

Impossible coexistence



Seven years of GMOs have contaminated organic and conventional maize: an examination of the cases of Catalonia and Aragon.

Index

1. INTRODUCTION

**2. THE ATTITUDE OF GOVERNMENTS SINCE THE CULTIVATION OF
TRANSGENICS IN SPAIN**

3. THE NUMBERS GAME IN RELATION TO AREAS OF GMOS

**4. THE HISTORY OF BT 176 IN SPAIN: PROHIBITED AND
CULTIVATED?**

5. MON 810 VARIETIES: WALKING A TIGHT ROPE

6. WHERE ARE THE REGISTERS?

7. THE BT 10 SCANDAL

8. SEGREGATION, TRACEABILITY, LABELLING

9. CONTAMINATION: MORE CASES EVERY YEAR

10. EXPERIMENTAL FIELDS OUT OF CONTROL

11. CONCLUSION: COEXISTENCE IS NOT POSSIBLE

APPENDIX

GLOSSARY

"Impossible coexistence"

Seven years of GMOs have contaminated organic and conventional maize: an examination of the cases of Cataluña and Aragon

This document is a translation of the body text of the report "La imposible coexistencia" by Greenpeace Spain, Assemblea Pagesa de Catalunya and Plataforma Transgènics Foral. However, the annexes of the original report such as all the laboratory analysis of the contamination cases or the letters and documents quoted in the report, are not appearing in this translated version. For these annexes, please refer to the Spanish version of the report found at www.greenpeace.es

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1. INTRODUCTION

In 1998, Spain approved the first commercial growing of the transgenic maize Bt 176 by Ciba Geigy (now Syngenta). France had authorized it in 1997, but as a result of the actions by Greenpeace and the Confédération Paysanne, in 1999, the French Council of State banned the cultivation of Bt 176. Since then, Spain is the only member state of the European Union that permits the cultivation of genetically modified organisms (GMO) on a wide scale, having approved of numerous varieties of transgenic Bt 176 and MON 810 maize, 31 varieties of which are currently authorized for cultivation in our country.

In the rest of the European Union, the existence of a "*de facto* moratorium" up until April of 2004 along with pressures from farmers and consumers prevented transgenic maize from being grown on a wide scale until 2005.

The actions of the PP (Popular Party) government headed in a single direction: toward supporting multinational agrobiotechnological companies against the interests of farmers and consumers and the environment.

As from March of 2004, a certain dialogue was established with the PSOE (Spanish Socialist Workers' Party) administration. The new Government promised to establish standards that would permit, despite the persistent aggressiveness of genetic engineering corporations, conventional and ecological agriculture to survive that would respect the consumers' right to choose their food, and that would minimize the environmental impact of these crops as much as possible.

Although Spain's position improved during votes on GMOs at the EU level,, the Spanish Government continues to allow transgenic maize growing although there is scientific uncertainty over its safety. It has also approved 14 new varieties, and in 2005 has tolerated the cultivation of thousands of hectares of Bt176, a maize that has been banned, in accordance with European standards, since January 1, 2005.

The Ministry of Agriculture, Fisheries, and Food (MAPA) has presented several drafts of the Royal Decree regarding the so-called "coexistence" between transgenic and non-transgenic crops, drafts that were clearly designed by and for those with interests in the agrobiotechnological and seed industries. At least three times, a wide-scale rejection movement managed to stop the approval of these texts. At the time this report was produced, several persons holding high positions with the Ministries of the Environment and Agriculture have announced they will be working on a new text that will be more in line with the demands of a broad coalition of critical organizations.

This document seeks to show to public opinion what the real situation is regarding the cultivation of transgenics in Spain, and is a true testimony to the non-viability of the "coexistence" of genetically modified agriculture and other forms of agriculture. It is the result of thorough research in the field carried out in different districts of Cataluña and Aragon. Dozens of statements¹ have been taken from farmers, livestock owners and managers of cooperatives; samples from maize fields have been analysed, and it has been found that the Administration has no measures in place to ensure separation, segregation and control.



Accomplishing this work has been difficult in many cases, especially when gathering testimonies. On the one hand, because the situation we have encountered is one in which administrative mistakes exist in combination with opacity in the world of research, nil or inadequate monitoring and control of

¹ The names used in the text have been changed due to the need to conceal the identity of many of the people who have helped to make this report possible.

the crops and cases of contamination, illegal varieties, unauthorised experimental fields, absence of records, no respect for minimum distances between fields, false CAP (Common Agriculture Policy) administrative statements made to gain subsidies for growing maize, owners of harvesters who acknowledge that they do not clean the machinery between fields that are genetically modified and those that are not, and managers of cooperatives who admit that they mix everything together "in the same heap".

On the other hand, we have confirmed that the creation of transgenic agriculture has sharpened the divide and conflict among farmers and has forced them to take charge of the risks and the problems that result from transgenic agriculture, while the companies responsible for creating GMOs wash their hands clean. The perceived reality in the field is that of fear and great concern. Consequently, many farmers and ranchers, managers or cooperative technicians prefer not to discuss their opinions and their experiences with GMOs.

Even so, dozens of testimonies have been gathered from people whose experiences have been very valuable in evaluating the true situation in which we find ourselves after 7 years of transgenic cultivation in the area, that perfectly illustrates the situations presented in this report².

The collaboration between Greenpeace, the Assembla Pagesa de Catalunya and the Plataforma Transgènics Fora! arose due to Cataluña and Aragon being the regions with the highest production of transgenic maize. In Aragon, transgenic maize surface area is estimated between 30,000 and 40,000 hectares, of a total of 67,753 hectares of maize cultivation. The transgenic maize surface area in Cataluña is 17,170 hectares, of a total of 40,913 hectares, according to the Cataluña Department of Agriculture (DARP).

At the very time that the Catalan and national governments are looking at a "coexistence" legislation, it is evident that the conditions do not exist that would allow the cultivation of GMOs in Spain. For this reason, and also because GMOs involve irreversible damage to the environment, the economy and potentially also to health, the central government and the administrations of the different areas and autonomous regions must urgently revoke the varieties approved to date and halt the cultivation of genetically modified crops in Spain.

The absence of rules and regulations to prevent the contamination of the fields, the absence of segregation (the cooperatives do not segregate the maize types), the lack of control and transparency, the lack of differentiation in price, the lack of human or technical means of handling the transgenic crops and their consequences are leading non-transgenic agriculture to a situation of unprecedented crisis. In Aragon, for example, the contamination cases in 2004 (100% of the samples taken by the Aragonese Organic Agriculture Committee (CAAE) were contaminated) have led to an alarming reduction of organic maize surface area.

With regard to imported commodities, public administrators should also ensure that traceability, correct labeling, and transparency be respected in order to guarantee the farmers' and consumers' right to choose.

Perhaps most striking and alarming is that while this research was in progress many cases of contamination have been discovered. With the means and resources of the organizations who participated in this report—which are obviously not much when compared to those of the regional and central governments—contamination has been detected in both conventional and organic crops. Each of these cases are conveniently explained and contextualized with the scandals of the previous years.

This demonstrates that "coexistence" is not possible, that contamination of crops is a fact, and that the strategy of the seed industry is to create contamination in order to bring about an irreversible situation that will eliminate any alternative crops and oblige society as a whole to accept increasing thresholds of GMO presence.

²The names used in the text are not real, due to the need to preserve the identity of many of the people who have collaborated in the effort to produce this report.

2. THE ATTITUDE OF GOVERNMENTS SINCE THE CULTIVATION OF TRANSGENICS IN SPAIN

The role of the Popular Party (Partido Popular - PP) government since 1998: encouragement given to GMOs

Since the first approval of a transgenic product in Spain in 1998, the Popular Party acted as a firm defender of multinational agrobiotechnological companies, despite the objection of most citizens to transgenic crops and foods. Neither these countries nor the United States government—which is promoting actively transgenic crops all over the world—could have dreamed of a partner more devoted to the cause of transgenic crops in the heart of the EU.

Some of the things that the Popular Party (Partido Popular - PP) government has done since 1998:

- Given the green light for cultivation of 16 varieties of genetically modified maize.

- Delegated the design and execution of the plans for monitoring and controlling these varieties to the companies that sell them, failing to meet their obligation to protect public health and the environment by monitoring the impact of these crops. It has denied society information about these crops.

- It has allowed them to be grown in Spain without any measure to guarantee transparency and public information.



- It transposed a diluted version of the EU directive on the Deliberate Release of GMOs into the environment 2001/18/CE³

- It has systematically denied the cases of contamination and attempted to charge the costs associated with contamination to the farmers that have suffered the contamination rather than the companies that caused it.

- It has proposed some measures for "coexistence" of genetically modified agriculture and conventional and organic agriculture that are designed to bring about irreversible contamination.

- It has defended the interests of the biotechnology industry in the voting that has taken place in the central bodies of the EU, jeopardising the future of conventional and organic agriculture in Spain and putting at risk the health of consumers and of the environment.

- It has ignored the voices that are critical of GMOs.

³ Directive 2001/18/EC of the European Parliament and the Council, of 12 March 2001 on the Deliberate Release of Genetically Modified Organisms into the Environment.

The government of the Spanish Socialist Party (*Partido Socialista Obrero Español - PSOE*) since March 2004: more of the same from the Ministry of Agriculture

With the incoming new government in March of 2004, the first meetings between the representatives of the Ministries of Agriculture and of the Environment and the agricultural, environmental, and consumer organizations provided a glimmer of hope in the sense that, although the transgenic era in Spain would not come to an end, at least some standards could be established that would permit conventional and ecological agriculture to survive amidst the constant aggression from corporations of transgenic products. The consumers' right to choose their food would be respected and the environmental impact of these crops would be minimized as much as possible.

A certain level of dialogue was established with the Administration. Nevertheless, despite the affirmations contained in the PSOE's electoral program and in President Zapatero's investiture speech, despite the statements by persons holding high positions in the two ministries involved, concerning the clear commitment to a more transparent model, and except for some change in Spain's viewpoint in the elections in the EU Councils of Ministers (which ended up from being openly pro-transgenic to abstention in many cases), none of these political intentions have put into practice specific measures to solve the problems, the reality is grim:

- There are 31 varieties of genetically modified maize that can be cultivated in Spain (due, among other things, to the 14 latest approvals granted by the Spanish government in July 2005).
- The surface area of GM maize has continued to increase up to this year.
- The system for segregation, traceability and labelling does not work.
- The experimental crops are characterised by an absolute lack of control and by the opacity of the authorisation procedures.
- Imports continue of millions of tons of maize and soya that are the result of the irreversible destruction of the environment and societies in countries such as Argentina, Paraguay or Brazil.

On a number of occasions in 2005, the Head of the Ministry for Agriculture, Fisheries & Food (MAPA) halted the Royal Decree on the "coexistence" of genetically modified and non-genetically modified crops as a result of the society's strongly expressed rejection of this. The said Crown Decree would have guaranteed irreversible genetic contamination intended to eliminate any possibility of developing non-transgenic agriculture. At the date of completing this report, some senior personnel in MAPA and the Ministry of the Environment (MIMAM) state that they are working on a new wording that is more in accordance with society's demands.

With regard to the position of the government in the context of the EU, it has at certain moments demonstrated glimpses of political will, as in the Council of Environment Ministers in June 2005 when the Spanish government voted against the proposal of the European Commission to lift the bans imposed by five European countries on specific GMOs, amongst which are Bt176 and MON 810. This decision - justified by the government by reference to the need for caution and the right of countries to decide - was greeted very positively by the social sectors concerned about this topic.

The new tripartite government of Cataluña: following in the wake of central government

During the last years of the Convergence & Union (CiU) government, the policy pursued in the Autonomous Region of Cataluña was a copy of that of the Popular Party in government. As a result of this, the cultivation of thousands of hectares of genetically modified crops was allowed. With the arrival

of the tripartite government, it was hoped there would be a change of course, especially as one of the members, the Iniciativa per Catalunya I Els Verds (ICV) had as a priority plank in its programme of government the declaration "Cataluña Free of Transgenics".

The reality, however, has been quite different. The Department of Agriculture, Livestock and Fisheries (DARP) has continued the policy of unconditional support of the GMO multinationals and has tried - so far without success - to take forward a decree of "coexistence", the draft of which is even more lax than that put forward by MAPA. In addition, the Government of Cataluña has not published the list of trial fields - in spite of multiple requests made by different organisations -, and this has given the GMO multinationals total impunity and freedom of action.

During 2005, as a result of pressure from citizens, the Department of the Environment has put forward the possibility of establishing a participatory discussion process about the question of "coexistence". But to date, DARP has not reacted publicly to this, nor has it defined dates or methodologies for putting it into practice.

The testimony of Mario, a Catalan farmer who refuses to grow transgenic plants, speaks for himself: *"Now, as far as the issue of transgenic crops, there are people who have already begun to tell me in a 'nice' indirect way, 'you watch what you do' because I have been on television a couple of times... I am always cautious and I say only the minimum, and I never say anything against farmers because those farmers are not to be blamed for all of this"* (personal communication, 08-27-2005).

Aragon, turned into Europe's leading area for the production of GMOs in Europe

In the Autonomous Community of Aragon, the major political forces have not opposed this type of crop. Both the Popular Party and the Party of Aragon (PAR) have promoted a type of agriculture that is productionist and unsustainable. The attitude of the Socialist Party (PSOE) that is responsible for the Department of Agriculture & Food, can best be described as lukewarm, it tolerates the situation. As regards the Party of Aragon (CHA) and the United Left (IU), although their position is anti-GMO, they have not done any work clearly opposing these.

The districts with the largest production of GMOs are Los Monegros and Cinco Villas, both situated within the geographical area or zone of influence of the Valley of the River Ebro.

Contradictions in The Facts... and the Speech: Quotes from high representattives

PSOE ELECTORAL PROGRAM, MARCH 2004

The following statement was taken from the chapter titled "Competitividad y calidad para el sector agroalimentario" (Competitiveness and Quality for the Agroalimentary Sector): "We propose a GMO policy based on transparency, on the right of consumers to choose... On the information about transgenic fields with public registers. The Government will work by consensus based on the necessity to guarantee compatibility throughout the entire chain, between GMO, conventional, and ecological productions."

INVESTITURE SPEECH BY PRESIDENT ZAPATERO, APRIL 2004

"...a compromise with rural Spain that guarantees its survival and allows quality of life. That will require a decided commitment to rural development, to the feasibility of the family agriculture, and to the competitiveness of the food industry."

PSOE-LOS VERDES (The Greens) PROGRAMMATIC AGREEMENT

For the PSOE and Los Verdes, to achieve an elevated level of consumer protection...constitutes one of the objectives of the public powers that cannot be waived" and also: "we must help increase citizen awareness on the important environmental and social repercussions of our spending decisions as consumers..."

STATEMENTS BY THE MINISTER OF THE ENVIRONMENT

The Minister of the Environment, Cristina Narbona, stated that the government intends to seek the opinion of independent researchers. The minister asked if it made sense to continue extensive transgenic cultivation in Spain and accused the previous conservative government of authorizing the massive increase of GM crops without waiting for the final opinion of independent scientists... In this country where there is so little research, many researchers are financially supported by companies that want the studies to have certain specific conclusions."

("Spain Questions Scientific Advice on GMO Crops", <http://www.euractiv.com/Article?tcmuri=tcm:29-117975-16&type=News>)

"In the past years Spain has become the transgenic maize granary of Europe." "There are those who believe that there is no reason to worry about GMOs and those, more independent from the financial support of the biotechnological industry, who believe the contrary."

("Spain to Seek Independent Advice on Biotech Crops – MADRID (AFP) 22-Jun-04.

<http://www.terradaily.com/2004/040622155326.ie2htn5t.html>)

As a result of the elections in the Council of the Environment on June 24, 2005, concerning the European Commission's proposal to lift moratoriums on certain member states,

"The decisive vote was that of Spain, who had abstained in previous debates, and who yesterday voted against the Commission's proposal in order to continue the principle of precaution and the right of countries to decide" (*El País*, 06-25-05).

"The Minister of the Environment, Cristina Narbona, invoked the principle of precaution to justify the radical turn in Spain's position, and contended that a complete European framework of rules is necessary and urgent to regulated GMOs (...) Moreover, Narbona criticized the Commission for not proposing community legislation on the distances between transgenic, ecological, and traditional crops in order to prevent pollen drift from transgenic crops to contaminating the other crops. Furthermore, she censured the Commission for not even submitting its proposals concerning minimum thresholds of GMO on the seeds in order to be labeled as transgenic.

3. THE NUMBERS GAME IN RELATION TO AREAS OF GMOs

Since 1998, due to promotion by the previous Popular Party government, the area of GMOs in Spain has been continuously increasing, although 2005 is the first year in which it has not increased in comparison with previous years. However, the Spanish government still does not offer clear figures resulting from a detailed analysis of these dangerous crops, and the figures quoted by the ministries vary considerably depending on where and when they have been presented. There is even still inconsistency in the figures put out for 2004.

If this juggling of numbers happens for a crop that was harvested more than one year ago, one can expect even greater discrepancies to exist in the 2005 figures, although the politicians responsible continue to state that everything is under control, that "coexistence" is possible, and that there is absolute traceability from the field to the plate. In the document from the Ministry of the Environment (MIMAM) dated October 2005⁴, it states that in 2004 "some 60,000 hectares" were grown, and in 2005 "the figure could reach some 50,000 hectares". Leaving aside the lack of precision in the wording, in absolute terms, and given that the total area of maize in 2005 fell significantly due to the lack of water, these figures suggest that the GM maize has remained at about 12% of the total amount of maize. Notwithstanding the above figures, on 22 September of last year, a representative of the Spanish government at the EU stated that in 2005 the amount of GM maize grown in Spain was 57,000 hectares.



Area of genetically modified maize in Spain, in hectares.

1998	1999	2000	2001	2002	2003	2004	2005
22.468	25.072	26.964	11.598	20.992	32.248	58.200 ⁵ to 60.000	50.000 to 57.000

The figures for 1998 to 2003 are taken from data compiled by Greenpeace from the figures received in February 2004: "Sales of seeds in the years 1998, 1999, 2000, 2001, 2002 and 2003. The Agriculture and Food Secretariat, Spanish Office of Plant Varieties, MAPA".

The situation in Aragon

Aragon is the Spanish autonomous community that has the largest number of hectares of genetically modified maize, as well as the greatest proportion in relation to the total area of maize. It is therefore the European region having the most GMOs. The districts where almost all the GM maize is grown are Los Monegros, Cinco Villas, Bajo Cinca, Bajo Aragon and Zaragoza.

It is extremely difficult to obtain data about areas, and therefore we only have only unofficial estimates. In 2005, taking the province as a whole, the percentages were around 50%, with between 30,000 and 40,000 hectares planted, in the areas with the greatest quantity of maize, the percentages exceeded 80%.

⁴ "GMO, the situation in the EU and Spain" provided by the Ministry of the Environment to the Environmental Advisory Council (Consejo Asesor de Medio Ambiente - CAMA) on 20 October 2005.

⁵ Verbal communication made by José Ignacio Ortega Molina, responsible for the Spanish Office of Varieties, in the debate "Coex between GM and non GM based agricultural supply chains", Montpellier, 15 Nov 2005.

The regions (and municipalities) of Aragon where almost all the transgenic maize is grown are, in this order, as follows:

Los Monegros (Sariñena, Bujaraloz, Peñalba)
 Cinco Villas (Ejea de los Caballeros)
 Bajo Cinca (Fraga, Candanos)
 Bajo Aragon (Caspe)
 Zaragoza (Zaragoza, Villanueva de Gallego, Fuentes de Ebro).

Just as is indicated in the table below, the surface area seeded with genetically modified maize has been progressively increasing in the past years.

Table: Surface Area of Transgenic Maize Compared to Total Maize Cultivation in Aragon, 2003-2005 (Hectares)

YEAR	Surface Area		
	Total	GM	GM/Total (%)
2003	88.340	12.593	14,25
2004	91.042	No Data	No Data
2005	67.753	30.000-40.000	51,66

SOURCES:

- Total Surface Area: Estimate by MAPA in September 2005
- GM 2003: Greenpeace
- GM 2005: Estimates by UAGA (It is extremely difficult to obtain official data.)

The situation in Cataluña

Cataluña is the autonomous community that has the second greatest percentage of genetically modified maize. Although in global terms the percentage was 42% in the year 2005, with 17,170 hectares, this proportion increases considerably – as much as 60% - in the maize-growing areas of Lleida (Segrià, Noguera and Pla d’Urgell).

Just as indicated in the table below, the surface area planted with genetically modified maize has been progressively increasing in Cataluña in the past years.

Table: Surface Area of Transgenic Maize With Respect to Total Maize Cultivation in Cataluña, 2003-2005 (Hectares)

YEAR	Surface Area			Genetically Modified	
	Total	GM	GM/Total (%)	Bt 176	Mon 810
2003	41625	5398	12.97		
2004	41925	16259	38.78	2187	14005
2005	40913	17170	41.96	928	16242

Source: Ferrer, 2005. DARP of the Generalitat of Cataluña⁶

At the same time, Cataluña has become the main nucleus for experimentation in GMOs. In the past 4 years more than half the experimental crops grown in Spain have been in this autonomous community. This trend has been on the increase up to 2005, when 83% of the experimental fields

⁶ GMO Situation in Cataluña: Regulating Framework. 27th Conference on Healthy Products of the Instituto Químico de Sarriá. October 25 and 26, 2005. Available at www.ruralcat.net/ruralcatApp/gecNews.Module.ruralcat?sectorid=5&contentId=635199.

authorised in Spain were located in Cataluña, thus reflecting the increasing influence of the biotechnology sector in Cataluña.

4. THE HISTORY OF Bt 176 IN SPAIN **Prohibited and cultivated?**

The commercial growing of GMOs began in Spanish agriculture under an official Agriculture Ministry (MAPA) Order in March 1998⁷, which authorised the first two varieties of GM maize in the country: Compa Cb and Jordi Cb, by Ciba Geigy, now Syngenta. These varieties contain an *event* or genetic modification consisting of three genes. Their commercial value is due to the Bt 176 gene, which contains information that enables them to produce a toxin that can kill insects like the corn borer and other lepidoptera (butterflies and moths). This gene is extracted from a soil bacteria, *Bacillus thuringiensis*. Another gene makes them tolerant to a herbicide, glufosinate-ammonium, and the third gene makes them resistant to an antibiotic, ampicillin.

The use of Bt 176 varieties, which produce a powerful insecticide, can affect both insect populations in the surrounding environment and the effectiveness of ampicillin and other related antibiotics (such as amoxicillin). Furthermore, independent studies have found that the corn borer had developed resistance to Bt 176^{i, ii}. This type of resistance was predictable: in October 2001, the US Environmental Protection Agency (EPA) withdrew the BT176 varieties from the list of registered GM products due to the threat of resistance in insectsⁱⁱⁱ.

Neither the EPA decision nor the proven environmental impact of these crops hindered the Spanish Government from authorizing new BT176 varieties almost a year and a half after the discovery of this evidence, in February 2003, when it allowed the growth of a new Bt 176 variety, Brama, marketed by Syngenta⁸ and again a year later, with two new varieties: Sansone Bt (Procasa) and Escobar (Syngenta)⁹.

In March 2005, this time under the Socialist Party government, statements by a senior member of the Agriculture Ministry during a meeting on GMOs astonished environmentalist organizations: "This year, Spain will continue to grow varieties of genetically modified Bt 176 maize". This further heightened the serious concern about the growth of genetically modified organisms in Spain: the Socialist Party (PSOE) Government had not only not withdrawn the authorised varieties, but had moreover approved a type of maize whose sale has been prohibited under Article 4 (2) of Directive 2001/18 since 31 December 2004! All environmentalist, farmer and social groups critical of GMOs concluded at this point that the Government was not taking even minimal precautions to protect human health, the environment and sustainable agriculture, and that, contrary to its official line, is really not striving to promote non-GM agriculture for the future.

In April 2004, the European Food Safety Agency (EFSA) published a report that recommended the prohibition of the growth of certain GMOs, including Bt 176 as from January 2005^{iv}. A few days later, the Spanish Food Safety Agency (AESAs) published a press release announcing that as from 1 January 2005, Bt 176 maize would not be allowed to be planted in Spain^v.

The use of antibiotic-resistant marker genes has been widely criticised by prestigious bodies such as the WHO (United Nations), the Royal Society and the Pasteur Institute, which are all concerned that these genes may create resistance in microorganisms and cause health problems in humans and animals. Nevertheless, the Spanish Government chose to allow the sale of Bt 176 maize seeds in 2005, without taking any particular precautionary steps regarding its growth and subsequent sale. No replies whatsoever have been received to reiterated questions submitted in writing to the Ministry of Agriculture including How much has been sown?, Where?, Does the Government intend to conduct specific monitoring of harvests in these fields?, and Will this maize end up in the food chain?

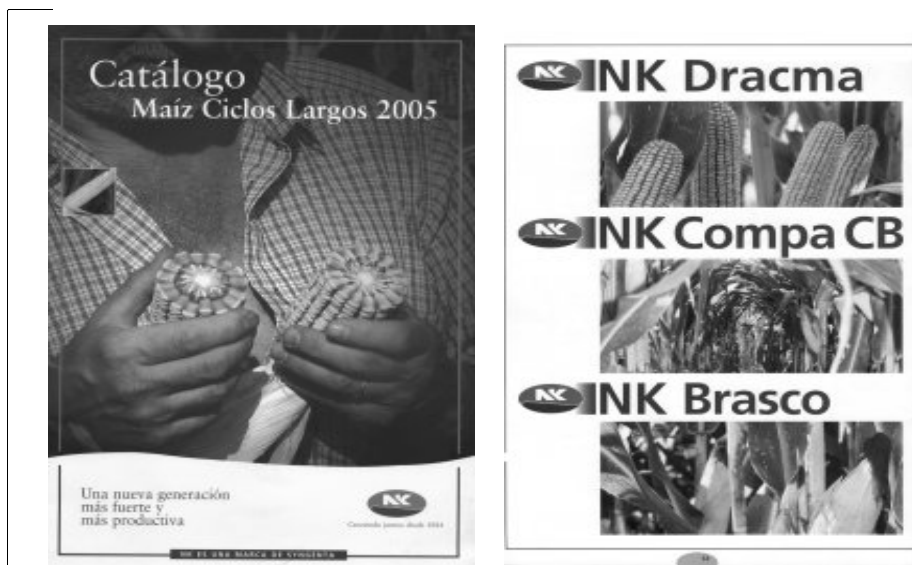
⁷ Ministry of Agriculture Order 7052 of 23 March 1998 by which maize varieties are inscribed in the Register of Commercial Varieties.

⁸ Order APA/520/2003, of 27 February.

⁹ Order APA /314/2004, of 4 February.

In July 2005, the Ministry of Agriculture published a new Ministerial Order ¹⁰ which authorised 14 new varieties of genetically modified MON 810 maize, and also determined that the varieties containing the Bt 176 event would be excluded from the Spanish Varieties Register, i.e., henceforth, they could not be sown. With this decision the Agriculture Ministry, which had permitted the growth of BT176 varieties in 2005 but had not described a single case of the procedure of removal of the thousands of sown hectares, implicitly gave legal cover to the growth of these varieties in the months preceding the revocation of their inscription in the Register in the face of numerous scientific recommendations and regulations. In spite of public accusations by a number of environmentalists and social organizations, the Ministry has also refused to explain the steps it will take to prevent the entry of these dangerous types of maize into the food chain.

During the 2005 season, as was to be expected, seed companies continued to promote the Bt 176 varieties of genetically modified maize, and the Government has continued to allow its cultivation. In fact, many of the interviewed farmers and cooperative technicians stated that they were unaware of the prohibition of these varieties because they had not been advised by either the companies responsible for their sale nor any of the Government bodies.



Bt 176 varieties continued to be listed in seed company catalogues during the 2005 season, without any clarification. The purchase of these varieties has even been encouraged, stated Pep, one of the interviewed farmers: *“This year, in my cooperative we were given a 20% discount on Bt 176”* (Personal comment, 08-08-2005).

In February 2005, the DARP issued a statement¹¹ accompanied by a list of varieties that farmers could plant, which clearly included the option of Compa, Jordi, Brama, Sansone and Escobar BT176 varieties amongst others, for inclusion in their declarations for the CAP subsidy application forms. In fact, as Xavier Ferrer, a DARP technician, stated in a speech in October 2005¹², in Cataluña 928 hectares were sown with BT176 varieties in 2005.

This is not only proof that the Government has legitimised the use of these varieties, whose growth should not be permitted under any circumstances. It is also indicative of the total lack of control over GMOs, contradicting those who try to convince the public that everything is transparent and under control. It also proves the lack of coordination between the different Government administrations, with

¹⁰ Order APA 2628/2005 28 July.

¹¹ Statement by DUN 2005 of DARP N° 28, 18 February 2005.

¹² Available at: www.ruralcat.net/ruralcatApp/gecNews.Module.ruralcat?sectorid=5&contentId=635199

Sansone Bt, one of the varieties mentioned by the DARP in the list of products that could be planted, having been withdrawn from the catalogue of varieties in October 2004¹³

The following is an example in the municipality of Els Arcs (Lleida), on the Belvis road. The field can be seen on the right of the photograph, and was analysed firstly using a quick test: the positive (double stripe) in the leaf and negative (single stripe) in the cob clearly shows that



this is a Bt 176 variety, because this type of test reacts to the presence of the protein Cry1Ab

produced by the Bt 176 and MON 810 varieties, but only in the case of the Bt176 varieties is this protein found only in the green parts (and not in the cob). This result was later confirmed by a laboratory analysis.



The case of Albacete:

Although this document conducts an in-depth case study of Cataluña and Aragon, our research has discovered additional cases in other Regions. This example refers to two plots in the Mahora municipality, Albacete Province. The analysis of the significant samples taken in each of the plots yielded the following results:

1. 30% Bt 176 + 30% MON 810.
2. 80% Bt 176 + 10% MON 810.

It is therefore highly likely that these were two fields planted sown with a mixture of seeds with two different events. Given that there are no records at all of GM crops in the Castilla- La Mancha Region, it was impossible for the signatory organizations of this document to clarify this case. It does, however, confirm the permissive attitude of Government administrations towards Bt 176, while also begging a number of questions: Are Governments aware of this type of practices? Are they sure that there will be no hybridisation between the two events in the field¹⁴? Will this crop be sold as Bt 176 or as MON 810?

¹³ ORDER APA/3826/2004, de 29 October. Government Gazette 281 22 November 2004.

¹⁴ The sale of this type of hybrid is not allowed in the EU

5. MON 810 VARIETIES: WALKING A TIGHT ROPE

In February 2003 the conservative Popular Party (PP) Government approved the first four varieties of MON 810¹⁵ (another type of Bt maize) and a year later, proceeded to inscribe a further seven in the register¹⁶. In July 2005, with the social democrat PSOE government now in power, the Ministry of Agriculture approved a further 14 varieties¹⁷. Thus, together with the six already in the European Catalogue¹⁸, a total 31 varieties of this GM maize have been authorised for planting in Spain since July 2005. Social and environmental organisations have asked the Government on a number of occasions to not authorize any new varieties of MON 810 and to prohibit those previously approved, their rejection of the MON 810 event and the varieties containing it based on the arguments set out in this chapter.

In 2003 many farmers on Mindanao, Philippines who lived beside fields grown with a hybrid between MON 810 and a local variety fell ill when the maize began to flower. Dr. Terje Traavik, director of the Norwegian Institute of Genetic Ecology (GENE□K), discovered antibodies in the serum from 39 affected farmers that reacted against the toxin Bt Cry1ab, produced by the MON 810 maize (his discoveries were made public during the First Meeting of the Parties to the Cartagena Protocol on Biotechnology Safety, held in Kuala Lumpur in February 2004).



The MON 810 event (patented by Monsanto, which charges royalties for the sale of the varieties that use it) was approved by the European Union in 1998 in the Directive 90/220/EC, with extremely limited obligations on risk evaluation and monitoring in comparison to the current Directive 2001/18/European Community¹⁹. The risk analysis of MON 810 maize did not include fundamental aspects such as the long-term effects on human and/or animal health or the indirect or deferred environmental impact, required in Annexe II of Directive 2001/18/EC. There is an indispensable need to update this risk analysis, especially bearing in mind the lack of precise information on the genes contained in the DNA of the MON 810 event at the time of its approval and the results of the subsequent characterization studies which suggested that the maize DNA underwent rearrangements and/or suppressions as a result of the transformation^{vi}.

There are also disturbing similarities between the Cry1Ab protein produced by MON 810 with the Cry9C protein in StarLink maize (withdrawn in the 2000), which has potentially allergenic characteristics.

The only monitoring plan available at the European level is a document submitted by Monsanto in 1995 when the company applied for a sales permit. There has been no update since that time, not even when the European Commission decided to inscribe the MON 810 maize varieties that had been approved by Spain for the Common Catalogue of Species Varieties of Agricultural Plants. This monitoring plan does not cover any of the scientific issues that have been under debate since the approval of this maize in 1998, and which, under Directive 2001/18/European Community, should be taken into consideration, including the structure of the genome after the integration of a foreign gene,

¹⁵ Order APA/520/2003, 27 February

¹⁶ Order APA/314/2004, 4 February

¹⁷ Order APA/2628/2005 28 July 2005

¹⁸ Varieties approved by other EU Member States and included in the Common European Catalogue

¹⁹ Directive 2001/18/CE of the European Parliament and Council, 12 March 2001, on the Deliberate Release into the Environment of Genetically Modified Organisms.

the risks for non-objective organisms, the changes in the secondary metabolic routes of the plants and the excretion and accumulation of the Bt toxin in the soil.

Several EU countries, in particular Austria and Hungary, argue that the national protection measures “national moratoria” which prohibit the growth of MON 810 maize varieties should be kept in place at least until there is a thorough evaluation of the risks and an exhaustive monitoring plan that matches the requirements of Directive 2001/18/EC. In the European Environment Council of 24 June 2005, Spain voted against lifting these “moratoria”. To act in congruence with this position, the Spanish Government can and should apply the same precautionary principle in its own country that it espoused in this vote, and politically opt for the prohibition of the growth of GM varieties across the board, and MON 810 in particular, as done by Austria, Greece, Hungary and Poland, for example.



With respect to the MON 810 varieties authorized in Spain, it is important to note that the Monitoring Plans envisaged in each official Order authorising their inclusion in the Register of Commercial Varieties include utterly insufficient requirements: they do not require any monitoring at all of the effects of MON810 on health, and the only environmental aspects to be monitored are “effects on entomofauna and micro-organisms in the soil in the fields planted with these varieties”.

According to the Directive, the genetic modification MON 810 has to be reassessed prior to 17 October 2006 if its sale is to continue. In the light of the new scientific evidence on numerous potentially adverse effects that has come to light since the authorization of this event in 1998, renewed sales permission seems unlikely. There is thus no guarantee that after 17 October 2006, harvested MON 810 maize will be able to be sold legally. This poses serious problems for farmers who have chosen these varieties for the 2006 planting season.

INSECT RESISTANCE:

One of the dangers of *Bt* crops is the potential development of resistance by the target insects, as constant exposure to the *Bt* toxin facilitates the survival of individuals that are genetically immune to it. This may well lead to a loss of effectiveness by *Bt*. The US Environmental Protection Agency (EPA) sets strict requirements on refuges (20% of the area must be left for non-GM plants) with a view to slowing down the onset of *Bt* resistance. However, many fear that this is not enough^{vii} and moreover, that the requirements are not being fulfilled. In addition, this system of refuges may not be valid in Europe due to the smaller size of our farms.



It has been proven, for example, that *Bt* resistance can develop rapidly in certain maize and cotton pests as the area covered by *Bt* GM crops increases^{viii}.

In addition, contamination of refuges by cross-pollination with *Bt* plants can cancel out the refuge effect, given that the insects are exposed to *Bt* in just the same way^{ix}. There is more than enough scientific evidence about the threat of resistance by insects^x, which may well lead to the need for greater use of insecticides than the

initial situation, as well as the loss of ecological methods of plague management using isolated applications of the Bt toxin.

UNEXPECTED EFFECTS?



The field shown in these photos is in the Ejea de los Caballeros municipality, Cinco Villas County, beside Highway A127 between Eja and Bardenas (Km 43.5 on the left heading towards Bardenas). The first photo was taken on 25 October 2005. It shows the DKC 6575 variety, one of the MON 810 GM varieties produced by the multinational Monsanto. The second photo was taken two weeks later, on 10 November: the stalks on most of the plants had snapped at the same height, probably due to heavy wind, and the signs had been removed. Did the company remove the signs to hide its poor image? What was the reason? What are the companies hiding? Unpredictable effects such as increased lignin in stalks, which causes considerable loss in the crops by making them more vulnerable to fungus attack^{xi} or the appearance of resistance by corn borers are some of the unexpected accidents in GMOs.

6. Where are the registers?

A register of plots where GMOs are planted commercially is envisaged in both the national government's latest draft Royal Decree on "coexistence" between conventional, ecological and genetically modified agriculture, presented in July 2005 by the Agriculture Ministry, and the Cataluña Regional government's latest draft decree, released by the DARP. This step is being presented as a sign of greater control over GMOs. While the creation of this register is indispensable to ensure control and monitoring of the crops as well as information for neighbouring farmers and the general public, once again the timetable has been ignored.

In fact, Directive 2001/18/EC²⁰ on the deliberate release of GMOs into the environment stipulated back in 2001 that "*Member States shall establish registers for recording the location of GMOs grown [...], inter alia so that the possible effects of such GMOs on the environment may be monitored...*". It also stipulates that these registers must be made available to the public. It is important to note that all citizens, not only farmers, have the right to know the location of the GM crops in order to monitor (and avoid) potential health problems. It is also essential for beekeepers to know the location of the GM crops, particularly in the case of insecticide producing crops which are feared to affect bee populations.

This obligation was included in Act 9/2003²¹ which transposed the above-mentioned Directive, however Royal Decree 178/2004²², which sets out the details of the Act, only partially transposed this requirement as it stipulated that the only information that had to be recorded was the distribution of GM crops by Regions and provinces. In addition to the fact that any information on such a large scale about the area sown with GMOs is almost useless for the monitoring purposes required by the Directive, the register has not been made public, as described in the chapter *Juggling statistics* in this report.

A more detailed register entry including information about the specific field, included in the above-mentioned Agriculture Ministry projects on rules for "coexistence", should be submitted a month before the GMO is sown. The mechanism for such a register is expected to be via the CAP declaration (for receiving subsidies), which is the only document available to the administration that provides details on each farmer's fields and types of crop. However, the declaration of GM varieties in the CAP questionnaires, begun in the 2005-2006 season, does not seem to be the most appropriate mechanism.

The CAP paperwork must be submitted by the end of March at the latest, while the maize is sown later. It is thus highly unlikely that farmers know which varieties they are going to plant when they fill in their declaration. It is therefore indispensable for the Government authorities to carry out field checks to ensure that the variety declared in the CAP document coincides with what has actually been sown (technicians usually only check the type of species that has been planted). There are serious doubts about the technical and human ability to carry out this monitoring work given the high cost of the tests.

²⁰ Directive 2001/18/EC of the European Parliament and Council 12 March 2001 on the Deliberate Release into the Environment of Genetically Modified Organisms, which supersedes Council Directive 90/220/CEE. Published in the Official Gazette of the European Communities 17 April 2001. L160/1-37.

²¹ Act 9/2003, 25 April, establishing the Legal Regime for the Confined Use, Deliberate Release and Sale of Genetically Modified Organisms. Published in the Government Gazette n°. 100, 26 April 2003, p. 16.214 to 16.223.

²² Royal Decree 178/2004, 30 January, ratifying the General Regulation for the implementation of Act 9/2003, 25 April, for the Confined Use, Deliberate Release and Sale of Genetically Modified Organisms. Published in Government Gazette n° 27, 31 January 2004, p. 4171-4216.

It is thus necessary to establish a specific register whose veracity is guaranteed by a system that permits cross-checks between the declarations and the real situation. It should also include a penalisation system for those who commit infringements.

At the same time, guarantees must be in place to ensure that the registers of fields planted with GMOs are public documents and easily accessible, while at the same time ensuring that farmers intending to plant GM crops must notify neighbouring farmers and also those with fields near the plot which is going to be planted with GMOs.

To date, whenever this document's signatory groups have requested CAP information, the answer been that the information is confidential until the subsidy has been paid. Given that subsidies are paid after the growth and harvest of the crop, this information is of no use as a public record to learn which fields have been sown with GM crops by the time that it becomes available.

“Normally the people who fill in the CAP form in a bank have no idea which field and even less which maize variety is going to be used, so when the farmer supplies the information about the variety he is going to plant –which he normally has still not bought at this stage-, they choose the quickest and easiest option and fill in varieties with easily remembered names like Juanita or Cecilia, which are varieties that everyone knows. They also often choose “other varieties not included in the CAP”²³. That way, they satisfy the farmer, who processes his subsidy through the local bank”.

It has become a habit for seed, pesticide and fertilizer distributors to hold “promotional dinners” in rural towns immediately prior to the planting period. They invite the farmers to the dinners and sell them their products. After these events, which are usually held after the CAP inscription date, many farmers contract seed for sowing with the sales representatives, and in doing so, make their CAP declaration invalid”.

Verbal information supplied by an agronomist working for a public body in Aragon

While this report was being compiled, field checks were conducted with technicians at county offices, banks and farmer's unions, which confirmed that a number of fields marked as being planted with non-GM maize were in fact the opposite. The table below shows two examples (the exact location of the plots is not included to protect the personal interests of those involved).

Municipality	Location	Variety registered for the CAP	Results of the analysis
Peñalba (Huesca)	Zone 502.	“Juanita”	MON 810 variety.
Candasnos (Huesca)	Zone 814.	“Other non-CAP varieties”	BT 176 variety.

²³ This category includes all authorized GM varieties.

7. THE BT 10 SCANDAL

On 22 March 2005, Syngenta spokesperson Sarah Hull announced at a press conference that a genetically modified variety of maize had been grown by mistake in the USA between 2001 and 2004. Instead of the genetically modified Bt 11 variety, which is permitted for animal consumption and experimental growth, approximately 15,000 hectares of varieties corresponding to the Bt 10 event had been planted^{xii}. Later it was found that this event, which is similar to Bt 11, also contains antibiotic resistant marker genes^{xiii}. Some of this maize was exported to Canada, Argentina, Japan, South Africa, Uruguay, Switzerland, Australia, New Zealand, Taiwan, Philippines, China, Russia, South Korea and the European Union.

Bt 10 maize has not been authorized by the European Union for import or planting, even not for experimental purposes. However, on 1 April, the European Commission released a press statement^{xiv} confirming that according to the data received from the USA authorities and Syngenta, Bt 10 maize seeds had been imported and grown in experimental fields in Spain and France. Moreover, 1,000 tonnes of the same maize might have been imported to the EU for animal consumption and had thus entered the food chain.



Three days later, the European Commission acknowledged that it lacked the protocols to be able to analyse the presence of Bt 10 because Syngenta had still not supplied this information.

The European Food Safety Agency also acknowledged that it could not provide a risk assessment because it lacked enough information to conduct the test. It has never been explained how 4 years could pass before the alarm bells began to ring. This calls into question the reliability of the GM control system in both the USA and the EU^{xv}.

Finally, on 15 April 2005^{xvi}, the Member States of the EU voted to set up a blockade of maize imports from the USA that were not accompanied by certification of the absence of Bt 10. It also obliged Syngenta to provide the analysis protocol of the variety, which at the end April was validated by the reference laboratory at the European Commission's Joint Research Centre²⁴.

It has been discovered (after the event) that Bt 10 maize entered Spain illegally and was planted by Syngenta in a number of field experiments instead of Bt 11. Minutes No. 44 of the National Biosafety Committee meeting held on 30 March 2005 report that these field tests²⁵ were carried out in Quinto del Ebro, Cabañas and Alforque (Zaragoza), Barrax (Albacete), Lleida and Torres de Segre (Lleida), L'Aldea and Amposta (Tarragona), Guareña (Badajoz), Buñuel (Navarra), Fuentes de Andalucía (Sevilla) and Espuñes.

As we explain in the chapter *Uncontrolled field experiments*, on 3 May 2004, the *Assemblea Pagesa de Catalunya* asked the DARP for a list of all experimental plantations in Catalunya in the course of the year. On 30 July it received the list of authorizations of deliberate releases for experimental growth in 2004. In addition to numerous irregularities contained in the information, discussed in the chapter *Segregation, traceability and labelling*, the list provided by the Administration did not include the above-mentioned fields where the Bt 11 variety had presumably been planted.

²⁴ All information about the Bt 10 event detection protocol is posted on the website of the JRC reference laboratory: <http://gmo-crl.jrc.it/bt10update.htm>

²⁵ Notifications B/ES/03/14 and B/ES/04/09

A number of issues still remain unresolved today. The Agriculture and Environment Ministries have still not replied to letters sent by several environmental organizations, leaving us unable to answer many questions including:

- What proof does the Government have of the destruction of harvested material from the Bt 10 field experiments?
- What steps is the Government taking to ensure that Bt 10 maize seeds are not being planted? What steps is the Government taking to ensure that no seeds of any other variety have been contaminated by Bt 10 and that no seeds imported from the USA are contaminated by this event?
- With respect to the entry of Bt10 into the stockfeed sale circuit: How much was distributed? What steps has the Government taken to withdraw this maize from the market?

8. SEGREGATION, TRACEABILITY, LABELLING

LABELLING AND TRACEABILITY. IMPROVEMENT ON PAPER BUT NOT IN PRACTICE

April 2004 marked the deadline for the application of the new European legislation on labelling and traceability^{26, 27}. The new regulations stipulated:

- A much more stringent food labelling system, with compulsory labelling of all food that is a GMO, contains GMOs or has been produced from GMOs.
- Henceforth, compulsory labelling of GMOs destined for animal feed.
- The reduction of genetic contamination levels from 1% to 0.9% for both food and stockfeed. This percentage refers to each ingredient of the product, not to the product as a whole. An addition aspect that must be noted is that the manufacturers must prove that have they have done everything possible to prevent this contamination.
- A new procedure for the approval of the use of specific GMOs in food or stockfeed, including a compulsory detailed risk assessment for each one.
- A new system of traceability of GMOs and the food and stockfeed produced from them.

Regulation 1830/03 defines GMO traceability as: *“the ability to follow the trace of the GMO and the products produced from GMOs throughout the production and distribution chain at every stage of their sale”*.

In a *Guide to Traceability* published in 2004 by the Federation of Food and Drink Industries, the Spanish Food Safety Agency and the Agriculture Ministry, we can read^{xvii}: *“having a traceability system for a product means being able to transmit and store information about the product at each delivery or operation. The information to be transmitted will cover the GMO in the case of Regulation 1830/03”*.

The Guide also says about the Regulation:

“1. The supplier is responsible for transmitting the information about the presence and nature of the GMO. The information should flow from the source to the final consumer. The company is also obliged to control or minimise cross-contamination during the manufacturing process in cases where GM and conventional raw materials are used in the same factory.

2. The information on GMO traceability should be included in the labelling or a document accompanying the merchandise in each of the production stages. (...) In addition, if the product is or contains a GMO, the supplier should define this GMO, indicating the corresponding identification number.

3. Operators receiving information about the GMO have several obligations:

- *Pass on the same information that they receive, specifying which ingredients they refer to.*

²⁶ Regulation (EC) N° 1829/2003 of the European Parliament and Council 22 September 2003 on Genetically Modified Food and Stockfeed.

²⁷ Regulation (EC) N° 1830/2003 of the European Parliament and Council 22 September 2003 on the Traceability and Labelling of Genetically Modified Organisms and Traceability of Food and Stockfeed produced from them, modifying Directive 2001/18/EC.

- For a period of 5 years after the supply date, the operator must store the information about the products, GMO ingredients or GMO derivatives that they receive, the food or stockfeed in which it is used, the individual identifiers in the case of a GMO and the clients that were supplied with the food containing GMOs or GMO derivatives. This information is what will allow them to provide consumers at the end of the chain with information about whether the product is a GMO or a derivative via the label or together with the product in case of non-packaged products”.

However, in spite of these improvements, the labelling system leaves a lot to be desired. On the one hand, because it does not oblige labelling for meat or derivatives from animals fed with GMOs, in spite of the fact that the majority of the current GM crops are used in animal feed.

In addition, because most government administrations have not set up a real, efficient system that guarantees labelling and traceability, i.e., a system that establishes the administrative processes that enable all importers, food and stockfeed producers, distribution chains (supermarkets, etc.) to provide guarantees about the traceability of their products. Although there is a European regulation on traceability and labelling, if there are no systems that guarantee this traceability from the field to the plate, it is unlikely that the food industry will comply with the legislation in force.

Moreover, the conditions under which maize is grown and then processed prevent any real traceability or transparent information flow right from the start of the crop. Ultimately the conditions for the consumer's right to choose are not, in fact, respected at all.

BLIND SOWING

Analysing the real situation in the countryside, the first thing we notice is that in many cases, the sales firms induce the buyers of their products to buy mistakenly, leading farmers to often buy a certain type of seed without knowing whether it is genetically modified or not. The catalogues and advertisements of these companies often avoid the use of words like “genetically modified” or “genetically modified organism”. Instead, they speak of “Bt technology”, “maize protected against corn borers” or “yieldgard technology”- terms that only better informed farmers can usually identify as GMOs.

NON-EXISTENT DISTANCES

As regards the coexistence of transgenic and non-transgenic fields, it is alarming to see the ridiculous distances at which the different types of crop are planted. We cite here just three examples of the many that we have encountered in the course of the campaign.

1. This case involves two plots situated in the municipality of Valcabrera (Huesca). The plot that appears on the left of the river is genetically modified maize MON 810.

The plot on the right of the river is a conventional variety. The distance between them is 19 m and the prevailing wind in the area blows in a direction perpendicular to the line that separates them and therefore the contamination of the conventional maize by its neighbour is practically guaranteed.



2. This case involves two plots separated by a narrow road, the A125, that links Ejea de los Caballeros and Tudela. The photo was taken at the crossroads at Sta. Anastasia. On one side, the variety DKC6041, one of the MON 810 maizes from

Dekalb (Monsanto) approved in July 2005 (therefore after this plot had been sown in April) and on the other side of the road (5 to 7 metres away) the conventional variety, "lagarto".

3. This example is situated in the municipality of Vallfogona de Balaguer (Lleida) and is especially revealing: The field on the left is a conventional variety from a known farmer, while the variety on the right (the owner of which is not know) is a genetically modified variety. The distance between both plots is less than 2 m.



CONTAMINATION DURING HARVEST



The harvest of the maize is usually carried out by companies that the farmers contract specially for the purpose. It is obvious that these companies have an interest in harvesting the largest number of hectares possible in the shortest possible time, and therefore they do not pay serious attention to cleaning the machinery when they move from one plot to another. Therefore it is common to find remains of the harvest from one plot when the machinery goes in to harvest the next plot. This is clearly a source of contamination.

LACK OF SEGREGATION: A STRATEGY TO CONFUSE THE MARKET

Most cooperatives do not treat conventional and genetically modified maize differently during transportation, reception, drying, storage or sale (it is commonly called "a single pile"). In some cases, this is due to a lack of technical or human resources to do this separation, but in many others, it is part of a "market confusion" strategy. The undifferentiated maize is sold to second level cooperatives or sales agents, its use specified for "animal feed". This material will then be labelled as genetically modified, making it impossible to buy non-GM stockfeed.



In addition, as we have seen, the labelling system does not make it compulsory to label derivatives (meat, milk and eggs) of animals fed with GMOs and there is no incentive to maintain a market for non-GM maize, as the same price is paid for conventional and genetically modified products. GMOs thus enter the food chain en masse via compound stockfeed used to feed animals.

This situation, in most cases deliberately encouraged by representatives of the companies that sell GMOs, ultimately makes real traceability impossible: the lack of segregation means there is no traceability.

In Cataluña, for example, the fact that more than 40% of the maize is genetically modified begs the following questions: Can the other 60% be considered to be non-genetically modified maize or is the majority of the output mixed hence contaminated? How can the authorities or the AESA guarantee traceability of the non-GM harvests under these conditions? Are maize consumers informed that they are being denied the right to choose?

"When you visit the cooperative, nobody looks at anything. At first I said it was genetically modified, but now they don't ask you anything".

Miquel, farmer who sows genetically modified maize, 08-08-2005

"When the maize arrives, you don't ask if it is genetically modified or not. Everything is for stockfeed and there is no segregation".

Antoni, cooperative manager, 25-08-2005

"Here at the cooperative, they mix all [the maize] together, and that shouldn't happen".

Pep, farmer, 27-08-2005

Until recently, on rare occasions some cooperatives in the area could send the first (early) types of maize from their associated producers to starching companies that manufacture starch for the food industry (these companies require non-genetically modified maize). Because the early varieties were not GM, it was possible to satisfy this demand reasonably easily. Now, however, early GM varieties are sown, with which the early varieties can no longer be considered to be GM-free crops unless they are specifically certified. The situation has become much more difficult for industries that use maize for human consumption, as they now have to invest large amounts of money to find uncontaminated types of maize.

LACK OF CONTROL OVER IMPORTS: MORE OF THE SAME THING



As with national maize production, imported raw materials also suffers from this arbitrary and uncontrolled situation. In several cases, the authors of this report have found that the cargo of GM-free maize or soya brought on ships was stockpiled in silos owned by multinational importers (e.g., Moyresa, part of the Bunge multinational group) which were contaminated by GM material.

This action is part of a clear strategy: to contaminate everything that enters Spain in order to ensure that all stockfeed compounds are labelled as GM material (even when they are not), in order to make it impossible to gain access to a non-genetically modified market.

A recent report by the EU Food and Veterinary Office published in November 2005 warns against the lack of control over imports to Spain^{xviii}. It includes sentences such as, *"Considerable amounts of raw materials that are not declared as animal feed or as food ready for consumption can enter Spain without the least inspection of GMO content"*, and, *"this serious shortfall may be allowing importers to avoid import controls"*.

All of the above evidence leads us to conclude that traceability is a theoretical concept which in Spain does not match the real situation. From the field to the plate, the companies with interests in GMOs and the authorities that protect them have established a situation in which contamination has evolved from being an exception to being the rule. Traceability is an impossible myth. None of the conditions necessary to guarantee correct labelling and real freedom of choice are fulfilled.

9. Contamination: more cases every year

The scenario described in this report has resulted in a number of serious cases of contamination by GMOs in Spain. An analysis is given here of the cases found during the 2005 campaign in Cataluña and Aragon, together with a brief summary of the cases of contamination detected in previous years, looking at contamination of seeds by cross-pollination, and contamination during harvest, transportation, processing and during the distribution of the product. It should be borne in mind that contamination of non-genetically modified foods by GMOs can occur throughout the food chain, and this has been demonstrated by relevant scientific studies^{xix}.



Seed sacks left next to the crop, on the edge of water channels and irrigation ditches, with some seeds inside. Is this the control maintained over GMOs?

It is also important to note that these cases are just the tip of the iceberg. The lack of systematic analysis by the authorities to define the scope of the problem and the lack of transparent publication of the results has led the real scope of the phenomenon to still remain unknown. Despite numerous statements to the contrary by sources at the Agriculture Ministry and Regional Agriculture Departments in Aragon and Cataluña, the truth is that since 1998, thousands of hectares of Bt maize have been planted in Spain without governments taking any steps at all to assess and even less prevent the pollination of fields of conventional or ecological maize by these GM varieties. Genetic contamination under these conditions is as inevitable as seawater splashing rocks on the shore.



Genetic contamination is unavoidable

In countries like the USA, the pioneer user of GMOs, conventional seed banks are already contaminated in alarming percentages. A nation-wide report published in 2004 states that in the United States, over 50% of "conventional" of maize and soy seeds, and up to 83% of oilseed rape already contain genetic information from GM varieties^{xx}.

This situation is closing off the market to organic farming, a fast-growing agricultural model whose positive environmental, economic and social effects are more than proven.

Cases of contamination in the 2005 campaign

In this section we analyse the cases of contamination detected during the extensive research undertaken in 2005 by this report's signatory organizations, as well as those that have come to light in Aragon during a study by the Aragonese Organic Agriculture Committee (CAAE).

Summary of contamination cases discovered in 2005:

	Municipality	Location	Conventional/Organic	GM	% contamination
Field research: Cataluña and Aragon					
1	Linyola (Lleida)	Zone 15, Field 43	Conv	MON 810	2.6
2a	Almenar (Lleida)	Zone 13, Field 56. Upper right zone.	Org (Local var.)	Bt 176	0.15
2b	Almenar (Lleida)	Zone 13, Field 56. Lower left & centre zone.	Org (Local var.)	MON 810	0.33
3	Arbeca (Lleida)	Zone 18, Field 14	Conv	MON 810	3.8
4	Bellcaire d'Urgell (Lleida)	Zone 14, Field 98	Org	MON 810	0.9
5	Bellcaire d'Urgell (Lleida)		Conv	MON 810	0.07
6	Albons (Girona)	Zone 4, Field 48, Precinct 1.	Org		12.6
7a	Gurrea de Gállego (Huesca)		Conv (Local var)	Bt 176	2
7b	Gurrea de Gállego (Huesca)		Conv (Local var)	Bt 176	0.2

Cases reported by CAAE					
8	Boquiñeni (Zaragoza)		Org	MON 810	1.90 0.41

	Municipality	Location	Conventional/Organic	GM	% contamination
9	Quinto de Ebro (Zaragoza)		Org		0.23
10	Huerto (Huesca)	Zone 101, Field 6	Org		0.03



INFORME DE RESULTADOS: ANÁLISIS DE MATERIAL TRANSGÉNICO EN ALIMENTOS Y PIENSOS

Resumen del informe: INFORME DE RESULTADOS DE ANÁLISIS DE MATERIAL TRANSGÉNICO EN ALIMENTOS Y PIENSOS

Fecha de emisión: 10/10/2005

Fecha de recepción: 09/10/2005

Fecha de análisis: 09/10/2005

Fecha de entrega: 10/10/2005

PROYECTO DE ANÁLISIS: 0301770200

MÉTODOS UTILIZADOS: ELISA-IMPULSAR

DESCRIPCIÓN DEL ANÁLISIS: Análisis de material transgénico en alimentos y piensos.

IDENTIFICACIÓN DE RESULTADOS Y RESULTADOS OBTENIDOS

Material	Material	Material	Material	Material	Material
1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30
31	32	33	34	35	36
37	38	39	40	41	42
43	44	45	46	47	48
49	50	51	52	53	54
55	56	57	58	59	60
61	62	63	64	65	66
67	68	69	70	71	72
73	74	75	76	77	78
79	80	81	82	83	84
85	86	87	88	89	90
91	92	93	94	95	96
97	98	99	100	101	102
103	104	105	106	107	108
109	110	111	112	113	114
115	116	117	118	119	120
121	122	123	124	125	126
127	128	129	130	131	132
133	134	135	136	137	138
139	140	141	142	143	144
145	146	147	148	149	150
151	152	153	154	155	156
157	158	159	160	161	162
163	164	165	166	167	168
169	170	171	172	173	174
175	176	177	178	179	180
181	182	183	184	185	186
187	188	189	190	191	192
193	194	195	196	197	198
199	200	201	202	203	204
205	206	207	208	209	210
211	212	213	214	215	216
217	218	219	220	221	222
223	224	225	226	227	228
229	230	231	232	233	234
235	236	237	238	239	240
241	242	243	244	245	246
247	248	249	250	251	252
253	254	255	256	257	258
259	260	261	262	263	264
265	266	267	268	269	270
271	272	273	274	275	276
277	278	279	280	281	282
283	284	285	286	287	288
289	290	291	292	293	294
295	296	297	298	299	300

CONCLUSIONES

El presente informe de resultados de análisis de material transgénico en alimentos y piensos, ha sido elaborado en el laboratorio de análisis de material transgénico en alimentos y piensos, de la Dirección General de Consumo y Alimentos, del Departamento de Agricultura, Ganadería y Pesca, del Gobierno de Aragón.

These photos illustrate some of the steps taken during the research: taking samples (cobs, leaves, styles), sample preparation, the ELISA test, PCR analysis.

Methodology

An analysis campaign involving some 40 farmers was conducted in fields of conventional and organic maize in Cataluña and Aragón between July and December 2005. The methodology used to detect cases of cross-pollination contamination is described in the *General Methodology Annex 1*, summarised below:

1. Selection of plots used by farmers growing conventional or organic maize.
2. Selection of adjacent or nearby plots. Collection and analysis of samples using ELISA qualitative tests.
3. In cases where the presence of genetically modified material was detected, random samples were taken from cobs in the field, which were then analysed by PCR.

Results

Fields contaminated by MON 810 and Bt 176 events with percentages between 0.07% and 12.6%. Three of the cases involved local maize varieties which, after years of careful selection, cannot be used any more in future plantations. One of these varieties, for example, was from the seed bank at the Centre for the Conservation of Crop Biodiversity (part of the Manresa Agriculture School) and was selected for sowing in Lleida because it had proved to be highly robust and appropriate for the local climate. This is a clear example of how the contamination of local varieties is an attack on biodiversity as it causes the elimination of the possibility of using the few varieties that are still in the hands of farmers.



The difficulties entailed in this research, the necessary time and resources and the disparity between these results and other analyses (compared, for example, with those of other organisations such as the Catalan Council for Organic Agricultural Production (CCPAE), indicative of the complexity involved in detecting contamination in real situations. The results show that it is impossible to grow genetically modified maize under safe, controlled conditions, all the more so in the Cataluña farming context with its mosaic of small plots with many owners and a wide disparity of situations.

The high cost of detailed analysis and detection work on contamination by genetically modified material (each lab test costs between €150 and €300), is an indication that if the authorities wished to conduct an exhaustive control of the technical measures required by a decree forcing "coexistence" (safety distances, refuge zones, etc), the costs could not be covered. Furthermore, it must be noted that our research was conducted with the active collaboration of farmers who provided all the necessary details about their properties and crops. It would obviously be extremely difficult to try to monitor the correct application of the "coexistence" measures in the absence of such collaboration. It therefore seems quite clear that in both the field and the rest of the chain of custody and final food production, "coexistence" is technically and economically unviable.

We consider that under the current growing conditions of genetically modified maize in Spain, it is impossible for the Administrations to apply and oblige compliance with the European regulations on labelling and traceability of food and stockfeed, given that to date, no official body has conducted any exhaustive studies of what is really happening on the ground. The cases of contamination detected by independent organizations (CAAE) have never been acknowledged or investigated in depth.

Case descriptions

A. CASES DETECTED DURING THE FIELD RESEARCH CARRIED OUT IN 2005 IN CATALUÑA AND ARAGON²⁸.

1. Municipality of Linyola (Lleida). Area 15, Plot 43
Variety PR34N43 grown conventionally.
Contamination detected. Presence of MON 810: 2.6%

Random cob samples from across the field were collected by the owner.

The aerial photo shows the structure of the surrounding fields: the field marked as 1 is currently under lucerne and field 2 is used for fruit trees. The rest were sown with maize in 2005. In this case, no samples were taken in neighbouring fields, and we thus lack information to know whether they were planted with conventional or GM varieties. This case illustrates the difficulty for a farmer to know which neighbour contaminated his crop: the contamination can come from an adjacent field or from a plot further away. As the photograph shows, there are seven neighbouring fields that have been sown with maize, all of which are potential sources of the contamination incident.



2. Municipality of Almenar (Lleida). Area 13, Plot 56
Local variety (certified as organic) grown organically.

The samples consisted of a series of cobs taken in two opposite areas of the field, and which were sent separately to the laboratory:

- a) Contamination detected. Presence of Bt 176: 0.15%
- b) Contamination detected. Presence of MON 810: 0.33%



The aerial photo shows the structure of the surrounding fields: all those in Zone 1 (adjacent to side B of the field) were maize fields in 2005. The tests on these fields showed they were sown with GMOs. The fields in Zone 2 (on the other side of the line of trees) were sown with other cereals. Samples were also taken in a field (outside the aerial photo, immediately west of field 56), which proved to be MON 810 maize.

The property owner, aware of the contamination threat, chose to sow later than his neighbours, however flowering in the field coincided with some of the neighbouring plantations. In fact, one of the samples yielded contamination by Bt 176 and the other by MON 810.

In 2004, this same farmer sent a letter to the DARP explaining his defenceless situation, the fact that this was the third consecutive year that he was not going to sow maize for fear of contamination and that in 2005, under the technical obligation of programmed crop rotation, he would have to sow maize again. In the letter he asked the authorities which body was going to cover the financial losses

²⁸ For high definition pictures with numbers and signs on them, please refer to the original spanish version

incurred as a result of the contamination and whether there was any type of legal protection. He still has not received any reply from the government.

3. Municipality of Arbeca (Lleida). Area 18, Plot 14
Maize grown conventionally.
Contamination detected. Presence of MON 810: 3.8%

The aerial photo shows the structure of the surrounding fields: the field marked as 1 is a plot of genetically modified maize that was analysed with a quick test, yielding positive. Field 2 was also positive. The rest of the fields seen in the aerial photo were not analysed due to access difficulty.



On this property, as with the others, it was clearly difficult to define the precise contamination source because a simple analysis of the nearest fields indicated two possible sources which had been sown with genetically modified maize in 2005.

4. Municipality of Bellcaire d'Urgell (Lleida). Area 14, Plot 98
Maize grown organically.
Contamination detected. Presence of MON 810: 0.9%

In this municipality, approximately 60-70 % of the area planted with maize is GM. The owner of this property has been growing organic maize and in recent years, to avoid contamination, he has been sowing one month and a half later than his neighbours. This delay has meant roughly 50% less yield, but until 2005, it had enabled him to avoid contamination. This year, however, due to the drought, pollination in the neighbouring fields was delayed and coincided with the crop on his property. The result was that one out of the two fields tested positive for contaminated.



All of the fields in the aerial photo that surround this property were also sown with maize in 2005, but were not tested during this study and thus the use of GM or other varieties could not be confirmed.

The CCPAE also collected samples on this property in 2005 and, in another contradictory situation, the results were also negative (this farmer has 5 fields in different parts of the municipality but the CCPAE only sampled one of them).



The contaminated field is on the left in the photograph. The field on the right was already harvested.

5. Municipality of Bellcaire d'Urgell (Lleida).
Variety Eleonora grown conventionally.
Contamination detected. Presence of MON 810: 0.07%

This property was sown on 30 April 2005. In the course of our research, we analysed the neighbouring fields, all of which contained GM varieties. The samples from the affected property, which yielded positive lab results, were collected by the owner himself and consisted of cobs distributed across the property.



6. Municipality of Albons (Girona). Area 4, Plot 48, sub-plot 1.
Variety PR34N43 (conventional) grown organically.
Contamination detected: 12.6%



In the 2005 season, the owner of this property sowed a 3,300 m² field. In February 2006 he notified the authors of this report that he had received a letter from the CCPAE containing notification - without any explanation- that contamination had been detected in his crop, that he would be unable to sell his maize as organic, and that he should explain what he intended to do with the crop. In this first letter he was not informed about either the detected transgene or the percentage of contamination. The farmer received a second letter on 11 February notifying him of the extremely high percentage of contamination: 12.6%. These results still did not identify the contaminant transgene (in the analysis, the laboratory only identified the presence of the 35S promoter, which is present in the authorized varieties of genetically modified maize).

There were two fields set 75 and 100 m away which had also been sown with maize during the 2005 season, and which were therefore the potential contamination sources. However, because they had not been tested, he could not know whether they were GM varieties or not. Such a high contamination percentage and the location of the fields extends the coverage of potential contamination sources to the entire Baix Empordà area on account of the strong prevailing winds, known locally as the Tramuntana.

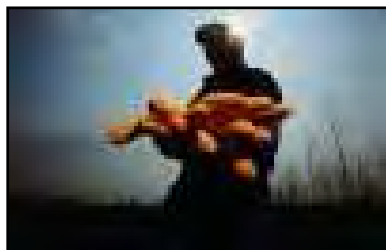
In the light of this new case, it is essential for both the DARP and the CCPAE to review their official position, which to date is still that there were no cases of contamination in Catalunya in the 2005 season.

“My crop was intended for an organic chicken farm in the district of Solsona. Despite the serious financial loss that this means for me, I do not want to sell the maize as conventional because I do not want to contribute to disseminating this contaminated material”.

(Personal statement made by the farmer affected, 04-02-06)

7. Municipality of Gurrea de Gállego (Huesca)
Local variety grown conventionally.

- a) Contamination detected. Presence of Bt 176: 2%
- b) Contamination detected. Presence of Bt 176: 0.2%



In September 2005, a farmer in Gurrea de Gállego contacted the Assemblée Pagesa de Catalunya and sent in samples of a crop of two local varieties that he had been sowing in fields located in the local market garden zone of his village. Their location in this area used for vegetable patches should mean that the properties are isolated from maize fields in spite of the fact that the Gurrea de Gállego municipality contains large areas of genetically modified maize. However, lab tests on the samples found that both were contaminated.

This contamination has been a serious blow to the farmer, as he intended to sow these organically grown varieties on a larger property for sale as organic maize. These plans are now impossible.

Moreover, because this is an unregistered local variety, it will be extremely difficult to find seeds again that are GM-free because their exact source is unknown. This example is further proof of the loss of biodiversity and the destruction of local maize varieties caused by genetically modified agriculture.

B. CASES REPORTED BY THE ARAGONESE ORGANIC AGRICULTURE COMMITTEE (CAAE)

In addition to the above-mentioned cases detected in Aragon, the Comité Aragonés de Agricultura Ecológica (CAAE) has carried out its own tests in both the field and in silos as a result of its concern about GM contamination in the largest GM crop producing region of the whole EU. The results were presented in conjunction with Unión de Agricultores y Ganaderos de Aragon (UAGA) and Greenpeace in December 2005. The figures are alarming: 50% of the test samples were contaminated, with percentages ranging from 0.03% to 1.9%, which has forced the CAAE to prohibit the sale of these harvests as organic products.

8. Municipality of Boquiñeni (Zaragoza). (The owner of the plots affected in this does not want the cadastral data of the farm to appear in this report)

Contamination detected. Presence of MON 810:

Sample taken in the plot: 1.9%

Sample taken in the store: 0.41%

9. Municipality of Quinto de Ebro (Zaragoza). Area 524, plot 4.

Contamination detected: Sample taken in the plot: 0.23%

10. Municipality of Huerto (Huesca). Areao 101, plot 6

Contamination detected: Sample taken in the plot 0.03%

"It is evident that plantations of GM seeds should not exist. They do not respect either the environment or agriculture". "I can give those who ask for it my information relating to loss of profitability due to contamination of my crop; the price at which I will sell this year is a lot lower than the price at which I would have sold my crop if it had not been disqualified."
Rosabel Ballarín Matute, Vice President of the CAAE. Affected by contamination.

Cases of contamination in previous years

Contamination due to cross pollination

-Aragon, 2004

In December 2004, the CAAE collected samples from organic maize crops to detect the possible presence of genetic contamination. The result speak for themselves: 100% of the organic maize samples were found to be contaminated.

1. Municipality of Sariñena (Huesca). Area 115, Plot 46a.
Organic crop. Local variety "rojo vinoso".
Contamination detected.
 Presence of Bt 176: 34%
 Presence of traces of MON 810.

The first case that was made public affected an organic farmer, Félix Ballarín, whose property is in Sariñena (Huesca). This farmer, who runs a 20 hectare farm with vegetables, legumes, alfalfa, maize and wheat, began to plant cobs of local red maize 17 years ago and later, by restricting and selecting the best plants, was able to recover a variety that had almost become extinct. Known as "wine red" by the local farmers, this maize is particularly appreciated on poultry farms because it gives the egg yolks and the meat a pink colour. It is also used in a local dish: farinetes de maíz.

In 2004, he sowed 2 hectares of organic maize on a single plot. In November 2004, the Comité Aragonés de Agricultura Ecológica informed him that the analysis of samples of his maize had tested positive for the presence of genetically modified material (34% of Bt 176 and traces of MON 810). The nearest genetically modified field was 500 metres away.
At the same time, the Agriculture Ministry also collected and analysed samples (using a different sampling and testing system), with the following contamination measurements: 27% Bt 176 and 9.7% MON 810.

"My name is Félix Ballarín, I am an organic farmer and it seems as though I am an "anecdote" because of the contamination that has affected the maize I have been growing. An "anecdote" that does not look important taking into account the advantages this genetically modified maize holds for farmers. Advantages they defend to the hilt with half truths which are all debatable, except for the advantages of the economic profit that goes to those who sell it and who monopolise these seeds (...). The coexistence of genetically modified crops and the rest is nullified when it has been demonstrated that contamination is a REALITY. And I am a reality not an anecdote (...).

Taken from an open letter written by a farmer affected in 2004.



2. Municipality of Rivas, Ejea de los Caballeros (Zaragoza)
Organic crop. Certified conventional seed.
Contamination detected. Presence of MON 810: 0.2%

The second case concerns Mariano Jiménez Lazcorreta, who reported that he had 43,000 kg of contaminated cereal, which had caused him a financial loss of €4,000 due to the lower market price paid for genetically modified maize than the organic product.

This farmer from Rivas (Ejea de los Caballeros, Zaragoza) had 4.88 hectares in three fields, separated physically from each other (only one of the three had a field of non-organic maize in the vicinity). The sown variety was certified Sancia seed from Nickerson.

The CAAE collected a sample at the facilities owned by a company certified by CAAE itself. Because it detected contamination by MON 810, the organisation disqualified the crop.

“This year (2005) I haven’t planted organic maize because I have no assurance that it is not going to be contaminated. If they want a progressive regulation, if they really want to protect organic production, they should prohibit GM crops”.
Mariano Jiménez, December 2005

3. Municipality of Binefar (Huesca)
Organic crop. Certified conventional seed.
Contamination detected. Presence of MON 810: 0.5%

The third case of disqualification due to contamination by GMOs occurred in the Binefar municipality. The affected farmer does not want his details to be published. This farmer had 4.10 ha. of organic maize distributed in two fields that were separated physically from each other, both adjacent to non-organic maize. The maize variety that was sown was N-43 certified seed from the Pioneer company. The CAAE collected a sample at the facilities owned by a company certified by CAAE itself. Because it detected contamination by MON 810, the organisation disqualified the crop.

-Aragon, 2003

In August 2003, Greenpeace located a field of genetically modified maize (Compa CB variety, Bt 176 event) in the Villanueva de Gállego municipality (Zaragoza), approximately 200 metres from another field sown with conventional maize. The analysis of a sample from the second field revealed that it was contaminated with the Bt 176 event.

-Navarra, 2001: Fields of contaminated organic maize

At the end of 2001, the Organic Farming Council of Navarra (CPAEN) detected the presence of GMOs in the harvests from two fields of organic maize. A more detailed analysis of one of the types of maize revealed that the contaminant agent was the Bt 176 event, present in the Compa CB genetically modified variety. The samples were not analysed quantitatively, however in both cases, the genetically modified material was present in proportions above 0.05%. Although Compa CB was only grown in small areas of Navarra, it was enough to cause contamination. This was clearly a case of cross-pollination.

This contamination caused the disqualification of both crops. Both were disqualified, and the affected crops, produced in accordance with the strict organic farming regulations, could not enter the organic produce market and could only be sold as conventional produce. This was obviously financially damaging for the farmer, who moreover had no right to any form of compensation.

As a result of the discovery of these cases of contamination, the CPAEN asked the Navarra Parliament to prohibit GMOs and enact strict control measures to prevent genetic contamination as well as legislation to establish responsibilities. In addition, a coalition of producers and consumers

denounced the alarming consequences of the growth of GM crops, particularly the difficulties encountered by farmers to control their crops and ensure GM-free crops and consumer products in the future. As a direct result of this case, almost all organic farmers in Navarra stopped growing organic maize.

Contamination of seeds

Seeds can be contaminated in a number of ways. In many cases, the seed bought by the farmer is contaminated by the distribution company, either by accident or deliberately.

In addition, maize is usually planted by agriculture service companies (the farmer pays a company to do the sowing because of the need to use specific, expensive machinery). Generally these service companies are interested in sowing the largest area possible in the shortest time, and as a result, the need to clean their machinery after leaving a field is not taken seriously. Seeds are thus often left on the equipment when it is moved from one property to another, and if the first crop is genetically modified, this is a serious source of contamination. All of our interviews and farm visits confirmed that the technical measures intended to prevent contamination during the harvest period are not employed.

Quote: “Last year I planted a special *variety of maize used for decoration, and when the equipment arrived, it was full of genetically modified maize. They don't clean the precision machinery. Everything is mixed up together. They ought to use different planting machinery (...) but that is almost impossible in reality*” (Personal comment by an organic farmer, 24-07-2005).

Navarra and Aragon, 2001: contamination of soya seeds for organic cultivation

At the end of 2001, the CPAEN detected contamination by genetically modified material in a batch of soya used as stockfeed on an organic poultry breeding farm. In this case, the CPAEN was obliged to disqualify the products from the farm, which had bought the soy from an organic farmer in Navarra. The contamination source was probably the seed, bought by the farmer from Monsanto. At the time there were no soy crops in the region, nor had there been in the last 15 years. The sacks contained GM or GM-contaminated seeds without any mention of the fact on the label. This seed was therefore illegal in Spain, as the growth of genetically modified soy is not authorized in the EU. Monsanto nevertheless sold the seed and paid no compensation to those affected for the financial losses accrued.

The farmer's organizations EHNE and UAGA then invited a notary to take samples from a sealed sack of soya seed from the same batch, which was still on the property of a CAE farmer, and send them to two laboratories for analysis. They yielded positive to the tests for GMO, although Monsanto continued to claim insistently that the batch was not genetically modified! This is a case of contamination from imported seed, as the batch had been brought from the USA.

Contamination of feed

Cataluña: presence of genetically modified soya in feed for organic livestock

An analysis of the impact of genetic contamination on organic farming in Cataluña, conducted in 2003 by the Consell Català de Producció Agrària Ecològica (CCPAE), detected at least one case of contamination of stockfeed for organic grazing (the CCPAE probably did not publish other cases). This was discovered not because of the information provided by the CCPAE, but because the grazer concerned decided to make the case known in order to publicise his vulnerability. This person has been producing veal on an organic, extensive-grazing farm for the last 15 years. The cows and calves are fed on fodder from his meadows, but the farmer uses a meal supplement (maize, rye, wheat,

vitamins and minerals) for the calves during the fattening phase. The analysis of the stockfeed he uses revealed that it contained 0.7% genetically modified RoundUp Ready soy, when it was supposed to not contain any soya at all. The most serious aspect of the case was that 6 months passed from the time that the company which produced the stockfeed received the result until it notified the farmer, by when the meat had already been marketed and was in the organic food chain.

Contamination due to lack of harvest segregation

As shown in the chapters “*Segregation, Traceability, Labelling*” and “*Experimental fields out of control*” there is a total lack of segregation at every stage, from harvesting to the sale of the crop. This leads to constant contamination of conventional harvests by GM products.

Government attitudes

While this is happening, while the affected farmers continue to be the only ones who shoulder the burden of the consequences and those responsible -the owners of the technology- press ahead with their contamination strategy, the government authorities generally seem to be reluctant to intervene. The Agriculture Ministry, in particular the Spanish Office of Plant Varieties -OEVV-) continues to deny the existence of the cases. Evidence gathered by journalists who have consulted different administrative bodies (such as the above-mentioned Office, for example) all point in the same direction: the Ministry claims to have no records of cases of contamination, in spite of innumerable letters and reports to the Agriculture and Environment Ministries submitted by environmentalist groups, organic farmers’ organisations and certification and control bodies.

Furthermore, instead of standing up to defend the most seriously affected sectors such as the organic farmers, instead of undertaking a serious, detailed analysis of the situation and assessing what is really taking happening in the field, certain Agriculture Ministry authorities have spent their time protecting the interests of the companies that sell genetically modified seed, repeating phrases like, “*There’s no big deal- there’s nothing much at stake, just a few contaminated organic farmers*”.

Who will pay?

The financial cost associated with contamination still has to be covered by the victims and society in general. Nobody is forcing the owners of the patent technology, i.e., those who are fully to blame for the damage, to accept their responsibility.

While the world trend is towards an increase in environment-friendly types of agriculture, the area used for organically grown maize in Spain is shrinking at an alarming rate. The only reason why farmers are abandoning its production is the fear of being contaminated. Most of the interviewed farmers stated that they will not repeat their organic plantings next season. The figures speak for themselves: in Aragon, for example, the area planted with organic maize in 2004 was 124 hectares while in 2005 it had fallen to 37 hectares²⁹ (the reduction of the area under maize in 2005 due to water shortages by no means explains this drastic loss of organically farmed land). This is a serious attack on the only real alternative to the prevailing industrial farming model, which has yielded solid proof of its social and environmental damage.



²⁹ Figures supplied by

Greenpeace activists demonstrate at the entrance to the Ag Ministry

Javier, an organic farmer, comments, "*When the other farmer plants GM, what can I say to him? My neighbour isn't my enemy. He was my classmate when we started school, my companion at parties, at dances (...), everywhere. This is a small community and we live together. He is my friend (...). I would rather stop growing maize than have to confront my fellow farmers*" (Personal comment, 16-04-2005).

10. Experimental fields out of control

Spain is not only the European country with the largest number of commercial-scale hectares of genetically modified maize, but in the last few years has also headed the number of field experiments. Between 1993 and 2005, more than 300 tests have been reported³⁰.

The vast majority of these tests (87%) have been undertaken by the private sector (primarily large biotech companies like Pioneer and Syngenta: see table). This may explain why research is focused on a few crops –primarily maize–, as the private companies tend to work mainly with products that have a massive market potential, low costs and high sales expectations.

Table: Number of authorizations for deliberate GMO release in Spain, 1993-2005.

YEAR	93	94	95	96	97	98	99	0	1	2	3	4	5	Total
Private centre	3	11	8	16	37	38	36	10	16	14	36	19	21	265
Public centre		1	1	3	4	9	6	1	2	4	5	2	3	41
Total	3	12	9	19	41	47	42	11	18	18	41	21	24	306
% private/ total	100	92	89	84	90	81	86	91	89	78	88	90	87	87

SOURCE: Joint Research Center³¹; Ferrer, 2005 (DARP, Cataluña Government³²)

As we explain in this chapter, the conditions used in the experimental field tests evidence a total lack of control:

- They are carried out without any type of isolation from the environment, the human population or nearby crops, even though the majority of the cases are varieties that have not been approved for sale.
- The recommended distances are not respected.
- It is not clear who authorises the tests.
- There are cases of unauthorised field experiments.
- Proof has been found of a number of cases in which unauthorised varieties have been mixed with permitted varieties in the same experimental field.
- In some cases they are camouflaged under euphemisms such as “demonstration fields”.
- They are not correctly signposted.
- In the majority of cases, it is impossible to obtain information about them.

Administration opacity: refusal to publish information on the location of field experiments

All information about experimental fields should be accessible to the public, including their location and the reports that explain the safety measures that have been applied. However, much of this

³⁰ It is important to note that a notification may be used to experiment with a single event at a number of sites, and thus the number of fields where these tests have been conducted is in fact much larger.

³¹ The European Commission Joint Research Centre manages the European database on GM experimental fields. It is listed in <http://gmoinfo.jrc.it/>

³² *Situation of GMOs in Cataluña*. Regulation framework, 27th phytosanitary product workshop at the Instituto Químico de Sarriá, 25 and 26 October 2005. www.ruralcat.net/ruralcatApp/gecNews.Module.ruralcat?sectorid=5&contentId=635199.

information is not available on either the European Commission's web site, where all the tests should be published, or in the Government Gazette.

In the case of Catalunya, several organizations including the Associació Naturalista de Girona –ANG- and the Assemblea Pagesa de Catalunya –APC- have repeatedly requested the list of experimental fields. On 3 May 2004, for example, the APC asked for the list of all experimental fields in Catalunya that had been authorized during the year. The reply by the DARP, which was not received until 30 July 2004 was a list of authorizations granted in the course of the year. The list was incomplete, in some cases the coordinates of the fields were false and in others the appropriate format was not used (6 out of 11 authorizations used exactly the same coordinates, as if they were the same field). Cross-checks were conducted on the ground, and the fields that we located displayed no indication of being experimental plots, contrary to the compulsory procedure stipulated in the European Directive.

This opaque Government attitude contrasts with the claims by political authorities, who repeat that transparency is one of the priorities in the GMO issue. This is further proof that the multinational biotech companies are doing exactly as they please across the country with a *fait accompli* policy, without any public authority daring to stand up to them.

Spanish regulations on field experiments

In Europe, Directive 2001/18/EC³³ describes the compulsory authorization methodology and the requirements that open air experimental fields must fulfil for deliberate release of GMOs into the environment. The transposition of this directive to Spanish law is via Royal Decree 178/2004³⁴, which defines a very strict procedure for the authorization of field experiments on the grounds that such cases amount to scientific tests that pose a serious risk to the environment and human health.

The steps required for authorization are the following:

1. A company wishing to conduct the test has to apply for authorization to the Agriculture Ministry or the relevant Regional authority. This application must include a number of documents, primarily a technical study (including information about potential interaction with the receptor environment and a monitoring plan for the effects of the GMO), an assessment of the hazards for human health and the environment, and data on similar tests that have been conducted in any EU Member State.
2. The Agriculture Ministry or the Regional Government must forward the application to the National Directorate-General of Quality and Environmental Evaluation (DGCEA).
3. The DGCEA has to forward the summary of the information and the advisors' reports to the corresponding administrations of the others EU Member States and the European Commission. The European Commission has to publish this information on the following website: <http://gmoinfo.jrc.it/info.asp>.
4. Any EU citizen has 30 days to submit comments about the test via the same website.
5. The European Commission then sends the comments to the DGCEA .
6. The DGCEA sends all the information from the European Commission to the corresponding Regional Government body or the Agriculture Ministry.

³³ Directive 2001/18/EC of the European Parliament and Council 12 March 2001 on the deliberate release into the environment of genetically modified organisms.

³⁴ Royal Decree 178/2004, 30 January, ratifying the general Regulation for the development and implementation of Act 9/2003, 25 April, establishing the Legal Regime for the Confined Use, Deliberate Release and Sale of Genetically Modified Organisms. Published in Government Gazette nº 27, 31 January 2004, p. 4.171-4.216.

7. These administrative bodies have to submit the dossier of the application to public information process for 30 days.
8. After studying the documents, the supplied data, the results of the public information process, any additional consultation and information, as well as any observations by other EU Member States, the government authority can proceed to resolve the application for the authorisation of the test.

The technical conditions to be fulfilled during field experiments in Spain must be included in the application, including:

- a) A detailed description of the GMO to be released into the environment.
- b) A detailed description of potential interactions with the environment, including the capacity for genetic transmission (contamination by cross-pollination) to other varieties and plant species.
- c) The control and treatment measures for the waste material generated that will be implemented during the tests.
- d) The measures to prevent the dissemination of the GMO outside the test site and protect it from entry by unauthorized individuals and animals.
- e) The method to be used to destroy the waste material and the crop to prevent its entry into the food chain.

The procedure for the authorization of field experiments on unauthorised GM varieties is obviously complex and should be implemented by every company that wishes to grow any variety of this type anywhere in Spain. As we have seen, a public information period must precede any authorization, and both the application dossier and the formal authorization should be published on the website of the European Commission's Joint Research Centre.

The technical conditions required for this type of field experiments obviously make it extremely important to prevent the dissemination of genetic material outside the test site, whether it be via pollen or contact with humans or animals.

The truth, however, is that the seed companies systematically breach both the authorization procedures and the technical measures to endure for isolation, while government authorities (particularly the Cataluña Regional Government's DARP) neither oblige compliance nor fulfil their own requirements prior to issuing the authorization. The following section describes several cases of field experiments that have been analysed in Cataluña in recent years. The majority are the responsibility of the PIONEER SEEDS company, which for many years has not complied with the procedure described above, without the DARP or the national authorities taking any steps to stop this practice.

Field demonstrations have become a mass propaganda strategy



Cases of non-compliance with regulations on field experiments in Cataluña.



In the last three years, the company PIONEER SEEDS has been sowing experimental fields while ignoring all of the authorization procedures defined by the Europeans Directives and their transposition to Spanish law. The company defines them as “demonstration fields”, consisting of small fields in which lines of unauthorised varieties of GM maize are planted alongside other varieties of conventional maize or authorized GM varieties. The main purpose of these fields is to show local farmers the agronomic performance of each variety and at the same time, organise a public presentation of the new varieties which are still not inscribed in the registers but are most likely to be approved in the future. The normal practice is to set up a public event at harvest time and invite all the local farmers to come along. They

are invited to a meal and presented with gifts. During the demonstration, each variety is harvested separately and, after calculating the yield, the grain is dumped on a trailer and later sold as conventional maize.

The demonstration fields containing conventional non-GM varieties have been grown for many decades in the Cataluña countryside and have become a mass propaganda event for new products or treatments that the multinationals want to market.



This procedure is not illegal, provided that the varieties that are planted are authorized for commercial growth. However, when one of them is a GM variety that is not listed in the Register of Plant Varieties, the demonstration field changes category and has to be classified as an experimental field involving the deliberate release of GMOs into the environment, and the above-mentioned authorization and control protocol must be followed.

The following chronological list summarises the detected cases of non-compliance with the law by PIONEER, the action taken by a number of groups and the response by the authorities. All of these cases are proof of the astonishing impunity of this multinational, which has gone so far as to publicise the unauthorised experimental fields without any fear of punishment at all.

Algèrri (LLeida)- October 2003

In October 2003, the company PIONEER invited farmers from LLeida to attend a public meeting in a field belonging to the Municipality of Algèrri (Lleida), in order to confirm the yields from the company’s different varieties of maize. Two of these were MON 810: the variety PR33P67 (P67) and the variety PR33N44 (N44). The second could only be used for experimental purposes.



After the different varieties had been harvested, including the N44, all the grain was mixed in one trailer in breach of the Spanish legislation that prohibits the mixing and sale of unauthorised varieties. The APC (Rural Assembly of Cataluña) reported this action to the police to prevent the GM variety N44 and the rest of the grain that had been mixed (and therefore contaminated) from



ENSAYO PIONEER			
VARIETAT	USADITZ BARSA	USADITZ BARSA	USADITZ BARSA
34 B 33	240,6	1347	1347
34 N 42	239,2	1310	2232
32 A 46	231,7	1322	1952
32 P 67	236,3	1323	192
32 R 73	231,7	1315	214
32 W 76	239,5	1308	198
ELEONORA	232,4	1300	212
32 R 42	230,7	1292	235
32 A 68	229,2	1284	195
3 A 6 98	227,8	1276	20
32 N 42	225,0	1260	18
32 W 76	223,6	1252	18
32 P 67	222,4	1244	18
32 R 42	220,7	1236	18

being sold and thus entering the food chain, and to have it destroyed. The Catalan police proceeded to put a halt on the maize and a technical specialist from DARP (Department of Agriculture, Livestock & Fisheries) came and took samples of the grain.

This incident was communicated months later to the legal services of DARP in Lleida. After a delay of a year, the APC received a notification from DARP in which it stated that: "the batch of maize does not represent any threat to human health or to the environment".

Present status of the case: Archived.

Algerri (LLeida)- October 2004

In October 2004, the same farm was again the meeting point for farmers and salespersons from PIONEER. Of the 13 varieties of maize that had been sown, one was of the type N44. As had happened the previous year, the different varieties were harvested and put into a single trailer.

The APC again reported the case, but instead of going to the police station, they made a telephone call to the person responsible for GM crops in DARP. After describing the facts to Mr. Ferré, the latter's only response was that according to the papers presented by the company, everything was legal because the destination of the grain from the unauthorised varieties was "destruction". In response to this statement the APC members expressed doubt that the batch was going to be destroyed and the conversation ended with the undertaking that information would be provided about subsequent actions and the appropriate measures taken.



At today's date, APC is still waiting for a written explanation

about the actions taken by DARP. In a response given by DARP in October 2005 to a number of questions raised by the representative of the Initiative for Catalunya and The Greens Party (ICV) in the Catalan parliament, it is clear that DARP is aware of the facts and that, in theory, sanctioning proceedings have been taken against PIONEER, although at the start of 2006 ARP has not received confirmation that these proceedings have been resolved.

VARIETAT	Hectàrees	Producció (kg/ha)	Superfície (ha)	Kg total
4 N28	7	222,6	1287	2177
52 T76	7	264,2	1295	2019
52 P5	8	265,8	1489	2331
33 B5	7	267,4	1310	2329
30 H	7	268,9	1318	2156
44	8	270,5	1515	2354
4 N27	7	273,7	1341	2269
31 676	8	275,3	1542	2276
30 663	7	276,9	1351	2290
52 P42	7	278,5	1365	
ELEANTHA	8	280,1	1569	
52 676	7	281,7	1380	
30 143	7	283,3	1388	

La Sentiu de Sió (LLeida)- September 2005

In September 2005 similar events took place in the municipality of la Sentiu de Sió, on a farm where a demonstration by PIONEER was being set up. It was confirmed that the company had put up a number of posters identifying the different lines of GM and conventional maize varieties. One of the posters read "EXPERIMENTAL", and another read PR34N44.

The companies PROSAPIA, S.A. (owner of the farm) and PIONEER SEEDS, and DARP were all reported because of their responsibility for sowing these two varieties. The variety PR34N44 at the time it was sown was not registered in the Register of Varieties. The court in Balaguer transferred the report and documentation to the Public Prosecutors Office (Ministerio Fiscal), which asked DARP for a report. Because the questions put to DARP by the Prosecutors Office were very basic, the APC decided to expand its denunciation with a number of requests and clarifications to which DARP should respond.

A representative from the ICV party in the Catalan Parliament put a number of questions to DARP. In reply, DARP acknowledged that the variety PR34N44 is not registered in the Register of Commercial Varieties and therefore it cannot be sown within Spanish territory. DARP also stated that this field had all the relevant authorisations, but refers to the Spanish Office of Varieties (Oficina Española de Variedades Vegetales) as the body responsible for approving authorisation.

Under Spanish legislation, however, it is the relevant Department of the Autonomous Community that is designated as the body responsible for issuing the authorisation for experimental fields. (In any case, if the field that was the subject of the denunciation had varieties sown in it that were not registered in the Register of Varieties, the field should have been classified as experimental and the authorisation procedure described above should have been followed and the technical conditions relating to isolation as defined in the legislation adhered to).



It was confirmed that on the European Commission website, where all the information about the experimental fields should be shown, there was no report about a trial in this municipality of Lleida. The Official State Bulletin and the DOGC were also consulted but there was no form of public information that referred to it.

With regard to the technical conditions of isolation of the trial, the accompanying photograph shows how the two varieties are mixed with other conventional varieties, and how, in addition, there is no type of barrier to prevent access by persons or animals, which leads us to believe that once again an unauthorised variety has been sown

with no type of safety protocol and that the government knows of this and allows it.

The present situation: In January 2006, the Assemblée Pagesa de Catalunya (APC) received a report from DARP answering the questions raised by the Inspector. This report states that PIONEER requested authorisation from MAPA to carry out the trials and that it also asked for these varieties to be registered in the Register of Varieties. It also states that MAPA did not reply to the application and that therefore Pioneer assumed that the answer was a positive one and went ahead with the sowing at the farm. The APC legal teams are analysing this response in order to determine how it could have happened that MAPA did not answer, and, in the event that authorisation had been granted, how it is possible that no government body checks the technical isolation conditions.

Algerri (LLeida)- Septiembre 2005

On 5 September 2005, news was received of another demonstration event being prepared by Sr. Torremorell in conjunction with PIONEER on one of the entrepreneur's properties. The APC attended the event and took photos that clearly show the placards identifying the PR34N44 variety. The expanded claim presented to the Balaguer Courts included a request for all the relevant documents.



Cases in which compulsory isolation conditions are ignored

We now have proof that not only are experimental fields of GM varieties being planted illegally in Spain, but that in the fields which are duly authorized, the compulsory technical conditions to prevent contact with the population and the dispersal of the GMOs into neighbouring properties are ignored. One such case is described below as an example.

IRTA-Gimenells experimental field (Lleida) - July 2004

In July 2004, members of Plataforma Transgènics Fora! [GM Out! Group] located an IRTA field experiment in Gimènells (Lleida). The company was experimenting with genetically modified wheat as part of a European project, SUSTAIN, which involved the Catalunya Regional Government, the Barcelona University (UB) and other scientific bodies in France and the UK.

When the records were sought, it was found that the experiment was not listed on either the European Community web site or the Government Gazette, and thus, this was yet another case of total opacity on the issue of experimental fields. It was also found that the field was less than 20 metres from a highway, less than 200 metres from the town of Gimènells, there was no signposting to indicate that it was an experimental field and there was no barrier to prevent animals, humans or birds from entering. All of these safety measures are compulsory, as mentioned above, and the fact that they are ignored leads us to believe that the "safety" championed by those who defend GM crops is by no means guaranteed.

This time, instead of filing a formal suit for non-compliance with Spanish law, Plataforma Transgènics Fora! decided to organise a peaceful protest in order to highlight the impunity and the lack of seriousness in the procedures used by the IRTA. The protest by 60 activists took place on July 3.

11. CONCLUSION: COEXISTENCE IS NOT POSSIBLE

All the information gathered in this report leads to an unequivocal conclusion that the “coexistence” of GM and non-GM crops is not possible, and it confirms what not only the APC, Greenpeace and the Transgenics Out! Campaign, but the vast majority of environmental and agrarian organisations have been stating for many years:

- The control and monitoring of GMOs from the laboratory to the plate is ineffective, and in many cases non-existent. The system for segregation, traceability and labelling does not work.
- There are no independent systems of detection and investigation of the cases of contamination, illegal crops (commercial or experimental), administrative irregularities or any negative effects of the GMOs. The vast majority of contamination cases are never detected.
- The economic costs of contamination and the other problems caused by the GMOs are high and are borne by those affected by them. The social, environmental and health effects are potentially enormous. All of this is the result both of the direct damage caused by these technologies, and of the loss of real and sustainable agricultural and food solutions, which has been brought about by the financial black hole associated with the biotechnology option.
- The tremendous cost involved in an exhaustive analysis and real rigorous control by the authorities means that this type of technology is socially, environmentally and economically unviable.
- The lack of transparency prevents most of the failings of the GMOs and the scandals associated with them being brought to public notice. At the same time society is constantly subjected to propaganda by an industry that only mentions the supposed benefits of these crops without offering objective and contrasting information, and with the sole aim of increasing its control over the agricultural and agro-foods sectors.
- The GM industry is capable of political influence at many levels, ensuring that its interest prevail over those of the environment and society.
- Governments are not capable of avoiding illegal sale and cultivation or of preventing non-compliance with legislation in the cultivation of genetically modified crops.
- Any system of control has its failings and there will always be human or technical carelessness and errors, and therefore in practice it is impossible to prevent other crops being contaminated.

In view of the above, the Rural Assembly of Cataluña (*Assemblea Pagesa de Catalunya*), Greenpeace and the Transgenics Out! Campaign (*Plataforma Transgènics Fora!*) demand that:

- **All authorisation of cultivation of GMOs in Spain be immediately suspended because we believe that the technical and legal framework does not exist to enable their cultivation under safe and controlled conditions.**

Consequently, the authorisations granted by the different governments to date must be revoked and experimental plantings prohibited.

- **Any attempt to approve decrees or Royal decrees on “coexistence” be suspended.**
- **The authorities must reconsider agricultural policy in Spain in order to guarantee the existence of production completely free from GMOs, thus ensuring freedom of choice for consumers and farmers above the interests of the GM industry and the multinational companies that own these technologies.**
- **A commission be created to study the environmental, social and health damage caused by GMOs in a rigorous and independent way and to carry out a transparent analysis of this, and to require that sanctions be applied to those who have caused such damage.**

The companies that produce the GMOs or own the patents must be considered liable of contamination and other damage, except when it can be demonstrated that the error or negligence arose from another party.

APPENDIX: GENERAL METHODOLOGY

The report summarised in these pages arises out of the need to analyse what is happening in the field after seven years of growing genetically modified maize. In carrying out this study, the authors have identified three objectives:

- ♣ To evaluate the real situation in the maize sector in relation to GMOs.
- ♣ To collect statements from farmers, agricultural technicians, sales persons and cooperative managers in areas where the genetically modified crops have been introduced on a massive scale.
- ♣ To analyse the applicability of the technical measures proposed in draft legislation on "coexistence" that different government bodies are seeking to approve.

The methodology used can be divided into two phases that have been developed in parallel throughout the study:

The first phase has consisted of a bibliographic review and analysis of all the available information.

The second phase has been that of research. Firstly, data has been collected from the persons, entities and government administrations that are involved with the GMOs or who suffer their effects. Secondly, fieldwork has been carried out (interviews, surveys, collection of data, analysis of commercial documentation, photographic documentation, etc.) in the provinces of Lleida (Cataluña), and Zaragoza and Huesca (Aragon), between July 2005 and February 2006.

During the second phase, farmers, technical specialists and those in charge of agricultural cooperatives were interviewed and dozens of fields were visited and samples for analysis taken. The following sampling protocol was used:

1. Selection of fields amongst farmers that grow conventional or organic maize.
2. Selection of fields adjacent to or near them. Sample collection from leaves, cobs and styles (in all the cases we ignored the plants in the first four rows around the fields). The analyses were conducted using the ELISA qualitative test (*Trait Bt1 maize leaf and seed Test Kit* from Strategic Diagnostics Inc.), which detects the Cry1Ab protein (known as Bt). In the cases where one of these surrounding fields tested positive to GM presence:
3. Collection of representative samples from cobs in different parts of the analysed (potentially contaminated) field, sample homogenisation and forwarding to a laboratory accredited by the National Accreditation Body (ENAC) for a PCR analysis. Two types of analysis were used: a qualitative test to determine the presence of GMOs and the corresponding transgene, and subsequently, a quantitative test to determine the exact percentages of contamination.

All the analytical results presented in this report have been confirmed by technical analysis in an accredited laboratory.

GLOSSARY

AEVV (Oficina Española de Variedades Vegetales)	Spanish Office of Varieties
Assemblea Pagesa de Catalunya (APC)	Rural Assembly of Catalunya
CAAE (Comité Aragonés de Agricultura Ecológica)	Aragonese Organic Agriculture Committee
CAMA (Consejo Asesor de Medio Ambiente)	Environmental Advisory Council
CATA (Coordinadora Antitransgénica de Aragón)	Aragonese Anti-transgenic Coordinator
CCPAE (Consell Català de Producció Agrària Ecològica)	Catalan Council for Organic Agricultural Production
CHA (Chunta Aragonesista)	Aragonese nationalist socialist party
CiU (Convergència i Unió)	Catalan Convergence & Union party
CPAEN (Consejo de la Producción Agraria Ecológica de Navarra)	Navarra Organic Production Council
DARP (Departamento de Agricultura, Ganadería y Pesca)	Department of Agriculture, Livestock and Fisheries
EFSA	European Food Safety Agency
EPA,	United States Environmental Protection Agency
ICV (Iniciativa per Catalunya I Els Verds)	Initiative for Catalunya and The Greens party
IU (Izquierda Unida)	United Left party
MAPA (Ministerio de Agricultura, Pesca y Alimentación)	Ministry of Agriculture, Fisheries & Food
MIMAM (Ministerio de Medio Ambiente)	Ministry of the Environment
PAR (Party of Aragón)	Party of Aragón
Plataforma Transgènics Fora!	Transgenics Out! Campaign
UAGA (Unión de Agricultores y Ganaderos de Aragón)	Aragón Farmers & Breeders Union

ⁱ Birrun, R; Landa, B; Armendariz, A; Esparza, M; Tiebas, M.A. *Defences of maize plants against corn borers (Sesamia nonagrioides and Ostrinia nubilalis) with GMO varieties – 1998, 1999 y 2000*. Oral presentation by the Instituto Técnico y de Gestión Agrícola (ITG-A) de Navarra at the Congress of Applied Entomology, 2001.

ⁱⁱ Altieri M. A. *The myth of coexistence: why transgenic crops are not compatible with agroecologically based systems of production*. Bulletin of Science, Technology & Society, Vol 25, issue 4 págs 361-371.

ⁱⁱⁱ Sloderbeck, P. *Current status of Bt Maize Hybrids*. Kansas State University, K. State Research and Extension, Southwest Area Extension Office, Garden City, 2002, Kansas.

^{iv} www.efsa.eu.int/science/gmo/gmo_opinions/384_en.html

^v www.aesa.msc.es/aesa/web/AesaPageServer?idpage=56&idcontent=5323

^{vi} Press Release, ISIS, 9-4-2004, *Comment on Assessment ReportC/GB/02/M3/03 (herbicide tolerant and insect resistant hybrid maize, NK603xMon810)*, Institute of Science in Society

^{vii} Knight, J. 2003. Agency 'ignores its advisers' over Bt maize. *Nature* 422: 5.

^{viii} Gould, F., N. Blair, M. Reid, T.L. Rennie, J. Lopez, and S. Micinski. 2002. *Bacillus thuringiensis*-toxin resistance management: stable isotope assessment of alternate host use by *Helicoverpa zea*. Proceedings of the National Academy of Sciences. 99: 16581-16586.

^{ix} Chilcutt, C.H. and B.E.Tabashnik. 2004. *Contamination of refuges by Bacillus thuringiensis toxin genes from transgenic maize*. Proceedings of the National Academy of Sciences 101:7526-7529.

^x See, for example, Andow, D.A. 2001. *Resisting resistance to Bt maize*. In: *Genetically engineered organisms: assessing environmental and human health effects*. Letourneau, D.K. and B.E. Burrows [eds.] Boca Raton, FL: CRC Press.

^{xi} Poerschmann, J., Gathmann, A., Augustin, J., Langer, U. & Górecki, T. 2005. *Molecular composition of leaves and stems of genetically modified Bt and near-isogenic non-Bt maize – Characterization of lignin patterns*. Journal of Environmental Quality 34: 1508-1518

^{xii} *Nature*, vol. 434, p. 423. 24 March 2005.

^{xiii} Macilwain, C., 2005. *Nature*, vol. 434, p. 548. 31 March

^{xiv} *Commission seeks clarification on Bt 10 from US authorities and Syngenta* - 01/04/2005 - <http://europa.eu.int/rapid/pressReleasesAction.do?reference=IP/05/382&format=HTML&aged=0&language=EN&guiLanguage=en>

^{xv} *Nature*, vol. 434, p. 807. 14 April 2005.

^{xvi} Press statement by the European Commission N° IP/05/437, 14 April 2005. <http://europa.eu.int/rapid/pressReleasesAction.do?reference=IP/05/437&format=HTML&aged=0&language=EN&guiLanguage=en>

^{xvii} Guide to the application of requirements for labelling and traceability of food and stockfeed GM. MAPA, AESA, FIAB. March 2004

^{xviii} Final report of a mission carried out in Spain 07/03/2005 to 11/03/2005 concerning controls on food & feed containing, consisting or produced from GMO. DG(SANCO)/7632/2005-MRFinal Directorate F – Food & Veterinary Office, Health & Consumer Protection Directorate General, European Commission

XiX EU Scientific Committee for Plant Evaluation, 2001. Opinion of the Scientific Committee on Plants concerning the adventitious presence of GM seeds in conventional seeds. European Commission: Health and Consumer Protection Directorate. SCP/GMO-SEED-CONT/002-FINAL. Available at: http://www.europa.eu.int/comm/food/fs/sc/scp/index_en.html.

Müller, W., 2003. Concepts for Coexistence. Final Report. ECO_RISK, Office of Ecological Risk Research. Commissioned by the Federal Ministry of Health and Women. Vienna, Austria.

Wenk, N., Stebler, D. and Bickel, R. 2001. Warenflusstrennung von GVO in Lebensmitteln. Prognos-Europäisches Zentrum für Wirtschafts und Strategieberatung. Untersuchung im Auftrag des Amtes für Gesundheit Schweiz.

^{xx} Mellon, M. y Rissler, J., 2004. *Gone To Seed: Transgenic Contaminants in the Traditional Seed Supply*, Cambridge, MA: Union of Concerned Scientists. http://www.ucsusa.org/food_and_environment/genetic_engineering/gone-to-seed.html