
GMCC
Fifth International
Genetically Modified (GM) Crops
Coexistence Conference
26-28 OCTOBER 2011
VANCOUVER, CANADA


GMCC
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Coexistence Conference
SELECTED THEMES FROM
GMCC-11
Nicholas Kalaitzandonakes
University of Missouri and Co-Chair, GMCC-11
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Fifth International Genetically Modified (GM) Crops Coexistence Conference

A BIT OF HISTORY

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Fifth International Genetically Modified (GM) Crops Coexistence Conference

Helsingør, Denmark GMCC 03

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Fifth International Genetically Modified (GM) Crops Coexistence Conference

Montpelier France, 2005

Seville Spain, 2007

Melbourne Australia, 2009

Vancouver, Canada, 2011

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GMCC….a place of deliberations to promote…

- **diversity in agriculture** that satisfies to the needs of producers and consumers *of* all kinds;
- **scientific advances** that improve the efficiency and integrity of production, processing and distribution of food
- **policy discussions** that improve the workings of governments and markets
- **cooperation among stakeholders** that assist a balanced expansion of different production systems and international trade

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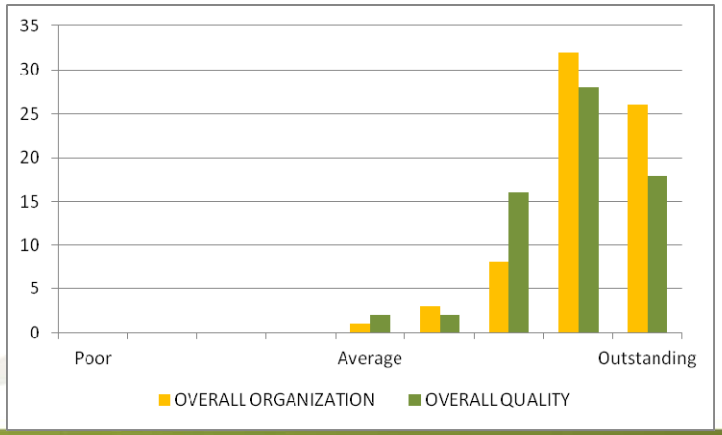
Main themes of GMCC-11 plenary sessions

- **Alternative approaches to managing coexistence**
  - Different national systems and basic legal & economic principles
  - best practices in various supply chains
  - technical measures
  - tolerances
- **Regulatory asynchronicity and LLP**
  - Unapproved events and market disruptions – learning from past experience
  - LLP policies and the way forward

Conference was well received

Post conference survey: "Taking all aspects of the conference into account, please rate the overall organization and quality of GMCC-11"



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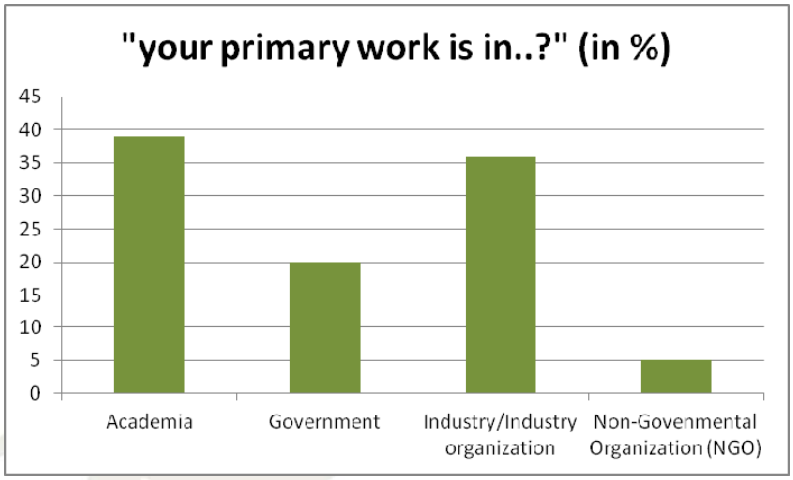
Composition of audience



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SELECTED THEMES
ASPECTS OF FUTURE OUTLOOK & IMPLICATIONS

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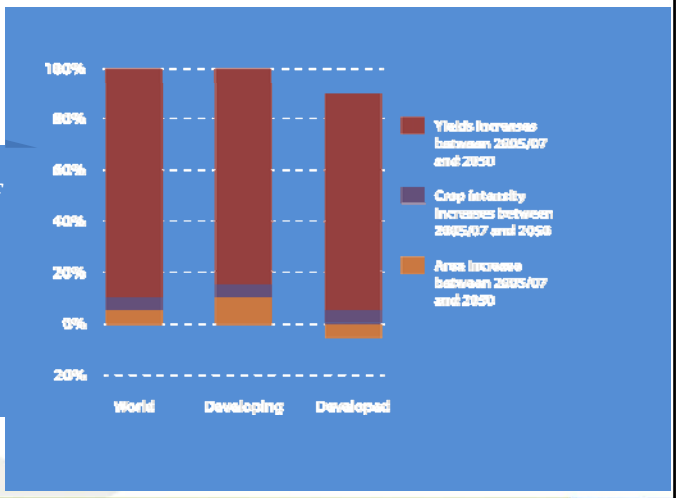
Innovation & productivity growth

Sources of Production Growth



Source: A. Tutwiler, FAO 2011

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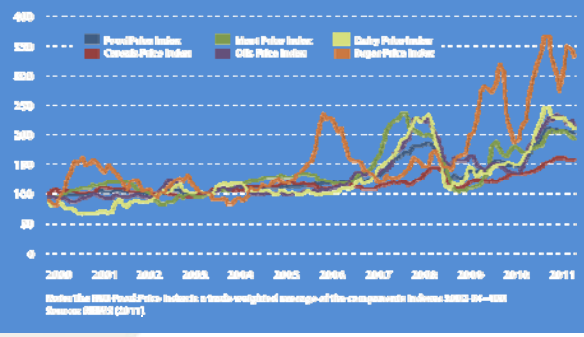
Price volatility

Manage and mitigate food price volatility



Source: A. Tutwiler, FAO, 2011

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Supply/demand conditions & price volatility

- **Supply and demand – balance has shifted**
  - From production push to consumer pull
- **Sustainability and food security have become values**.

Source: R Giroux, Cargill, 2011

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SELECTED THEMES
COEXISTENCE SYSTEMS AROUND THE WORLD: PRINCIPLES & PRACTICE

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COEXISTENCE IN NORTH AMERICA

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Coexistence in North America

Coexistence of agricultural products with specific attributes is well established

- Functional Characteristics
  - Specific food/feed uses
  - Specific starch properties
  - Varietal Purity
- Production Methods
  - Organic
  - Non-GMO
  - Specific on-farm management practices

Source: R Giroux, Cargill, 2011

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Coexistence in North America

Example: NON-GM IP Soybeans In Canada

- Co-exist with GM soybeans
- Consistently meet market requirements (allow 0.5 to 1.0% approved GM content)
- Market premiums for non-GM soybeans
  - **15-60% over price for crush soybeans**

Source: L. Anderson, Canadian Grain Commission, 2011

Coexistence in North America

- IP – Getting the buyer what he wants with minimal contamination
- Contract production of selected hybrids
- Follow segregation protocols from seed selection and planting through delivery to buyer
- Post harvest filtering
- 3rd party testing, verification
- Buyer testing

Achievable tolerance level today – private experience

- Average GMO AP in corn supplied from serious IP program that tests all incoming loads for GMO is less than 0.5%.
- Satisfy Non-GMO verified standards? Blending? Yes? Meet organic standards? Blending? No?

Source: L. Clarkson, Clarkson Grain, 2011


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Coexistence in North America
Existing coexistence systems have evolved some basic tenets that enable markets to function
The specialty crop isolates itself from the generic commodity
Commodity is the undifferentiated fungible product not the most widely grown product
Specialty markets define marketing standards/thresholds to manage the products efficiently and effectively
Specialty supply chains should cover the full cost of commercialization
Source: R Giroux, Cargill, 2011
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Coexistence in North America
Existing coexistence systems have evolved some basic tenets that enable markets to function
Customer and consumers willingness to pay a premium for the differentiated (specialty) food products
Since the specialty crops costs more to produce (isolation, segregation), cost must be transferable to the end user for the markets to work
If cost cannot be passed forward, specialty markets are not sustainable
Source: R Giroux, Cargill, 2011
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Coexistence in North America

Existing coexistence systems have evolved some basic tenets that enable markets to function

- **Commercial agreements (contracts) based on clear, verifiable and achievable specifications**
  - There is often a verifiable specification written in the contract
  - Unverifiable specifications can potentially disadvantage responsible companies
  - Standards(e.g. thresholds) need to be commercially-relevant and cost effective to be sustainable

Source: R Giroux, Cargill, 2011

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Managing Coexistence: What side of the fence?

- Open Range Laws
  - Similar historical conflict between livestock and crop producers in the USA
  - Burden on was on crop farmers to erect fences
  - As crops continued to move into range lands; eventually the burden shifted

Source: R Giroux, Cargill, 2011

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COEXISTENCE IN THE EUROPEAN UNION

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Coexistence in the EU

Basic principles of EU coexistence policy

- Subsidiarity principle
- Principle of the freedom of choice
- "Polluter pays" principle
- Principle of proportionality

and there are more…

Source: V Beckman, Ernst-Moritz-Arndt-University Greifswald, 2011

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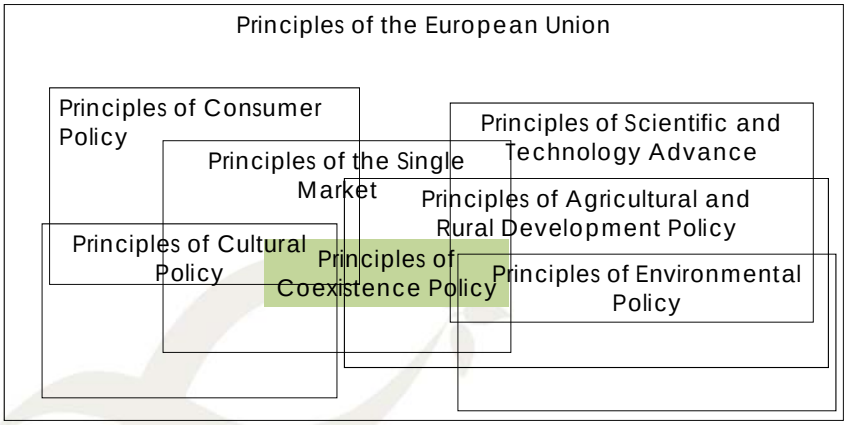
Nested and overlapping principles in Coexistence policy in the EU



Source: V Beckman, Ernst-Moritz-Arndt-University Greifswald, 2011

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Coexistence in the EU

Principle of the freedom of choice

- Basic principle of EU treaty and the Single Market
  - Treaty of Lisbon, Article 3: "The Union shall offer its citizen an area of freedom, security and justice without internal frontiers…"
  - Charter of Fundamental Rights of the European Union – Article 16 "Freedom to conduct a business: The freedom to conduct a business in accordance with Union law and national laws and practices is recognized."
- Commission Recommendations of 23 July 2003 states that
  - "No form of agriculture, be it conventional, organic or agriculture using GMOs, should be excluded in the EU"
  - "Co-existence refers to the ability of farmers to make a practical choice between conventional, organic and GM-crop production, in compliance with the legal obligations for labeling and/or purity standards."

Source: V Beckman, Ernst-Moritz-Arndt-University Greifswald, 2011

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Coexistence in the EU

"Polluter Pays" Principle

- Basic principle of the EU environmental policy
- Article 174 of the Treaty of Lisbon:
  - "Community policy on the environment shall aim at a high level of protection taking into account the diversity of situations in the various regions of the Community. … **environmental damage should as a priority be rectified at source and that the polluter should pay**."
- Commission Recommendations of 23 July 2003 states that
  - "As a general principle, during the phase of introduction of a new production type in a region, **operators (farmers) who introduce the new production type should bear the responsibility of implementing** the farm management measures necessary to limit gene flow."

Source: V Beckman, Ernst-Moritz-Arndt-University Greifswald, 2011

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Coexistence in the EU

EU-27 Coexistence Policy principles and roles

- "Subsidiarity": Responsibility to develop laws/strategies for coexistence at EU member states level (regional)
- European Commission retains roles on:
  - General policy guidelines (updated 2010)
  - Formal exchange of information
  - Offering technical advice and developing best practice documents (European Coexistence Bureau)

Source: E. Rodriguez-Cerezo, IPTS, EU Commission, 2011

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Coexistence in the EU

The ECoB finalised and published the Best Practice Document on Maize coexistence in July 2010

Source: E. Rodriguez-Cerezo, IPTS, EU Commission, 2011

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Coexistence in the EU

Spatial isolation: distances between maize fields

Admixture level	Proposed isolation distances	
	Grain maize	Silage-whole plant use
0.1%	105 to 250-500 m	85 to 120 m
0.2%	85 to 150 m	50 to 65 m
0.3%	70 to 100 m	30 to 55 m
0.4%	50 to 65 m	20 to 45 m
0.5%	35 to 60 m	15 to 40 m
0.6%	20 to 55 m	0 to 35 m
0.7%	20 to 50 m	0 to 30 m
0.8%	20 to 50 m	0 to 30 m
0.9%	15 to 50 m	0 to 25 m

Source: E. Rodriguez-Cerezo, IPTS, EU Commission, 2011

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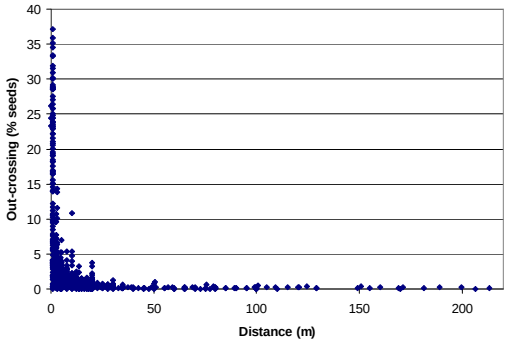
Coexistence in the EU

Distances needed to limit cross-fertilization between GM and conventional maize in Europe



Nature Biotechnology, vol.28, Aug 2010

Source: E. Rodriguez-Cerezo, IPTS, EU Commission, 2011

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Coexistence in the EU

Alternatives to spatial isolation: temporal isolation (differences in sowing dates or in maturity class used)

Member State	Minimal recommended difference in maturity classes (FAO units)
Greece	400
Italy	200
Portugal	200
Romania	200
Slovenia	250
Spain	300

Member State	Minimal sowing delay recommended (days)
Greece	45-50
Italy	30
Portugal	20
Romania	15-20

Source: E. Rodriguez-Cerezo, IPTS, EU Commission, 2011

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Coexistence in the EU

2009: Comparative analysis of Coexistence in EU-27
http://ecob.jrc.ec.europa.eu/documents/2009Coexreport.pdf

- 15 countries legislated
- In all cases measures must be taken by GMO growers
- Otherwise, heterogeneity in
  - Administrative measures: information, compulsory registration, training, etc.
  - Technical measures

Source: E. Rodriguez-Cerezo, IPTS, EU Commission, 2011

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Coexistence regulations across member states

	Germany	Italy	Spain
Distance	Yes	(Yes)	(Yes)
Bufferzones		(Yes)	(Yes)
Registration of areas in publicly available database	Yes		(Yes)
Record keeping	Yes	Yes	Yes
Prohibition of planting GM-crops in specific areas	Yes	(Yes)	
Compulsory training of farmers planting GM-crops to be paid by the GM farmer		(Yes)	
Consent from landowner needed		(Yes)	
Informing authorities on the intention to cultivate GM crops prior to cultivation			(Yes)
Informing authorities on the intention to cultivate GM crops prior to cultivation and at a fixed dates of the year		(Yes)	
Informing neighboring farmers and/or landowners	Yes	(Yes)	(Yes)

Source: , J. Wesseler Technische Universität München, 2011

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Coexistence regulations across member states

	Germany	Italy	Spain
Rotation intervals			(Yes)
Plant cycles			(Yes)
farmer to farmer agreements for not applying segregation measures are allowed			(Yes)
GM farmers need to provide a financial guarantee or a private insurance against damages		(Yes)	
liability based on civil law (usually fault based)			Yes
Strict and joint liability	Yes		
fines for non-compliance with ex-ante regulations		(Yes)	

Source: , J. Wesseler Technische Universität München, 2011

Coexistence in the EU

2009: Comparative analysis of Coexistence in EU-27
http://ecob.jrc.ec.europa.eu/documents/2009Coexreport.pdf

- Liability is a case of civil law (MS)
- All national jurisdictions foresee a minimum protection under regular conditions of tort law (but heterogeneity)
- No court cases recorded (limited experience)
- No specific insurance products in the market
- Some MS have established “compensation funds” with a levy for GM crop cultivators (never used)

Source: E. Rodriguez-Cerezo, IPTS, EU Commission, 2011

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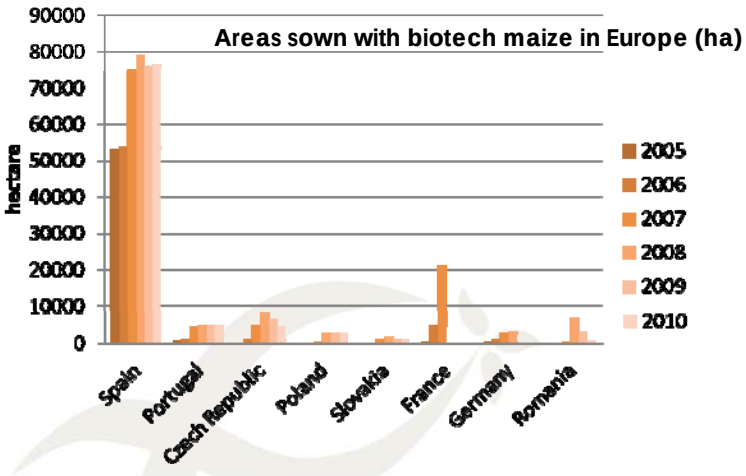
Coexistence in the EU



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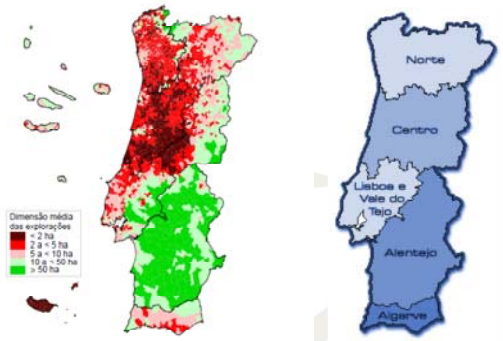
Coexistence in the EU– Case of Portugal

Region	North	Center	LTV	Alentejo	Algarve	Azores	Madeira
Average UAA (ha)	5.8	5.6	9.8	61.5	7.1	8.9	0.4



Source: Maria de Fátima Quedas (IPS) & Paula Cruz de Carvalho (DGADR), 2011

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Coexistence in the EU– Case of Portugal

Farmers that intend to grow GM maize must…

- undergo mandatory **training**
- **notify GM crop cultivations** (GM variety, area, place and intended coexistence measures) to the regional agricultural authority
- **inform** their immediate **neighbors** and the **operators** with whom they share agricultural machinery
- **cooperate** with **agricultural authorities** in all control and monitoring actions, namely by record keeping

Source: Maria de Fátima Quedas (IPS) & Paula Cruz de Carvalho (DGADR), 2011

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Coexistence in the EU– Case of Portugal

Seed distributors must…

- **inform farmers** about the **coexistence rules**, by means of a leaflet approved by the national agricultural authority and provided with each seed bag
- **report** to the **regional agricultural authority** the farmers that bought GM seeds and their amount

Source: Maria de Fátima Quedas (IPS) & Paula Cruz de Carvalho (DGADR), 2011

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Coexistence in the EU– Case of Portugal
Regional agricultural authorities must…
publish farmers' notifications
monitor GM growers, including sampling of neighbor maize crops
convey all information to the national agricultural authority.
Source: Maria de Fátima Quedas (IPS) & Paula Cruz de Carvalho (DGADR), 2011
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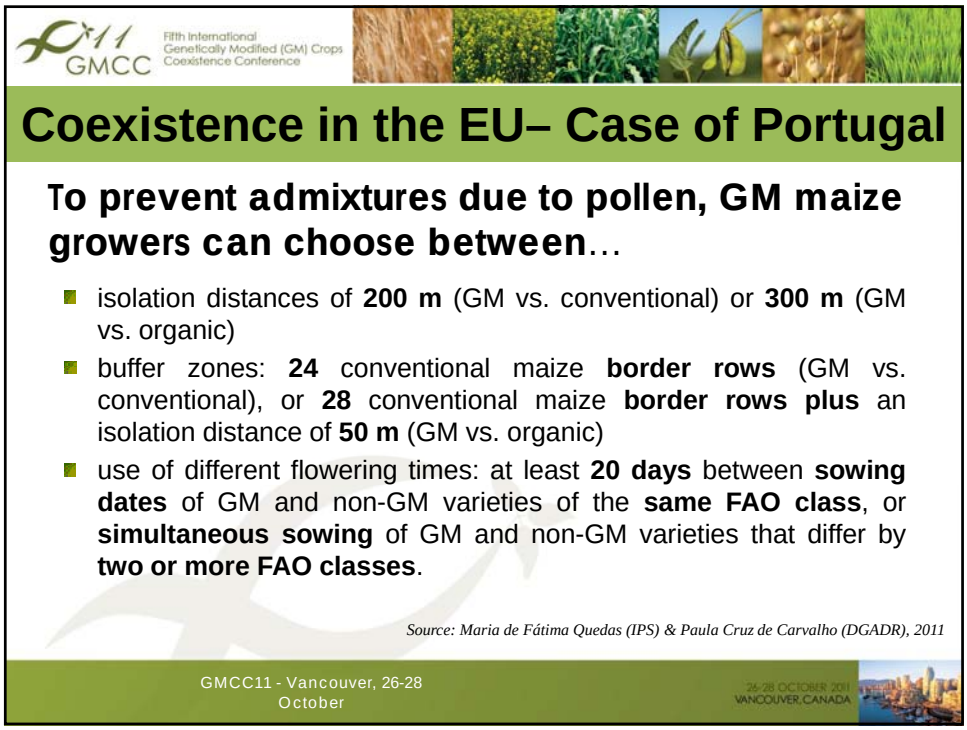
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Coexistence in the EU– Case of Portugal
To prevent admixtures due to pollen, GM maize growers can choose between…
isolation distances of 200 m (GM vs. conventional) or 300 m (GM vs. organic)
buffer zones: 24 conventional maize border rows (GM vs. conventional), or 28 conventional maize border rows plus an isolation distance of 50 m (GM vs. organic)
use of different flowering times: at least 20 days between sowing dates of GM and non-GM varieties of the same FAO class, or simultaneous sowing of GM and non-GM varieties that differ by two or more FAO classes.
Source: Maria de Fátima Quedas (IPS) & Paula Cruz de Carvalho (DGADR), 2011
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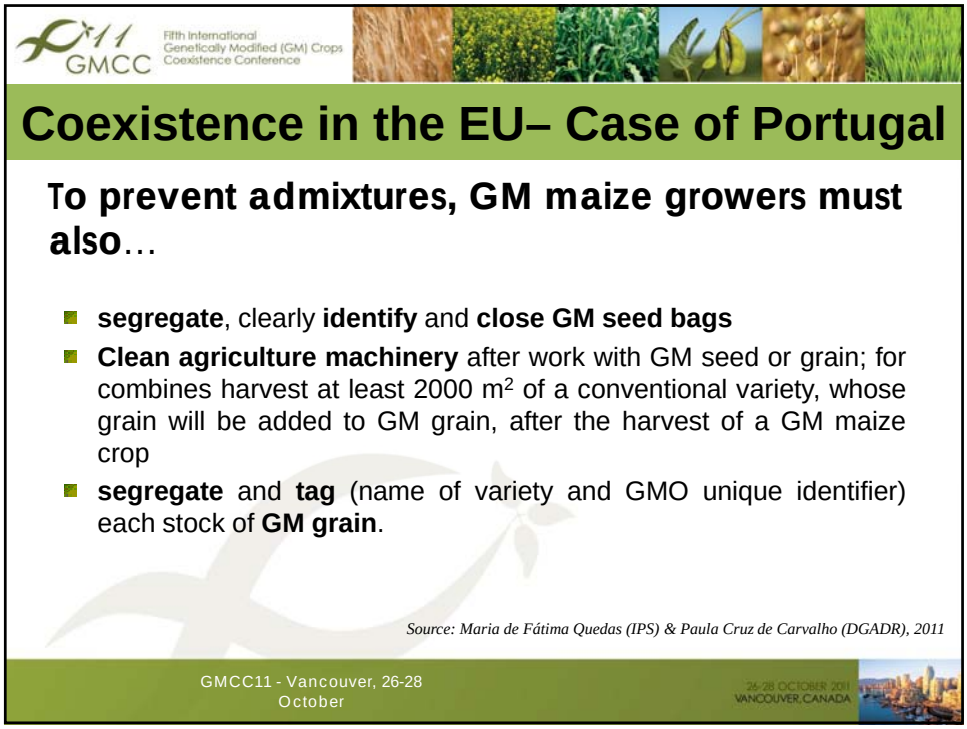
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Coexistence in the EU– Case of Portugal
To prevent admixtures, GM maize growers must also…
segregate, clearly identify and close GM seed bags
Clean agriculture machinery after work with GM seed or grain; for combines harvest at least 2000 m2 of a conventional variety, whose grain will be added to GM grain, after the harvest of a GM maize crop
segregate and tag (name of variety and GMO unique identifier) each stock of GM grain.
Source: Maria de Fátima Quedas (IPS) & Paula Cruz de Carvalho (DGADR), 2011
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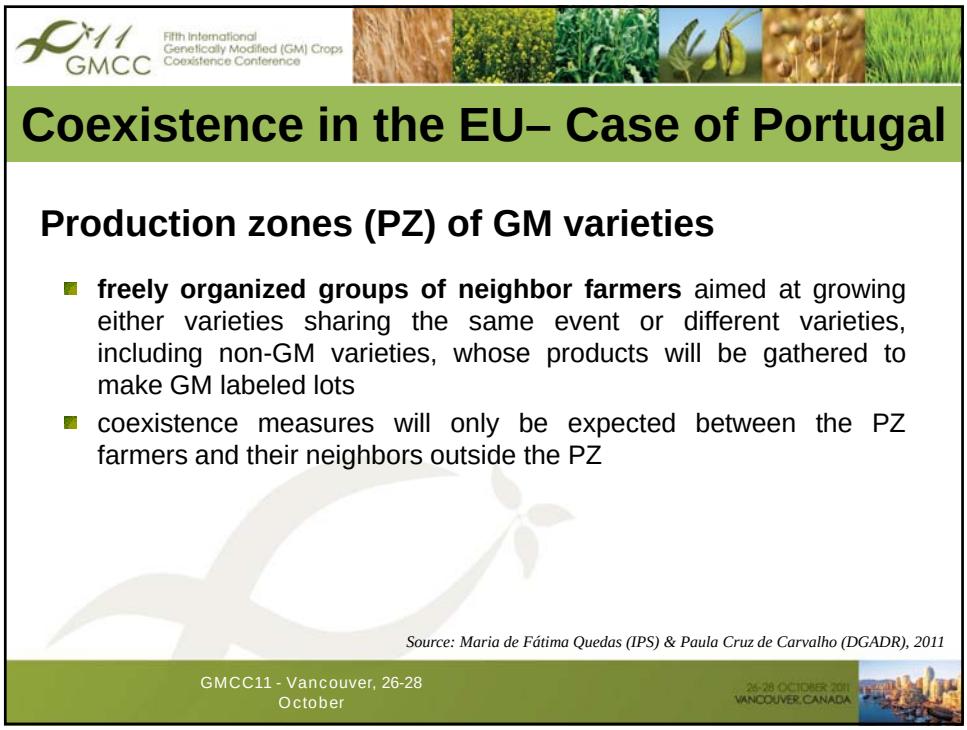
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Coexistence in the EU– Case of Portugal
Production zones (PZ) of GM varieties
freely organized groups of neighbor farmers aimed at growing either varieties sharing the same event or different varieties, including non-GM varieties, whose products will be gathered to make GM labeled lots
coexistence measures will only be expected between the PZ farmers and their neighbors outside the PZ
Source: Maria de Fátima Quedas (IPS) & Paula Cruz de Carvalho (DGADR), 2011
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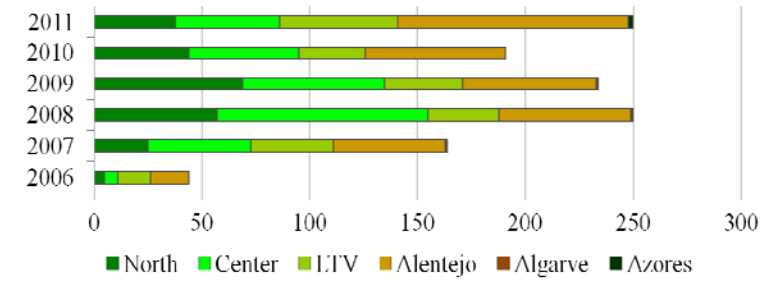
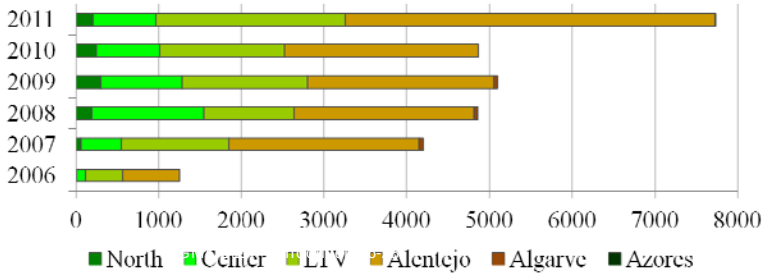
Bt maize: numbers of notifications (top) and growing areas (ha) (bottom)





Coexistence in the EU– Case of Portugal

Region	Number of PZ		Bt maize grown in PZ				Bt maize growers in PZ			
			(ha)		Share in Bt maize area (%)		Number		Share in all PZ growers (%)	
	2007	2010	2007	2010	2007	2010	2007	2010	2007	2010
North	1	7	13	31	20.5	12.5	6	11	33.0	25.0
Center	4	6	152	586	31.0	66.4	22	35	33.0	48.6
LTV	3	3	476	428	36.8	28.3	8	7	100.0	22.6
Alentejo	3	5	1186	1285	51.4	54.8	18	18	100.0	27.7
National	11	21	18.27	2252	43.5	46.3	54	71	49.0	37.2

Source: Maria de Fátima Quedas (IPS) & Paula Cruz de Carvalho (DGADR), 2011

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Coexistence in the EU– Case of Portugal

Compensation scheme

- 4 €/80,000 seeds paid by seed supplier
- Requests can be made by farmers who can demonstrate they have grown certified seed and suffered loss due to adventitious presence
- Request is analyzed by assessment group which includes representatives of different stakeholders (government, farmers, seed industry, food and feed organizations)
- The fund does not cover adventitious presence due to non-compliance
- No requests have been made so far since the scheme was instituted in 2007

Source: Maria de Fátima Quedas (IPS) & Paula Cruz de Carvalho (DGADR), 2011

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Coexistence in the EU– Case of Portugal

Control, inspections and compliance

- Four suits, 1 due to late information to neighbors and 3 due to lack of notification of Bt maize cultivation; in all cases isolation measures were in place.
- In one case isolation measures were not applied, but a neighbors' agreement was made.
- 3 Spanish Bt growers holding farms in Portugal and having bought Bt maize seed in their country of origin were not aware of the need of notification.

Source: Maria de Fátima Quedas (IPS) & Paula Cruz de Carvalho (DGADR), 2011

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COEXISTENCE IN SOUTH AMERICA: THE CASE OF BRAZIL

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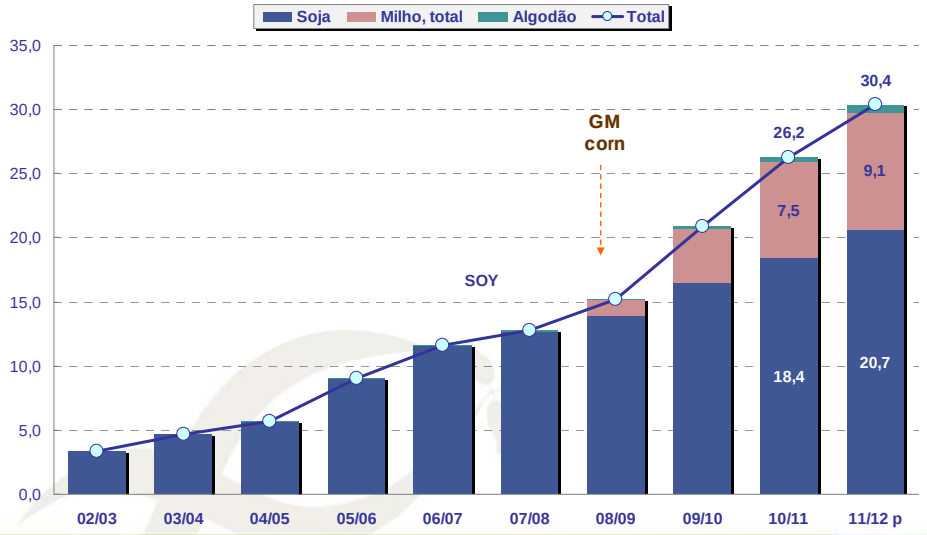
Agricultural Biotechnology Adoption in Brazil
per crop in million hectares



MV Coelho, Ministry of Agriculture, Livestock and Food Supply of Brasil, 2011

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Resolution CTNBio nº 04/07 measures

Scope:

- Only to situations involving authorized GM corn
- Not applied to seed production which is regulated by specific rules
- Not applied to research activities with regulated GMOs

Principles:

- Biosafety concerns are already met
- Issue related only to aspects of production (organization, comercialization and labelling)

MV Coelho, Ministry of Agriculture, Livestock and Food Supply of Brasil, 2011

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Resolution CTNBio nº 04/07 measures

- Establishment of minimum distances to ensure that the presence of GM corn in the harvested production does not exceed 1%
  - Distance: 100 m
  - Alternative distance: 20 m when a border with at least 10 rows with non GM corn is used
- Distances established based on gene flow studies and considering national rule of labelling

MV Coelho, Ministry of Agriculture, Livestock and Food Supply of Brasil, 2011

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Implementation

- Contact with producer associations and other entities linked to agricultural production to inform and clarify new rules
- Contact with organic and non-GM production association in order to get the location of production areas and prioritize these locations for inspections
- Inclusion of advice about the rules on corn seed bags
- Inspector training and investment in the official laboratories to support official controls
- GM corn field inspections to verify compliance

MV Coelho, Ministry of Agriculture, Livestock and Food Supply of Brasil, 2011

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Seed industry initiative

Distribution of leaflets

media coverage

"At the time of sowing transgenic corn keep aligned with the good neighborhood: cultivate in coexistence"

MV Coelho, Ministry of Agriculture, Livestock and Food Supply of Brasil, 2011

Fifth International Genetically Modified (GM) Crops Coexistence Conference

Inspections 2009-2010

Region/State	Nº Inspections	Nº Violation	% Noncompliance
NORTH	17	-	-
Tocantins	17	-	-
NORTHEAST	163	3	1,8
Bahia	163	3	1,8
MIDWEST	285	24	8,4
Mato Grosso	58	10	17,2
Goiás	79	8	10,1
Distrito Federal	5	-	-
Mato Grosso Sul	143	6	4,2
SOUTHEAST	209	8	3,8
São Paulo	96	5	5,2
Minas Gerais	113	3	2,7
SOUTH	541	61	11,3
Rio Grande Sul	97	6	6,2
Paraná	344	46	13,4
Santa Catarina	100	9	9,0
TOTAL BRAZIL	1215	96	7,9

MV Coelho, Ministry of Agriculture, Livestock and Food Supply of Brasil, 2011

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Some observations from Brazil

- Cases of arrangements among farmers with the view to overcome compliance problems e.g. through the acquisition of product from the neighbor's area
- Organic farms normally away from areas with cultivation of GM corn
- No reported cases of complaint or litigation between neighbors
- Rapid and massive adoption of technology has decreased situations of coexistence in the field
- Increased complexity of official controls due to the increase of the number of events authorized

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