GMO in seeds
actual state of affairs

- The EU concept of co-existence
- costs of co-existence
- liability
- GMO free regions and zones
- Seed contamination, labelling and approval
- Save our Seeds

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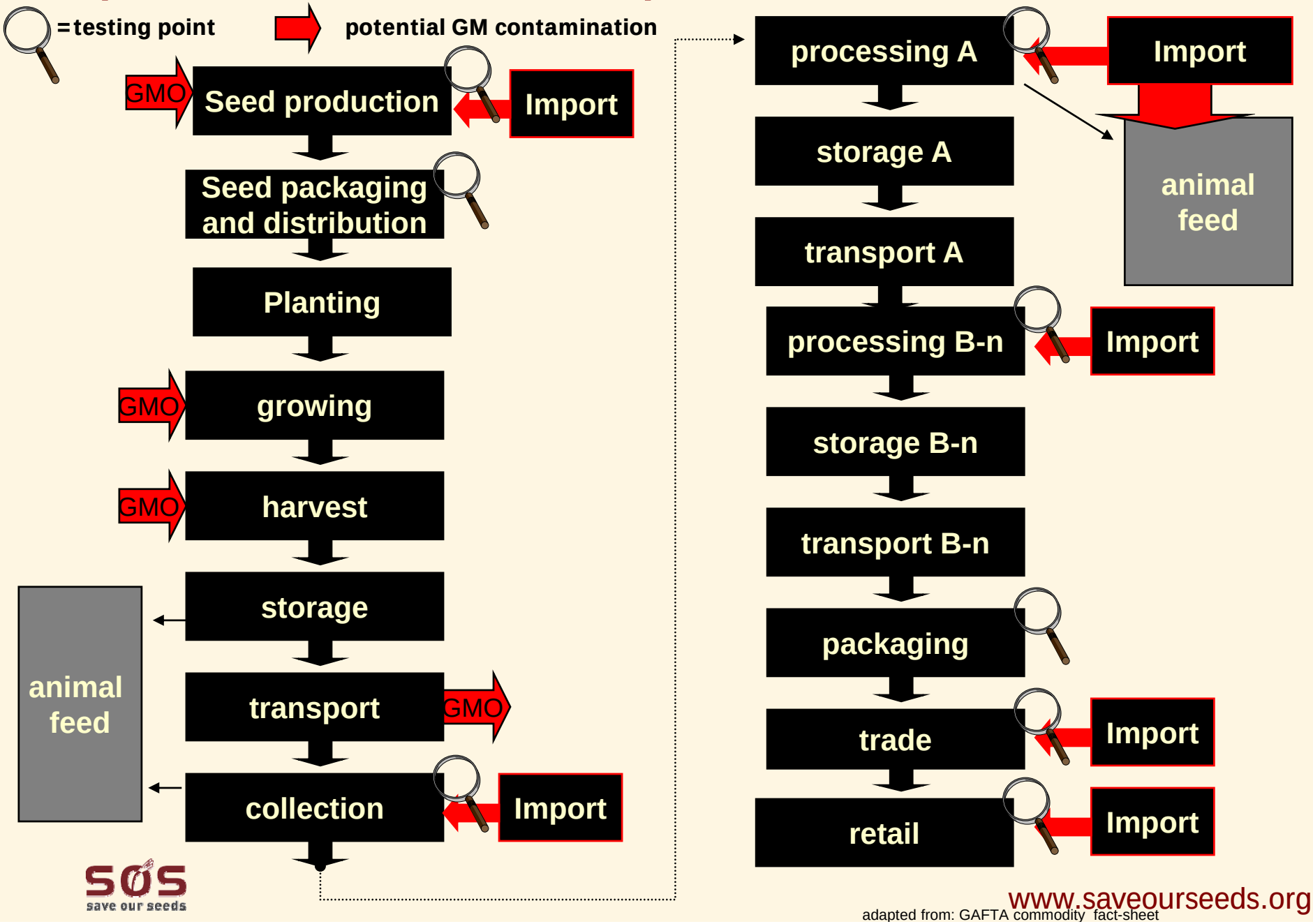
production chain and critical points



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adapted from: GAFTA commodity fact-sheet

Key questions regarding co-existence

- **Is it feasible? What happens when GMO and non-GMO farming are not compatible?**
- **Which measures will be effective and necessary?**
- **Who is responsible ?**
  - **GMO and Seed industry**
  - **GMO users / farmers**
  - **Non-GMO farmers / organic producers**
  - **bee keepers and other stakeholders**
- **Who will be liable for which type of damages ?**
- **Who will cover the costs of prevention, control and market impacts?**
- **Can entire regions be kept GMO free?**

Co-existence policy - mission impossible?

EU Commission wants to leave to the member states

1. to establish code of good agricultural practice,
2. protection of non-GM and organic farmers,
3. protection of ecologically sensitive areas,
4. liability and redress

Many member states & EU Parliament demand

- EU wide regulations on co-existence
- EU wide civil and environmental liability regulations
- Option to establish GMO free areas where co-existence is not reasonably feasible

Denmark, Austria and soon Germany established co-existence and liabilty rules in their national legislation, which already differ significantly.

EU Directive 2001/18, Article 26a

Measures to avoid the unintended presence of GMOs

1. **Member States may take appropriate measures to avoid the unintended presence of GMOs in other products.**
2. The Commission shall gather and coordinate information based on studies at Community and national level, observe the developments regarding coexistence in the Member States and, on the basis of the information and observations, develop guidelines on the coexistence of genetically modified,conventional and organic crops.'

EU Commission guidelines and recommended measures

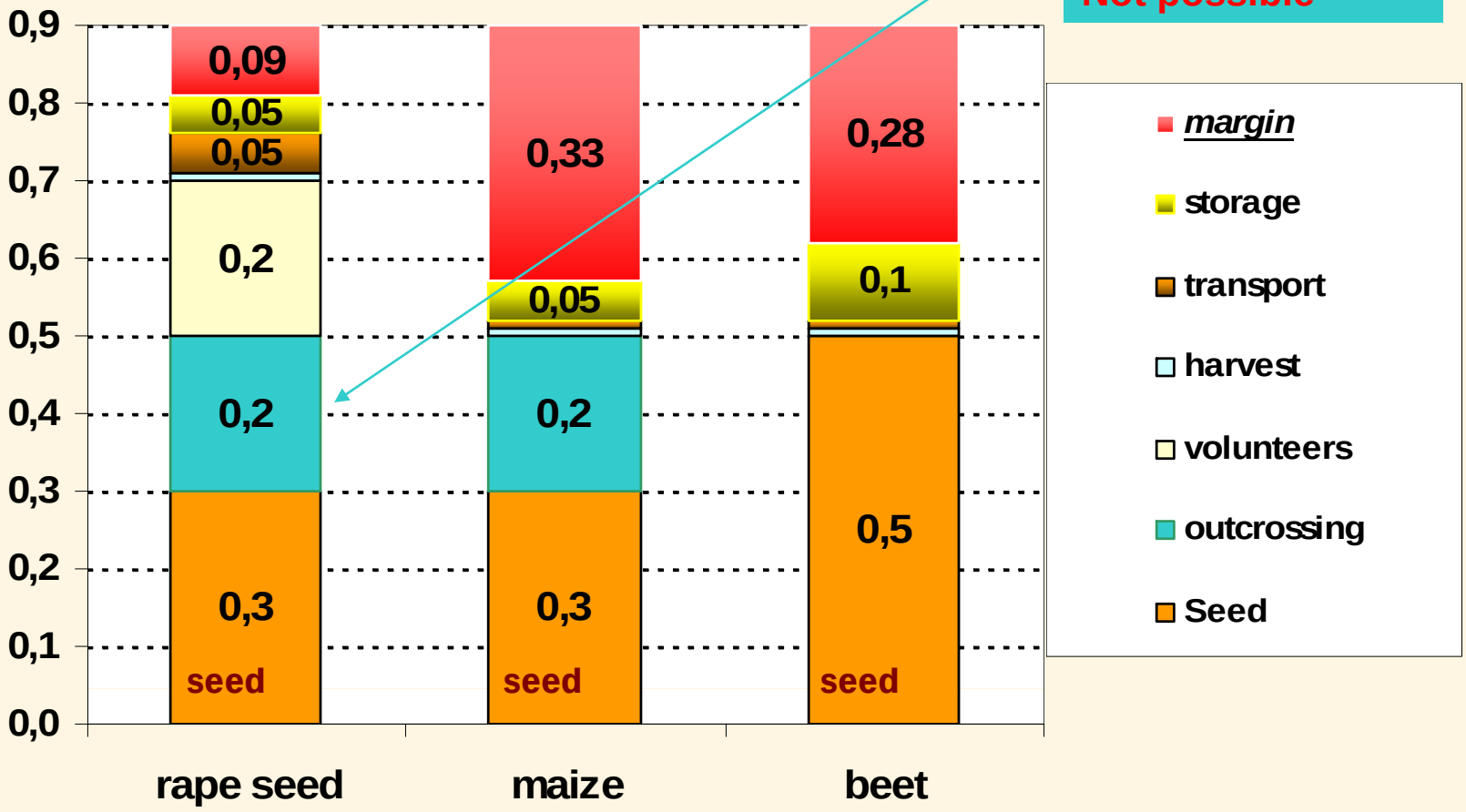
- **isolation distances and buffer zones**
- **pollen traps, barriers, hedgerows**
- **field monitoring and elimination of seed spillage**
- **sowing and crop rotation agreements between farmers**
- **cleaning of machinery and facilities**
- **reduced seed saving of farmers (only where "save")**
- **use mandatory land-register of GMO cultivation (GIS system)**
- **review of national liability legislation**

Source: **Commission Recommendation of 23 July 2003 on guidelines for the development of national strategies and best practices to ensure the coexistence of genetically modified crops with conventional and organic farming**

Initial calculations on contamination levels

Source: Scientific Committee on Plants (2001)

Prof. Jeremy Sweet:
0,2 - 0,4 %
General agreement:
Not possible



EU-Commissioner David Byrne to European Parliament, 19.9.2003:
"...the SCP clearly shows that starting with seeds at the limit of such thresholds will result in a product with a GM presence of around 0,8%, which still leaves a margin vis à vis the 0,9 % threshold for the final product."

No solid scientific basis

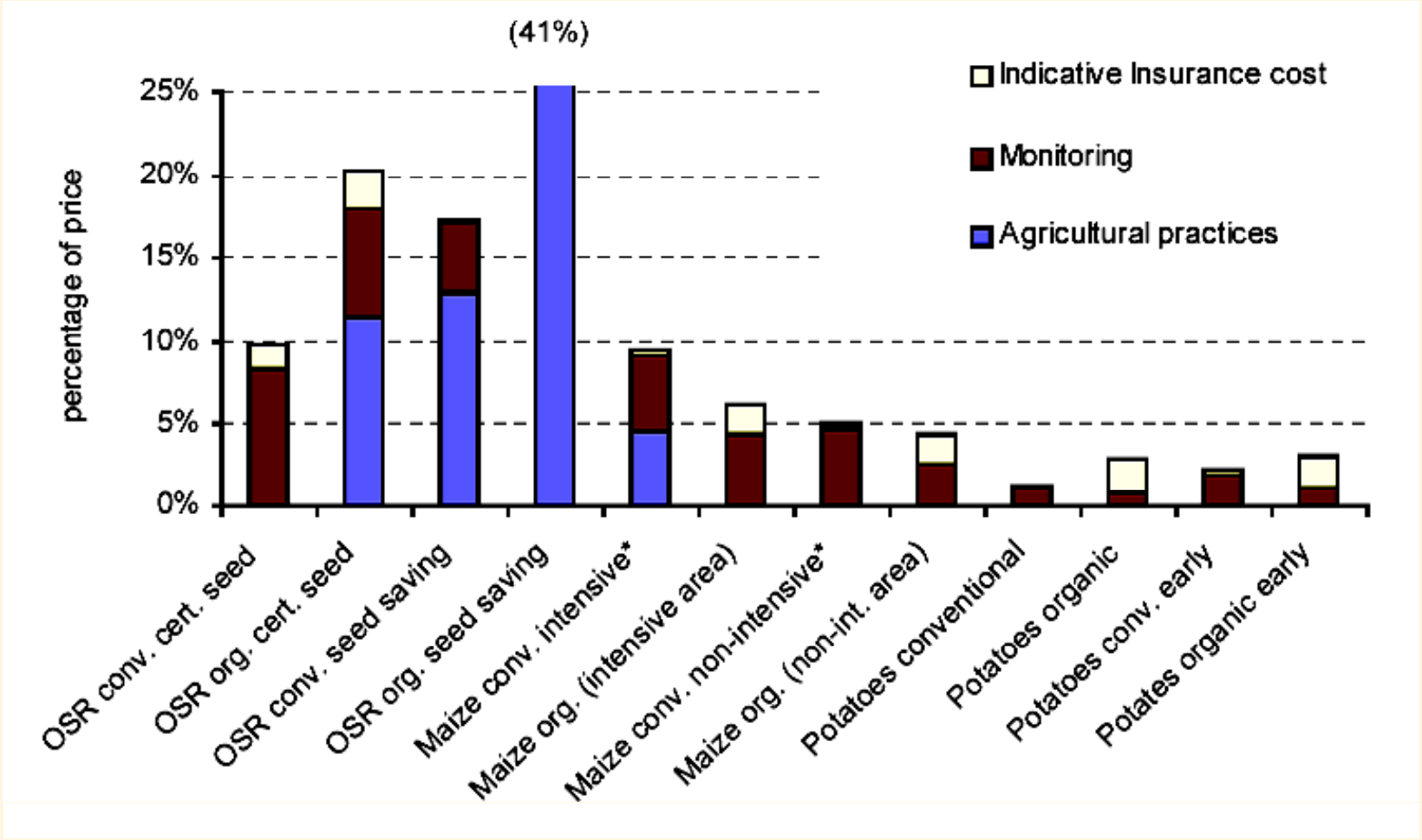
- EU Scientific Committee and other scientific institutions are very cautions regarding the feasibility of co-existence
- are sceptical on keeping contamination below of 0,9 %
- emphasise that "zero" contamination is impossible
- agree on need for further research
- disagree on key details such as outcrossing frequency, distances, seed survival in soil, role of bees and other insects, impact of scale (small GMO islands vs. small non-GM islands), accumulation of GMOs over time
- have no concept for critical species such as oilseed rape
- base their findings mostly on small scale experiments and computer models and not on large scale and long term experience (poor documentation in GMO growing countries)

some worrying facts

- **Non-GM growing of oilseed rape no longer feasible in Canada**
- **emergence of recombined multiple herbice resistant GMOs (gene stacking)**
- **Seeds found in soil 13 years after initial planting; UK ministry of agriculture prohibits planting of oilseed rape on former test sites**
- **Outcrossing events found up to 26 km from source**
- **Outcrossing frequency proves not to be linear**
- **Massive GM contamination found in non-GM seeds in the USA**
- **"Starlink"-maize found in 12% of test samples in the US 3 years after ban and massive recall measures and even in Mexican landraces**

Costs of co-existence

Estimated additional production costs due to co-existence
53 € - 345 € per ha



Source: [EU Joint Research Centre: Scenarios for co-existence]

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testing costs

Table 36: Costs for currently available methods for GMO analysis

DNA analysis	Price Euro/test	Event/DNA analyte	Limit of detection	Sensibility/ variability	Applications
Qualitative (detection) PCR	178 €	CaMV 35S, nos terminator			GMO detection in complex mixture
	187 – 158 € (1 to 40 tests)		0.1%	+/- 20%	All GM crops approved in Europe and world-wide
Quantitative PCR	396 €	Cry1Ab, EPSPS, Bar for maize Bar for oilseed rape			
	305-260 € (1 to 40 tests)		0.1%	+/- 20%	All GM crops approved in Europe and world-wide
Real-time quantitative PCR	436 €		0.1%	+/- 20%	All GM crops approved in Europe and world-wide

Protein analysis	Price Euro/test	Event/ protein analyte	Limit of detection	Sensibility/ variability	Applications	Recommended for
ELISA Plate kit	143 €	Cry1Ab Cry1Ac	-	2.5% - 0.55%	Bulk grain maize, cotton leaf tissue	Bt11 maize; not recommended for Cry1Ab in Bt176 maize
	222 €	Cry9C	-	0.05% - 0.25% 0.01% - 0.125%	Bulk grain	Starlink™
	570 €	Cry1Ab	-	-	-	Mon810 maize, Bt 11 maize
	570 €	Cry9C	≤0.01%, 0.01% - 0.1%, 0.1% - 1%, >1%	-	-	Aventis Starlink

No conclusive picture of total costs of co-existence

- few scientific studies and scenarios; no systematic overview available from EU Commission or governments
- available estimations only refer to costs in agricultural production, not to total costs within the food and feed production chain (processing, retail, trade)
- seed purity is a key factor and still undeciced
- Who will pay the bill? Allocation of most cost factors unclear, massive share of costs will have to be borne by those not wishing to plant or use GMO under current legal and market conditions

Scientists calculate insurance costs as they expect frequent contamination above the labelling threshold level.

But insurances explicitely exclude coverage for GM-contamination.

The EU Commissions planned GMO Seed Directive

Contamination of conventional and organic seeds with "adventitious and technically unavoidable presence of GMO" needs not be labelled below thresholds of

0,3% in Oilseed Rape and in Maize (new)

0,5% potatoes, tomatoes, beet, chicoree

0,7% in Soybeans

- **Initial proposal withdrawn after massive protest**
- **New proposal by Commissioner Wallström expected soon**
- **Legal basis: "Commission Directive" to be approved by Standing Committee on GMOs (regulatory procedure)**

every 200th maize plant on a non-gmo field could be a GMO

To scale: Maize field with 0,5 % GMO contamination

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No precaution – no control
no co-existence

Unlabelled seed contamination would

- **prevent registration of GM planting**
- **make monitoring impossible**
- **prevent GMO free zones and regions**
- **Make a recall pracitally impossible**
- **disable co-existence and liability regulations**

European "Save our Seeds" initiative

- **no forced GMO cultivation through the back door**
- **GMO labelling in seeds at the detection limit**
- **no additional costs for GMO free farming**

- **200.000 European citizens signed "Save our Seeds" Petition to EU Commission and governments**
- **350 organisations of farmers, consumers, environmentalists, co-operatives and companies with more than 25 Mio members EU wide support "Save our Seeds"**
- **An increasing number of EU governments and the European Parliament support labelling of GMOs in seeds at the detection limit**

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Positions of EU member states on seed purity

19 for detection level (0,1) **19 for contamination thresholds** **49 undecided**

Country	Votes	Remarks
***France**	**10**	requested review of Scientific Committee assessment at Seed Committee
Germany	**10**	split between Greens and some SPD ministers
Italy	**10**	"Zero tolerance" policy
UK	**10**	presently reviewing its position
Spain	**8**	firmly in favour of GM growing and high thresholds
Belgium	**5**	expressed concern in Council, split between flamish and wallonian Ag minister
***Greece**	**5**	rather critical position on Commission proposal
Netherlands	**5**	major point of EU imports from US, notoriously on Commissions side
***Portugal**	**5**	expressed concerns in Council, rather critical of Commission proposal
***Austria**	**4**	All party agreement, has seed law with 0,1 % in force
Sweden	**4**	So far supported Commission position, reviewing position
***Denmark**	**3**	Minister asked Parliament to confirm his 0,1 % position
Ireland	**3**	Presidency from 1.1.2004, outspoken pro-GMO position
Finland	**3**	So far firmly on Commissions side
***Luxemburg**	**2**	All party agreement for 0,1 % position
TOTAL	**87**	
qalifiied majority	62	

*** = Moratorium States**

European Parliament: Resolution **(2003/2098)**
labelling at detection level

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Conclusions

1. EU seed purity legislation at the detection limit
2. EU wide liability to be borne by GMO producers
3. EU wide standards for GMO planting
4. All costs and financial risks must be estimated and taken into account
5. GMO producers and users must cover all additional costs
6. No approvals for GMO *cultivation* without EU wide co-existence measures
7. No special GMO-thresholds for organic farming
8. GMO free regions and zones should be established and protected


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