

B - Contact Details

Member State: GREECE

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MINISTRY OF RURAL DEVELOPMENT AND FOOD

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REPLIES FROM:

Upstream

- 1.1. Farmers
- 1.2. Seed industry

Downstream

Consumers;
Cooperatives and grain handling companies;
Food and feed industry;
Transport companies;
Insurance companies;
Laboratories;
Innovation and research;
Public administration.

Economic context

Internal market

2 - Agronomic sustainability

Biodiversity, flora, fauna and landscapes
Renewable or non renewable resources
Climate

Transport / use of energy

3 - Other Implications

ANNEX

Lead questions per area and stakeholder

For each question, answers should be broken down:

- *by the purpose of the genetic modification if this affects the content of the responses,*
- *between ex ante and ex post considerations.*

PUBLIC ADMINISTRATION (MINISTRY OF RURAL DEVELOPMENT AND FOOD-Crop Inputs): Until now, no GM cultivation has occurred in Greece, so the questionnaire has been answered by various stakeholders as a general prevision-expectation, based also on international and scientific data. To be noted that Greece presents a diversity of concerns in case of GM plant cultivation -as several other Member States do- and this explains the ban of MON 810 cultivation in its territory. The small agricultural plots, the very developed apiculture as well as the anxiety of all scale, from farmers to consumers are only a few of the reasons of this position.

1. - Economic and social implications

Upstream

1.1. Farmers

For each question, answers can be broken down by the range of relevant agricultural stakeholders farmers

- *farmers cultivating GM crops;*

- *conventional crops; organic crops and beekeepers;*

NGOs: Cultivation of GMOs results in contamination risk for non-GM crop farmers: although conventional farmers are protected by legislation, it will be necessary for them to apply extra controls to all seeds for GM contaminations, imposing extra input costs on all farmers. Moreover, as coexistence cannot be controlled as the acreage in Greece is small, farmers will suffer from contaminations causing conflicts among neighbours. To avoid these conflicts, among other consequences the organic production risks to be reduced.

CONFEDERATION OF BEEKEEPERS:

Beekeepers would not be anymore able to produce safe and quality bee products, organic & traditional products, as well as products of designations of origin, as it would be practically impossible to apply coexistence measures, able to protect bees from GM crops. The same difficulty would be raised even by experiment GM cultivations. But even in the cases that apiculture products are not super infected, beekeepers would have to pay the analyses in order to prove it! To be noted that the consumers of apiculture products are typically the ones that prefer them as pure and healthy ones, so any infection by GM material would make these products definitely rejectable.

- *seed producers producing GM seeds;*
- *seed producers producing conventional seeds;*
- *seed producers producing organic seeds;*

NGOs: additional measures for seed production will have to be taken, increasing cost.

Has GMO cultivation an impact regarding the following topics? If so, which one?

- farmers' revenues (output prices and agricultural yields);
- farmers' production costs;
- labour flexibility;
- quality of the harvest (e.g. mycotoxins);

NGOs: Despite claims by the genetic engineering industry that Bt maize leads to reduced insect damage and hence reduced mycotoxins, scientific works show that the picture is not so clear.

- cost of alternative pest and/or weed control programmes;
- price discrimination between GM and non-GM harvest;
- availability of seeds and seed prices;
- dependence on the seed industry;
- farmers' privilege (as established by Article 14 of Regulation (EC) No 2100/94 on Community plant variety rights) to use farm-saved seeds;
- the use of agriculture inputs: plant protection products, fertilisers, water and energy resources;
- health of labour (possible changes in the use of plant protection products);

NGOs: It has been demonstrated that the use of herbicide-resistant GM crops may result to an increase in weed resistance to this herbicide. Consequently, there will be a need of using bigger quantities or other more toxic herbicides, to which farmers will have to be exposed.

- farming practices, such as coexistence measures and clustering of GMO and/or non-GMO production;
- cost of coexistence measures;
- conflicts between neighbouring farmers or between farmers and other neighbours
- labour allocation- insurance obligations;
- opportunities to sell the harvest due to labelling;
- communication or organisation between the farmers;
- farmer training;
- beekeeping industry.

Any other impacts you would like to mention:

1.2. Seed industry

For each question, answers can be broken down by the range of relevant stakeholders, including:

- *plant breeders;*
- *multiplying companies;*
- *seed producing farmers;*
- *seed distributors;*

And/or:

- *GM seeds;*
- *conventional seeds;*
- *organic seeds;*

And/or:

- industrial / arable crops;
- vegetable crops...

Has GMO cultivation an impact regarding the following topics? If so, which one?

- employment, turn over, profits;
- the production of seeds (easiness/difficulty to find seed producers, easiness/difficulty to find areas to produce these seeds...);
- marketing of seeds;
- the protection of plant breeders rights; - the protection of plant genetic resources.

SEED INDUSTRY COMPANIES APPLYING BIOTECHNOLOGY IN AGRICULTURE

(ESAV): GMO cultivation may result in:

1. Added value by offering new products, from field to shelf
2. Added value coming from royalty collection from seed multiplying companies and seed distributors
3. State revenues coming from taxation of the added value
4. Provide new employment and investment opportunities through direct investment & collaboration with public research institutes.

SEED PRODUCERS & SEED TRADE ASSOCIATIONS: Concerns are expressed about the land management vis-à-vis conventional neighbouring fields with GMO farmers as well as for an unbalanced cost-productivity ratio and a negative effect on product quality. Concerns are also raised about biodiversity, dispersion of GM pollen resulting in “genetic pollution”, production of herbicide-resistant herbs, herbicide accumulation in herbicide-resistant GM plants, effect of GM plants to non-target insects.

PUBLIC ADMINISTRATION (Ministry of Rural Development & Food - Crop Inputs): The management of GMO production as a whole requires a complete separation from the conventional and organic, in all levels (farming, transporting, storing, processing, logistical, control system etc.). This will lead to additional financial surcharge and increase of the price of the final product.

Does the marketing of GM seeds have an impact on the seed industry and its structure in the EU (size of companies, business concentration, competition policy)? Please specify per sector.

- for plant breeders;
- for seed multiplication;
- for seed producers;
- for the availability of conventional and organic seeds;
- creation/suppression of barriers for new suppliers;
- market segmentation.

SEED PRODUCERS & SEED TRADE ASSOCIATIONS: Although the biggest of them agrees partially with the position of ESAV (above), all associations of the country non applying biotechnology have concerns that as GMO technology is at the hands of very few companies, the threat of mono or oligo-polizing of the trade and of the seed distributors would be very probable. Due to the above, the future of multiplying companies (small to medium in Greece) is bleak.

Any other impact you would like to mention:

Downstream

1.3. Consumers

Has GMO cultivation any impact regarding the following topics? If so, which one?

- consumer choice (regarding quality and diversity of products);

CONSUMERS ASSOCIATIONS: The GM products would have a lower quality and can acquire lower price, while the non-GM products would present a gradually decreased diversity. The lower price of GM products would represent a good financial incentive for expanding their cultivation on the expenses of the natural varieties and relevant products. Consumer choice will be significantly limited.

NGOs: Keeping conventional and organic supply chains strictly GMO-free is impossible. This will gradually make the consumption of GMO-free products impossible and thus seriously affect consumer's freedom of choice.

- the price of the goods;

CONSUMERS ASSOCIATIONS: Products deriving from GMOs are usually cheaper, so they may be preferred against non GMOs which will become more and more expensive, in order to preserve their purity.

NGOs: The "polluter pays" principle is reversed, meaning that GMOs impose testing and segregation costs on GMO-free producers thereby creating an unfair price advantage for GM-produce.

- consumer information and protection;

CONSUMERS ASSOCIATIONS: Since it is doubtful whether producers would be able to implement the relevant legislation, limited consumer choice would be imposed. Moreover, it is highlighted that there was not enough information and communication by the EU and the governments to the consumers. Therefore all the communication was left to the consumers' associations and the NGOs. The majority of consumers may not be aware of the changes in legislation, although a labeling system has been introduced. Many do not know that there may already be GM in food. However, the current legislative environment has brought improvements in terms of consumers' interests.

Any other impact you would like to mention:

CONSUMERS ASSOCIATIONS and CONFEDERATION OF BEEKEEPERS: Risks to be confronted are:

- decreased biodiversity, biopiracy and other environmental impacts
- negative socioeconomic impacts
- GMO cultivation doesn't take into account ethical-philosophical-religious concerns
- loss of freedom of people to decide and choose according to their preferences

CONSUMERS ASSOCIATIONS: To note that consumers are not in general against new technologies but accept recognition of clear benefits and a positive balance when compared with risks. For example they are not against the red and white

biotechnology. In contrast, they are against the green biotechnology, all for cultivation, food, feed etc. as they are anyway linked. They also believe that GM in food has not been tested enough for safety and there is a too high risk for consumers related to uncertainty and lack of data on the long-run.

Another indication of the consumers' rejection of GMOs was given in the case of a text book used in the secondary grade school in 2006, describing GMOs only as beneficial without mentioning the concerns and the lack of acceptance.

1.4. Cooperatives and grain handling companies

Has GMO cultivation any impact regarding the following topics? If so, which one?

- work organisation;

FEED TRADE ASSOCIATION: For feed, it is considered that GM cultivation would not be considered a problem area: most of the grain trading and handling companies have at their disposal experienced staff, knowledgeable of the relevant E.U. regulations in force, and would easily handle this matter. Besides, most of the grain trading and distribution companies already enforce or are currently trying to establish certified food safety systems such as ISO 22000 which allow for integrated traceability procedures together with the implementation of firm rules against GMO admixture and contamination.

- handling and storage;

FEED TRADE ASSOCIATION: In this area improvements need to be made: The total suitable and geographically appropriately located storage capacity for grains in the country is considered inadequate. As coexistence of GMO and non GMO products is not allowed in the same storage area, a lot of space will be wasted. Also, grain handling installations do not have by design the proper structure to prevent mixing.

- transport;

FEED TRADE ASSOCIATION: As long as specific procedures such as cleaning of the loading machinery and trucks are properly followed, problems in the transportation will remain minimal. However delays and extra cleaning are also expected to add an extra cost.

- administrative requirements on business or administrative complexity;

FEED TRADE ASSOCIATION: The experience in administrative issues already exists, however an extra cost will incur. This significant cost will reach the final consumer who will be asked to pay for both GMO and non GMO products of his choice.

Any other impact you would like to mention:

FEED TRADE ASSOCIATION: Although feed traders believe that there would be significant benefits, they note the need for extra attention to be drawn in view of the small size of farms in our country.

1.5. Food and feed industry

Has GMO cultivation any impact regarding the following topics? If so, which one?

- range of products on offer;

- employment, turn over, profits;
- work organisation;
- crop handling (drying, storage, transport, processing, etc...);

- administrative requirements on business or administrative complexity;

PUBLIC ADMINISTRATION (General Chemical State Laboratory): In case of GMO cultivation in our country, the food & feed industry would be asked to treat a much bigger volume of products coming from GMOs, as compared to the present situation, where only imported material has to be controlled for traceability and labeling, as well as to be submitted to controls of conventional products, according to directive 1829/2003.

Any other impact you would like to mention:

PUBLIC ADMINISTRATION (Ministry of Rural Development & Food – Crop Inputs): The management of GMO production as a whole requires a complete separation from the conventional and organic, in all levels (farming, transporting, storing, processing, logistical, control system etc.). This will lead to additional financial surcharge and increase of the price of the final product.

1.6. Transport companies

Has GMO cultivation any impact regarding carriers (insurance, cleaning, separate lines...)? If so, which one?

1.7. Insurance companies

Does the GMO cultivation have any impact regarding insurance companies (e.g. in terms of developing new products)? If so, which one?

1.8. Laboratories

Has GMO cultivation any impact regarding the following topics? If so, which one?

- employment, turn over, profits;

PUBLIC LABORATORIES: More people would have to be employed in laboratories since the work of GMO analyses will increase, and this would increase even more the cost of the final product. Furthermore these people would have to be skilled and specialized in GMO testing.

- feasibility of analyses;

PUBLIC LABORATORIES: It will result in greater needs for laboratory recourses and infrastructure therefore increasing the cost of analyses.

- time necessary to provide the results;

PUBLIC LABORATORIES: Under the present situation the time of analyses is expected to lengthen due to more samples needed to be tested.

- prices of the analyses.

PUBLIC LABORATORIES: Initially the prices for analyses will go up. Later on, it will take some time until they go down due to the economy of scaling up.

Any other impact you would like to mention:

PUBLIC ADMINISTRATION (General Chemical State Laboratory): In general, GMO cultivation will increase the number of samples to be submitted to laboratory analysis and consequently time and cost of laboratory work will increase considerably too, especially for the cases of GM plants with multiple events.

1.9. Innovation and research

Do GMO cultivation and the technology spill over have an impact on the following topics? If so, which one?

- investment in plant research, number of patents held by European organisations (public or private bodies);
- investment in research in minor crops;
- employment in the R&D centres in the EU;
- use of non-GM modern breeding techniques (e.g. identification of molecular markers);
- access to genetic resources;
- access to new knowledge (molecular markers, use of new varieties in breeding programmes, etc.).

PUBLIC LABORATORIES: It will have an impact on all the topics mentioned, under 1.8.

1.10. Public administration

Has GMO cultivation any impact regarding the actions of the national public administrations and the necessary budget (national and local level) for example policing and enforcement costs

PUBLIC LABORATORIES & PUBLIC ADMINISTRATION (General Chemical State Laboratory): It will have an impact regarding the actions of the national public administrations because every government will have to allocate funds and important resources in order to organize, policing, putting enforcement costs and quality control testing, in application of the existing legislation.

Any other impact you would like to mention:

Economic context

1.11. Internal market

Does the placing on the market of GMO seeds have an impact on the functioning of the EU internal market on seeds? If so, which one?

Does it have an impact on the internal markets for services (if so which impact and which services), for agriculture products and on workers' mobility? If so, which one?

Does GMO cultivation have an impact on monopolies? If so, which ones (emergence/disappearance)?

Does it provoke cross-border investment flows (including relocation of economic activity)?

Any other impact you would like to mention:

PUBLIC ADMINISTRATION (Ministry of Rural Development & Food – Crop Inputs): In case that GM cultivation expands, there is an evident risk of monopoly or oligopoly in seed market as GM varieties belong only to a few companies. This will result in a negative impact on the functioning of the seed market in the EU.

PUBLIC LABORATORIES: Most of GM seeds originate from companies outside the EU. This fact will result in the squeezing and diminishing the local European markets,

by accepting the imported seeds from foreign companies. This will create monopolies and will make European farmers to depend on foreign markets and policies.

CONSUMERS ASSOCIATIONS: Currently there is an oligopoly at global level for the production of GMOs, so the concerns of the consumers is that they could become victims of this system.

1.12. Specific regions and sectors

Answers can be broken down on the purpose of the level (national, regional, local) and according to region.

Has GMO cultivation any regional and local impact in those regions regarding the following topics. If so, which one?

- agriculture incomes;
- farms' size;

NGOs: Cultivation of GMOs can lead progressively to a massive increase in the size of farms (resulting monoculture) and decrease in the number of farmers.

- the farm production practices (e.g. increase or decrease of monoculture);

NGOs: There is risk of monoculture due to GM cultivation, as it has already occurred in other countries where GM cultivation is already expanded.

- the reputation regarding other commercial activities of the region/localities.

Any other impact you would like to mention:

PUBLIC LABORATORIES: Cultivation of GMOs will have a negative impact to all the above. This will be mainly due to the fact that farmers will be totally depended on foreign companies for seeds' supply and prices thereof. They will have to adopt new production practices. Moreover, until present in many cases the effect of GMO cultivation in agriculture income has been very controversial.

2. - Agronomic sustainability

2.1 Agricultural inputs

Does the cultivation of EU approved GMOs for cultivation have an impact regarding the use of pesticides against target insect pests (i.e. corn borer)?

PUBLIC ADMINISTRATION (Ministry of Rural Development & Food – Environment):

While insect resistance traits of GM plants may reduce one insect pest, these traits may result in increased numbers of secondary pests, needing insecticide application. This phenomenon increases in case of repeated GM cultivations and in large area.

PUBLIC LABORATORIES, NGOs & PUBLIC ADMINISTRATION (Ministry of Rural Development & Food – Crop Inputs): As target insects may express resistance to the compound produced by the GM plants, spraying with insecticides will be required. Moreover: GMO plants may become susceptible to other pests against whom the genetic modification does not provide resistance. In both cases an increase of insecticides will occur.

Does the placing on the market of GMOs have an impact, and if so which ones, regarding the use of pesticides or/and on the patterns of use of chemical herbicides?

PUBLIC ADMINISTRATION (Ministry of Rural Development & Food-Environment):

The use of herbicide resistant plants may lead to increased selection pressure for resistant weed biotypes and reinforce the use of broad spectrum herbicides, which as in the case of insect resistant plants may eventually result in the development of a number of plant biotypes which are resistant to herbicides.

NGOs: It has been demonstrated that the use of herbicide-resistant GM crops may result to an increase in weed resistance to this herbicide. Consequently, there will be a need of using either much higher quantities of the initial herbicide or other more toxic herbicides.

2.2. Biodiversity, flora, fauna and landscapes (other impacts than the ones considered in the environmental risk assessment carried out under Directive 2001/18 and Regulation (EC) No 1829/2003)

Does the cultivation of EU approved GMOs have an impact regarding the number of non agriculture species/varieties?

PUBLIC LABORATORIES: There is not a general agreement of all scientists, but many of them believe that GMO cultivation will have an adverse effect on flora, fauna and landscapes.

CONSUMERS ASSOCIATIONS: The impacts of the release of GMOs in the environment may be irreversible.

NGOs: GMOs as a continuation of industrial farming will lead to loss of traditional varieties and knowledge. Besides, directive 2001/18 requires a case-by-case environmental risk assessment, which has not been applied for MON810.

Does GMO cultivation have an impact on agriculture diversity (number of plant varieties available, agriculture species, etc?)

PUBLIC ADMINISTRATION (Ministry of Rural Development & Food):

New traits developed by genetic engineering could lead to widespread use of limited number of crop varieties and eventually loss of cultivar biodiversity. Reducing the diversity of cultivars may cause problems such as higher susceptibility to widespread plant diseases and pests.

Does GMO cultivation have an impact, and if so which one, regarding:

- protected or endangered species;
- their habitats;
- ecologically sensitive areas;

Does GMO cultivation have an impact, and if so which one, regarding:

- migration routes;
- ecological corridors;
- buffer zones.

Does GMO cultivation have an impact, and if so which one, regarding:

- biodiversity;

- flora;
- fauna;
- landscapes.

PUBLIC ADMINISTRATION (Ministry of Rural Development & Food, Environment):

The transfer of genes from GM plants into conventional crops or other species in the wild (outcrossing), is related to the capability of GMO to escape and potentially introduce the engineered genes into wild populations, the persistence of genes after GM plants have been harvested, the susceptibility of non-target organisms to the engineered gene, the stability of the gene, the reduction of spectrum of other plants including loss of biodiversity and increased use of chemicals in agriculture. If GM plants pass their new traits on to wild relatives, these relatives may change in a way that could make them play a different ecological role, potentially enabling them to out-compete other species.

The development and cultivation of insect resistant GMO plants may reduce the number of phytophagous and pollen-feeding insects in the field. Reduction in the number of insects may have an impact throughout the food chain (effects to insectivores or carnivores) and potentially interfere in the predator-prey relationships and biodiversity in general. The effect of insect resistant crops on non-target species, particularly those living in the soil, are not well studied and therefore knowledge on insect resistance and general function of the entire ecosystem is lacking.

NGOs: In the past years, new peer-reviewed scientific studies have demonstrated that the effects of Bt maize varieties are far from predictable and their potential to cause negative effects is even greater than previously thought. For example, they may affect aquatic life, while the levels of the Bt toxin produced by MON810 varies strongly between different locations. Also, unknown toxins may be found, which will affect the behaviour of non target organisms.

CONFEDERATION OF BEEKEEPERS

-Science until today cannot predict and follow unexpected effects of the genetic modification process, while this genetic material cannot be withdrawn if needed. In particular the results on bees would be unpredictable.

-Moreover, the competitive trade advance of GM cultures would definitely damage biodiversity and consequently result in degradation of bee feeding, especially as feeding tactic of bees exposed to GM cultures it is not known yet.

-Recent scientific works have shown that toxin Cry1Ab produced by the only genetically modified maize approved for cultivation in the EU, has negative effect on communication and learning capacity of bees as well as on feeding collection capacity. Other work has demonstrated modification of the intestine surface and glands, susceptibility to pathogens and reduction of weight.

Any other impacts you would like to mention:

PUBLIC ADMINISTRATION (Ministry of Rural Development & Food - Environment):

An important impact of insect resistance of GM cultivations, may be the potential adverse effect on soil structure if detrital plant material retains its toxicity and thereby affecting decomposition by insects. Although insecticidal proteins is supposed to degrade rapidly and have a restricted spectrum of toxicity there is a concern on the

potential leaching of toxic materials from insect resistant crops to the soil through root systems.

Possible impact of GM plants on the environment can be summarized as follows:

- Transfer of genetic material to sexually compatible plants in the wild;
- Expression of pollen-mediated toxicity;
- Effects on microbially-mediated biogeochemical cycles and soil biotransformation and decomposition processes on ecosystem function;
- Increased persistence in the environment through increased survival, establishment and invasiveness of GM plants;
- Adverse effects on non-target organisms;
- Wider biodiversity implications as a consequence of specific agronomic practices to manage GM plants;
- Changes in pesticide residues as a result of changed crop protection practices on/or metabolic changes in GM plants

2.3. Renewable or non-renewable resources

Does the placing on the market of GMOs have an impact, if so which ones, regarding the use of renewable resources (water, soil...)?

NGOs: The Bt toxin from GM maize may affect headwater stream ecosystems. It has been demonstrated that GM crops producing Bt toxins can affect ecosystems via unexpected pathways, because interactions in the natural environment are complex and not fully understood. Thus, the current risk assessment does not consider all toxicity pathways and therefore all risks of GM plants.

Does the placing on the market of GMOs have an impact, if so which ones, regarding the use of non-renewable resources?

Any other impacts you would like to mention:

2.4. Climate

Does GMO cultivation have an impact regarding our ability to mitigate (other than by possibly reducing CO₂ emissions from fuel combustion – see next section) and adapt to climate change? If so, which ones?

Any other impacts you would like to mention:

2.5. Transport / use of energy

Does the cultivation of EU approved GMOs have an impact regarding energy and fuel needs/consumption? If so, which ones?

Does the cultivation of EU approved GMOs have an impact regarding the demand for transport in general terms? If so, which ones?

Any other impacts you would like to mention:

3 - Other Implications