LMO detection in Brazil:
status, challenges and future needs

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Layout

- The context

- Key points

  – Current status of LMO detection in Brazil

  – Experiences and challenges working in the field of LMO detection

  – Overview of actions needed for the advancement of LMO detection in Brazil

Context

- Brazil second largest producer of GMOs with 42.2 million hectares planted with soybeans, maize and cotton in 2014 (ISAAA Brief 49, 2014)

- 72 GMO event approvals
  - 44 Plants (6 soybean, 24 maize, 12 cotton, 1 pinto bean, 1 eucalyptus)
  - 20 Vaccines (porcine, canine, poultry, etc)
  - 6 Microorganisms (2 microalga, 4 yeast)
  - Others (1 mosquito, 1 enzyme)

LMO detection provisions

- Brazil has traceability and labeling provisions
  - Decree No. 4680/2003 - right of information regarding food and feed ingredients intended for human consumption and animal feed when **they contain (> 1%) or are produced from GMOs**

    (to be replaced by new law– ongoing voting)
  - New Law Project 4148/2008 – eliminates traceability provision, no symbol, no labeling of GM fed animals. "Detectability principle"

Access to information on LMO detection

- **Information relating to LMO detection methods**
  - Requirements upon the developers: DNA based detection methodology and transgene sequence data; but no Certified Reference Materials; insert sequence data is CBI.
  - New Electronic system service for citizen information (e-Sic): access to documents; spread information.
  - Biosafety Information System (SIB): information portal imposed by the Biosafety Law 2005; never existed.

e-SIC
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Activities in the field of LMO detection

Ministry of Agriculture & National Health Surveillance Agency:

- inspect research and commercial activities (cultivation, food and feed import, research labs)
- 2 national and 2 private certified labs
- 1244 inspections in 2013

Ministry of Agrarian Development & Ministry Environment:

- interest potential threats to traditional farming systems and environment (monitoring)

- transgene flow to landraces and LMO presence in seed saving systems

- Partnership with uni labs

Activities in the field of LMO detection

- **Objectives**
  - To contribute to the implementation of CP articles 15, 16, 17, 18 and 26 and Aichi Biodiversity National Targets

  - To pursue **co-existence** of GM and traditional farming systems throughout the agri-food chain (**87% are small-scale properties** corresponding to 44% of the agricultural territory; IBGE, 2006)

  - To promote the protection of **maize landraces** (Shannon Score – High diversity; Almeida et al., 2013) (secondary center of diversity) and others

Experience with LMO detection in Brazil

- **Developed through**

Regional training and capacity building courses in biosafety and detection (small farmers, scientists, regulators, NGOs, etc)

- *Two Latin American Courses (2010 and 2013)*

Networking workshops (research groups), technical support to CTNBio members, research activities

Detection and identification of grains and seeds from seed saving and agroecological systems (free of charge)

Experience with LMO detection in Brazil

- **Gaps and challenges identified by Ministry Agrarian Development**
  - Lack of a legal mandate to perform GM detection in landraces (potential threats to agrobiodiversity, unintentional TB, accidental release, etc)
  - Technical capacity not incorporated into institutional mandate/legal frame (rely on collaborative projects with academia)
  - Lack of sequence information data (CBI)
  - Laboratory method harmonization/standardization for GM detection in landraces (diverse genetic backgrounds)
  - Lack of commercial product support ("regional" LMOs)

Specific areas for capacity building

- **Technical and action needs for the detection of transgenes in landraces and wild relatives**
  - Capacity building in relation to sampling, extraction, LMO detection & quantification, statistics in diverse genetic backgrounds (seed population dynamics in traditional farming is different from trade systems (social factor might be challenging; representative sampling)
  - Capacity building in relation to detection and identification of LMOs created by new plant breeding techniques (RNAi, SDN, etc)
  - Support to set up labs (infrastructure and equipment)
  - Establish monitoring systems for LMO detection in landraces
  - Establish participatory approaches and capacity building with traditional farmers for LMO detection

Ongoing projects involving LMO detection in Latin America

- Conserving the Genetic Biodiversity of Maize in Mexico: Understanding a complex problem and developing participatory solutions http://genok.com/the-biodiverseedy-project

- Strengthen the production and supply of corn seeds for organic and agroecological production in southern Brazil (Federal University of Santa Catarina, SC State University, Small Farmers Cooperative Oestebio)

- Molecular characterization of GM plants using *omics* approaches (Federal University of Santa Catarina and Gen

- Agrobiodiversity mapping Project (detecting transgenes in 30 regions in Brazil) (Ministry of Agrarian Development)

Thank you!

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