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Risk Assessment

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CERA's purpose

- To enable the development and application of sound science to the environmental risk assessment of agricultural biotechnologies so their contributions to sustainable production of food, fuel and fiber may be safely realized

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How we work…

- Focus is on science support for ERA
- CERA's activities are carried out for public benefit
- Tripartite participation – academia, government, private sector
- Expert panels, networks and cooperative programs on issues related to ERA with international representation from the scientific and regulatory communities

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Program platforms

- Platform 1: Improving systematic approaches to ERA of GM plants.
- Platform 2: Understanding the receiving environment
- Platform 3: Science support for rationalizing ERA in the context of limited releases to the environment
- Platform 4: Capacity building to support and strengthen regulatory and scientific communities involved in ERA of agricultural biotechnologies

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Where we work…

- South America: Argentina, Brazil, Chile, Paraguay, Uruguay
- South Asia: Bangladesh, India, Pakistan
- East Africa: Kenya, Tanzania, Uganda
- Southeast Asia: Vietnam

www.cera-gmc.org

An Introduction to Coexistence

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The Plant Biotechnology and Biosafety Workshop

Embrapa · Brasilia · 8-10 April 2013

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What do we mean by “coexistence”?

- “Exist at the same time or in the same place” *Oxford Dictionary*

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What do we mean by “coexistence”?

- In agriculture, it is applied to the compatibility of production systems
- Measured in economic terms
  - The economic sustainability of different production systems in the same geographic region

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Examples of co-existence in agriculture

- Certified seed production
  - Established purity standards
  - Operates to threshold levels of off-types
  - Miss the standard → no certification → no premium
- Practices include:
  - Crop specific mitigation strategies that consider the biology of the crop and the environment where it is grown
  - Crop rotation
  - Handling practices

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Examples of co-existence in agriculture

- Contract farming to meet private production or quality standards
- High erucic acid oilseed rape
  - Used to manufacture industrial oils
  - Anti-nutrient properties
  - Threshold 2% HEAR in canola
  - Achieved through voluntary arrangements with neighboring farmers

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Coexistence of GM and non-GM production systems

- Define practices to ensure that crop value losses are minimized (*ex ante*) or reimbursed (*ex post*)
- Non-statutory stewardship or good agricultural practices guides
- Statutory instruments that define co-existence practices *e.g.*, EU, Brazil

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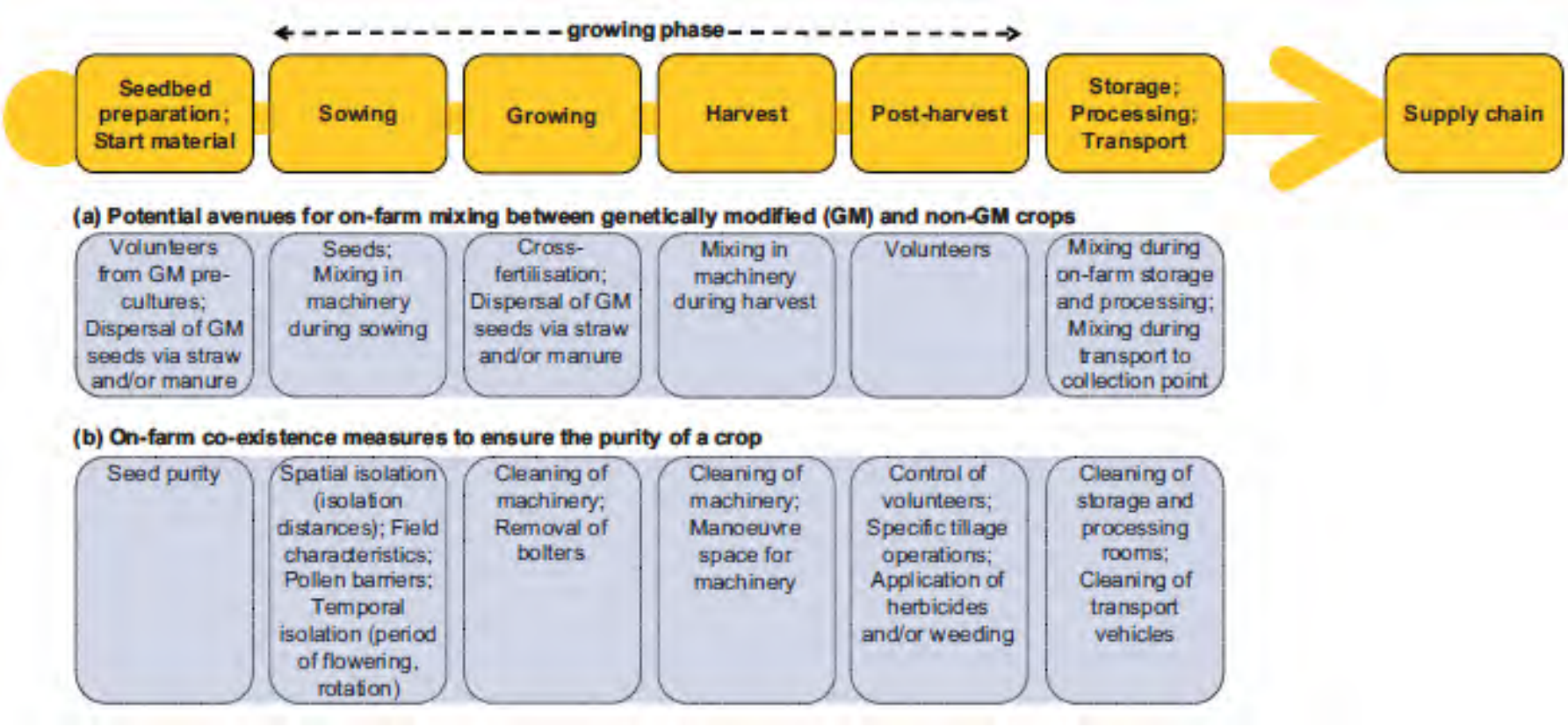
Avenues for on-farm adventitious mixing



Devos et al. 2008.

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Tolerance levels (thresholds)

- Some adventitious mixing is unavoidable → tolerance levels
- Tolerance levels = testing
- Testing = costs
- The cost of limiting gene flow ↑ as tolerances ↓
  - As tolerances approach zero, segregation costs increase exponentially, and production and trade of the segregated crop will tend to cease (Magnier et al., 2009)

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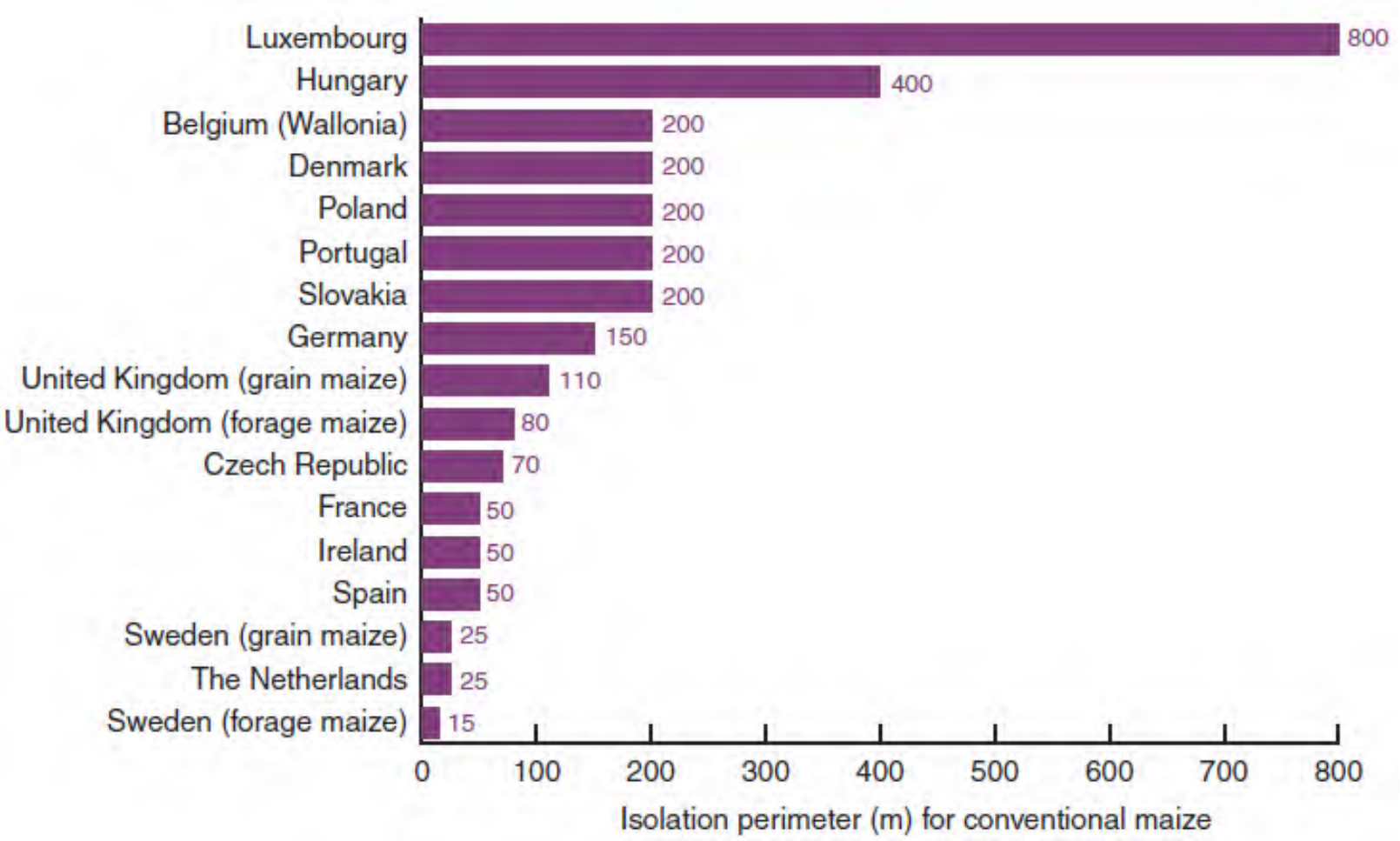
Is the goal really co-existence?



Proposed isolation distances to ensure co-existence between GM and non-GM maize (Devos *et al*. 2008)

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Principles for co-existence (Brooks 2004)

- Context: relative agronomic and commercial importance of different crop production systems
- Consistency: adhering to established standards
- Proportionality: proportionate, science-based and non-discriminatory
- Equity: fairness – equal access to compensation for any negative economic consequences arising from the practices of neighboring farmers
- Practicality: based on scientific, legal, and workable realities

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Summary

- Coexistence is an economic issue: it is not a safety issue
- Coexistence measures need to be practical, proportionate and workable
- Coexistence requires mutual cooperation and shared responsibilities

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