



**24, 25 e 26 de maio de 2018**

Marina da Glória - Rio de Janeiro

Threats to Pollinators  
Protecting Bees in Brazil  
Plant Protection:  
side effects, risk assessment  
and management in Brazil

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# ***Brazil: General Information***

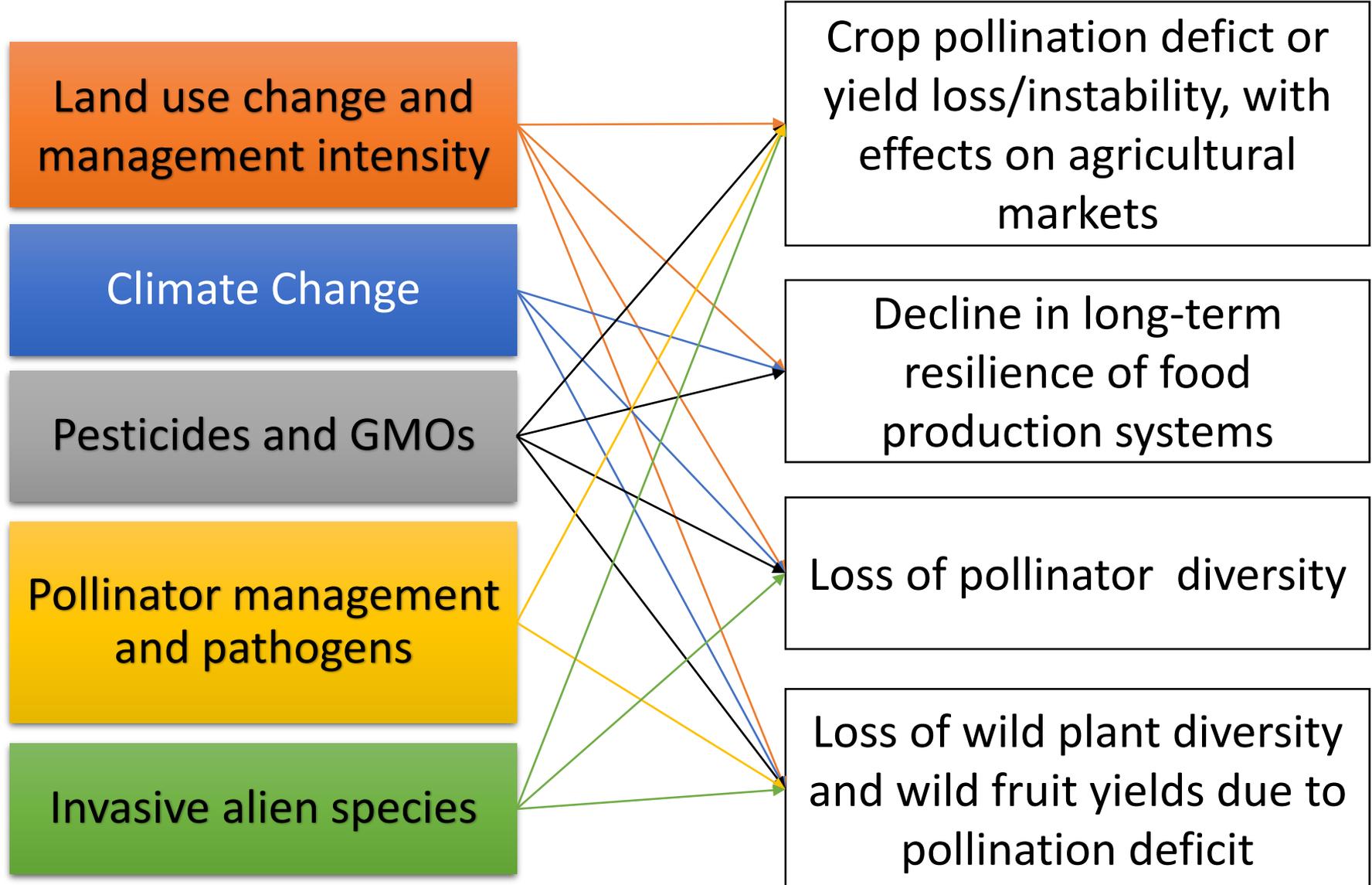


- Total Area: 8.514.877 km<sup>2</sup> (5<sup>th</sup> in the world);
- Biggest country in Latin America;
- Population: 207 millions (2017);
- 26 states, a Federal District and 5.570 municipalities;
- 7 different biomes;
- It is the country with the greatest biodiversity of flora and fauna on the planet.
- 7<sup>th</sup> largest economy in the world;
- 4<sup>th</sup> largest country in cultivated areas
- Agribusiness represents 23% of Brazil's GDP
- Brazilian food is currently sold in more than 170 countries on the global market and, according to FAO (2015), it will be the biggest exporter of food in the next decade
- Since 2008 the largest market of pesticides in the world (in US\$)

Balancing agriculture production and biodiversity protection presents itself as a huge challenge and pollinators constitute a key element for sustainability of agricultural systems



# *Anthropogenic drivers of pollinator decline*



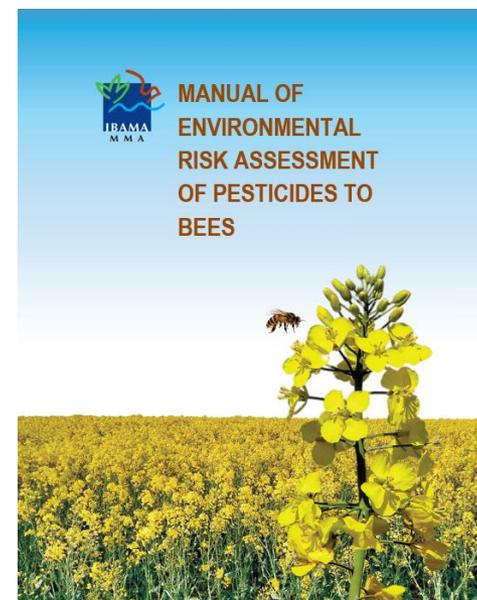
# *Ten policies for pollinators*

What governments can do to safeguard pollination services

## Ten policy recommendations

1. Raise pesticide regulatory standards
2. Promote integrated pest management
3. Include indirect and sublethal effects in GM crop risk assessments
4. Regulate movement of managed pollinators
5. Develop insurance schemes to help farmers benefit from ecosystem services instead of agrochemicals
6. Recognize pollination as an agricultural input in extension services
7. Support diversified farming systems
8. Conserve and restore "green infrastructure" (a network of habitats that pollinators can move between) in agricultural and urban landscapes
9. Develop long-term monitoring of pollinators and pollination
10. Fund participatory research on improving yields in organic, diversified, and ecologically intensified farming

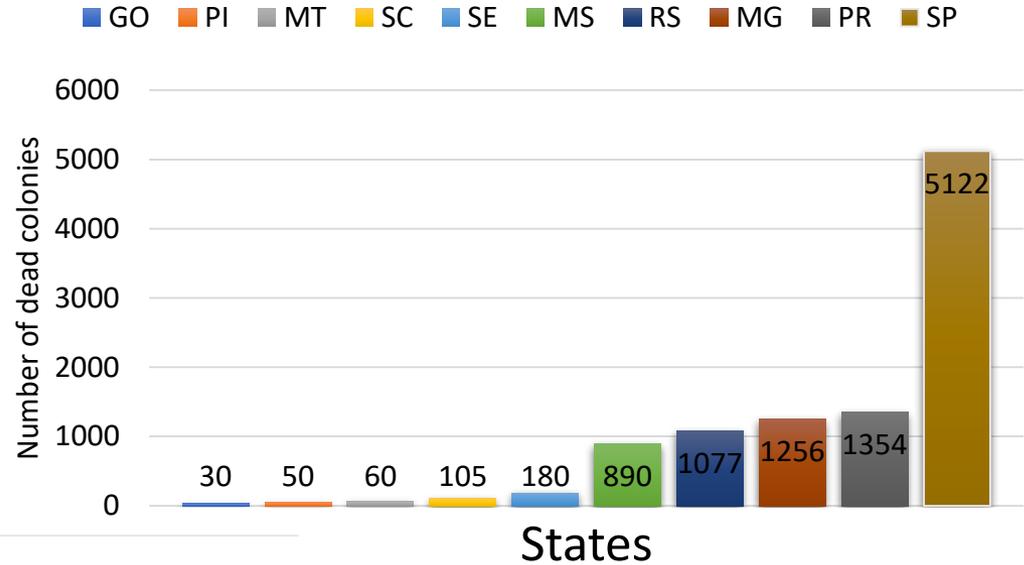
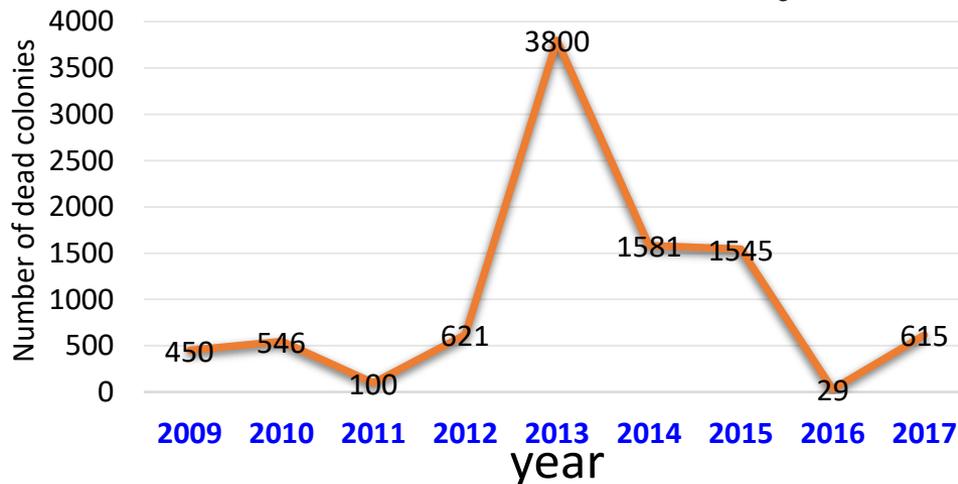
February 2017:  
**Normative  
Instruction  
02/2017**  
Risk  
Assessment of  
pesticides to  
Bees in Brazil





# Brief background

Reported cases of massive mortality for managed bees (2009 – 2017)  
**(not CCD!)**



...at the same time other countries discussing risk of pesticides for bees, a lot of papers relating effects of insecticides to bees...



## Brief background

### Reference Documents:

- 🐝 2011: Setac Pellston Workshop
- 🐝 2012: North America White Paper and EFSA Scientific Opinion
- 🐝 2013: EFSA Guidance published
- 🐝 2014: North America Guidance published
- 🐝 2015: Australia - Road Map published
  
- 🐝 2017: Brazil - Normative Instruction (IN) nº 02 published

## HAZARD

#

## RISK

### Botulinum toxin

LD<sub>50</sub> for rats: 0,4 ng/kg

**20 ng is enough to kill a person of 50 kg**

### Botox

Aesthetic treatments  
(wrinkles reduction)

Maximum dose: **80 ng**



The danger is inherent to the substance, is part of its characteristics, its capacity to cause damage. Risk is a probability and it depends on the **hazard** (or toxicity) but also on the **exposure...**

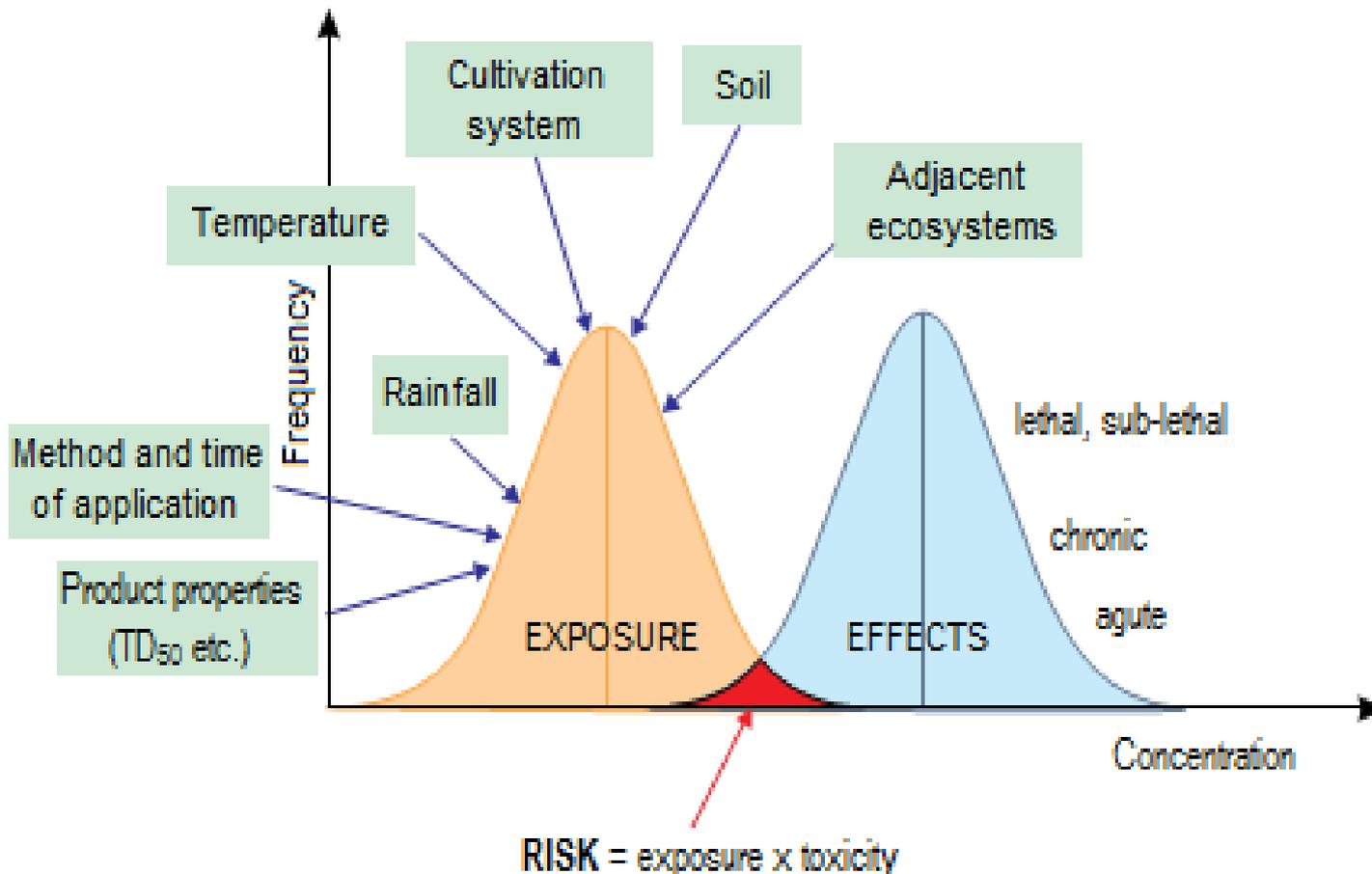


## Brief background – so, what have changed?

- 🐝 Environmental assessment for pesticide registration started to be required in 1989 (before that, registered only by Agriculture Authority)
- 🐝 Classification and labeling based on hazard assessment (no consideration of exposure)
- 🐝 Risk assessment procedures started to be developed in 2010 (so, this is relatively a **new topic** for Brazil)



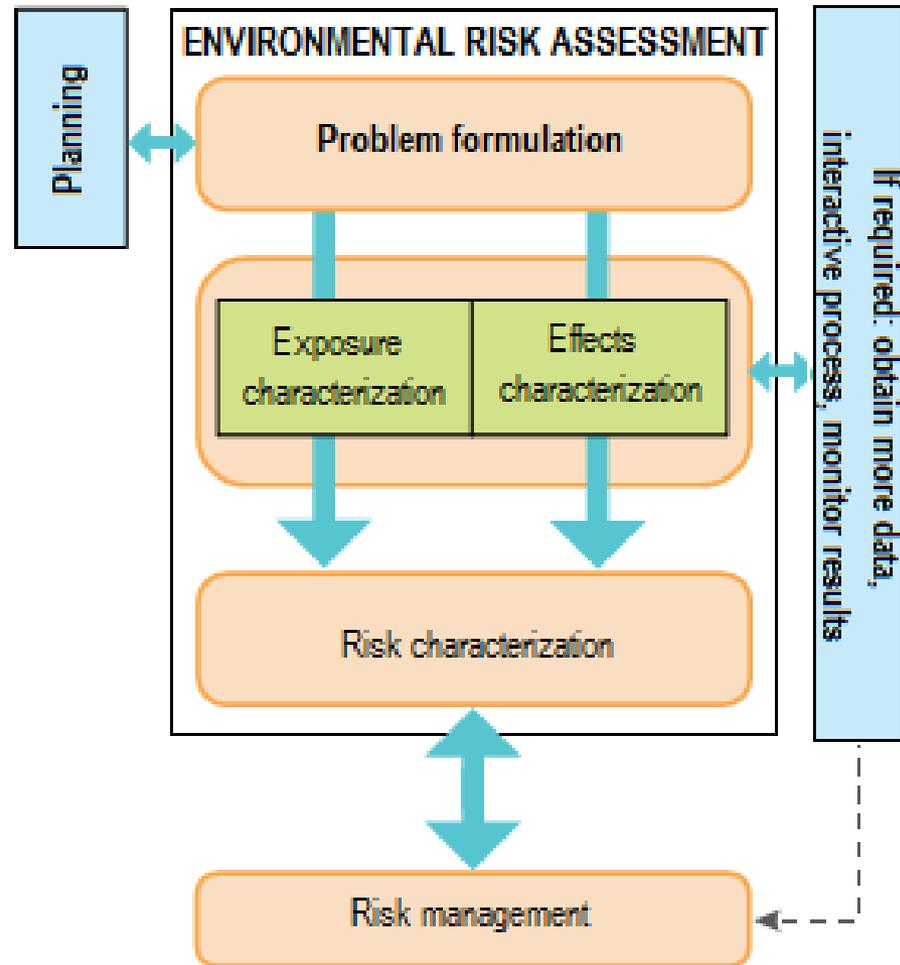
From the Normative Instruction 2/2017, all the new products has to be assessed regard with its RISK to pollinators.

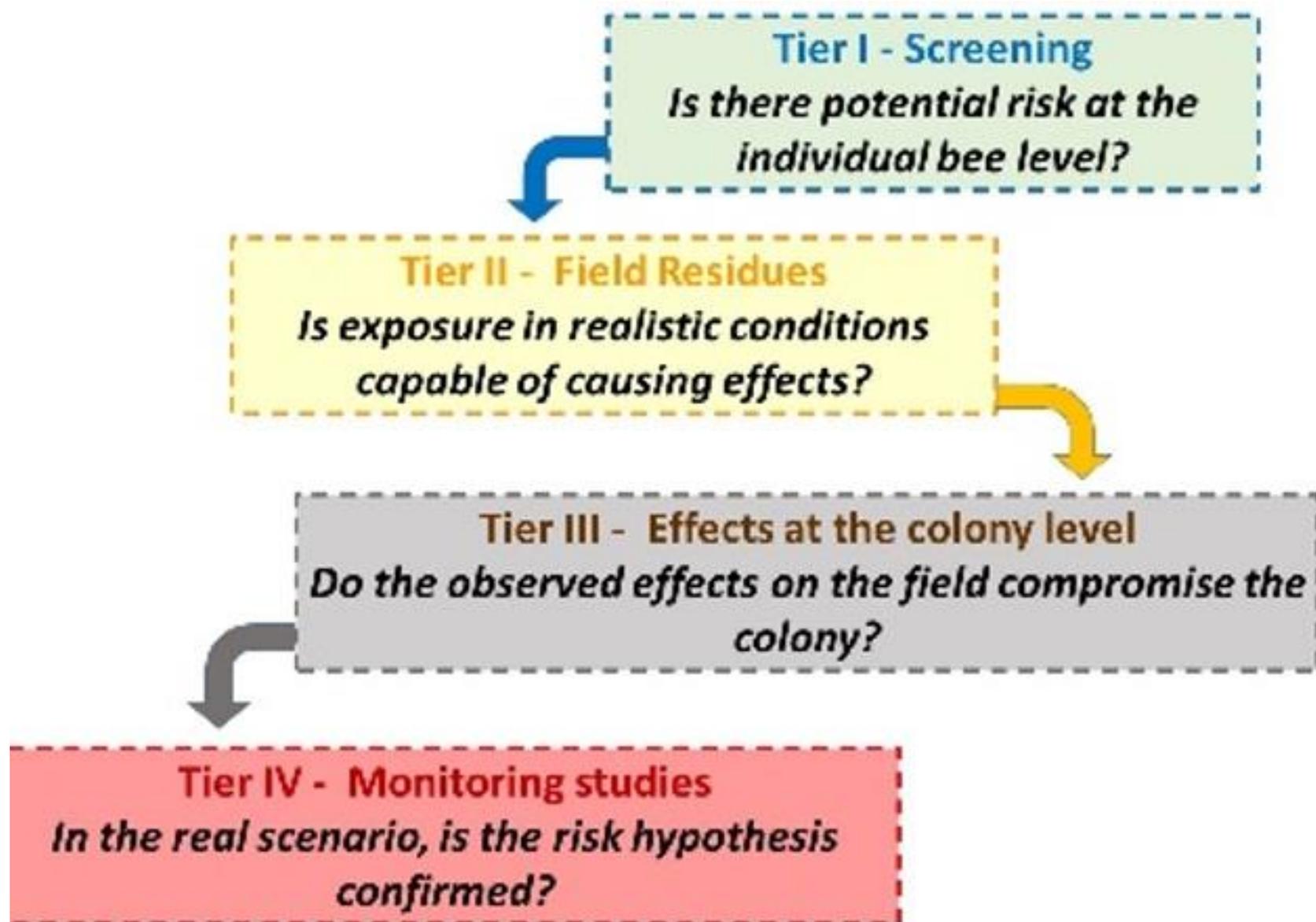


**Figure 1**  
Integration between risk components: exposure and toxicity

# Risk Assessment Framework

- 🐝 Brazilian framework and methodology were strongly based on the North American Approach
- 🐝 Uses *Apis mellifera* as a surrogate for all the other species





# Example of some of the new requirements

- Acute and Chronic Toxicity lab tests
- Lab tests with adults and also with the larvae
- In case of need of residue studies, they must be performed in Brazil and preferably with the crop of interest
- Semi-field and field tests effect studies



Foto: Ibacon GmbH



Foto: Ibacon GmbH



Foto: Cristiano Menezes

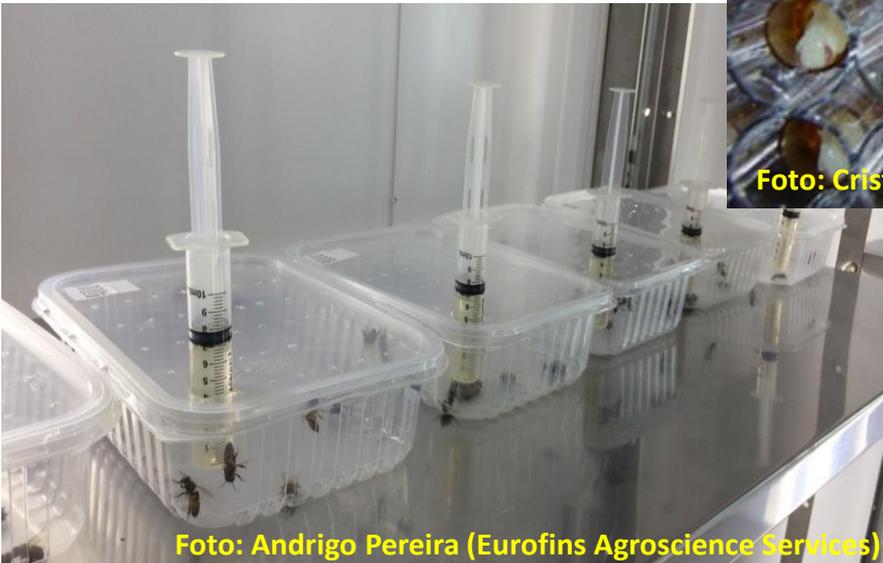


Foto: Andriago Pereira (Eurofins Agroscience Services)



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# THE CHALLENGE:

- to achieve the effectiveness of the environmental risk assessment, the recommendations for use of the product on label must be strictly followed!
- Demands cooperation among a lot of sectors



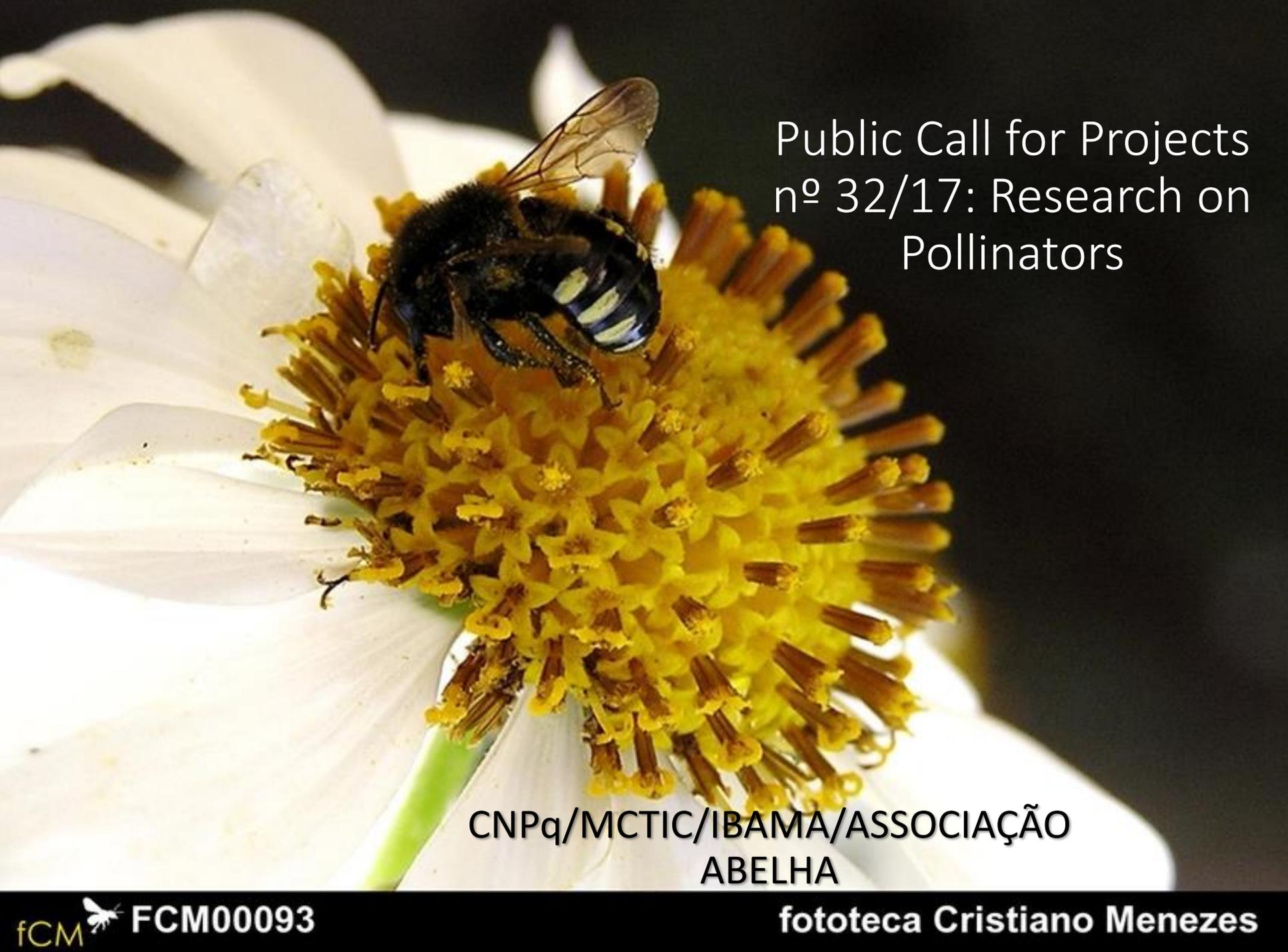
## Next steps:

Is the species *Apis mellifera* a good surrogate for all the Brazilian native species in the risk assessment?



### SELEÇÃO DE ESPÉCIES DE ABELHAS NATIVAS PARA AVALIAÇÃO DE RISCO DE AGROTÓXICOS



A close-up photograph of a black and white striped bee on a yellow flower head. The bee is positioned on the left side of the flower, facing right. The flower has many small yellow florets and prominent stamens. The background is dark and out of focus.

Public Call for Projects  
nº 32/17: Research on  
Pollinators

CNPq/MCTIC/IBAMA/ASSOCIAÇÃO  
ABELHA

## **Objective of the Public Call of Projects:**

To support research projects which contributes to the scientific/technological development and for innovation related to pollinator insects

The aim is to fill in the gaps of knowledge about pollinator insects through integrated research to the productive sector with direct application in:

- development of risk assessment methodologies;
- valuation of pollination services
- increase of agricultural productivity
- Enhance of the knowledge on brazilian pollinator insects biodiversity

## Lines of research and funds:

Line of research	Value
<b>Line 1:</b> Patogens and parasites in native bees and in <i>Apis mellifera</i>	R\$ 400.000,00 (~ U\$107.000)
<b>Line 2:</b> Monitoring and evaluation of native bees in Brazil	R\$ 450.000,00 (~ U\$ 120.000)
<b>Line 3:</b> Ecotoxicity of pesticides to selected native bee species	R\$ 650.000,00 (~ U\$ 174.000)
<b>Line 4:</b> Quantification and characterization of natural resources collected by native species	R\$ 550.000,00 (~ U\$ 147.000)
<b>Line 5:</b> Bioeconomic evaluation of the pollination service in the agricultural productivity per relevant crop	R\$ 250.000,00 (~ U\$ 67.000)
<b>Total</b>	<b>R\$ 2.800.000,00 (~ U\$ 749.000)</b>



**OBJETIVOS**  
DE DESENVOLVIMENTO  
SUSTENTÁVEL



# Thank you!

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<http://www.ibama.gov.br/agrotoxicos>