GREEN RIO GREEN LATIN AMERICA

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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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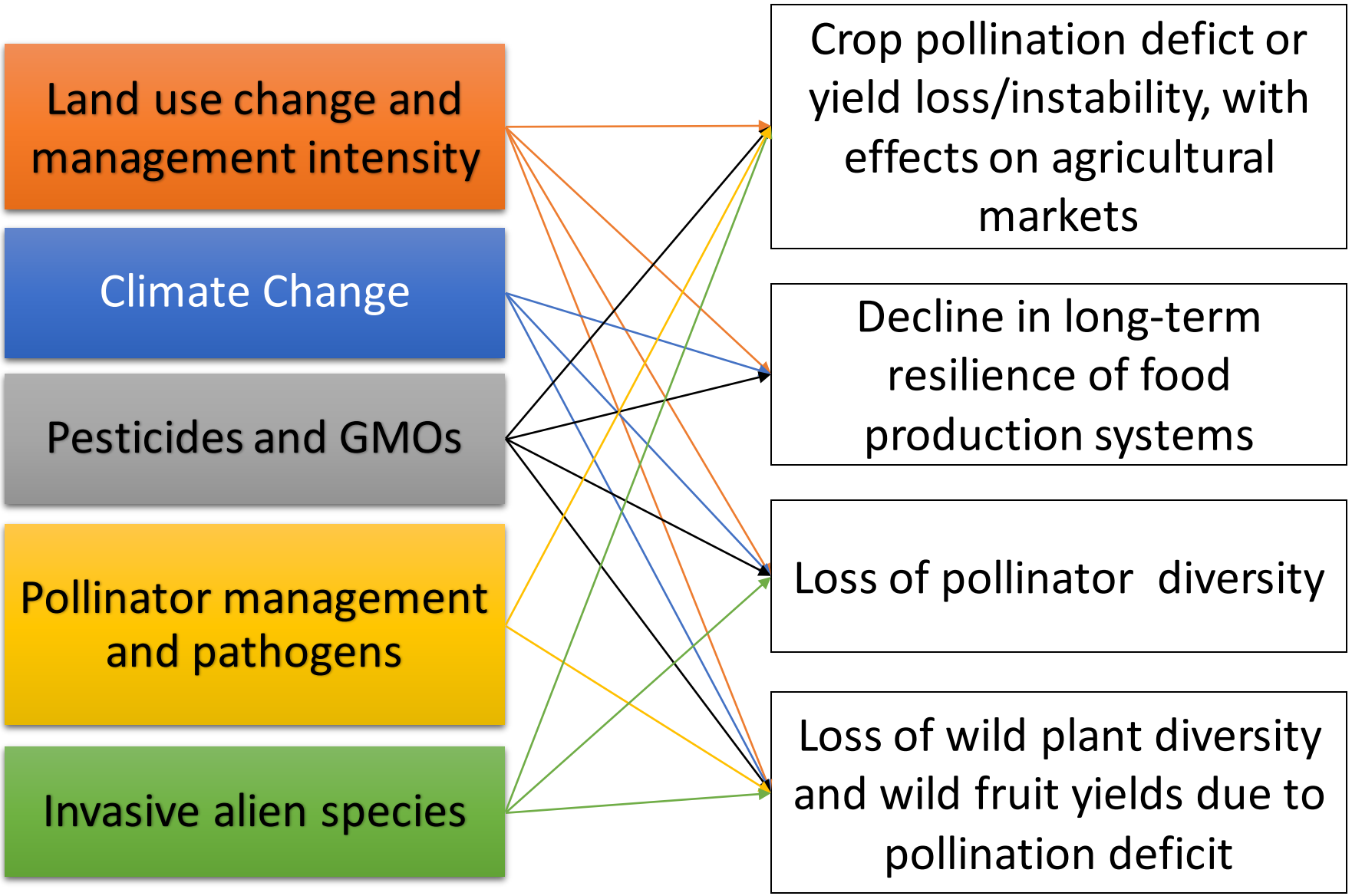
Brazil: General Information

- Total Area: 8.514.877 km² (5th 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 bio-diversity of flora and fauna on the planet.
- 7th largest economy in the world;
- 4th largest country in cultivated areas
- 1st country in extension and number of protected 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 presentes itself as a huge challenge and pollinators constitute a key element for sustainability of agricultural systems

Anthropogenic drivers of pollinator decline



Adapted from POTTS, Simon G. et al. Safeguarding pollinators and their values to human well-being. **Nature**, v. 540, n. 7632, p. 220, 2016.

BIODIVERSITY

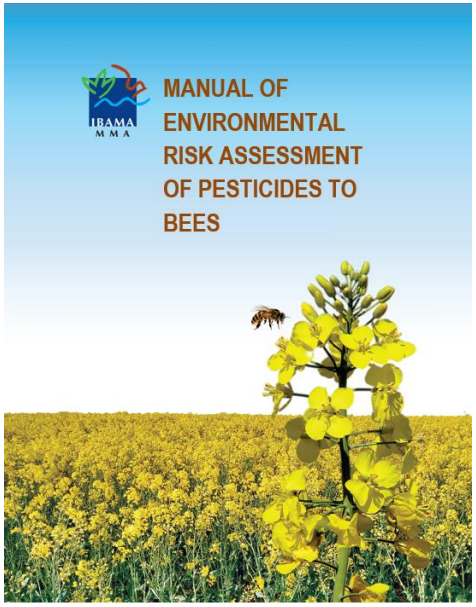
Ten policies for pollinators

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

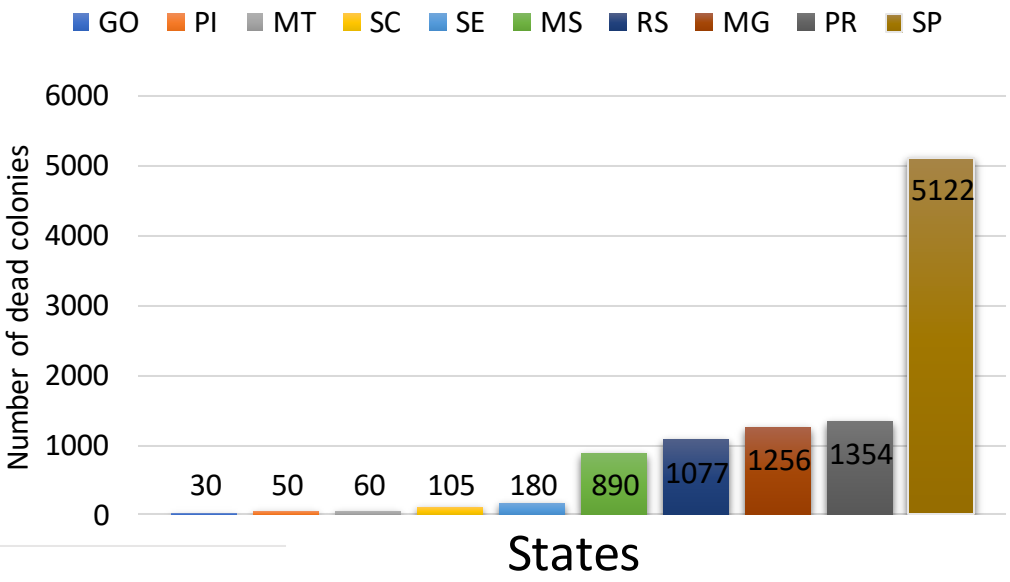
February 2017:
Normative Instruction 02/2017
Risk Assessment of pesticides to Bees in Brazil

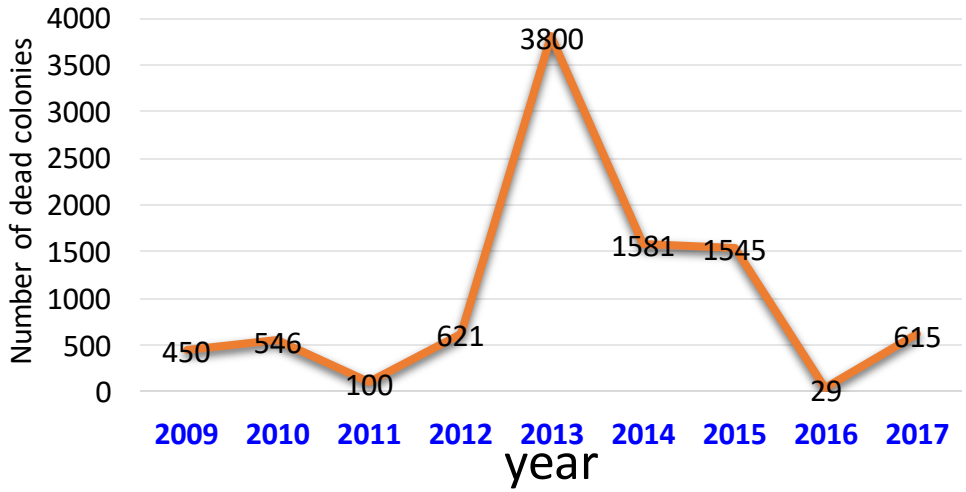


DICKS, Lynn V. *et al*. Ten policies for pollinators. **Science**, v. 354, n. 6315, p. 975-976, 2016.

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_{50} 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.

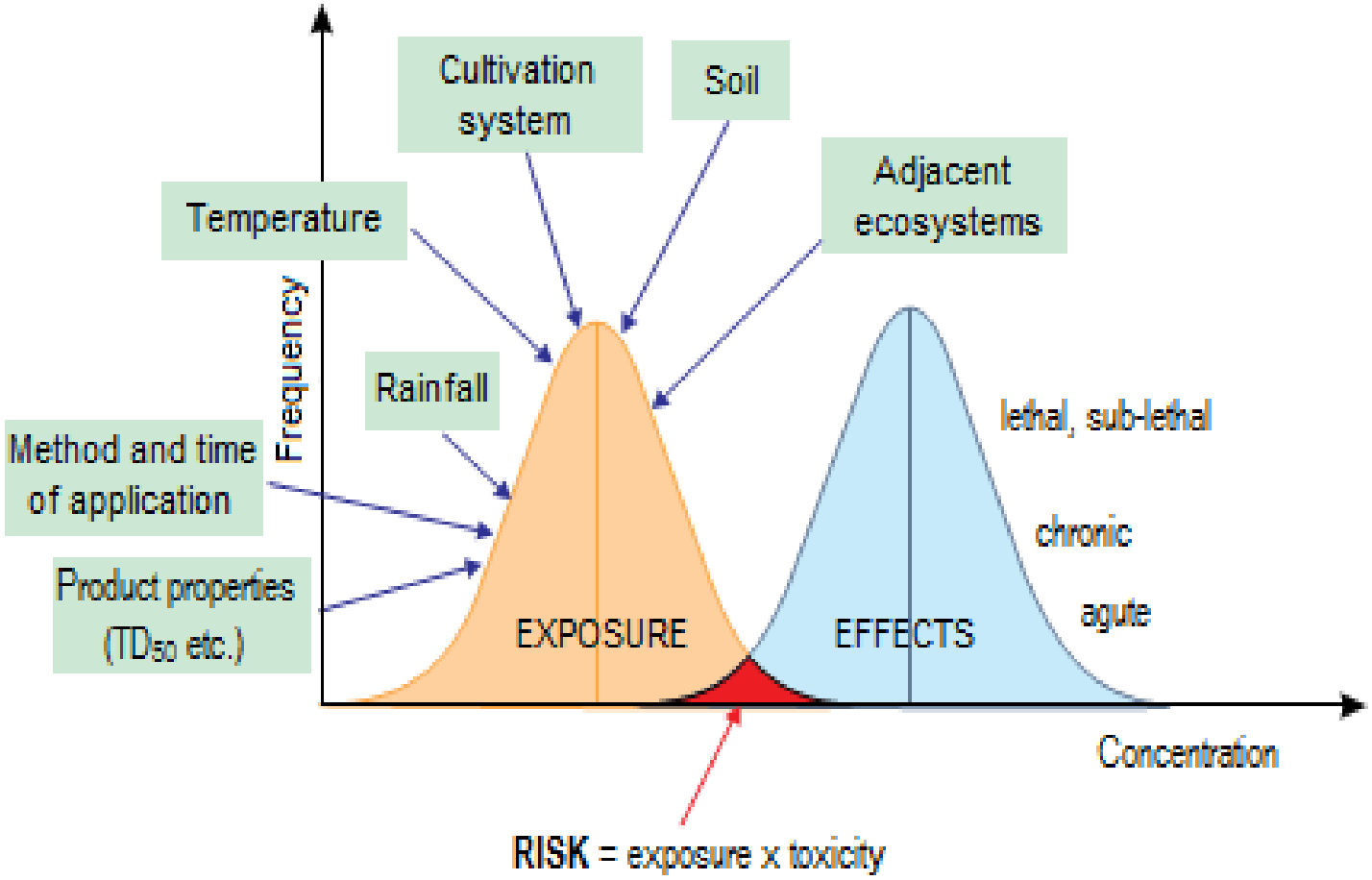
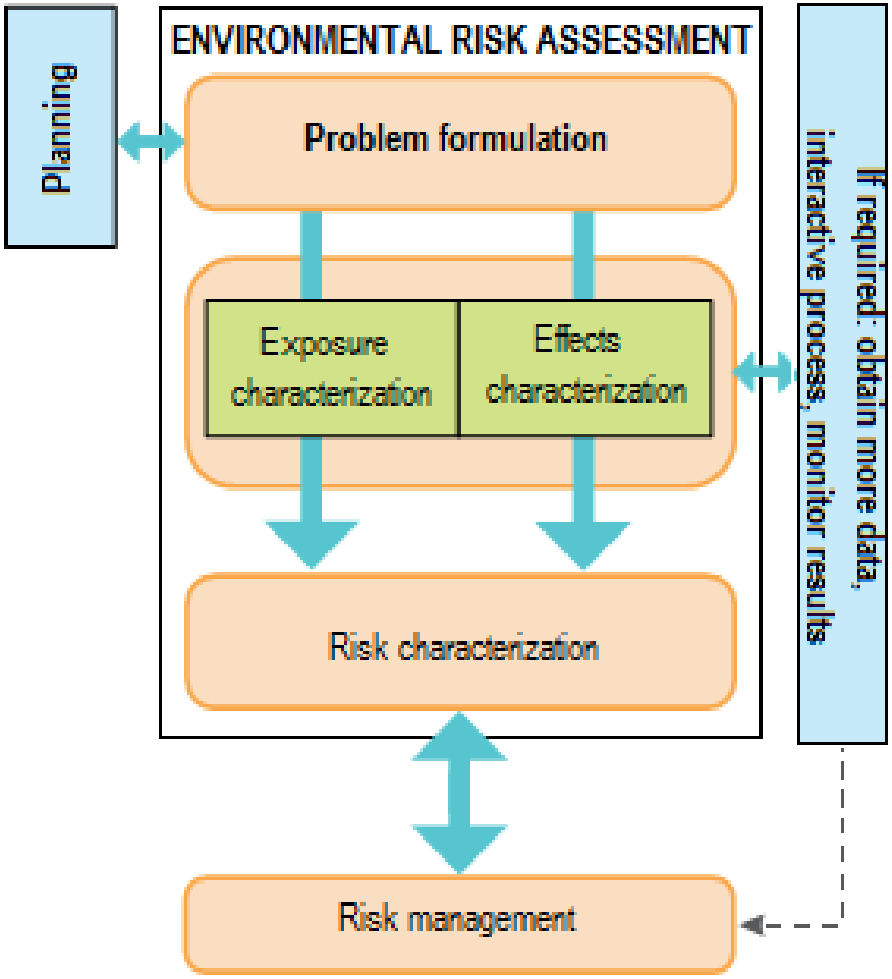
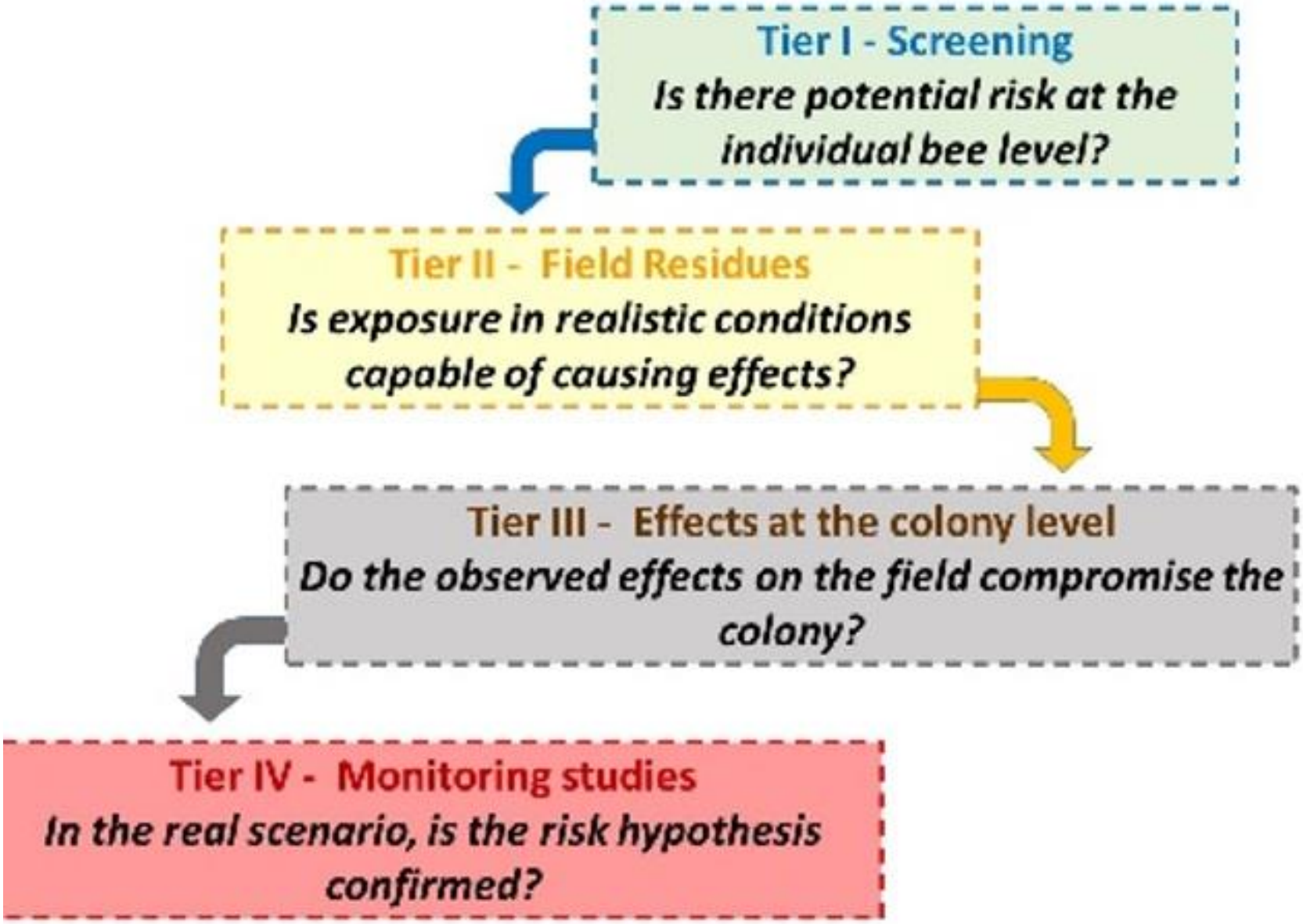


Figure 1
Integration between risk components: exposure and toxicity

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




Tier I - Screening
Is there potential risk at the individual bee level?
Tier II - Field Residues
Is exposure in realistic conditions capable of causing effects?
Tier III - Effects at the colony level
Do the observed effects on the field compromise the colony?
Tier IV - Monitoring studies
In the real scenario, is the risk hypothesis confirmed?

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


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Foto: Cristiano Menezes

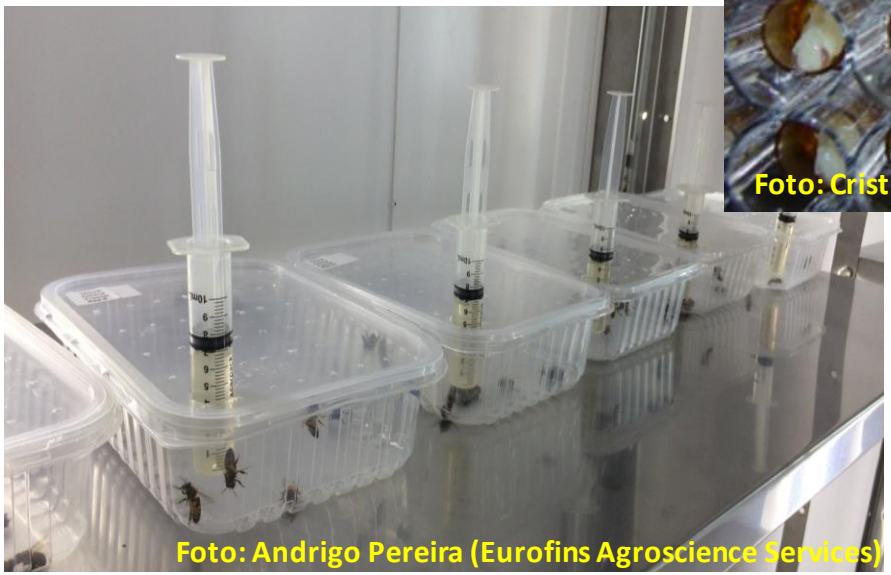
Foto: Andrigo Pereira (Eurofins Agroscience Services)


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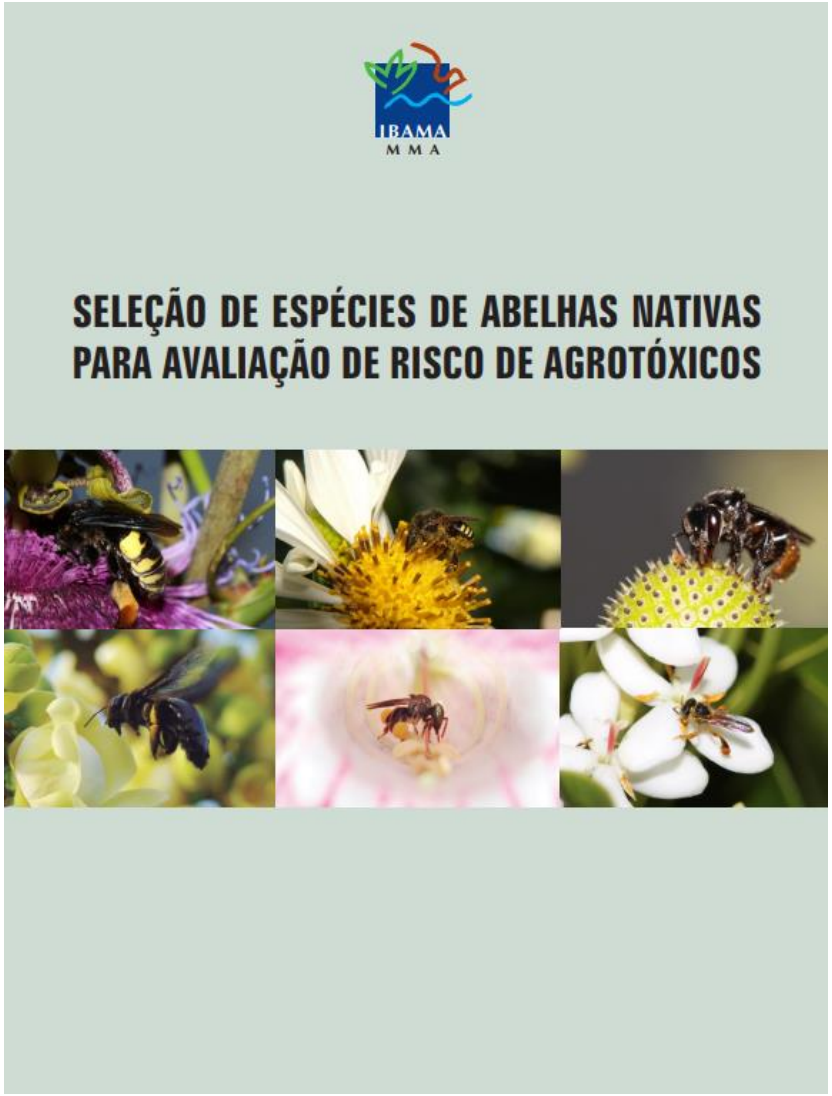
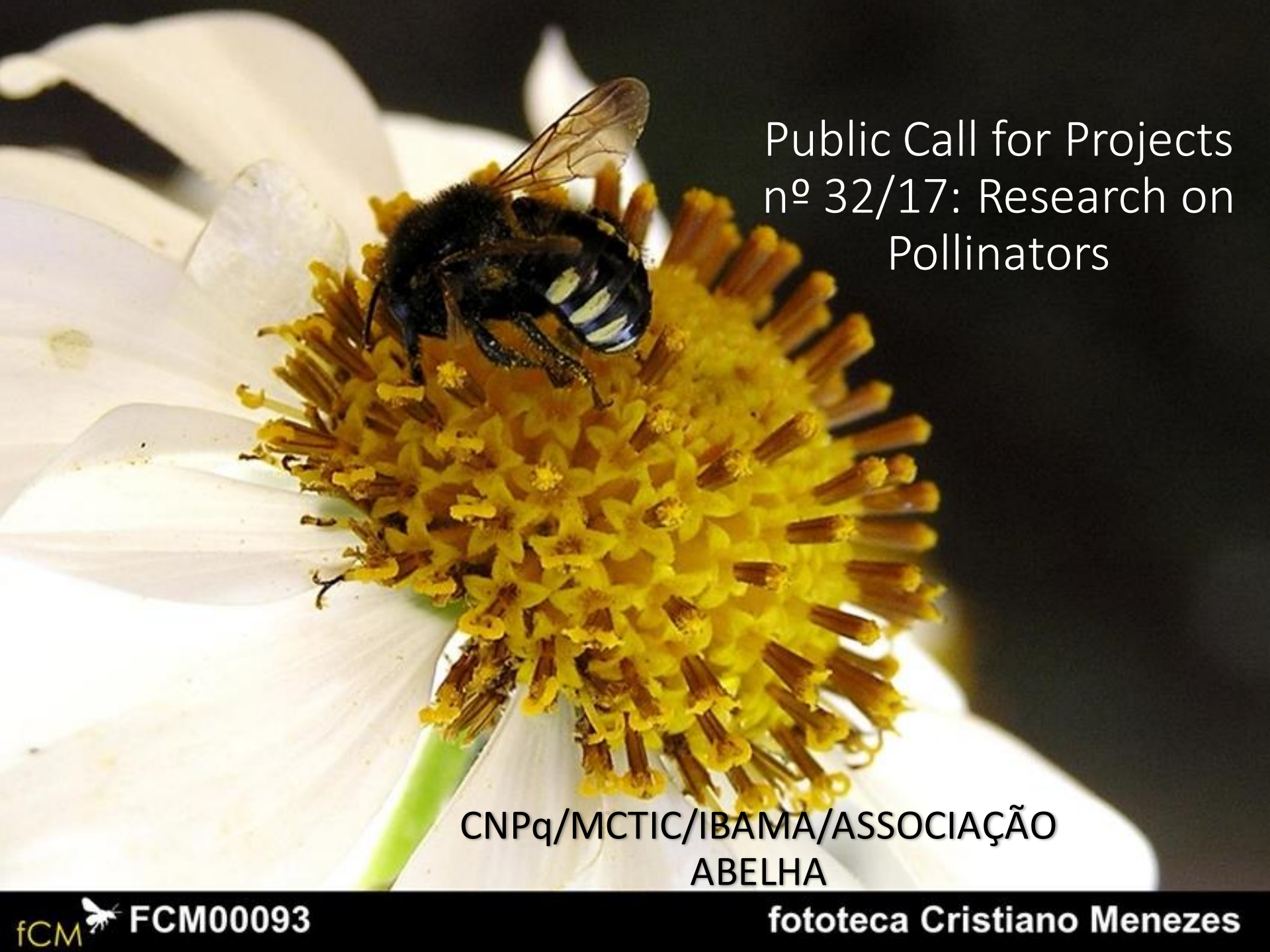
THE CHALLENGE:

- 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?




Public Call for Projects nº 32/17: Research on Pollinators
CNPq/MCTIC/IBAMA/ASSOCIAÇÃO ABELHA
FCM00093
fototeca Cristiano Menezes

Objective of the Public Call of Projects:

To support research projects which contributes to the cientific/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
Line 1: Patogens and parasites in native bees and in Apis mellifera	R$ 400.000,00 (~ U$107.000)
Line 2: Monitoring and evaluation of native bess in Brazil	R$ 450.000,00 (~ U$ 120.000)
Line 3: Ecotoxicity of pesticides to selected native bee species	R$ 650.000,00 (~ U$ 174.000)
Line 4: Quantification and caracterization of natural resources colected by native species	R$ 550.000,00 (~ U$ 147.000)
Line 5: Bioeconomic evaluation of the pollination service in the agricultural productivity per relevant crop	R$ 250.000,00 (~ U$ 67.000)
Total	**R$ 2.800.000,00 (~ U$ 749.000)**

Thank you!

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