

# PREVENTING GMO CONTAMINATION

► AN OVERVIEW OF NATIONAL  
“COEXISTENCE” MEASURES  
IN THE EU

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# 1. INTRODUCTION

Organic farming in Europe is on the up. In 2012, organic farms covered 11.2 million hectares in Europe, of which almost 10 million hectares was in the 28 EU Member States (EU-28). Among the 'old' Member States, the so-called EU-15, Spain, Italy, Germany and France were the countries with the biggest organic farming sectors, while Poland, the Czech Republic and Romania were the biggest among the 'new' Member States or EU-13. Per capita spending on organic products in Europe in 2012 was €34.7, while total retail sales were around €22.7 billion. And the future continues to look bright: experts estimate that the market will double by 2020 (Meredith, S., Willer, H., 2012).

But there are still a number of factors that could hold back this expected growth, not the least of which is the threat of contamination. In the EU, conventional food and feed containing GMOs have to be labelled, although Regulation 1829/2003 does allow for the adventitious and technically unavoidable presence of a GMO in a given ingredient, provided it remains below 0.9%. By definition, organic products are free from genetically modified organisms (GMOs). The EU regulation for organic food and farming specifically states that "*GMOs and products produced from or by GMOs shall not be used as food, feed, processing aids, plant protection products, fertilisers, soil conditioners, seeds, vegetative propagating material, micro-organisms and animals in organic production*" (European Community, 2007; article 9).

There is no specific threshold for organic products established by EU legislation, because in organic farming it is the production process which is certified, not the end product. Nonetheless, all organic operators strive to ensure that their products are free from contamination by GMOs, below the detection level. Certifying bodies apply their own standards, but the general rule is that any organic product found to be contaminated with GMOs would be decertified.

Such contamination would of course be devastating for organic farmers and processors, but in reality the risk is also shared by conventional food producers, given the overwhelming distrust of GMOs by European consumers. As a result, few if any food processors have been brave enough to risk marketing GM foods in the European market.

The 0.9% labelling threshold is sometimes used as a basis for the modelling of costs associated with GMO presence in products, but this does not reflect industry practice, and in reality most farmers and processors strive to ensure a far lower presence. For organic food processors, this is around 0.01-0.1% of GMOs in raw materials, while for the conventional food industry, the figure is slightly higher at 0.1-0.3% but still well below the labelling threshold. In reality, the European food industry prefers to source its raw materials from regions with no GMO cultivation at all in order to minimise both costs and risks. Once contamination is found in a product, a farmer risks permanent loss of market share.

In Europe, 66% of consumers are worried about GMOs in food (European Commission, 2010) and most consumers who buy organic products cite the understanding that these foods are "free from GMOs" as one of the most important reasons why they buy them. And yet there is a clear cost to ensuring that food is guaranteed to be GMO-free, as raw materials have to be stored separately and traced throughout the entire food chain. The International Food & Agricultural Trade Policy Council estimates that sourcing non-GM soybean and maize means an additional annual cost to consumers in Japan and Europe of around \$100 million (Kalaitzandonakes, N., 2004).

The problem of increased costs and loss of market share is also a risk for non-GM conventional farmers. For example, Spanish farmers cultivating conventional maize for the gluten market lost up to €18 per tonne when their crop and/or harvest was contaminated by GM maize, forcing them to sell it for conventional animal feedstuffs rather than for human consumption (Greenpeace, 2009). In the province of Aragon (Spain) between 2003 and 2007, crops from 16 farms were contaminated by GM products, and each one of them lost their organic certification, in turn forcing the livestock farmers they supplied to source their non-GM maize feed from other regions, at an increased cost (Greenpeace, 2009).



## THE COST OF CONTAMINATION

It is estimated that the economic losses directly attributed to problems caused by GM farming can rise to as much as €14,756 per farmer. These costs are related to additional measures specifically designed to mitigate contamination such as forced unseasonal sowing dates, as well as the loss of organic status and the obligation of farmers to sell their produce in the conventional market (based on the difference between what they can obtain for selling seeds on the organic market and the price on the conventional market).

Keeping crops free from contamination is not limited to the field. It is a constant effort throughout the entire supply chain, both before a crop is sown and after it is harvested. During seed production there are 100 points of vulnerability and if the seed is contaminated, the cost of securing GMO-free production in all the following steps is multiplied by five (FoEE, 2009). According to the findings of the EU project CO-EXTRA (European Commission, 2009), the cost of achieving maize seed purity with GM content below 0.3% could exceed 20% of the current costs of producing seed. During sowing, to minimise the contamination from GM seeds caused by commingling in the seed drill, 30 to 40 minutes of cleaning is recommended. But even after five hours of cleaning, the first tank of organic seed could contain more than 1% of plant residues, and in the case of GMOs, this increases the risk of contamination (FoEE, 2009). However, the exact costs of coexistence between GM and non-GM production is hardly known: no comprehensive economic studies have been carried out to try to identify and evaluate all the related costs.

During harvesting, the sharing of machinery increases the possibilities of contamination, but to thoroughly clean a harvester can cost up to €1800 and take several hours. Elevators are one of the main sources of unintended impurities in supply chains. In the US, segregation costs for elevators were projected to be up to €10/t for commodities like wheat, corn and soy. When processing certified non-GM soybeans, processors incur additional costs of 25% compared to GM soybeans (FoEE, 2009).

If some GMOs are eventually authorised for cultivation across the EU, legally binding rules for coexistence will have to be established to guarantee that food and farming can remain GMO-free. These binding rules could be developed on the basis of the various regional rules already in place. The costs of preventing contamination (sampling, testing and technical measures) throughout the food chain (seed production, in the field, machinery, transport and storage facilities) and the loss of reputation in case of contamination will have to be taken into account in order help bolster farmers' capacity to stay GMO-free.

For now, however, the problem of coexistence is considered by the Commission as an issue for which the subsidiarity principle should apply – in other words, it is considered to be better handled at national or regional levels than at the European. The various different national or regional coexistence measures therefore need to be analysed with a critical eye to help identify the most relevant and efficient coexistence measures already in place.

This is the purpose of this report. It is based on information collected directly from IFOAM EU members, as well as from European Commission reports on coexistence and from national draft laws on coexistence notified to the European Commission via the so-called TRIS procedure (European Community, 1988).

After a description of the legal framework on coexistence measures established under Directive 2001/18/EC (European Union, 2001), the report will provide an overview of coexistence measures in Member States. Case studies from specific countries highlight the different coexistence practices across Europe. Finally, the report sets out a number of recommendations about which measures should be taken by the Commission and Member States to protect the organic sector from contamination.

## 2.

# LEGAL FRAMEWORK FOR COEXISTENCE MEASURES

### 2.1. LEGAL BASIS FOR COEXISTENCE MEASURES IN THE EU

The authorisation of GMOs is regulated in the EU by Directive 2001/18/EC on the deliberate release of GMOs in the environment (European Community, 2001), and Regulation 1829/2003 on the marketing of GMOs for food and feed (European Community, 2003). Authorisation is based solely on an evaluation of the risks of the GMO on health and the environment. It therefore excludes any consideration of the socio-economic impact of GMOs and, as a principle, the consequences of contamination by GMOs are not taken into account by the European Food Safety Authority (EFSA), the European Commission or Member States.

Yet the need to take into account the socio-economic impact was first acknowledged in 2003 (European Commission, 2003). During the final round of negotiations between the three EU institutions (Commission, Parliament and Council) on the new centralised procedure for authorising GMOs (the future 1829/2003 Regulation), Parliament insisted that a new article be inserted in Directive 2001/18/EC to provide Member States with a legal basis to take measures to prevent contamination of other products by GMOs.

Article 26a of Directive 2001/18/EC was added with that purpose. It stated that *“Member States may take appropriate measures to avoid the unintended presence of GMOs in other products.”*

This was a very weak compromise given that NGOs and the organic movement were asking at the time for the risk of contamination and its economic impacts to be recognised at the EU level and taken into account in the evaluation process. This was opposed by the European Commission, which eventually acknowledged the problem but claimed that this issue of “coexistence” would be better dealt with at the national level, as a matter of subsidiarity.

This means that while GMO authorisations are delivered at the EU level, measures to prevent contamination are adopted at the national level. At the same time, they must not contradict the principles of EU law, including the principle of free circulation. Such measures have to be notified to the Commission through the TRIS procedure under Directive 98/34/EC (European Community, 1998). The Commission checks that they conform with EU law and can ask Member States to change them if it considers that they go too far and breach the principle of proportionality.<sup>1</sup>

In the Commission’s initial thinking on the issue, the free circulation of a GMO could only be restricted on environmental or health grounds, and farmers would be free to grow a GM crop authorised at the EU level. The Commission was reluctant to acknowledge contamination as a problem and to find a solution to reconcile measures to prevent contamination with the EU legal framework. The very term “coexistence” used by the Commission implies that it is possible to grow GM alongside conventional and organic crops.

Lastly, it also means that the decision to adopt coexistence measures is up to Member States. There is no obligation for a national government to take measures to protect conventional and organic farming from contamination.

Another aspect that affects the scope of the coexistence measures is the definition of GMOs themselves. Article 3 of Directive 2001/18/EC states that the legislation *“shall not apply to organisms obtained through the techniques of genetic modification listed in Annex I B”*. The only technique that falls under the scope of European legislation is the so-called transgenesis. As a consequence, national coexistence measures only have to apply to GMOs obtained through this specific technique. Other techniques (such as mutagenesis, zinc finger nuclease technology, and cisgenesis) which would fall under the definition of GMOs are currently excluded from the legislation (European Community, 2001: article 2.2), even though they could trigger similar contamination problems.

<sup>1</sup> The principle of proportionality regulates the exercise of powers by the European Union. It seeks to set actions taken by the institutions of the Union within specified bounds. Under this rule, the involvement of the institutions must be limited to what is necessary to achieve the objectives of the Treaties. In other words, the content and form of the action must be in keeping with the aim pursued.



## 2.2. THE EVOLUTION OF THE POSITION OF THE EUROPEAN COMMISSION

Since the Commission decided that the subsidiarity principle should apply, coexistence measures are under the competence of Member States, but they have been strictly controlled by the Commission. In order to complement Article 26a of Directive 2001/18/EC and to provide guidance to Member States, on 23 July 2003 the European Commission issued recommendations on coexistence (European Commission, 2003). These guidelines were replaced by new recommendations on 13 July 2010 (European Commission, 2010) at the same time that the Commission issued the so-called “opt-out” proposal (modifying Directive 2001/18/EC), allowing Member States to introduce national or regional bans based on other reasons than those assessed at the EU level). The analysis of these two sets of guidelines and of a similarly themed Communication from 2006 (European Commission, 2006) shows that while the general principles remain the same, the Commission’s legal interpretation of the issue of coexistence has evolved from 2003 to 2010.

### 2.2.1. 23 JULY 2003 RECOMMENDATIONS ON COEXISTENCE

According to the Commission, freedom of choice for both consumers and farmers should be the guiding principle in the design of national coexistence measures. This means that the measures should not contravene article 22 of Directive 2001/18/EC<sup>2</sup> and not be a barrier to the free circulation of GMOs or to the freedom of farmers to grow them. As long as it has been authorised and therefore been proven safe for health and the environment, according to the Commission, “no form of agriculture should be excluded.”

From 2003 to 2010, the Commission applied a strict interpretation of the proportionality principle when reviewing national or regional measures, in particular by making a direct link between the measures and the need not to exceed the 0.9% labelling threshold which entered into force in 2003.

At the time, the Commission considered that the measures should not be stricter than necessary to make sure that contamination was not above 0.9% (“National strategies and best practices for coexistence should refer to the legal labelling thresholds and to applicable purity standards for GM food, feed and seed.” (European Commission, 2003; page 12)). The legal validity of such an interpretation was questioned and later abandoned by the Commission.

The 2003 guidelines insist on science-based decisions, an appropriate scale for the measures (farm level, reluctance to accept regional measures), crop-specific measures, proportionality, voluntary arrangements and cooperation between farms. As a general principle, farmers who introduce a new type of crop should bear the responsibility for implementing farm management measures.

### 2.2.2. REPORT ON THE IMPLEMENTATION OF NATIONAL MEASURES ON THE COEXISTENCE OF GENETICALLY MODIFIED CROPS WITH CONVENTIONAL AND ORGANIC FARMING

The 2006 Communication from the Commission acknowledged the negative economic implications of growing GM crops but confirmed the approach by which “Member States may generally not prohibit, restrict or impede the placing on the market of authorised GMOs” (European Commission, 2006; page 3). It also confirmed the strictness with which the Commission evaluated the measures notified by Member States or regions. “By the end of 2005, 20 items of draft legislation from seven Member States had been notified under Directive 98/34/EC laying down a procedure for the provision of information in the field of technical standards and regulations. In 10 of these cases the Commission considered that the notified measures could create obstacles to the free movement of goods; in four cases it raised no such objections. Two notifications have been withdrawn and four others were still pending at the end of 2005.” (European Commission, 2006; page 4)

The Commission has consistently rejected any ban or other type of measure that could appear to be a duplication of the EU approval, or that is considered discriminatory or disproportionate.

<sup>2</sup> Article 22, Directive 2001/18/EC “Without prejudice to Article 23, Member States may not prohibit, restrict or impede the placing on the market of GMOs, as or in products, which comply with the requirements of this Directive.”



### 2.2.3.

#### COMMISSION RECOMMENDATION OF 13 JULY 2010 ON GUIDELINES FOR THE DEVELOPMENT OF NATIONAL COEXISTENCE MEASURES TO AVOID THE UNINTENDED PRESENCE OF GMOS IN CONVENTIONAL AND ORGANIC CROPS

In 2005, the Commission withdrew a draft proposal aimed at setting up contamination thresholds in seeds, which was opposed by a large coalition of NGOs, farmers' organisations and the food processing and retail industry. In the following years, the ongoing controversy concerning the flaws and loopholes of the risk assessment process, conflicts of interest within EFSA, and the continuous and strident rejection of GMOs by consumers, the food industry, regional authorities and by many governments through the use of safeguard clauses, led the Commission to adopt a more flexible approach.

In 2009 the then Commission President José Manuel Barroso committed to granting Member States the right to "opt out" from GMO cultivation, as a way to re-start the authorisation process for GMOs for cultivation at the European level. A proposal allowing Member States to ban GMOs on any grounds - not related to the health and environmental risk assessment carried out at the EU level - was published in July 2010 (European Commission, 2010). At the same time, the Commission issued new recommendations on coexistence in which it implied that it would give Member States more flexibility in the design of their national measures (Guidelines 2010 Recital 7). "It is necessary to replace Recommendation 2003/556/EC to better reflect the possibility provided by Article 26a for Member States to establish measures to avoid the unintended presence of GMOs in conventional and organic crops. Accordingly, the current guidelines limit their content to the main general principles for the development of coexistence measures, **recognising that Member States need sufficient flexibility to take into account their regional and national specificities and the particular local needs of conventional, organic and other types of crops and products.**"

In this new Communication, the Commission eventually acknowledged that assessing the proportionality of the measures in relation to the 0.9% labelling threshold had no legal basis, and that the reality of the market was that economic operators in the food sector did not work with a 0.9% threshold but with a 0.1% threshold in most cases.

According to the European Commission Guidelines, 2010, Section 1.1: "In principle, farmers should be able to cultivate the types of agricultural crops they choose — be it GM crops, conventional or organic crops. This possibility should be combined with the wish of some farmers and operators to ensure that their crops have **the lowest possible presence of GMOs.**" [...] "However, the potential loss of income for producers of particular agriculture products such as organic products is not necessarily limited to exceeding the labelling threshold set out in EU legislation at 0.9%. In certain cases, and depending on market demand and on the respective provisions of national legislations (e.g. some Member States have developed national standards for different types of 'GM-free' labelling), **the presence of traces of GMOs in particular food crops — even at a level below 0.9% — may cause economic damages to operators who would wish to market them as non-containing GMOs.**

Moreover, the admixture of GMOs has specific implications for producers of particular products, such as organic farmers, impacting also the final consumer. Since such production is often more costly, stricter segregation efforts to avoid GMO presence may be necessary to guarantee the associated price premium. In addition, local constraints and characteristics may render these particular segregation needs very difficult and costly to be met efficiently in some geographical areas. It is therefore necessary to recognise that Member States need sufficient flexibility to take into consideration their particular regional and local needs with regard to GMO cultivation in order to achieve the lowest possible presence of GMOs in organic and other crops, when sufficient levels of purity cannot be achieved by other means."

Section 2.3 of the European Commission Guidelines, 2010, covers the levels of admixture to be attained through national coexistence measures to avoid the unintended presence of GMOs in conventional and organic crops. It states: "National measures to avoid the unintended presence of GMOs in conventional and organic crops should take into account available knowledge on the probability and sources of admixture between GM and non-GM crops. These measures should be proportionate to the level of admixture to be pursued, which will depend on regional and national specificities and the particular local needs of conventional, organic and other types of crops and production."



Section 2.3.3. continues: *“In several other cases, the potential loss of income for organic and some conventional producers (e.g. certain food producers) may be due to the presence of GMO traces at levels lower than 0.9%. In those cases, and in the interest of protecting particular types of production, concerned Member States may define measures that aim at reaching levels of presence of GMOs in other crops lower than 0.9%.”*

Additionally the Commission acknowledged that GMO-free zones could be considered (Section 2.4). *“Under certain economic and natural conditions, Member States should consider the possibility to exclude GMO cultivation from large areas of their territory to avoid the unintended presence of GMOs in conventional and organic crops. Such exclusion should rest on the demonstration by Member States that, for those areas, other measures are not enough to achieve sufficient levels of purity. Moreover, the restriction measures should be proportionate to the objective pursued (i.e. protection of particular needs of conventional and/or organic farming).”*

Organic agriculture was already taken into consideration in 2003, but the 2010 guidelines particularly underline the importance of protecting the organic sector from contamination. This is highlighted in Section 1.1: *“The admixture of GMOs has specific implications for producers of particular products such as organic farmers, impacting also the final consumer. Since such production is often more costly, stricter segregation efforts to avoid GMO presence may be necessary to guarantee the associated price premium.”*

In the 2010 guidelines, the Commission also gives more flexibility to Member States to adopt more meaningful and efficient measures and invites them to start cross-boundary cooperation (Section 2.1.1). “Science-based” decisions (meaning those solely based on health or environmental impacts) are no longer required by the 2010 guidelines and proportionality is also defined with more flexibility for Member States.<sup>3</sup>

As far as liability rules are concerned, the 2010 guidelines only mention that they are *“the exclusive competence of Members States.”* In contrast, the 2003 guidelines advised Member States to examine if their civil liability laws could apply to GMOs issues or if specific legislation was required to deal with them.

## 2.3. THE IMPLICATIONS OF THE “OPT-OUT” PROPOSAL

The proposal was controversial for many reasons. In the first place, the European Parliament and many governments doubted whether the text would provide legal backing for national bans on GMOs authorised at the EU level. The purpose here is not to discuss the “opt-out” proposal, but rather to highlight that the agreement eventually reached between the Council and the Parliament in December 2014 does include “socio-economic impacts” as a reason for Member States to ban GMO cultivation. The proposal was formally adopted by the European Parliament in January 2015.

The following citations detail the grounds on which Member States can enact national bans:

*“Member States should also be able to base the decisions which they adopt pursuant to Directive 2001/18/EC on grounds concerning socio-economic impacts which might arise from the cultivation of a GMO on the territory of the Member State concerned. While coexistence measures have been addressed by the Commission Recommendation of 13 July 2010, there should also be the possibility for Member States to adopt measures restricting or prohibiting cultivation of authorised GMOs in all or part of their territory under this Directive. Those grounds may be related to the high cost, impracticability or impossibility of implementing coexistence measures due to specific geographical conditions, such as small islands or mountain zones, or the need to avoid GMO presence in other products such as specific or particular product. Furthermore, the Commission has, as requested in the 2008 Council conclusions, reported to the European Parliament and the Council on socio-economic implications of GMO cultivation. The outcome of that report may provide valuable information for Member States considering taking decisions on the basis of this Directive. Grounds relating to agricultural policy objectives may include the need to protect the diversity of agricultural production and the need to ensure seed and plant propagating material purity. Member States should be allowed to base their measures also on other grounds that may include land use, town and country planning, or other legitimate factors including those relating to cultural traditions.”*

<sup>3</sup> Notions of efficiency and cost effectiveness disappeared in the new guidelines.



*“Where no demand was made pursuant to paragraph 1 of this Article, or where the notifier/applicant has confirmed the geographical scope of its initial notification/application, a Member State may adopt measures restricting or prohibiting the cultivation in all or part of its territory of a GMO, or group of GMOs defined by crop or trait, once authorised in accordance with Part C of this Directive or with Regulation (EC) No 1829/2003, provided that such measures are in conformity with Union law, reasoned, proportional and non-discriminatory and, in addition, are based on compelling grounds such as those related to:*

- (a) environmental policy objectives;*
- (b) town and country planning;*
- (c) land uses;*
- (d) socio-economic impacts;*
- (e) avoidance of GMO presence in other products without prejudice to Article 26a;*
- (f) agricultural policy objectives;*
- (g) public policy”*

*Coexistence measures remain the responsibility of Members States but, as mentioned in Article 1, they “shall take appropriate measures in border areas of their territory with the aim of avoiding possible cross-border contamination into neighbouring Member States in which the cultivation of those GMOs is prohibited, unless such measures are unnecessary in light of particular geographical conditions. Those measures shall be communicated to the Commission.”*

*“To ensure that the cultivation of GMOs does not result in the unintended presence of GMOs in other products whilst respecting the principle of subsidiarity, particular attention should be paid to the prevention of possible cross-border contamination from a Member State where cultivation is allowed into a neighbouring Member State where it is prohibited, unless the Member States concerned agree that particular geographical conditions render it unnecessary.”*

Banning GMO cultivation is without doubt the most cost-effective way to protect conventional and organic farming from contamination. Despite the new Directive, the legal solidity of such bans and their compatibility with the existing EU legal framework on the authorisation of GMOs and with WTO rules remains to be seen. But it is a clear recognition of the economic problem that contamination by GMOs can create for the food and farming sector.

# 3. OVERVIEW OF COEXISTENCE MEASURES IN MEMBER STATES

Since the entry into force of Directive 2001/18/EC, many Member States have adopted various measures aimed at preventing contamination by GMOs based partly on the recommendations from the Commission and their own regional context.

According to the Commission (European Commission, 2009), by February 2009, 15 Member States had adopted coexistence legislation.<sup>4</sup> Our own analysis shows that by 2014, 13 countries had no specific coexistence legislation,<sup>5</sup> but some of them, like France, have general rules on GMOs that can be related to coexistence. Latvia, for example, is currently drafting such a regulation and 15 other Member States had adopted one.<sup>6</sup> As this suggests, the situation can vary significantly from one country or region to another.

## 3.1. COEXISTENCE MEASURES AND NATIONAL BANS

Indeed, in the 13 Member States with no coexistence measures, the situations are very different, but the absence of such measures does not necessarily mean that a country is not addressing the issue of GMOs or that it does not oppose GMO cultivation.

Some countries like France, Greece, Italy and Poland use a national ban on GMO cultivation as an instrument to prevent contamination of the supply chain. As a consequence, they do not see a need for coexistence rules in their territories.

- France introduced a national law on GMOs in 2008 (French Republic, 2008) regulating liability, information and defining general principles about coexistence. But the technical conditions of coexistence, such as isolation distances, were to be specified in another text. A draft was prepared and notified through the TRIS procedure (Republic of France, 2012) but was never published by the subsequent government.
- Finland has no national coexistence law, but one of its nineteen regions, Åland, has adopted some coexistence rules (Finland; Åland Region, 2012).

- Austria also has no national rules, but eight of its nine “Länder” (regions) have adopted legislation on the issue.
- The situation in Italy is unique. One region, Valle d’Aosta, tried to adopt a regional regulation on coexistence. A draft was transmitted through the TRIS procedure (Italy; Valle d’Aosta, 2014), but the text has still not been published. Currently, Italy has no national or regional coexistence rules in place. But the country based its first national ban on the absence of coexistence measures, considering that GMO cultivation should not be allowed until such rules were adopted. The Court of Justice of the European Union (ECJ), in a preliminary ruling, declared such an argument illegal (European Court of Justice, 2012).

It is important to underline that the legality of national bans based on the use of safeguard clauses (European Community, 2001; Article 26) or emergency measures (European Commission, 2003; Article 34) has been questioned by the European Commission.

This is the case for most countries except Poland, which referred to the EU seed legislation and banned the maize varieties rather than the GMO itself. The Commission recognised in 2006 that 16 varieties of MON810 “are not suitable for cultivation in any part of Poland because of their too high maturity classes”, meaning that these varieties are not adapted to the Polish climate. The Commission authorised the country to prohibit the use, in any part of its territory, of the 16 genetically modified varieties (European Commission decision, 2006).

For many years, it was not clear whether Directive 2001/18/EC or Regulation 1829/2003 should be chosen as the correct legal basis for a national ban against maize MON810.

Since 2008, the French ban has been regularly challenged in court and twice declared illegal (in 2011 and 2013), making the current ban the third one to be put in place. The first revocation took place in 2011 when the French moratorium was declared illegal because it was based on the wrong legal basis.

<sup>4</sup> Austria, Belgium, Czech Republic, Denmark, France, Germany, Hungary, Lithuania, Luxembourg, Latvia, Netherlands, Portugal, Romania, Sweden and Slovakia.

<sup>5</sup> Croatia, Cyprus, France, Finland, Greece, Ireland, Italy, Latvia, Malta, the Netherlands, Poland, Spain and the United Kingdom.

<sup>6</sup> Austria, Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Germany, Hungary, Lithuania, Luxembourg, Portugal, Romania, Slovakia, Slovenia and Sweden.



Maize MON810 was authorised under Directive 90/220/EEC (European Council, 1990), now replaced by Directive 2001/18/EC, but the application to renew the authorisation was called for under the Regulation (EC) 1829/2003. Even if the renewal is still not in force, maize MON810 remains authorised with Regulation 1829/2003 as its legal framework. Hence, a national ban on maize MON810 should be taken under Regulation 1829/2003. Bans in Austria, Germany, Bulgaria, Hungary and Luxembourg are also based on this “wrong” legal basis and could be threatened, but until now they have never been legally challenged.

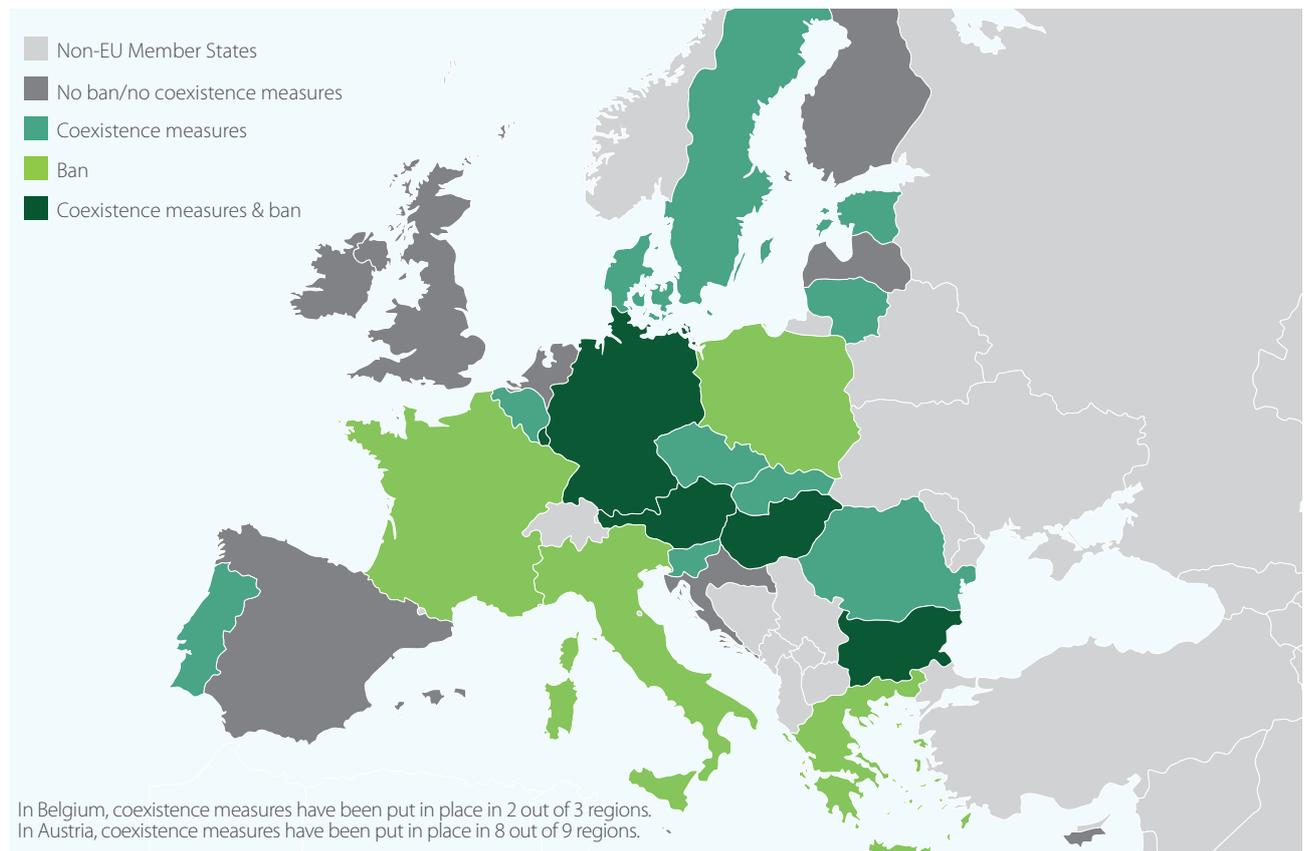
More generally, such measures are supposed to be scientifically based in order to prevent “a risk to human health or the environment” (Directive 2001/18/EC) or a “serious risk to human health, animal health or the environment” (Regulation 1829/2003). National bans contradict the EU assessment, and neither EFSA nor the European Commission have ever considered such measures to be justified. The second French ban was declared illegal because no “serious risk” was proved (French Republic, 2013).

Italy also had difficulties with its national ban, which was revoked before a new one was introduced in 2013.

Because the legal framework made it difficult for national governments to ban GM crops on a solid legal basis, some countries chose to adopt strong national coexistence measures to complement a ban. Luxembourg, Hungary, Bulgaria and Austria chose to introduce both measures (ban and coexistence rules (see map).

Ireland, the UK and the Netherlands are not particularly concerned by maize cultivation and do not specifically require measures to prevent contamination. However, they could be concerned if GMOs from other species, such as potatoes, were authorised. More problematic is the situation in Spain, which has no coexistence measures, but is almost the only producer of GMOs in Europe and where many cases of contamination have been reported.

### National GMO bans and coexistence measures in force





## 3.2. COMPARISON OF ADOPTED COEXISTENCE MEASURES

Likewise, among those Member States that have adopted coexistence measures, the situations and the types of measures are very different from one country to another. While the majority of countries have adopted national laws, in Austria it is the regions that have adopted coexistence measures (eight out of nine Länder (regions)).

All countries adopted rules that must be implemented at farm level, sometimes with the involvement of neighbouring farms. Indeed, isolation distances are usually required and are implemented at the farm scale either by the GMO-producing farm or on neighbouring farms. On the other hand, measures can also be taken at a regional scale: many European regions have declared themselves as GMO-free.<sup>7</sup> The competence to ban GMOs on a regional or sub-regional scale has never been recognised by the European authorities. However, political statements against GMO cultivation remain legal (see section 3.2.6.).

### 3.2.1. SEGREGATION DISTANCES AND OTHER TECHNICAL CONDITIONS

One of the most frequent types of coexistence measures put in place by the majority of Member States is that of isolation distances. These distances can vary from a couple of metres to several kilometres, depending on the crop and, sometimes, on regional characteristics. This measure can be partially or fully replaced by buffer zones between GM and non-GM crops.

The segregation distance is usually simply given as a distance that must be respected, although in some countries it is seen rather as the minimum distance to be respected (Hungary, Latvia's draft, Slovenia). Local authorities can decide to set a greater distance on account of specific geographical particularities, for example.

The regulations in the Czech Republic (Czech Republic, 2010) and the Walloon Region (Belgium; Walloon Region, 2009) define a distance range. This means that the distance can be reduced if complemented by a buffer zone.

For example, in the Walloon Region (Belgium), the isolation distance of 600 metres can be reduced to 300 metres if a buffer zone is sowed representing at least 20% of the GMO cultivation area. In the Czech Republic, the isolation distance (70 metres or 200 metres when "environmental agriculture" is involved) for GM maize cultivation can be reduced by two metres for each conventional maize row sowed as a buffer zone. When "environmental agriculture" is involved, the distance cannot be reduced under 100 metres. The current draft coexistence measures in Sweden (Sweden, 2007) would allow the isolation distance to be reduced if farmers nearby agree, without adding any buffer zone.

The size of the isolation distances put in place generally depends on the GM crop being grown (maize, sugar beet, soya, potatoes, etc.). Some countries - Belgium (Walloon Region), Germany, Portugal, Romania and Slovenia - only clarify the distance for GM maize as this is currently the only GMO authorised for cultivation in Europe. The Åland region in Finland and Latvia's draft regulation do not establish different distances for different types of GMO.

For maize, distances range from five to 600 metres, but most countries have decided on a distance of 200 metres. Distances for potatoes are between three and 50 metres. The Czech Republic chose a range of 10 to 20 metres for soya. For sugar beet, the range is between 10 and 50 metres. Lithuania is the only country with a distance for GM wheat cultivation (50 metres) and Slovakia has a segregation distance of 400 metres for oilseed rape. If adopted, Latvia's draft regulation on coexistence (Republic of Latvia, 2013) would be one of the strictest in Europe, requiring a segregation distance of 14,000 metres for every type of GMO - effectively making it all but impossible to grow any GMOs in the country.

Legislation in some Member States offers the possibility to create buffer zones. In Estonia, a buffer zone has to be six metres in the case of maize cultivation and six rows for potatoes. Slovenia makes it mandatory to set up a few rows of conventional maize in a GM field as a buffer zone, but also border rows that "must cover at least 20% of the total GM maize crop land area." In Belgium (Walloon Region), the buffer zone must represent at least 20% of the GMO crop's field surface. In the Czech Republic and Slovakia, the use of buffer zones are not mandatory, but can be used to justify the reduction of isolation distances.

<sup>7</sup> <http://www.gmo-free-regions.org/gmo-free-regions.html>.



On the contrary, in Hungary, buffer zones must be used to complete isolation distances that cannot be reduced. Some countries, including the Czech Republic, Germany and Austria, demand that crops in buffer zones should be treated as GM crops after harvesting, notably as far as labelling requirements are concerned. According to European labelling legislation (European Community, 2003), such production must be labelled as soon as it is found to contain GMOs, regardless of the level of contamination.

Isolation distances between GM and non-GM crops can imply that neighbouring farmers should not grow the same species on their farms. But national legislation does not usually make this requirement explicit and it is unclear if, for example, a farmer refused to grow a different crop whether this would render it impossible for his neighbour to grow GM crops.

In Latvia's draft regulation on coexistence, however, it is clearly stated that farmers within a circumference of 14,000 metres around the farm in question must agree not to grow other GMOs or the same conventional species.

Spatial segregation is not the only option chosen by Member States. Some (Denmark, Slovenia, Slovakia and Latvia) have also set up time segregation, for example insisting that after cultivating GM maize farmers must wait between one and 10 years before cultivating non-GM maize on the same field. Another way to consider time segregation is to delay flowering between GM and neighbouring conventional crops. Portugal and Hungary have adopted such measures: farmers need to coordinate with neighbouring farmers so as not to sow at the same period and to organise crop rotation. Some Member States, like Denmark, have special rules to protect seed multiplication from contamination with wider isolation distances (Denmark, 2008).

Seven Member States (Finland (Åland region)), France, Germany, Hungary, Lithuania and Portugal - see table on p. 18-19) have defined technical conditions to prevent contamination during transportation, storage or the cleaning of tools. Some of them oblige farmers to destroy plants germinated from GMOs and to practice crop rotation. Other countries, like Sweden, highlight the need for measures at the levels of cultivation and transportation, without providing further details on the type of measures.

None of the national regulations clearly clarify who is responsible for the cost of implementing coexistence measures. Some countries have created liability regimes only in order to compensate contamination, not to compensate for the costs of the preventive measures (see section 3.2.5).

### 3.2.2. SPECIFIC RULES TO PROTECT ORGANIC AGRICULTURE OR PROTECTED AREAS

Several Member States, namely Bulgaria, the Czech Republic, Finland (Åland region), Germany, Portugal and Slovakia, have decided to increase segregation distances when organic crops are grown in the same area as the GMO field. This increase can be a few metres or, as in Bulgaria, from a few hundred metres to seven kilometres.

In the French draft decree on coexistence, special measures are also set out to protect certain quality or geographical indications.

The presence of beehives can also be reason enough to increase segregation distances. Lithuania and Bulgaria decided that GM crops cannot be authorised for cultivation within a distance of three metres (Lithuania) and 10 kilometres (Bulgaria).

Protected areas, such as Natura 2000 or national parks, can also benefit from special protection measures against GMOs in some Member States (Bulgaria, France, Hungary and Luxembourg). In some of these countries GMO cultivation can be banned from protected areas. In France, this possibility was introduced by a general law on GMOs, but it is difficult to achieve the conditions needed to introduce such a ban like the approval of every farmer present in the area. At the moment, only the natural park of Monts d'Ardèche has succeeded with this procedure, thanks to a loose interpretation of the law (the park's ban received the unanimous backing of the farmers' union not the unanimous support of all farmers). This interpretation has not yet been taken to court. Other countries have increased the segregation distance in order to protect those special areas. In Bulgaria, for example, GMOs cannot be cultivated within a distance of 30 kilometres around protected areas.



### 3.2.3. INFORMATION

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Different parties can be concerned by information requirements when GMOs are cultivated: public authorities, neighbouring farmers, but also landowners, other farmers with whom tools are shared and land buyers.

Almost every country with coexistence measures has agreed mandatory procedures for farmers intending to grow GMOs obliging them to inform the authorities before cultivation actually starts (except Bulgaria, Estonia, Germany and Slovakia). Neighbouring farmers must also be informed before sowing (except Bulgaria, Estonia, Portugal and Romania). In the draft legislation drawn up by the Åland region (Finland), the approval of all neighbouring farmers is required before a farmer can grow GMOs.

The notion of “neighbouring farmers” is different from one country to another, however. In some cases (France, Slovakia and Sweden) these are the farmers working along the direct border of the farm where GMO cultivation is planned. Other countries have decided that the area within which there is an obligation to inform should be the same as the segregation distance (Latvia and Lithuania) or even wider than the segregation distance (Denmark, Åland region). In the Czech Republic, the information distance is wider when organic crops are involved. Lithuania has a special information distance for beekeepers (three kilometres).

The time scale within which authorities must be notified also differs from country to country. The information period is not specifically determined in some countries (Denmark, Finland, France, Hungary, Latvia, Slovenia and Belgium (Wallonia)), although the legislation states that the information must be provided before seeding. Some countries have chosen a fixed date in the year (Belgium, Walloon Region, 2008) or a specific time period before seeding. In Lithuania, farmers only have to notify the regional competent authority one month before sowing. However, it is clear that the sooner the GM-farmer provides information on his or her intentions, the better for the transparency of the process and for the non-GM farmers, who have time to take measures to prevent contamination.

In some Member States some measures have been taken to make sure third parties are also informed. In Hungary, Finland (Åland region) and Luxembourg, the landowner must give his approval before GM crops can be sown. In Denmark and Slovenia, when a field is sold the future owner has to be informed if GM crops have been grown on it and how germinated plants have been managed and destroyed. In Denmark, anyone involved in the transportation and storage of GMO crops need to be informed by the farmer.

Third parties and the general public are informed about the cultivation of GM crops via a public register (which is supposed to be set up by all Member States according to article 31 of Directive 2001/18/EC), but the content of the register differs in every country since there are no mandatory sections. Furthermore, some Member States have chosen instead to implement their own national registers, namely Austria, Belgium (Flemish and Walloon regions), Bulgaria, Denmark, Estonia, Finland (Åland region), Germany, Hungary, Italy, Latvia, Lithuania, Luxembourg, Portugal, Romania, Slovenia, Sweden and the UK. In France, the national register was available online until the national GMO ban was adopted. Poland was recently condemned by the European Court of Justice for failing to implement a national register.

The definition of the location of the GM crops disclosed in the register is quite vague in the majority of Member States because in most cases the law does not demand a specific definition. Instead, definitions range from considering a location as a full region (e.g. in Spain), to GPS coordinates of the exact location of the field, as in Germany and Romania.

### 3.2.4. TRAINING

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Some Member States have decided that every farmer wanting to grow GMOs should be obliged to follow a special training programme. Sometimes this means taking an exam, for example in Denmark, Estonia, Finland (Åland region), Hungary, Latvia, Lithuania, Slovakia and Slovenia. Best practices from the private sector are also available in France for farmers to share.



### 3.2.5. LIABILITY

The liability regimes that define compensation rules if contamination occurs also differ from one country to another.

Several Member States do not have specific liability rules (Croatia, Cyprus, Germany, Ireland, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Romania, Slovakia, Spain, the UK). In these cases, civil laws are supposed to apply, but without any definition of the damage that can be caused by the cultivation of GMOs and what damage can lead to compensation, it can be difficult to rely on general responsibilities. Hungary and Greece are two countries that specifically refer to civil law when dealing with GMO contamination cases.

Despite the fact that the commercial cultivation of GM crops is still very limited in the EU, there have already been numerous contamination cases (Greenpeace, 2009). But they are not consistently and properly reported (Price B. et al., 2013) even in those Member States in which monitoring programmes are in place. Farmers, conventional and organic producers are sometimes put under pressure not to report such contamination (Greenpeace, 2009).

Some Member States have decided to adopt specific rules on compensation in cases of contamination where coexistence measures have failed to protect conventional or organic production. In addition to liability in cases of contamination, offenders can also usually be charged with noncompliance with national legislation, failure to respect isolation distances, failure to inform the authorities or neighbouring farmers and failure to properly label their produce. Punishment for those found guilty depends on the country in question, ranging from fines (between €200 and €125,000) to prison sentences (up to two years in France for illegally growing GM crops, or six months for failing to inform the correct people). Other measures can also be taken such as the destruction of crops, the closure of an establishment, the suspension of authorisations for growing GMOs, and the removal of licences and permits.

If contamination occurs, the costs of the damage (for example, the loss of premium prices or organic certification) must be borne by someone and, at the moment, Member States are at liberty to decide who this should be.

Reputational damage and the loss of consumer trust can become a long-term problem for GMO-free producers whose crops are contaminated and they may need to embark on costly communication campaigns to overcome such a crisis.

In France, in cases of crop contamination, a strict liability regime applies, and even farmers who carefully respect coexistence rules are not exempt from having to pay compensation. French liability legislation does not, however, cover contamination from fields used for research purposes. Further, while compensation in France is calculated on the difference in price between a GM-labelled product and a non-GM labelled product, there is no economic compensation for subsequent moral or image prejudice suffered by farmers. Nor do farmers whose crops become contaminated have the right to demand compensation to cover the costs of quality scheme controls or the costs of a new organic certification process. And compensation for contamination is only possible when produce is from fields or beehives situated near GM crops and from the same year of production.

As in France, in Flanders (Belgium), only farmers whose fields border a field of GM crops can claim compensation. In other countries, the distance from the GMO field is not so clearly defined. The direct causal link between fields of GMOs and different contamination cases can be hard to prove. The solution in place in Flanders and France helps to circumvent this problem, but it ignores the fact that contamination can happen much further away and not just on neighbouring farms. Many contamination cases therefore risk being ignored and farmers left without any compensation.

In Austria, a similar scheme exists. Special liability rules take into account the interests of farmers who want to practice non-GM farming, and conventional farms are entitled to compensation for “significant adverse effects” as a result of GMO contamination, for example, if they can no longer sell their harvest.

French law obliges every farmer who wants to use GMOs to subscribe to some kind of financial security. What this means exactly is yet to be clarified in a decree, but two options can be considered, namely insurance or public compensation. Many insurance companies have already made it known that risks linked to GMOs will not be covered. As a consequence, the second option, a compensation fund, needs to be developed and there needs to be a discussion about how it will be financed.



In some countries compensation funds are already in operation, but they are not without problems and some have run out of cash even before they started operating because of a limited annual budget. In Portugal, money for this compensation fund is generated by a charge on GM-seed (€4/package of 80,000 seeds). But a farmer wanting to access these funds has to pay €100 as an administrative fee to request this compensation, and must provide copies of analysis showing contamination for which he must also pay, and seven other documents. In the Netherlands, seed growers, breeders, farmers (including organic farmers) and processors all contribute to the fund, as did the State in its initial phase.

In short, liability issues still raise many questions:

- The real difficulty of identifying the actor responsible for a given contamination case and of demonstrating a causal link between the farmer growing GMOs and the operator who is the victim of contamination. Taking into account only the immediate vicinity between GM crops and a contaminated field is too narrow and excludes many contamination cases.
- All types of damage must be taken into account to accurately calculate the amount of the compensation that should be awarded: economic losses even if the contamination is under 0.9% (including loss of contracts, certification or market), moral damages (such as loss of credibility as a supplier) and damages to common goods.

### 3.2.6. GMO-FREE ZONES AND BANS ON GMOs

Before adopting coexistence measures it is absolutely necessary to assess the technical and financial feasibility of such measures. This should reveal the impossibility of adopting coexistence measures in some regions. Indeed, even with strict rules, coexistence can be extremely hard to achieve, and, as a consequence, it may be necessary to exclude GMO cultivation from large areas.

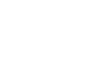
In its latest recommendations on coexistence (European Commission, 2010), the European Commission recognises this possibility, but says that it should not be up to Member States to have to prove that it would not be possible to prevent the unintended presence of GMOs in conventional or organic crops in certain areas.

Many countries have tried to ban GMOs on their territory. Some of them have used European legislation to do so (Directive 2001/18/EC and Regulation 1829/2003), but such bans can be legally challenged (see section 3.1.). In its 2008 general legislation on GMOs, France introduced the possibility to ban GMOs from national parks and this was legally used by one of them (see section 3.1.). Other countries and regions, such as Bulgaria, the Brussels region of Belgium, the Valle D'Aosta region in Italy and Åland region in Finland in its draft legislation, demand that farmers leave such a large area around environmentally protected areas, beehives or special cultivation, such as organic crops, that they impose a de facto ban on the culture of GMOs.

Many regions and municipalities have declared themselves as "GMO-free." But this is more of a political statement than an effective ban since they do not have the competence to introduce such a ban. The French Council of State (Conseil d'État) recognises that local councils and regions have the power to examine issues pertaining to the growing of GM crops, but bans taken at the regional or local council level have been systematically overturned.

The possibility to create GMO-free regions could be reinforced by the "opt-out" Directive that modifies Directive 2001/18/EC. Under this legislation, regions and municipalities are still unable to ban GMOs from their territory but state authorities are able to allow such bans and justify them with reasons other than those assessed at the EU level.

## OVERVIEW OF NATIONAL MEASURES TO PREVENT CONTAMINATION\*

	AT (depending on region)	BE - Brussels-Capital Region (2013)	BE - Flanders Region (2010)	BE - Wallonia Region (2008)	BG (no info)	CZ (2010)	DE (2008)	DK (2008)	EE (2012)	FI - Åland region only (2012)
<b>Ban on GMO cultivation</b>	Maize MON810	All GMO crops	Maize MON810		Maize MON810		Maize MON810			
<b>GMO-free regions**</b>	✓		✓	✓	✓		✓			
<b>Technical measures</b>	    		 	 	   	   	  	   	  	    
<b>Information and training</b>	 		  				 	  		  
<b>Liability regime</b>	 		 	 	 			 	 	 

\* Brussels-Capital Region, France, Latvia and Italy have submitted drafts but they are not in force.

\*\* Only national and/or regional and local policy bodies are taken into account. Private land owners banning GMOs have been left out.



Spatial isolation and/or buffer zones between all types of conventional crops and GM maize



Spatial isolation and/or buffer zones between organic crops and GM crops



Temporal isolation for sowing & growing of organic/conventional vs GM crops



Spatial isolation and/or buffer zones between all types of conventional crops and GM crops other than maize



Spatial isolation between beehives and GM crops



Other technical and physical measures taken during seed handling, cultivation, harvest, post-harvest, transport and storage

FR (2008)	HU (2006)	IT (2005)	LT (2007)	LU (2008)	LV (2013)	PT (2007)	RO (no info)	SI (2009)	SK (2006)	SE (2007)
All GMO maize	Maize MON810	Maize MON810		Maize MON810						
✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
   	   	  	    	  	   	   		 	    	
 	  	 	  	 	  	 	 	  	 	 
 		 								



Restriction of cultivation or any other measure in or near protected areas, e.g. Natura 2000 areas



Mandatory and voluntary training procedures on GM crop management and coexistence measures for GMO growers



Specific liability regimes or legal provisions for GMO contamination cases



Mandatory procedures for informing authorities and/or neighboring farmers about (the intention of) growing GM crops



Public register of GM crops



Fines for GMO contamination and non-compliance

# 4.

## ANALYSIS OF COEXISTENCE RULES IN SPECIFIC COUNTRIES

This section analyses in more detail coexistence measures in five countries: Spain, Poland, Romania, Germany and Austria. This analysis aims to identify the strengths and weaknesses of each set of national measures and to assess their level of efficiency in protecting the conventional and organic sectors from contamination by GMOs.

### 4.1. SPAIN: GMO CULTIVATION WITHOUT COEXISTENCE RULES

Five Member States are currently commercially cultivating GMOs, but only in Spain is the scale of cultivation significant<sup>8</sup> (MAGRAMA, 2014).

Farmers started growing GM crops in Spain in 1998, and a general law on GMOs, strictly based on Directive 2001/18/EC, was adopted in 2003 (Spain, 2003).

Despite significant commercial cultivation of GMOs, Spain has never adopted specific rules on coexistence: there are no demands for isolation distances, buffer zones or mandatory information for the authorities or for neighbouring farmers. In case of contamination, no liability regime is in place. Some regions have worked on draft coexistence measures, but these have never been formally adopted (Prat, F., 2008).

Contamination inevitably happens, and there are no measures to mitigate it. And with no monitoring or compensation system to encourage farmers to disclose contamination on their farms, it is impossible to have a comprehensive overview of the situation in Spain.

Even information about the exact acreage of arable land cultivated with GMOs is difficult to obtain. Available figures are based on sales declarations from seed producers, but they are not consistent (Greenpeace, 2014). Such figures are only averages<sup>9</sup> and cannot represent the reality in the same way as verified sowing declarations clearly would. The state, regional and local authorities do not properly coordinate to collect information and the precise locations of GM crops are not known. A striking paradox is that some countries like Poland, which have a national ban on GMO cultivation, were prosecuted by the European Commission (European Court of Justice, 2014) because of their lack of national register, even if

there was no immediate practical need for it, while the absence of a register of the precise location of GMO cultivation in Spain, where it would be necessary, has never led the Commission to start an infringement procedure. The European Court of Justice (ECJ) in the Polish case highlights the need for Member States to transpose the Directive about national registers with *“all [the] specificity, precision and lightness required.”*

The fact farmers do not have to notify the authorities when they cultivate GM crops and there is no national register of farms growing GMOs is a real problem. This absence of information (on GM crop locations, their nature and quantity) seriously limits the effectiveness of measures that individual farmers can try to take to prevent or mitigate contamination.

In the absence of national or regional coexistence rules, organic farmers try to take individual measures: early or late sowing, the use of maize with shorter growing cycles and regular testing. But such individual measures are not sufficient, and they are taken without the farmer knowing when and where GMOs are grown. Such measures can result in increased costs and sometimes lower yields (Noisette, C., 2009). These costs are borne by farmers wanting to protect themselves from contamination, not by the “polluters”.

In this situation, it is not surprising that, according to the Spanish authorities, not a single contamination case has ever been reported. The impossibility for farmers to know where GM crop fields are and to identify sources of contamination means that farmers who want to get compensation for contamination would need to sue all the neighbouring farmers. There is therefore no incentive for a farmer to disclose a contamination case which would likely do little more than jeopardise the sale of his harvest.

Greenpeace in Spain collected several testimonies of contamination cases and published them in a report in 2009 (Greenpeace, 2009). Without being exhaustive, this report documents the maize situation in Spain and the difficulty, if not the impossibility, for organic farmers to guarantee GMO-free production. The farmers’ testimonies collected in this report show that contamination has resulted in certification loss, economic loss, reputational damage (in the minds of suppliers and clients) and moral prejudice (such as discouragement). Some organic farmers have therefore decided to no longer grow maize because of the high level of contamination and

<sup>8</sup> 2014: 92% of GMOs grown in the EU come from Spain. Portugal is the second biggest producer, cultivating 6.5% of European GMOs. In 2014, GM maize represented 29% of maize cultivation in Spain (GM maize: 131,538 hectares, GM and non-GM maize cultivation: 449,497 hectares).

<sup>9</sup> This will not show if seeds are not used in the same sowing period as they were bought, if seeds are bought in a foreign country or if farmers outside Spain receive seeds from Spain.



the impossibility of preventing it. In the Aragon region, for example, organic maize is progressively disappearing (2004: 120 hectares, 2007: 42 hectares). Some organic livestock producers are obliged to buy feed produced outside Spain, increasing the cost of the feed (transportation and lower availability of GMO-free feed).

The lack of transparency is a real problem: the testimonies reported by Greenpeace are just *“the tip of the iceberg”* and the majority of the problems caused by GM crops remain unknown. Some farmers refuse to declare when their production is contaminated because they feel under threat not to do so.

Such a situation is a vicious circle; the less well-informed producers are, the less they can do to try to prevent contamination. The Greenpeace report ended with the analysis that *“coexistence between GM and non-GM crops is impossible.”* CO-EXTRA, a European research programme conducted between 2005 and 2009, also highlighted the extreme difficulty of keeping different cultivations totally separate from one another, stating that to do so would require significant technical and political measures.

The Spanish example highlights how serious the situation can be for conventional and organic farmers when GMOs are grown. This situation is even made worse by the absence of any coexistence rules: organic farmers are the first to be affected and they are the most visible sufferers because of the loss of certification. All this raises crucial questions about the costs of coexistence and by whom they should be borne.

#### **4.2. POLAND: NATIONAL BAN AND SEED CONTROLS**

Poland has had a national ban on GM maize MON810 since 2006. It is the only national ban ever accepted by the European Commission because it is not the GMO itself which is banned on the basis of a safeguard clause under Directive 2001/18/EC, but the maize varieties containing this GM event, which are deemed *“not suitable for cultivation”* in this particular country. Those varieties of maize are not suited to the climate of the country *“because of their too high maturity classes.”* Poland enacted another ban in 2013 on the GM “Amflora” potato. Because of these bans, Poland did not put in place any coexistence measures. However, a general law on GMOs,

adopted in 2001 and reviewed in 2014 (Republic of Poland, 2011), does contain liability rules. For the same reason, a public national register of GMO cultivation was never put in place.

This is in breach of Directive 2001/18/EC and the European Court of Justice recently ruled against Poland in this respect (European Court of Justice, 2014).

The Polish authorities have conducted many controls on seed samples. Between 2005 and 2010, 1,685 samples of maize, rape and mustard seeds were analysed. Sixty-six of them (3.92% of the analysed samples) contained traces of different transgenic lines. However, only seven samples contained GMOs above the quantification limit (0.1%). The control of seeds is very important as seeds contaminated above the detection level should not be put on the market. In order to guarantee that a final product is under the labelling threshold (0.9%), seeds need to be guaranteed to have a contamination level of less than 0.01%.

#### **4.3. ROMANIA: HIDDEN CULTIVATION OF UNAUTHORISED GMOS<sup>10</sup>**

Romania is one of the five European countries growing maize MON810, but only on 771 hectares (in 2014), which represent no more than 0.54% of the total area cultivated with GMOs in Europe (Noisette, C., 2014). The country has introduced specific legislation on GMOs: a minimum isolation distance of 200 metres between GM and non-GM maize has to be respected, and a buffer zone can also be set up depending on the species.

The Romanian GMO legislation does not include any specific liability rules, but refers clearly to common law and to the possibility to invoke civil damages (Romania, 2012). There is no specific provision for economic damages and here as well general law should apply. A national register of GMO cultivation in Romania is available online.<sup>11</sup>

One important loophole in Romania is that there is no monitoring of possible contamination by the public authorities. Two testing campaigns carried out by Greenpeace (in 2010 and 2014) found contamination cases (Greenpeace Romania, 2014). The tests revealed cultivation of GM soya in several fields in the Botosani region. No GM soya is authorised for cultivation in the European Union, but cultivation of GM soya used to be

<sup>10</sup> Section based on results from interview with Infogm Romania. <http://www.infogm.ro/web/en/>.

<sup>11</sup> <http://www.anpm.ro/registre>.



allowed in Romania before the accession of the country to the EU in May 2004. Romanian farmers are allowed to save seeds and then use them for the next planting season, and some farmers have used farm-saved seeds from illegal GM soya cultivation. There are few controls of fields carried out by the authorities or by companies, and so any information obtained from these sources cannot be considered trustworthy or reliable. The information in the public register is also considered untrustworthy, and field inspectors frequently complain about a lack of equipment to detect GMOs. Indeed, Romania's national laboratory is not equipped with the technology needed to analyse GMOs.

In short, the Romanian national legislation on GMOs is not robust enough to protect non-GM farmers from contamination. The lack of public monitoring and of measures to avoid contamination, in a country where the illegal cultivation of GM soya takes place, is a threat to conventional, organic and GM-free production.

#### 4.4. GERMANY: DETAILED COEXISTENCE MEASURES

Germany adopted a general law on GMOs in 2004 (Germany, 2004). Another text, on good farming practice in the cultivation of genetically modified plants was adopted in 2008 (Germany, 2008).

GMO growers have to notify their neighbours about their intention to plant GM crops "no later than three months prior to sowing or growing." "Neighbours" are defined as the farmers situated in the adjacent areas "within a distance of 300 metres of the edge of the area of cultivation." National authorities must also be informed about GMO cultivation.

Between GM and non-GM crops a minimum separation distance is required: 150 metres when the nearby farmers are conventional and 300 metres in cases of organic or GMO-free culture.

Special measures have to be taken concerning storage, transport and harvest (Germany, 2008). GM and non-GM seeds must be stored in separate and sealed containers, and GM storages must be labelled. GM seeds or produce harvested from GM plants that contains parts capable of reproduction must be transported in sealed vehicles.

In case of spillages during loading or transportation, genetically modified seed, planting material or harvested produce must be deemed to be GM production or destroyed. *"In the course of harvesting, a suitable harvesting technique shall be used to keep the dispersal of genetically modified produce into external plots of land to the minimum possible level."*

The German legislation does not precisely describe what could be considered as "suitable harvesting techniques," but it insists that "machinery and equipment employed in the sowing, harvesting, processing or transport of seed, planting material or harvested produce" must be cleaned properly after it has been used for GM crops, and before being used for non-GM cultivation.

If GMOs "volunteer" – whereby seeds are left in the ground and germinate the year after amidst a new crop – farmers must destroy the volunteer plants unless GMOs from the same species are to be cultivated in the following growing season. Monitoring must also be carried out in the year following the cultivation of a GM crop.

Moreover, farmers are obliged to keep information about "the variety of the genetically modified seed or planting material, the types of operation, the application of substances..." for at least five years after the end of GMO cultivation. The obligation to keep information, to monitor and to eliminate volunteers also applies to any farmer who takes over a field on which GMOs have been cultivated in the past.

There are also rules establishing a so-called 'time isolation': "an area of cultivation may be sown with non-genetically modified maize no sooner than the second year after the genetically modified maize has been harvested."

Germany also has coexistence legislation and a national ban on maize MON810. This plurality of measures seems to be the best way to prevent contamination by GMOs. However, German legislation could be complemented by a wider liability system in case of contamination. The German liability regime specific to GMOs only applies to some specific cases, especially from contamination caused by unauthorised GMOs or GMOs in confinement, with a restricted authorisation. Other cases are covered by the general rules of the German Civil Code.

#### 4.5. AUSTRIA: THE MOST DEVELOPED COEXISTENCE RULES IN EUROPE

Austria has one of the most legally robust liability regimes and it has also developed very detailed and strict coexistence measures at the regional level. Indeed, the country has a national ban and coexistence and liability measures that are adopted at a regional level and can therefore be easily adapted to take into account regional particularities.

Since 1999, Austria has had a ban on GMO cultivation. Eight out of nine regions (Länder) have adopted specific rules on coexistence. Only Vorarlberg has not adopted such regulation. All the measures are locally adjusted in a regional act and can be implemented and modified with additional measures at farm level, depending on the local context.

Regarding information of the authorities and third parties, notification and authorisation at national level are required before any GMO cultivation can take place. However, the European Court of Justice declared such national or regional authorisation systems illegal (European Court of Justice, 2013), since the cultivation of a given GMO is granted at EU level. As a consequence, it is not legal to add a national authorisation to the European one. Furthermore, European law has an immediate applicability before national judges, meaning that such national legislation is generally legally weak. But until such national or regional authorisation systems are attacked in front of a national court of justice, they can remain in force, as is the case in some Austrian regions.

The liability regime is detailed and quite strict:

- Fines can be awarded in cases of unauthorised cultivation or contamination.
- The “polluter” must restore the environment as much as possible.
- Monitoring is the responsibility of both public authorities and farmers.
- The creation of isolation distances and buffer zones are mentioned, but there are no details about how big these areas should be or whether they should be governed by any specific rules. This lack of detail can be explained by the national ban, which makes it unnecessary to offer clarification.

In the Vienna region (Austria; Vienna Region, 2005), the use of GMOs requires authorisation from the local authorities which can only be granted if, on account of the position, size and nature of the plots of land concerned, it is assumed that compliance with the precautionary measures will be possible (Austria; Vienna Region, 2005; Section 3).

The Viennese act gives a long list of coexistence measures which must be followed in this territory:

1. Compliance with isolation distances or the erection of buffer zones between fields containing GMOs and those containing unmodified plants belonging to the same species or genus;
2. The installation of pollen traps or barriers (e.g. hedgerows);
3. Compliance with appropriate crop rotation systems and the planning of the production cycle (planting arrangements for different flowering and harvesting periods);
4. The control of the population around the edges of fields by means of suitable cultivation methods;
5. The selection of specific sowing times and suitable cultivation methods;
6. The careful handling of seeds;
7. The use of GM varieties with reduced pollen production or of sterile male varieties;
8. Measures to prevent contamination by dispersal on agricultural machinery and equipment (e.g. cleaning prior to and after use, separate logistics);
9. Suitable tillage of the land during and after harvest.”

The region has not yet set down specific isolation distances.

Protected areas and areas dedicated to seed production can put in place more stringent protection measures. The public is informed about the growing of GM crops via a regional register and farmers must make detailed mandatory notifications to neighbouring farmers.

The public authorities are responsible for monitoring compliance with this regulation and any suspicions that it is being violated must lead to a specific investigation. The liability rules are also quite detailed: if unauthorised GMOs are cultivated, the land must be restored and the farmer may be fined as much as €15,000-30,000.

The Burgenland act (Austria; Burgen Region, 2005) is quite similar to the Viennese legislation. Natural monuments<sup>14</sup> must be protected and GMO cultivation is authorised only if “wild animal and plant species” will not be impaired.

<sup>14</sup> A natural monument is “a natural/cultural feature which is of outstanding or unique value because of its inherent rarity, representative of aesthetic qualities or cultural significance.” Definition available at: [http://glossary.eea.europa.eu/EEAGlossary/N/natural\\_monument](http://glossary.eea.europa.eu/EEAGlossary/N/natural_monument).



Other countries, such as France, also planned for the possibility to ban GMO cultivation in protected areas. The ECJ has never released any ruling on the legality of such a ban. The modification of Directive 2001/18/EC should reinforce this possibility (European Parliament, 2013).

Coexistence measures in the Burgenland region are not as detailed as in the Viennese act but offer an open list of measures, and others that are not explicitly detailed in the legislation can be considered. Notification to the regional authorities and neighbouring farmers is required. The public authorities can refuse to allow the cultivation of GMOs if contamination cannot be avoided, and specific measures can also be ordered on a given piece of land.

In cases of suspected contamination, notification to the authorities is required *“immediately”* and an investigation must be carried out. The authorities are allowed to *“enter and inspect plots, carry out investigations, demand the necessary information and take the quantity of samples necessary for analyses purposes, without compensation being paid.”* Public authorities are also responsible for monitoring.

Criminal penalties are lighter than in the Viennese region with recommended fines of between €5,000 and €10,000. In the case of unauthorised cultivation, the land must be restored as much as possible.

In Lower Austria (Austria; Lower Austria Region, 2005), the regional government can adopt specific measures for individual species of GMO in accordance with specific production aims and regional aspects. The open list of possible coexistence measures is the same as in the Viennese region with once extra detail: *“precautionary measures and an emergency plan (procedure for the disposal or destruction of the GMOs).”* Prior authorisation is required before GMOs can be cultivated and this must only be given if measures *“can prevent the contamination of others parcels of land by GMOs, even if those parcels are located in another province.”* GMO cultivation can be authorised in protected areas only if it *“does not adversely affect the conservation area in terms of the components that are essential for the conservation objectives.”* Nearby farmers and authorities need to be informed. Monitoring is under the responsibility of the public authorities, though farmers must also carry out their own monitoring. Compensation and the need for a register are also considered by the act.

Like other Länder (regions), Upper Austria (Austria; Upper Austria region, 2006) requires notification about GM cultivation to the public authorities and neighbouring farmers.

Section 4 of the legislation describes different cases in which cultivation can be refused, mainly in order to protect special areas (European, national or regional protected areas), organic farming and seed multiplication areas.

The act is quite similar to the others, but gives no list of possible coexistence measures. Fines are between €1,000 and €15,000 and up to €30,000 in cases of aggravating circumstances.

The Tyrol legislation (Austria; Tyrol Region, 2005) is much the same as those in place in other Austrian regions. Protected areas must be considered as special cases with a GMO cultivation authorisation, and they are more precisely described: mountain pastures, glaciers and their catchment areas, lowland forest and wetlands and Nature 2000 areas. But fines are lower than elsewhere at €2,000–€4,000.

The Styria rules (Austria; Styria Region, 2005) are very similar to the other acts discussed above with few very interesting additions in terms of the authorisation process. Again, the authorisation of the regional authorities is required before seeding. The applicant, neighbouring farmers and environmental lawyers are considered as parties to the process, and various other parties must also be consulted, namely:

1. the municipality in which the land intended for the application of GMOs is located, as well as neighbouring municipalities;
2. the Provincial Chamber for Agriculture and Forestry;
3. the Styrian Chamber of Employees;
4. the environmental organisations recognised under Section 19(7) of the Act on environmental compatibility testing 2000.”

The list of coexistence measures is the same as in Lower Austria act. Fines are up to €30,000.

The Carinthian legislation (Austria; Carinthia Region, 2005) does not describe which coexistence measures can be taken. But the list of special areas that must be protected is a little bit different and includes Alpine regions, glacier regions and their drainage areas, marsh and swamp land, reed and reed bed stand, lowland riparian and fenwood forest.

Notification to the authorities is required four weeks before seeding, which is less than the three months required in others regions.

The Salzburg act (Austria; Salzburg Region, 2005) is very similar to Lower Austria’s act, with no remarkable differences.

# 5. RECOMMENDATIONS

## A. AT THE EU LEVEL

### › No new approvals of GMOs for cultivation and import

The Commission should not add new sources of contamination on the European territory. The comitology procedures used to authorise GMOs since the 1990s have allowed the Commission to deliver authorisations for more than 50 GMOs for import and processing on the EU market, despite the fact that no qualified majority was reached in favour of any of those authorisations in the Council, and in many cases a simple majority of Member States was against it.

The food market is preserved from GMOs thanks to consumer pressure and to the commitment of the food industry not to put on the shelves products labelled as GMOs. The vast majority of European farmers does not want to grow GMOs. But GMOs imported to be processed into feed, agromaterial or biofuels are viable seeds, living organisms able to reproduce and multiply, and can be a source of contamination. This is even more likely in the case of plants with wild relatives in Europe, such as oilseed rape. Spillage from the import and transportation of the seeds can lead to the uncontrolled spread of the genetically modified plants into the environment.

At the time of writing only one GMO is approved for cultivation in the EU (GM maize MON810). Authorisations of new GMOs for cultivation would inevitably trigger contamination and significantly increase the costs for European agriculture and food production. This would jeopardise the possibility of keeping supply chains GMO-free. National bans would lower the problem in some countries, but they are not a solution in the long term.

### › No tolerance thresholds for unauthorised GMOs in food products should be set up

### › No tolerance thresholds either for unauthorised or authorised GMOs in seeds should be set up

Seeds are the first step of the production chain. Allowing contamination in seeds would jeopardise the ability of the whole production chain to stay GMO-free and multiply costs down-stream. It would also rapidly render GMO-free production impossible in Europe. The standard should remain the technical detection limit.

### › Trade negotiations should not lead to more authorisations or to a lowering of European standards, directly or indirectly

No trade agreement, including any Transatlantic Trade & Investment Partnership (TTIP), should contain mechanisms (such as Investor State Dispute Settlement (ISDS) or regulatory cooperation) that could be later used to lower standards, e.g. for approval, cultivation and labelling of GMOs.

### › Labelling of animal products made with animals fed with GMOs should be mandatory

Products from animals fed with GM feed should be clearly labelled. The loophole in the EU traceability and labelling regulation currently allowing them not to be labelled should be closed. In the meantime Member States should introduce national schemes for a voluntary labelling of GMO-free conventional and organic animal products. The standards for GMO-free labelling should be in line with the GMO-free production rules laid down in the Organic Regulation 834/2007.

### › New breeding techniques should be regularly evaluated and if necessary be legally defined as GMOs

under Directive 2001/18/EC, and should therefore not be exempted from the evaluation and authorisation of GMOs (Directive 2001/18/EC and Regulation 1829/2003) and should be subject to the traceability and labelling system (Regulation 1830/2003). The evaluation of new breeding techniques should be based on transparent procedures involving all stakeholders.

› The seed legislation should provide transparency on the breeding techniques used for the production of the seeds, whether these techniques are considered as GMOs or not from a legal point of view for the time being. Transparency should include the intellectual property rights attached to these breeding techniques. This is the condition for the organic breeding sector to be able to provide consumers and processors with plants that meet the principles of organic agriculture.



## B. AT THE NATIONAL AND/OR REGIONAL LEVELS

### ► Ban GMOs

A ban on GMO cultivation is the most efficient and least expensive way to protect organic and conventional farming from contamination.

It is not a surprise that, in most cases, countries with the more developed and detailed measures on coexistence are the same ones that have banned GMO cultivation on a case by case basis. Whether governments protect the organic and conventional sectors from contamination or not is a matter of political will. Given that until 2010 the Commission denied Member States and regions the right to ban GM crops, and questioned the legal validity of the bans based on safeguard clauses, some governments adopted coexistence measures in parallel to their bans, but never had to put them into practice.

The new Directive on cultivation “opt-outs” offers new legal possibilities to ban the cultivation of GMOs in Member States, including groups of GMOs, on the whole territory of a Member State. The legal validity of these new bans will ultimately be decided by the European Court of Justice.

### ► National and regional authorities should help GMO-free food and feed sectors access GMO-free supply from Europe or abroad

In particular, public authorities should encourage the development of the production of alternative materials (proteins or seeds) in Europe.

### ► In countries where GMO cultivation is not forbidden, governments should adopt measures to protect organic and conventional farming from contamination

The position of the European Parliament, reconfirmed during the second reading in the trilogue negotiations on the “opt-out” proposal, was to make the adoption of coexistence measures compulsory for countries that would not use the “opt-out” clause. This was opposed by some Member States in the Council, but is an essential requirement.

These measures should address the following aspects:

#### GMO-free zones

GMO-free zones should be established in regions where a majority of citizens is against the cultivation of GMOs, or a majority of farmers and processors make a living in the organic and conventional GMO-free sectors.

Quality schemes and certain types of production should benefit from special protection, such as beehives, products with geographic and quality indications, GMO-free production, national organic specification and private organic standards, conventional or organic seeds production, conservation varieties and farmers’ seed-saving systems.

GMO-free zones should also be established in seed production areas.

GMO cultivation should be declared incompatible with regional, national or European protected areas, and UNESCO Biosphere reserves, and should be banned in those areas. A protection distance is also necessary around such areas.

#### Transparency and information

European legislation obliges Member States to set up public national registers. This should be properly implemented and registers should be as precise as possible and indicate field locations. Registers should be public and easily accessible on the internet.



### Mandatory notification

When a farmer decides to grow a GM crop, mandatory notification to neighbouring farmers should be required. This notification should be done sufficiently in advance to allow other farmers to take their own protective measures. The notion of “neighbouring farmer” needs to be clarified and should be applied on an area as large as possible. Applying the notion only to farms directly touching fields containing GM crops would be too narrow a definition (for notification, isolation distance and to be able to claim compensation). Notification must be also mandatory to beekeepers situated around GM crops in a radius of at least 3 km, to the owner of the land if he/she is not the person planting the crops, buyers or renters of the land, and farmers who shares tools with the GMO producer.

### Mandatory training

Farmers who want to grow GMOs should be obliged to attend a training programme on the measures that they have to take to prevent the contamination of neighbouring fields.

### Technical segregation measures

Isolation must be considered both at the spatial and temporal levels. Specific isolation distances should be implemented in order to avoid and mitigate contamination. Furthermore, a lapse of time should be required between the cultivation of a GM and a non-GM crop of the same species on neighbouring fields. Further, all the following coexistence measures should be taken into consideration: isolation distances, buffer zones, information distances, crop rotation, earlier or later sowing and the cleaning of tools.

It is also necessary to insist that farmers of GM crops monitor second growth (volunteers).

Measures to prevent contamination must consider the whole production chain (cultivation, harvesting, transport, storage and transformation) and not just what happens at the field or farm level.

### Liability and compensation

The costs linked to coexistence should be borne by the GM producers and the owners of the patent, who disrupt existing practices by introducing a new type of crop. And the following questions should be asked when agreeing legislation on liability and compensation: Which damages can be taken into consideration? How is it possible to prove the causal link between a GM crop and a given case of contamination? Who can ask for compensation? How will the amount of compensation be evaluated? Furthermore, strict liability should apply (as opposed to fault-based liability); even if the source of the contamination is difficult to identify, farmers should receive compensation in all cases. The compensation should cover the loss of premium price but also loss of contracts, loss of markets and moral damages (loss of reputation).

Investigations should be conducted by private operators and public authorities to identify the origin of the contamination and to put a stop to it.

The owner(s) of the patent(s) on the GM crop or on the GM event should bear full liability for their products and therefore full liability for contamination resulting from it.

A few countries have set up funds to compensate victims of contamination.

The costs of preventive measures for non-GM operators, in particular the costs of testing, should also be compensated.

# 6. REFERENCES

Austria; Burgen Region (2005): über Maßnahmen der Gentechnik-Vorsorge (Bgl. GentechnikVorsorgegesetz – Bgl. GtVG). Available at: <http://ec.europa.eu/enterprise/tris/en/index.cfm/search/?trisation=search.detail&year=2004&num=459&fLang=DE>. Last accessed: 25.02.2015

Austria; Carinthia Region (2005): Act on the regulation of precautionary measures for genetic engineering. Available at: <http://ec.europa.eu/enterprise/tris/fr/index.cfm/search/?trisation=search.detail&year=2003&num=200&fLang=DE>. Last accessed: 25.02.2015

Austria; Lower Austria Region (2005): Engineering Precautionary Measures Act. Available at: <http://ec.europa.eu/enterprise/tris/fr/index.cfm/search/?trisation=search.detail&year=2005&num=5&fLang=DE>. Last accessed: 25.02.2015

Austria; Salzburg Region (2005): Act on precautionary measures for genetic engineering. Available at: <http://ec.europa.eu/enterprise/tris/fr/index.cfm/search/?trisation=search.detail&year=2003&num=475&fLang=DE>. Last accessed: 25.02.2015

Austria; Styria Region (2005): Act putting into place precautionary measures for genetic engineering. Available at: <http://ec.europa.eu/enterprise/tris/fr/index.cfm/search/?trisation=search.detail&year=2005&num=297&fLang=DE>. Last accessed: 25.02.2015

Austria; Tirol Region (2005): Act taking precautionary measures in relation to genetic engineering. Available at: <http://ec.europa.eu/enterprise/tris/fr/index.cfm/search/?trisation=search.detail&year=2004&num=311&fLang=DE>. Last accessed: 25.02.2015

Austria; Upper Austria Region (2006): Provincial act regarding precautionary regulations and measures in the sphere of genetic engineering. Available at: <http://ec.europa.eu/enterprise/tris/fr/index.cfm/search/?trisation=search.detail&year=2005&num=610&fLang=DE>. Last accessed: 25.02.2015

Austria; Viennese Region (2005): Act on precautionary measures in connection with genetic engineering. Available at: <http://ec.europa.eu/enterprise/tris/en/index.cfm/search/?trisation=search.detail&year=2004&num=538&fLang=DE>. Last accessed: 25.02.2015

Belgium (2009): Annexe 1 - Arrêté du Gouvernement wallon du 27 mars 2009 relatif à la coexistence des cultures génétiquement modifiées avec les cultures conventionnelles et les cultures biologiques (*M.B. 19.05.2009*). Available at: <http://environnement.wallonie.be/legis/agriculture/qualite/qualite062.htm>

Belgium; Walloon Region (2009): Arrêté du Gouvernement wallon relatif à la coexistence des cultures génétiquement modifiées avec les cultures conventionnelles et les cultures biologiques. Available at: <http://environnement.wallonie.be/legis/agriculture/qualite/qualite062.htm>.

Denmark (2008): Bekendtgørelse om dyrkning m.v. af genetisk modificerede afgrøder. Available at: <http://www.ec.europa.eu/enterprise/tris/en/index.cfm/search/?trisation=search.detail&year=2007&num=598&fLang=DA>

European Commission (2003): Commission Recommendation of 23 July 2003 on guidelines for the development of national strategies and best practices to ensure the co-existence of genetically modified crops with conventional and organic farming Available at: [http://ec.europa.eu/agriculture/publi/reports/coexistence2/guide\\_en.pdf](http://ec.europa.eu/agriculture/publi/reports/coexistence2/guide_en.pdf). Last accessed: 25.02.2015

European Commission (2006): Communication from the commission to the council and the European parliament. Report on the implementation of national measures on the coexistence of genetically modified crops with conventional and organic farming Available at: [http://ecob.jrc.ec.europa.eu/documents/COM\\_2006\\_104final.pdf](http://ecob.jrc.ec.europa.eu/documents/COM_2006_104final.pdf). Last accessed: 25.02.2015

European Commission Decision (2006): Commission decision of 8 May 2006 authorising the Republic of Poland to prohibit on its territory the use of 16 genetically modified varieties of maize with the genetic modification MON 810 listed in the Common catalogue of varieties of agricultural plant species, pursuant to Council Directive 2002/53/EC. Available at: <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32006D0335&from=EN>. Last accessed: 25.02.2015

European Commission (2009): Summary of main Co-Extra deliverables & results, perspectives, information dissemination & application. Outcomes of Co-Extra. Final report. Available at: <http://www.bch.cbd.int/database/attachment/?id=3397>

European Commission (2009): Report from the Commission to the Council and the European Parliament on the coexistence of genetically modified crops with conventional and organic farming. Available at: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2009:0153:FIN:en:PDF>. Last accessed: 25.02.2015

European Commission (2010): Special Eurobarometer: Biotech, 2010. Available at: [http://www.ec.europa.eu/public\\_opinion/archives/ebs/ebs\\_341\\_en.pdf](http://www.ec.europa.eu/public_opinion/archives/ebs/ebs_341_en.pdf). Last accessed: 21.02.2015

European Commission (2010): Commission Recommendation of 13 July 2010 on guidelines for the development of national co-existence measures to avoid the unintended presence of GMOs in conventional and organic crops. Available at: <http://ecob.jrc.ec.europa.eu/documents/CoexRecommendation.pdf>. Last accessed: 25.02.2015

European Community (1998): Directive 98/34/EC of the European Parliament and of the Council of 22 June 1998 laying down a procedure for the provision of information in the field of technical standards and regulations. Available at: <http://www.eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31998L0034&from=EN>. Last accessed: 24.02.2015



European Community (2001): Directive 2001/18/EC of the European Parliament and of the Council of 12 March 2001 on the deliberate release into the environment of genetically modified organisms and repealing Council Directive 90/220/EEC. Available at: [http://www.eur-lex.europa.eu/resource.html?uri=cellar:303dd4fa-07a8-4d20-86a8-0baaf0518d22.0004.02/DOC\\_1&format=PDF](http://www.eur-lex.europa.eu/resource.html?uri=cellar:303dd4fa-07a8-4d20-86a8-0baaf0518d22.0004.02/DOC_1&format=PDF). Last accessed: 24.02.2015

European Community (2003): Regulation (EC) No 1829/2003 of the European Parliament and of the Council of 22 September 2003 on genetically modified food and feed. Available at: <http://www.eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32003R1829&from=FR>. Last accessed: 25.02.2015

European Community (2003): Regulation (EC) No 1830/2003 of 22 September 2003 concerning the traceability and labelling of genetically modified organisms and the traceability of food and feed products produced from genetically modified organisms and amending Directive 2001/18/EC. Available at: <http://www.eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32003R1830&from=FR>. Last accessed: 25.02.2015

European Community (2007): Council Regulation (EC) No 834/2007 on organic production and labelling of organic products and repealing Regulation (EEC) No 2092/91. Available at: <http://www.eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32007R0834&from=FR>. Last accessed: 21.02.2015

European Community (2015): Consolidated text of the European Parliament legislative resolution of 13 January 2015 on the Council position at first reading with a view to the adoption of a directive of the European Parliament and of the Council amending Directive 2001/18/EC as regards the possibility for the Member States to restrict or prohibit the cultivation of genetically modified organisms (GMOs) in their territory. Available at: <http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//TEXT+TA+P8-TA-2015-0004+0+DOC+XML+V0//EN>. Last accessed: 24.02.2015

European Council (1990): Directive 90/220/EEC of 23 April 1990 on the deliberate release into the environment of genetically modified organisms. Available at: <http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:31990L0220>. Last accessed: 25.02.2015

European Court of Justice (2011): In Joined Cases C-58/10 to C-68/10. *Monsanto vs Ministre de l'Agriculture et de la Pêche*. Available at: <http://curia.europa.eu/juris/document/document.fjsessionid=9ea7d2dc30dd833da7f118a24acba04bdb786f280b02.e34Kaxilc3qMb40Rch0SaxuPahz0?text=&docid=109243&pageIndex=0&doclang=EN&mode=lst&dir=&occ=first&part=1&cid=339024>. Last accessed: 25.02.2015

European Court of Justice (2012): Case C-36/11. *Pioneer Hi Bred Italia Srl vs Ministero delle Politiche agricole alimentari e forestali*. Available at: <http://curia.europa.eu/juris/document/document.jsf?doclang=EN&text=&pageIndex=0&part=1&mode=DOC&docid=126437&occ=first&dir=&cid=704558>. Last accessed: 25.02.2015

European Court of Justice (2013): Case C-542-12, Preliminary ruling. *Tribunale di Pordenone (Italy) v. Giorgio Fidenato*. Available at: <http://curia.europa.eu/juris/document/document.jsf?text=&docid=137582&pageIndex=0&doclang=FR&mode=lst&dir=&occ=first&part=1&cid=56364>

European Court of Justice (2014): Case C 478/13 *European Commission vs Republic of Poland* (2014). Available at: <http://curia.europa.eu/juris/document/document.jsf?text=&docid=158187&pageIndex=0&doclang=FR&mode=lst&dir=&occ=first&part=1&cid=86344>. Last accessed: 25.02.2015

European Court of Justice (2014): Case C-478/13. *Commission v. Poland Republic*. Available at: <http://curia.europa.eu/juris/document/document.jsf?text=&docid=158187&pageIndex=0&doclang=FR&mode=lst&dir=&occ=first&part=1&cid=86344>

European Parliament (2013): Question for written answer to the Commission, Sandrine Bélier (Verts/ALE), 11 July 2013, E-008463-13. Available at: <http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//TEXT+WQ+E-2013-008463+0+DOC+XML+V0//EN>

European Union (2007): Treaty of Lisbon amending the Treaty on European Union and the Treaty establishing the European Community. Available at: <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:12007L/TXT&from=EN>. Last accessed: 25.02.2015

Finland; Åland region (2012): Notification detail. Available at: <http://ec.europa.eu/enterprise/tris/en/index.cfm/search/?trisaction=search.detail&year=2011&num=611&fLang=SV>. Last accessed: 25.02.2015.

FoEE (2009): The socio-economic effects of GMOs: Hidden costs for the supply chain. Available at: [http://www.foeeurope.org/sites/default/files/publications/FoEE\\_Socio\\_economic\\_effects\\_gmos\\_0311.pdf](http://www.foeeurope.org/sites/default/files/publications/FoEE_Socio_economic_effects_gmos_0311.pdf)

French Republic (2008): Loi n° 2008-595 du 25 juin 2008 relative aux organismes génétiquement modifiés. Available at: <http://legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000019066077>. Last accessed: 25.02.2015

French Republic (2012): Notification Detail: Order on the technical conditions for cultivating, harvesting, storing and transporting genetically modified plants. Available at: <http://ec.europa.eu/growth/tools-databases/tris/en/index.cfm/search/?trisaction=search.detail&year=2012&num=42&mLang=EN>. Last accessed: 25.02.2015

Germany (2004): Gesetz zur Neuordnung des Gentechnikrechts. Available at: <http://ec.europa.eu/growth/tools-databases/tris/fr/index.cfm/search/?trisaction=search.detail&year=2004&num=133&fLang=DE>.



Germany (2008): Verordnung über die gute fachliche Praxis bei der Erzeugung gentechnisch veränderter Pflanzen. Available at: <http://ec.europa.eu/enterprise/tris/en/index.cfm/search/?trisaaction=search.detail&year=2007&num=460&fLang=DE>

Greenpeace (2014): *La superficie real cultivada con transgénicos en España es muy inferior a la estimada por el MAGRAMA* (Press release). Available at: <http://www.greenpeace.org/espana/es/news/2014/Octubre/La-superficie-real-cultivada-con-transgenic-os-en-Espana-es-muy-inferior-a-la-estimada-por-el-MAGRAMA/>

Greenpeace (2009): Testimonies of contamination, Why co-existence of GM and non GM crops remains impossible, Available at: <http://www.greenpeace.org/eu-unit/Global/eu-unit/reports-briefings/2009/10/testimonies-of-contamination-15-10-09.pdf>

Greenpeace Romania (2014): *În România încă există culturi ilegale de soia modificată genetic* (Press release). Available at: <http://www.greenpeace.org/romania/ro/campanii/agricultura-sustenabila/activitati/soia-modificata-genetic-in-romania/>

French Republic (2012): Commune de Valence. Available at: <http://www.legifrance.gouv.fr/affichJuriAdmin.do?oldAction=rechJuriAdmin&idTexte=CETATEXT000026410515&fastReqId=1952029630&fastPos=1>

French Republic (2011): *Rapport sur les conditions d'une coexistence pérenne entre les filières OGM, conventionnelles, biologiques et "sans OGM"*. Available at: [http://www.hautconseildesbiotechnologies.fr/IMG/pdf/120117\\_Coexistence\\_Recommandation\\_CEEES\\_HCB.pdf](http://www.hautconseildesbiotechnologies.fr/IMG/pdf/120117_Coexistence_Recommandation_CEEES_HCB.pdf)

French Republic (2013): Case n°358103. *AGPM et autres vs ministre de l'agriculture, de l'alimentation, de la pêche, de la ruralité et de l'aménagement du territoire*. Available at: <http://legifrance.gouv.fr/affichJuriAdmin.do?oldAction=rechJuriAdmin&idTexte=CETATEXT000027800642>. Last accessed: 25.02.2015

Italy; Region of Valle d'Aosta (2014): Available at: <http://ec.europa.eu/enterprise/tris/en/index.cfm/search/?trisaaction=search.detail&year=2014&num=250&dLang=EN>. Last accessed: 25.02.2015

Kalaitzandonakes, N. (2004): The Potential Impacts of the Biosafety Protocol on Agricultural Commodity Trade. International Food & Agricultural Trade Policy Council, 26 December 2004. Available at: [http://www.canadagrainscouncil.ca/uploads/BSP\\_Paper\\_Final.pdf](http://www.canadagrainscouncil.ca/uploads/BSP_Paper_Final.pdf)

MAGRAMA (2014): *Encuesta sobre superficies y rendimientos de cultivos en España, 2014*. Ministerio de Agricultura Alimentación y Medio Ambiente, MAGRAMA. Available at: [www.magrama.gob.es/es/estadistica/temas/estadisticas-agrarias/00ESPA%20C3%91A\\_tcm7-352546.pdf](http://www.magrama.gob.es/es/estadistica/temas/estadisticas-agrarias/00ESPA%20C3%91A_tcm7-352546.pdf). Last accessed: 25.02.2015

Meredith, S., Willer, H. (2012): Organic in Europe: prospects and development. IFOAM EU.

Noisette, C. (2009): *UE - Les scientifiques sont formels : la coexistence GM et non GM n'est guère possible en Europe*, Inf'OGM, 2009. Available at: <http://www.infogm.org/spip.php?article4084>

Noisette, C. (2014) : *OGM- Légère diminution des surfaces en Europe*, Inf'OGM, 2014. Available at: <http://www.infogm.org/spip.php?article5753>

Price, B. et al. (2013): The GM Contamination Register: a review of recorded contamination incidents associated with genetically modified organisms (GMOs), 1997–2013. International Journal of Food Contamination, 2014, 1:5.

Prat, F. (2008): *La France va-t-elle « rattraper » l'Espagne en matière d'OGM ?*, Le Courrier de l'environnement de l'Inra, N°55, février 2008, pp.139-147. Available at: <http://www.inra.fr/dpenv/pdf/PratC55.pdf>. Last accessed: 25.02.2015

Republic of Latvia (2013): Regulation on the coexistence of genetically modified crops. Issued pursuant to Article 5(1)(4) of the Law on the Handling of Genetically Modified Organisms. Available at: <http://www.ec.europa.eu/enterprise/tris/fr/index.cfm/search/?trisaaction=search.detail&year=2013&num=214&dLang=EN>.

Sweden (2007): Administrative provisions of the Swedish Board of Agriculture on precautionary measures for the cultivation of genetically modified crops. Available at: <http://www.ec.europa.eu/enterprise/tris/fr/index.cfm/search/?trisaaction=search.detail&year=2007&num=705&dLang=EN>

Republic of Poland (2011): USTAWA z dnia 22 czerwca 2001 r.o organizmach genetycznie zmodyfikowanych. Available at: [http://gmo.ekoportal.pl/opencms/export/sites/default/rdata-GMO/dokumenty/ustawa\\_GMO\\_2001.pdf](http://gmo.ekoportal.pl/opencms/export/sites/default/rdata-GMO/dokumenty/ustawa_GMO_2001.pdf). Last accessed: 25.02.2015

Romania (2012): Ordi nr. 61 privind autorizarea și controlul cultivatorilor de plante modificate genetic și măsuri pentru asigurarea coexistenței plantelor modificate genetic cu cele convenționale și ecologice. Available at: [http://old.madr.ro/pages/arhiva\\_legislativa/ordin-61-din-26-martie-2012.pdf](http://old.madr.ro/pages/arhiva_legislativa/ordin-61-din-26-martie-2012.pdf). Last accessed: 25.02.2015

Spain (2003): LEY 9/2003, de 25 de abril, por la que se establece el régimen jurídico de la utilización confinada, liberación voluntaria y comercialización de organismos modificados genéticamente. Available at: <http://www.boe.es/boe/dias/2003/04/26/pdfs/A16214-16223.pdf>. Last accessed: 25.02.2015





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