THE IMPOSSIBLE COEXISTENCE IN THE FRENCH AGRICULTURAL LANDSCAPE CALLS FOR A MORATORIUM ON GM MAIZE CROP S BEFORE THE SOWING OF SEEDS OF SPRING 2007

PLAN

Translation FR > EN : Anne May, Barbara Forbes, Robert Corner, Coorditrad

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I. WHY A MORATORIUM BEFORE THE 2007 SOWING OF SEEDS

Whatever the outcome of the parliamentary debate on the law to legalize GMO crops voted by the Senate in spring 2006, it seems today technically not feasible that implementation decrees be published prior the sowing of seeds of spring 2007. Indeed, as one part of the law was translated into decrees, it is now necessary that another law be voted by the Parliament, and, hence, by the Senate as well, in the same terms. Two, even three parliamentary debates on such a sensitive subject, one to which the majority of French people are opposed, seem most unlikely on the eve of the elections. In other terms, apart from a modification by decrees which could only be minimal in scope, the legal framework for the sowing of seeds in 2007 will be the same as in 2006: a de facto moratorium on oilseed rape and beetroot crops, one single variety of maize authorized and actually marketed (event MON 810 [1]) and **no framework whatsoever for GM crops**.

As in 2006, it will be possible, with no one knowing anything about it, to cultivate transgenic maize in protected zones, Regional parks or other such places where any GM crop is forbidden, in the border of apiaries, biological crops or maize population… thereby generating out of control contamination. The proponents of GMOs who already announce 30 to 100 000 hectares of transgenic maize in France for 2007 are relying on the "Brazilian - type[2]" strategy of the accomplished fact to then compel the government to adopt a regulation and members of the parliament to vote a law of global contamination. Hence, according to the *Direction Générale de l'Alimentation*, the Ministry of Agriculture held in 2006 a voluntary register of GMO crops introductions, which, however, was not publicly available. On December 12, 2006, the same Ministry announced that a national register of GMO field crops would be in place soon, thereby ratifying, without consulting members of the parliament, the possibility left to farmers to sow GMOs wherever they wish with no consultation of elected representatives, citizens nor other farmers. In this context, only a moratorium on GMO maize crops established prior to April 2007 would allow to avoid GMO presence in non-GM products. The European legal framework offers the possibility for such a moratorium which is only dependent on the political will of elected representatives and the government. And even if a law providing a general framework for GMOs was to be voted soon, such a moratorium would remain necessary in the implementation of the law.

II. THE LEGAL FRAMEWORK FOR SUCH A MORATORIUM

On December 18, 2006, the European Environment Council rejected the European Commission's proposal requesting that Austria get over with its provisional ban on maize MON810 and T25 (the only ones authorized to date in the EU), highlighting that:

- scientific evaluations carried out in 1998 during the authorization procedure for such maize, pursuant to Directive (90/220), now repealed, were not rigorous enough and did not respect the recommendations of Directive 2001/18, the only one currently valid;

[1] What are transformation events? A successful integration of a transgene in a cell is called a transformation event. http://biotech.indymedia.org/or/2004/02/2654.shtml

[2] In Brazil seeds of transgenic soya were brought in from Argentina and secretly distributed by Monsanto itself until the government was obliged to authorise the cultivation of GM crops, and thus legalise tens of thousands of hectares already in existence.

- the application of the safeguard clause of Directive 2001/18 (article 23) is therefore legitimate;
- "the different agricultural structures and regional ecological characteristics in the European Union need to be taken into account in a more systematic manner in the environmental risk assessment of GMOs."

II.1. The European evaluation: MON810, the only maize event currently on the market, should be reassessed.

Maize varieties including MON810 event are, in effect, the only maize varieties currently marketed and cultivated in Europe given that the exploitation of event T25 by its owner (Bayer) was given up. A ban on this event would therefore, in the short-term, be tantamount to a ban on all GM maize crop. **Nothing hinders the French government from repeating the Austrian argumentation, which it backed up by the European Environment Council, in order to obtain immediately a ban on the use and sale off MON810 on its territory: To take or not to take this decision is a purely political act which, following the December 18 decision, is no more coming into conflict with any technical nor legal obstacle.**

According to article 23 of Directive 2001/18, such a ban may only be declared "provisionally." In agreement with Directive 2001/18 recommendations, the lifting of the ban by the Commission would, however, make a new evaluation of this event mandatory. Indeed, EFSA's (European Food Safety Authority) March 29, 2006 opinion, indicating that there is no reason to believe that this GMO might have any negative impact, failed to convince the Environment Council - though it was deemed sufficient by the Commission.

This new evaluation will anyway be essential before 2008, date of expiry of the current authorization for MON810 granted for a 10 year period in 1998. Today or in one year from now, this will inevitably trigger a number of controversies given:

- critiques pertaining to the poor quality of EFSA's evaluations formulated by the Environment Council itself and in the EC's memorandum in response to the World Trade Organization's panel on GMOs[3]
- work published by Professor TRAVICK highlighting damage to Filipino farmers' and villagers' health following the cultivation of maize issued from a crossbreeding of MON810 with a local variety. As this work could not be repeated (no sponsor volunteered to that effect), it could not be validated nor published in a peer-reviewed scientific journal. Still, it exists and political authorities may as well become sensitive to the necessity of a fully neutral follow up to check them;

- numerous studies published in peer-reviewed scientific journals reveal the **harmful, unexplained effects of transgenic plants on animal health or on the health of humans consuming them**, studies which lead the European Commission to state, in the same report delivered to the WTO: "Consequently, one can accept with a high degree of confidence that there is no acute toxicological risk posed by the relevant products, as this would probably not have gone undetected – even if one cannot rule out completely acute anaphylactic exceptional episodes. However, in the absence of

[3] European Communities – Measures affecting the approval and marketing of biotech products (DS291, DS292, DS293). Comments by the European Communities on the Scientific and Technical Advice to the Panel", Geneva, 28 January 2005, a document distributed by Greenpeace and Friends of the Earth in the spring of 2006, following an administrative procedure obliging the European Commission to publicise the official documents.

exposure data in respect of chronic conditions that are common, such as allergy and cancer, there simply is no way of ascertaining whether the introduction of GM products has had any other effect on human health . (§45)"

None of these publications deal directly with MON810 but their existence may sensitize political authorities to the necessity of carrying out longer than 90 -day studies across several animal species as well as accurate epidemiological studies which require a minimal level of traceability with regard to consumed food.

-Published scientific studies which reveal the negative impact of GMOs on the environment and their deficiencies which lead the European Commission to state, in the same report delivered to the WTO about Bt varieties such as MON810 that: " *It is a reasonable and lawful position to say that no Bt crops can be planted until there is information on all potential non-target organisms in the soil, particularly given that scientists do not know much about most of the organisms in the soil (they cannot be reared and it is not known what they feed on). (§ 702)"* .

Certainly, the fear that such a new evaluation might be accelerated was the reason why the EFSA, the Commission and Monsanto left Austria with a legal avenue to justify its moratorium. With such logic, the temporary loss of a small country market is better than taking the risk of:

- loosing straight away the totality of the European market, in particular the Spanish one,
- loosing the "Brazilian-type bet" made on the French market in 2007,
- intensifying the debate on the evaluation of previous authorizations to such an extent that the one on their renewal would not go unnoticed and, hence, not being able to botch these new evaluations as in 1998.

II.2. National evaluations: the recourse to the safeguard clause in order to preserve the permanence of existing, non-GM, agrarian structures and to protect them from contamination risks is today feasible at State, not Regional, level.

Article 26 bis of Directive 2001/18 authorizes Member States to take measures necessary to avoid the unintentional presence of GMOs in other products. Nothing is said about whether the products in question are non GMO labelled products, which may be contaminated up to a threshold of 0.9%, or products "*not containing GMOs*" which should not contain any trace of GMOs at the detection level. Nothing is said either regarding the fact that these measures may or may not consist in "a limitation or an interdiction" in application of the safeguard clause.

The European Union and the EFSA are evaluating the risk of such a transgenic event on the environment and health in general, but they cannot take into account the specificities of agrarian structures, nor the ecological characteristics of each region. This consideration is under the responsibility of States or Regions: any risk to agrarian structures or regional ecological characteristics as well as any risk of leading to the unintentional presence of GMOs in other products originating from regional agrarian structures authorizes Member States to take measures necessary to avoid them. However, in the current legal framework, the recourse to the safeguard clause in order to ban the marketing and culture of a transgenic event authorized by the EU may only originate from States, not Regions. The Italian government understood that well and included in its 2001 national law on seeds an article allowing it to ban on its territory the marketing of seeds and the culture of transgenic events authorized by

the EU should they encompass risks for health, the environment or traditional agrarian systems.

The French government has not, to date, taken any measure to carry out a risk assessment on agrarian structures or on regional ecological characteristics, nor to take appropriate actions, if applicable. And that while nothing in European regulations prevents it to do so and while the Environment Council is asking for it.

III. THE SCIENTIFIC ARGUMENTS FOR A MORATORIUM

To invoke the safeguard clause a state must bring "new or additional information made available since the date of the consent and affecting the environmental risk assessment or reassessment of existing information on the basis of new or additional scientific knowledge (… and which provides) detailed grounds for considering that a (...consented) GMO constitutes a risk to human health or the environment". The information set out above (the necessity for a re-evaluation, of the risks to health and the environment in particular) justifies on its own the implementation of the safeguard clause. It also opens up another area of concern, with respect to the environment.

The environment includes not only non-cultivated areas, but also those under cultivation, and the agrarian systems associated with them. Italy's 2001 law (which has never been contested by the EU) as well as the Environment Council's conclusions of 18 December 2006 clearly stipulate that the specificities of regional agrarian systems must be taken into account in the evaluation of environmental risks. It is therefore necessary to evaluate, by region and by country, the very possibility of coexistence, within the framework of existing agrarian systems. The presence of GMOs in produce can compromise the sustainability of the agrarian systems that produced them and the environmental balance that these systems ensure, irrespective of any compensation for economic loss: it is this risk that must be taken into account.

A great number of scientific studies have been published since 1998 (when GMO crops were last authorised), on gene flows and coexistence. The studies on rape led the French government to introduce a moratorium on rape, given the impossibility of managing the pollen flows, the dispersion of the seeds, and the risks of contaminating non-GM crops and related wild species. The UK government took the same decision following the publication of scientific studies showing the impact of herbicide-resistant rape on biodiversity in the wild.

Research into beet varieties has prompted the sugar industry to resist the introduction of transgenic crops, given the impossibility of preventing crossover between crops and quality strains.

Jacques David[4] has provided evidence of the hybridisation between "wild wheat" (aegilops) and the hard-grain wheat varieties cultivated in the south of France.

And with respect to plants propagated by vegetative methods (which - although it is often forgotten - can also exchange pollen), Doyle McKey[5] and Gérard Second[6] have shown, in studies on manioc and manioc and Arracacia (an umbellifer like the carrot) respectively, that there is frequent and reciprocal exchange of genes between cultivated and related wild

[4] INRA-ENSA Montpellier
[5] CNRS Montpellier
[6] IRD Montpellier

varieties, and that these are exploited by farmers to improve their cultivated varieties. The same observations have been made for the potato in Bolivia.

Pascal Simonet[7] has shown that four years after the decomposition of transgenic plants, these plants' transgenes have been found in the soil and were still capable of working transformations; he also showed that genes in the soil can be transferred to bacteria.

These recent studies all reveal the inevitable risks that GM crops present to the environment, through the contamination of non-GM crops and of related wild species and of the soil.

IV. THE CASE OF MAIZE: IMPOSSIBLE COEXISTENCE

IV.1. Insufficient research to justify coexistence

It is curious that maize has been spared such research until recently. Although maize is fertilised by cross-pollination (the flowers of each plant of maize are generally fertilised by pollen coming from other plants of maize), and is therefore particularly vulnerable to gene flows, there has been no monitoring of gene flows in France or indeed Europe, apart from within the perimeter, a few metres wide, of the transgenic plots that have been cultivated over many years as part of trials or, more recently, commercial operations. Maize is nevertheless the only transgenic crop cultivated on a wide scale (the other crops having only been grown on a trial basis).

The only references regularly communicated concern the precautions taken to ensure levels of varietal purity compatible with regulations on the production of commercial seed stock: to achieve 98% or 99% varietal purity rates, distances of 200 to 400 metres must be respected between crops. But these figures refer to morphological characteristics that are visible on the maize itself; they do not take into account genetic contamination (such as the production of Bt toxins or herbicide resistance) by genes external to the variety required and having no impact on the visible morphological characteristics of the plant. **These references are therefore inappropriate.**

The only data available on gene pollution is provided by the French customs and excise; it only covers imported maize seed (in 2004 36% of the seed lots tested were slightly contaminated).

IV.2 Movement of pollen revealed in recent studies

The study produced by ARVALIS / Institute of Vegetables, on which the AGPM [8] relies in order to recommend its guide to good practice for possible co-existence, draws attention to the flow of pollen between two neighbouring plots, in a context of GM production which does not exceed 0.2/1000 of all French maize. The notorious inadequacy of this type of approach is broadly recognised today: during the first planning seminar of the ANR-OGM[9] on 14th/15th December 2006 in Paris, Claire LAVIGNE [10], when pressed by many other scientists, recognised that it is impossible to extrapolate results from the "plot" model with reference to long distances.

[7] CNRS Lyons
[8] General Association of Maize Producers
[9] National Research Agency
[10] University Paris-sud, Models for the dispersal of genetically modified plants at different levels: synthesis of studies carried out in France over recent years

The same seminar allowed Yves BRUNET[11] to give an account of his field studies on maize pollen dispersal over long distances. During the flowering period, maize pollen, no matter how heavy, moves at an altitude of within two kilometres in a maize-producing region such as Aquitaine. The strength of this pollen certainly diminishes with time, but is contingent on humidity and temperatures which can be much higher at an altitude during the day than at ground level. In this way, according to Yves BRUNET's calculations, an average of 2000 grains of fertile maize pollen fall on each square metre of this region. Around fifteen small plots of white maize planted experimentally **several kilometres** away from any other maize cultivation have been fertilised by these "travelling pollens" at varying degrees between 0.05% and 0.25%, depending on whether or not the white maize had been sterilised. In the case of extensive cultivation of GM maize, this "pollen pool" is inevitably added to other contamination factors between two neighbouring plots, but at very long distances which need to be measured in kilometres.

IV.3 The significance of the countryside and agrarian systems: fragmented, material, seeds……

In a report for the European Commission on co-existence produced at the beginning of 2006, Antoine MESSEAN and Frédérique ANGEVIN[12] established several models based on maize production in the regions of Poitou-Charente and Pyrenees Atlantiques. These models did not limit themselves to looking at individual plots but tried to take into account the entire agrarian landscape. Paradoxically, the European Commission hastened to state that this report showed that co-existence was possible.

However, the results of the establishment of these models showed the following:

1. In conditions of normal flowering (with a time-lag between the flowering of different varieties of GM and non-GM of less than two months and wind blowing the GM towards the non-GM fields), and even with two seed varieties with no trace of GM, the threshold of 0.01% of GM presence within the non-GM maize is routinely crossed whatever the distances separating the two fields. This means that **no co-existence between GM cultivation and non-GM cultivation is possible.**
   In fact, according to the DGCCRF[13], for a product to be qualified as "non-GM", *"all traces of GM must be excluded. In other words, the threshold in this case is the limit at which it can be detected in analysis, and not the limit of quantification or the fortuitous threshold of 0.9%"*. Today, the threshold for detection is 0.01% and the threshold for quantification is 0.1%.

2. With a "significant" level of seed impurity (above 0.01%), which today is already exceeded by more than 30% of seeds of imported maize, the threshold of 0.1% at harvesting is impossible in most situations.
   With a 0.5% level of impurity in the seeds (a level currently deemed by the Customs as not requiring special labelling), the threshold of 0.9% is not reached at harvesting in almost half of all cases. This means namely that co-existence would require seeds with no trace of GM, an aim which all seed producers say is impossible to achieve wherever GM maize is being cultivated.

3. Respecting the threshold of 0.9% at harvesting would therefore need not only pure seed, but also relatively restrictive arrangements between cultivators. In the case of seed production, arrangements of this type are possible as they are on the whole paid

[11] INRA, Bordeaux
[12] INRA-ECO/INOV Paris Grignon
[13] DGCCRF, information note 2004-113 from 16th August 2004

according to the significance of the added value. In the case of GM, it is essentially the non-GM cultivators who do not receive any benefit from this production, and who have to put up with the arrangements without any compensation. Which means th at **the necessary arrangements between cultivators for guaranteeing a co -existence up to a threshold of 0.9% cannot be achieved in most cases.**

4. The constraints on the purity of the harvested material are very considerable, indeed they come at an unbearable cost for non-GM farmers who do not have their own material. Furthermore, no solution is possible for farmers whose small units of land are scattered amongst large stretches of GM crops, which means that **co-existence at the 0.9% threshold is impossible for most of the small-scale producers who do not want to produce GM crops.**

5. In the case of GM production, the additional costs linked to the production of non -GM seeds, even those contaminated to up to 0.3% or 0.5%, would, according to statements from the seed producers, lead them to re-locate their production outside the EU to areas where no GM crops are cultivated. This means that **co-existence would lead to re-locating the most profitable aspect of maize cultivation and would condemn to bankruptcy a significant number of farmers who live purely from this seed production.**

The raw results of this report on co-existence presented above already put into clear perspective the conclusions which have been drawn from it by the European Commission. Furthermore, the models are only valid for the factors which it applies to. Several essential factors have been ignored in this study, for example apiculture, pollution during the transformation and marketing stages of the harvests, the actual capacities of the seed companies to manage this pollution and the impact on the different varieties of maize.

IV.4 GM Maize and apiculture

Claire LAVIGNE emphasised in the ANR/OGM seminar *that "rape-seed pollen is transported by insects and there is currently no valid dispe rsion model (for pollens) between fields which takes this element into account."* The situation is the same for maize pollen.

Supporters of GM crops claim that as bees do not produce honey from maize, this factor does not need to be taken into account. Ho wever, in a study published in 2005[14], Agnes PORTAIS and Gerard ARNOLD[15] showed that a hive can absorb between 10 and 20 kgs of maize pollen annually. This is not for honey production but to feed the brood and the bees. Irene KELLER, Peter FLURI and Anton IMDORF[16] have reviewed 114 studies on the composition of pollens harvested by bees in differ ent European countries and in Egypt: in 60% of the cases, maize pollen is predominant. This harvesting of maize pollen by bees has several consequences:

- An experiment carried out by the CIV AM Agrobio in Lot et Garonne during the summer of 2006 showed that the pollen harvested during flowering of a field of GM maize **1200 metres** from the hive contained **39% of GM DNA**. The pollen is regarded as a dietary product and the least presence of GM DNA makes it impossible to sell. Even if the bees do not make honey from maize pollen, the pollen is, however, present in small amounts in the honey when they collect it. This makes it impossible for the honey to be marketed with a "non-GM" label, which is demanded by consumers and most of the purchasing centres for hypermarkets.

[14] Apidologie 36 (2005) 71–83, © INRA/DIB-AGIB/ EDP Sciences, 2005, DOI: 10.1051/apido:2004071
[15] CNRS, Gif sur Yvette
[16] Research Centre Liebefeld in Berne, Switzerland

- **The inevitable contamination of pollen and honey through the cultivation of GM maize makes the practice of guaranteed "non-GM" apiculture impossible in the relevant regions.**
- While the bees are harvesting the maize pollen, they can also carry it with them and pollinate other maize fields in a radius of several kilometres as a result of pollen exchange between bees in the hive. This risk, which the supporters of GM claim is marginal[17], could become very significant in the case of professional apiaries containing dozens or hundreds of hives. These apiaries are essential for fruit or sunflower production, which is significant in the maize-growing regions in the south of France. In the case of large areas of GM maize, the producers of non-GM maize will of course be opposed to the presence of these apiaries, thus heavily penalising the activity of their colleagues in the fruit-farming and sunflower-growing business. Arrangements between producers are essential for co-existence, as indicated by the study by Antoine MESSEAN and Frederique ANGEVIN, and will otherwise be impossible to achieve.
- **GM maize production will generate unsolvable problems between farmers, apiarists, fruit farmers…..**

IV.5. Pollution during the stages of transformation and marketing

All the models have set as their objective a threshold of contamination of not more than 0.9% in the field. Legally, this threshold is related to the sale to the end consumer and not the harvesting in the field. Claire LAVIGNE has emphasised that *"the distribution of hybrid pollens inside the fields is difficult to predict (mainly the high level in the initial rows)."* In fact, even beyond the effects on the edges, a contamination of a field of less than 0.9% means that some grains are contaminated and others are not, and that some cobs might be contaminated at higher levels and others not at all.

Today's consumers of sweetcorn demand that it be labelled "non-GM", which requires a total absence of contamination and not a tolerance of up to 0.9%. Furthermore, for reasons of quality, sweetcorn is kept on the cob until it is tinned. In a tin of sweetcorn sold to the consumer, there are only a limited number of grains from a few cobs. Even an average contamination of a field of less than 0.1% would give a majority of tins of non-GM corn but also tins with a very high level of contamination, which would require them to be labelled as *"containing GM"*. As it is impossible to analyse each tin before sale (the cost of analysis being more than the price of the tin!), all the tins would need to be labelled as *"containing GM"* starting from the smallest level of contamination in the field, even if this is on average considerably less than 0.9%. This applies also when market gardeners sell whole corn on the cob at markets.

For this reason, a guarantee to the consumer of 0.9% needs a threshold of almost 0% in the field, which is impossible with the cultivation of GM maize in the region under consideration.

IV.6 Inability of the seed companies and the bio-security agencies to manage this pollution

From the earliest days of the cultivation of GM crops, the seed companies have regularly shown that they are unable to guarantee that the separation of GM and non-GM lines is watertight. Without returning to the contamination of imported seeds referred to in § IV.1 , we

[17] The bee visits the male maize flowers where the GM pollen has to fall in order to reach the female flowers.

also need to address other forms of accidental contamination in some specific cases amongst the most well-known of the hundred or so cases which have already been identified. After the case of Starlink maize, then that of Syngenta's Bt10 whose sale was forbidden but which was marketed for several years under the name BT11, the recent simultaneous contamination of American rice by an unauthorised GM incident from Bayer (LL601) and Chinese rice by a not yet officially documented modified gene, reveals clearly the incapacity of companies and authorities to cope with accidents. In fact, the contamination through Bayer's LL601 was only documented on one major occasion, and it is only thanks to Greenpeace that the Chinese contamination was discovered; its discovery has still not been officially recognised as the Chinese authorities have not yet provided the necessary information about the modified gene.

In every case of accidental contamination, it is primarily the non-GM producers who suffer and lose out in the market!

IV.7 Impact of GM maize on the total production

The production of hybrid maize, which forces the producer to buy new seed from the seed company each year, makes up the major part of the current production in France. In addition, the maize cannot become crossed with any other wild plant in our country, which enables patterns to be established on an annual basis. As well as this, even if the contamination of the hybrid maize crop is almost 0.9% at the end of the cycle, these patterns can be started from scratch with any other given contamination factor, such as the neighbouring field and the purchased seed which is normally controlled.

Contrary to the hybrid maize F1, the production of "maize population" enables the farmer to use part of the harvest to provide the seed for the following year and thus to adapt the maize type to his land and growing conditions, especially when he wishes to reduce or abandon intensive cultivation with chemical fertiliser, insecticides, herbicides and water. This production is still in the minority but is significantly on the increase. Its agronomical and financial results are becoming increasingly important, sometimes superior to the results of hybrid maize especially in difficult regions, in cases of drought or in organic farming[18] .

The cultivation of "maize population" provides an interesting alternative to the blind alleys of intensive hybrid maize monoculture which relies on the use of large amounts of substances which are environmentally harmful such as nitrogen-based fertiliser, water and pesticides. **It is primarily monocultures which encourage the proliferation of destructive insects which GM crops claim to provide an answer to, even though they settle for limiting the symptoms without addressing the causes.**

The cultivation of "maize population" also allows for the protection, renewal and development of bio-diversity, which is the indispensable basis for future food production in a context which will be fundamentally disrupted by climate and social changes.

The different varieties of maize however have not been taken into account in any scientific study on co-existence!

Because farmers use part of their harvest as seed, studies about maize cultivation are only valid if they are done over several years. In fact, the level of contamination can rise rapidly from one year to the next, for two reasons: the cobs chosen to provide the seed can have a much higher level of contamination than the average of the field; and each year, the level of seed contamination from the previous year's harvest is automatically added to other

[18] See « L'Aquitaine cultive la Biodiversité » 2006, Bio d'Aquitaine, 6 rue du château Trompette, 33 000 Bordeaux

contamination factors. In this way a red maize from Aragon (Spain) kept by an organic farmer is shown to have been contaminated to a level of 36% over several years [19].
From the moment that GM cultivation begins, the inevitable expo nential contamination of the maize population by GM crops prevents alternatives to hybrid maize monocultures which are environmentally damaging and which cause irreversible harm to our bio-diversity.

THE DECLARATION OF THE EUROPEAN COMMISSION CLAIMING TH AT COEXISTENCE IS POSSIBLE HAS THEREFORE NO SCIENTIFIC BASIS. IT IS THE RESULT OF A DELIBERATE POLITICAL CHOICE TO DECRY

- ALL NON-GM PRODUCTION
- SMALL PRODUCERS WHO DO NOT WANT TO GROW GM CROPS
- APIARISTS AND THOSE WHOSE WORK IS LINKED TO APIARY
- THE MAIZE POPULATIONS WHICH STILL PROVIDE AN INTERESTING ALTERNATIVE TO THE MANY BLIND ALLEYS OF INTENSIVE HYBRID MAIZE MONOCULTURE.

V. ADVANTAGES VERSUS RISKS, AND CONCLUSION

In an interview in the September 2006 number of the magazine "Semences et Progres" , Guy RIBA, executive general director of INRA, said that *"the GM varieties of maize Bt which are currently permitted provide more advantages and fewer drawbacks than the current practices."*

In fact, the impact of hybrid maize monoculture on the environme nt and on health is so devastating that GM could seem, if we limit ourselves to this aspect, like the lesser evil….

On the other hand, if we think about agrarian systems and if we take into account all the factors, especially those noted above, this opini on becomes a political choice and not a purely scientific point of view – just like that of the European Commission. This is why Guy RIBA's assertion, based on an approach which is purely entomological and agronomic, narrowly limited to the observation of growth in a single year and ignoring many other environmental, health and socio-economic aspects, seems surprising coming from a vice-director of INRA.

In fact, the reproductive cycles of the insects which destroy maize and which are used to justify the use of these GM Bt variants are easily controlled as soon as the practice of industrial monocultures is given up in order to return to normal crop rotation,

Furthermore, these monocultures have little future in France. They are in fact only a result of the CAP incentives given for maize to the detriment of other crops, especially grass. Since the beginning of the disjunction of these incentives (which will in future be identical regardless of the crop being grown), the areas used for maize have decreased by more than 20% and this is only the beginning. Furthermore, GM maize production would speed up the relocation of the major intensive cultivation towards the countries of the South or East which are less demanding both socially and environmentally.

In addition, in view of the market demand for *"non-GM"* products, Europe will benefit more in future by remaining a GM-free zone than by taking the risk of contaminating harvests which would become just as impossible to sell on our most remunerative market s as American or Chinese rice. Co-existence would in fact inevitably reduce consumer confidence

[19] A critique of the draft Mini sterial Order setting out the publication of the recommendations for co-existence between GM, conventional and organic crops, Friends of the Earth/Ecologists in Action/Greenpeace, April 2004

in conventional products which would, quite rightly, be under suspicion of being contaminated. It is for this same reason – i.e. not losing the European and Jap anese markets – that American and Canadian wheat farmers are opposed to GM wheat cultivation.

Finally, the loss of food sovereignty in a country such as France for the benefit of a few multinationals which hold all the licences on GM seeds is a bigger fac tor than a very relative agricultural advantage.

MORE THAN EVER, A MORATORIUM ON GM MAIZE BEFORE THE 2007 SOWING PERIOD IS LEGITIMATE, ESSENTIAL AND LEGALLY ENTIRELY ACCEPTABLE.

Guy Kastler, with contributions from Valentin Beauval, Olivier Keller, Chant al Gascuel, Jean-Marie Loury, Sylvette Escazeaux and Michel Dupont, 10 th January 2007.