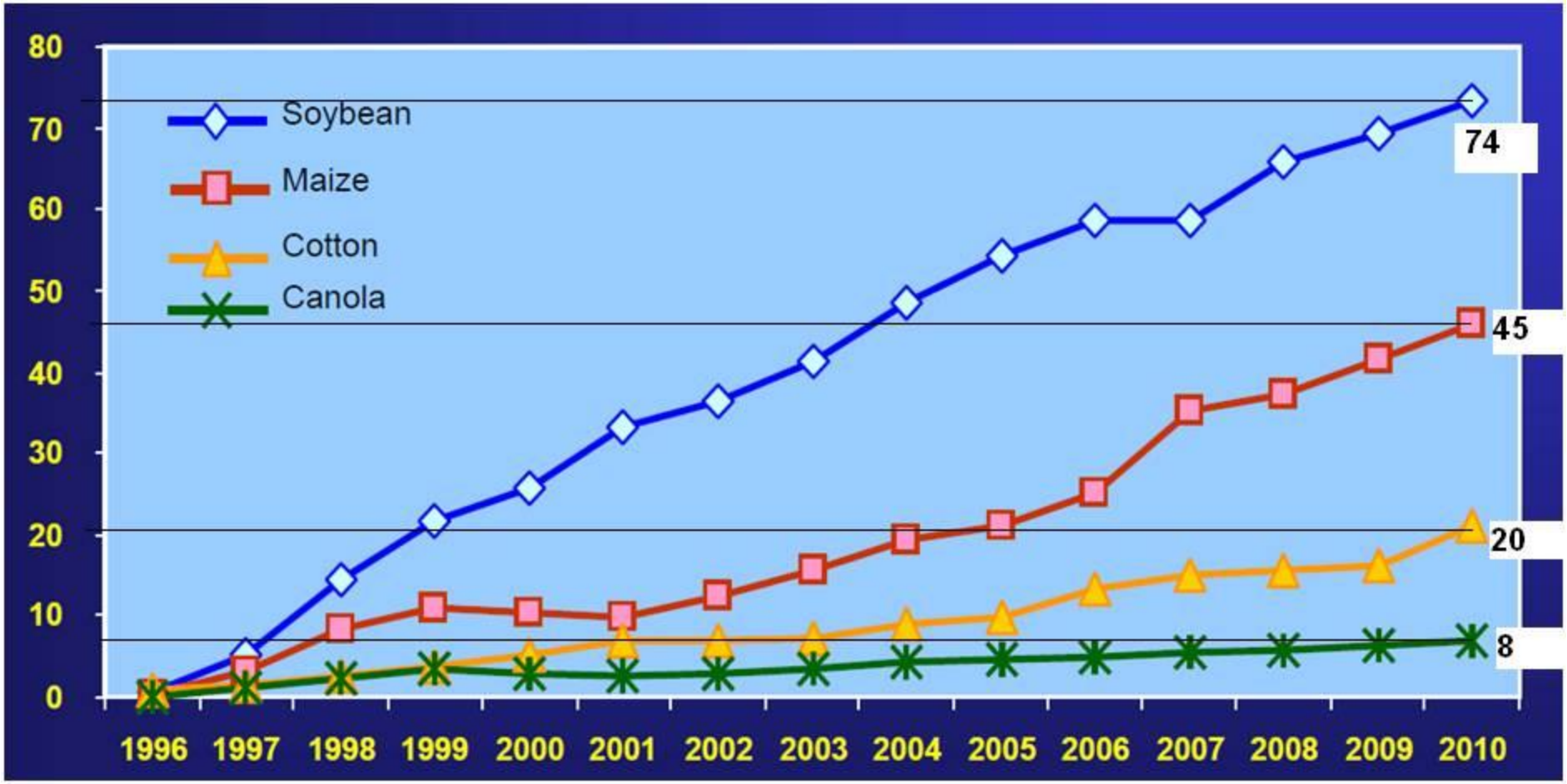


Highlights 2010

- How about GM crops in the world?
  - GM soybean = ¾
  - GM cotton = ½
  - GM maize = ½
  - GM canola = 1/5
- Herbicide tolerant soybean, the dominant crop.
- Herbicide tolerance, the dominant trait.
- Stacked traits
  - 11 countries planted GM crops with stackled traits.
  - Smartstax™: GM maize with eight gene (pest resistance, herbicide tolerant traits).
  - Future stacked crops: Pest resistance, tolerance to herbicides, drought, output traits: high omega-3 oil soybean, pro-vitamine A in rice.

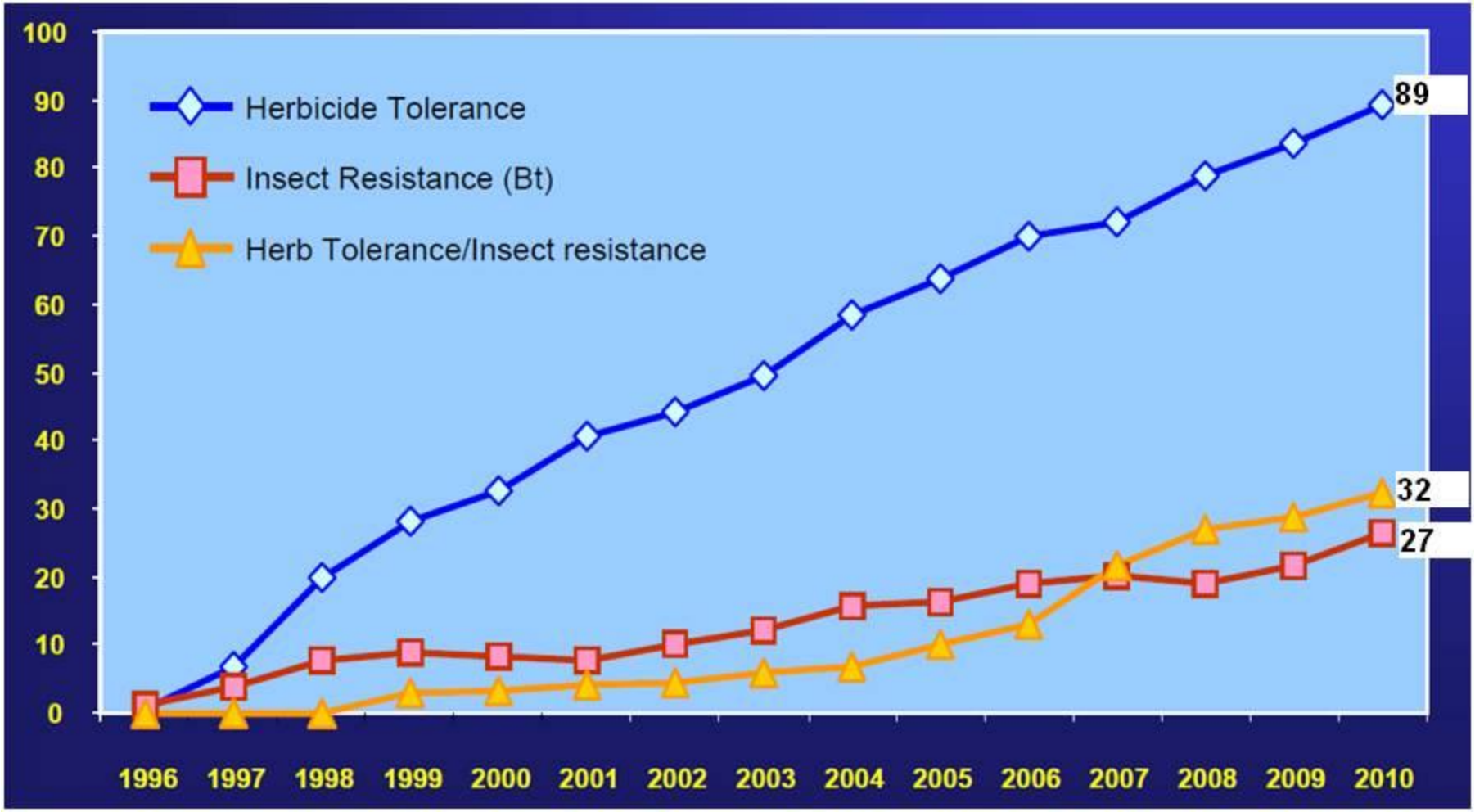
Source: Clive James, 2011

GM crops in the World, 1996-2010:
By crop (Million hectares)



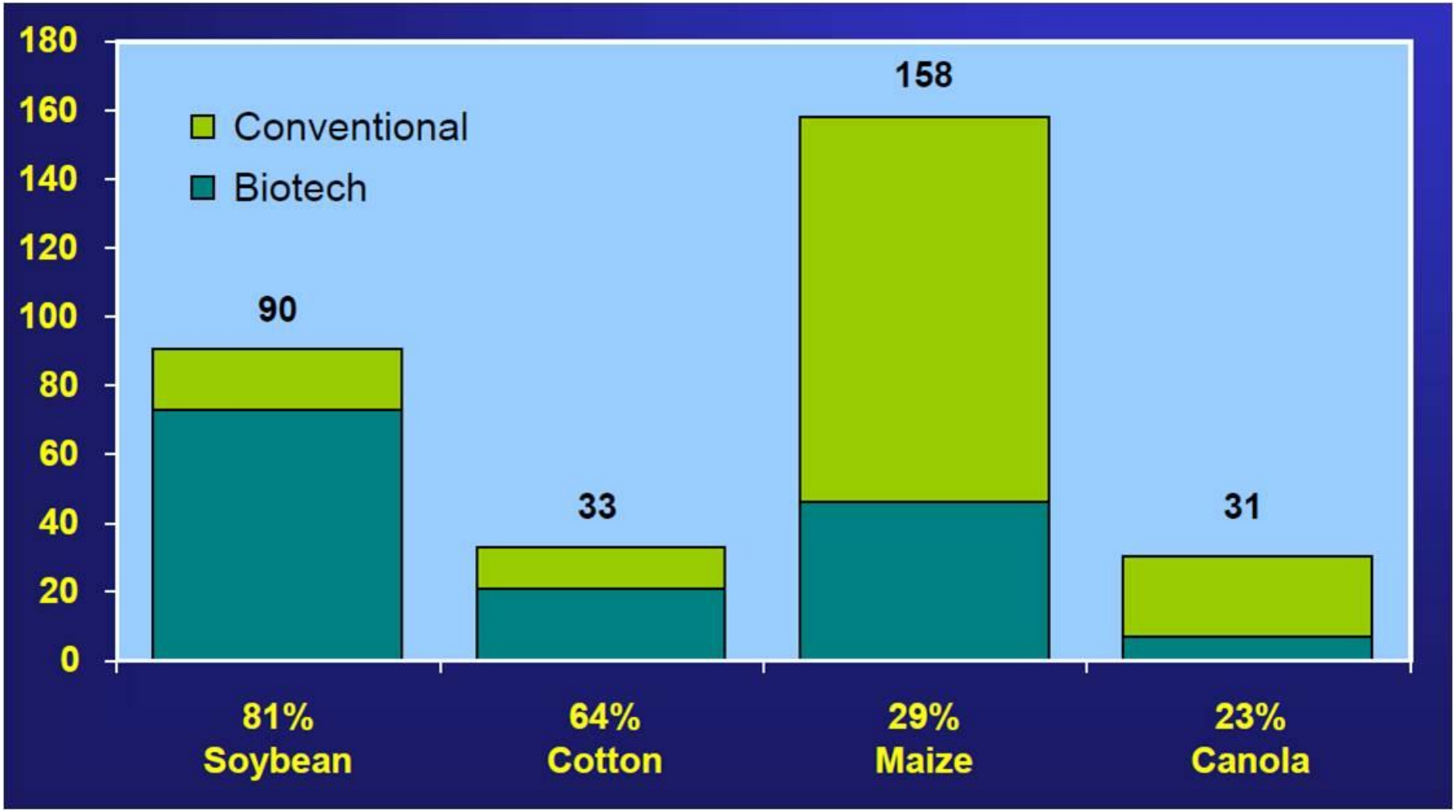
Source: Clive James, 2011

GM Crops in the World, 1996-2010: By Traits (Million hectares)

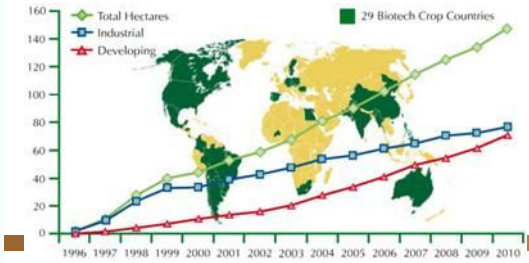


Source: Clive James, 2011

Adoption Rate (%) of GM Crops in the World (Million hectares)



Source: Clive James, 2011

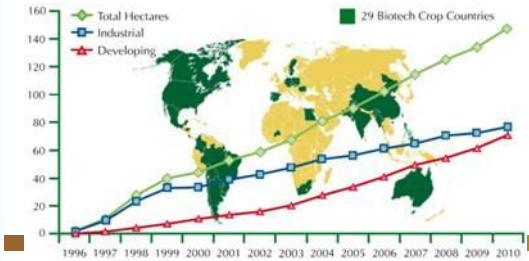


Contribution of GM crops to sustainability

"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (United Nations, 1987)

- Increasing productivity
  - Food, feed and fiber security and self sufficiency (at farmer level)
  - Conserving biodiversity
    - Land-saving technology
    - Optimizing land use
- Reducing agriculture´s environmental footprint
  - Reduction in use of pesticides
    - 1996 – 2009: accumulative reduction of 393 k ton of active ingredient
    - 2009: reducción of 39.1 k ton
  - Saving on fossil fuels
  - Decreasing CO_2 emissions (no or less ploughing)
  - Conserving soil and moisture (due to no till)

Source: Clive James, 2011



Contribution of GM crops to sustainability

- Increasing efficiency of water usage.
  - GM maize hybrids with drought tolerance (to be commercialized in 2012, USA; and 2017 in Sub Saharan Africa).
  - In Australia, GM wheat field trials showed 20% more yield than its non-GM counterpart.

- Helping mitigate climate change and reducing greenhouse gases.
  - Permanent savings in CO_2 emissions through reduced use of fossil based fuels.
    - Fewer insecticide and herbicide sprays.
    - Need for less or no ploughing.
    - In 2009, carbon sequestration was equivalent to a saving of 17.6 million ton (or removing 7.8 million cars).

- Speeding the breeding.
  - Introduction of novel traits.

Source: Clive James, 2011

Requirements

- Regulatory systems
  - Designed 15 years ago
  - Must be:
    - Adequate
    - Responsible
    - Low cost
    - Time efficient
- Communication must move, in parallel, with GM development
- Cooperation Public-Private

Source: Clive James, 2011

Trends

- Crops 2010 – 2015
  - Maize GM with drought tolerance by 2010
  - Golden rice by 2013
  - GM rice by 2016
- Routine use of stacked genes
- Introduction of novel traits
  - Final quality of products for end user –nutraceutics, pharmaceuticals (vaccines, special chemicals, etc.)-

Source: Clive James, 2011

Final thoughts

- GM technology is being adopted in a fast and reliable way.
- GM events are impacting primarily crop producers (herbicide resistance, pest tolerance, etc), but new GM generation of events is coming.
- There are still concerns on risks associated to GM technology.
  - In the past: "*There is a risk adopting GM technology*"
  - At the present: "*There is a risk no adopting GM technology*"
- Current central issue: To labell or not to labell?

Final thoughts

- Implementation of Biosafety frames is essential for the countries.
  - International agreements /commitments.
  - Financial resources available.
  - Use of illegal seed is taking place in countries where there is no Biosafety framework.

- Communication is a key factor for GM technology.
  - The lack of information and the misinformation radicalize the theme.
  - There are different groups to focus with the strategy of communication.
  - **Key issue: Biotechnology is more than just GM-technology**

And what about organic agriculture?

- Statistics (based on “The World of Organic Agriculture”, 2009, 12th ed.)
  - 37 million ha of organic crops.
    - Australia (12M), Argentina (4.4M, USA 1.9M).
    - Growth 6% annually.
  - 1.8 M producers.
    - 40% in Asia, 28% in Africa, and 16% in LAC.
  - Market size: 55 billion USD.

Final thoughts

- Why competition between GM and AO?
  - Both are growing.
  - Both are useful and necessary.
  - AO & GM are not enemies, they are fighters against world hunger and friends of a better environment.
  - Just two techniques used by biotechnology are not accepted by OA:
    - Transgenesis.
    - Use of ionizing radiation for biological alteration.
- **Co-existence** of [GM/AO/conventional] will be the rule.
  - Several topics must be addressed.

Thanks!

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