



Economic impacts of labelling thresholds for the adventitious presence of genetically engineered organisms in conventional and organic seed

Seed purity: costs, benefits and risk management strategies for maintaining markets free from genetically engineered plants

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Summary

Within the EU, the option of establishing labelling thresholds for the adventitious presence (AP) of genetically engineered (GE) organisms in conventional and organic seed has been under discussion for several years. It can be expected that the Commission will come up with a legal proposal for a labelling regime between 2010 and 2014.

The level of the labelling threshold will have profound impacts on the future of farming with respect to the possibility of co-existence and consumer choice: co-existence costs for farmers and the entire food chain will be influenced by the level of seed purity. A labelling threshold above 'zero' would allow contamination with GE organisms to become permanently entrenched at the seed level, threatening existing EU food markets that rely on segregation, traceability and transparency. It would increase costs for maintaining co-existence and also bring about financial losses for farms and processors. Consumer choice would be narrowed, and in some market segments even completely eliminated. To some extent the tasks of the risk manager would be impacted as well.

To permit permanent admixtures of genetically engineered (GE) seeds without labelling is to integrate a degree of contamination into the food chain on a permanent basis. Without doubt, this would impact farms, grain elevators, processors and food producers, already under economic pressure in complying with legal requirements and demand-driven quality standards. Up to levels of 0.9 percent, the adventitious and technically unavoidable presence of GE components in food and feed is exempt from labelling requirements in European legislation; this provides a safety margin for non-GE food production. To make sure that the end product stays below this threshold, food industries have established thresholds of between 0.1 and 0.5 percent for adventitious and technically unavoidable presence of GE components in raw materials. Farmers therefore have to work within a margin that lies between the labelling threshold in seed and the thresholds set by the industry at 0.1 to 0.5 percent. However, any contamination of seed can become a major problem for the downstream food and feed chain, making it difficult to keep levels of GE components below 0.9 percent in the end product. The possibility arises that sensitive food markets might collapse as a result, rendering farmers unable to sell their products.

This study presents data enriched by detailed case studies affording an overview of the costs associated with avoiding GE components in food production. It was found that the current safety margin of 0.9 percent for the labelling of adventitious or technically unavoidable presence of GE components in feed and food requires significant investments and high annual costs for food production in Europe. Total yearly co-existence costs for the EU food and feed processors introduced in the case studies range from about €880,000 to €50,000. Thresholds of over 0.1 percent for adventitious presence of GE seed in non-GE batches are likely to increase these costs and the associated strains on farmers, food and feed processors, traders and retailers.



With regard to establishing effective co-existence measures that enable segregation in European food production, seed production plays a pivotal role. Seed contamination can be self-perpetuating, affect markets on a large scale, and can occur even after a GE crop is de-registered. Seed contaminations not only show patterns of broad spatial distribution but also of persistence over long periods of time. On the basis of economic and technical analyses this study recommends a low ('zero') labelling threshold for adventitious presence (AP) of authorised GE seed in non-GE seed. For the purpose of this report a 'zero' threshold is defined as a thresholds below 0.1 percent in accordance with the Austrian Seed Law (Saatgut-Gentechnik Verordnung, 2001).

There is strong evidence that seed purity is of fundamental importance for co-existence and only low ('zero') labelling thresholds for seed enable farmers and processors to obtain at reasonable costs end products that do not have to be labelled as GE. The feasibility of complying with a low labelling ('zero') threshold for AP of authorised GE seed in non-GE seed varies depending on conditions, and should be sensitively assessed from all perspectives. There are, however, no insurmountable hurdles in evidence. To the contrary, compared to other sectors such as agriculture and food production, seed production has several characteristics which are advantageous for effective implementation of specific co-existence measures:

- In breeding and production of seed, specific measures against comingling with other conventional varieties are already established. These can be adapted and developed.
- Areas used for seed production (that can be subjected to specific co-existence measures) are small compared to areas used for agricultural production, and are concentrated in certain regions. The amount of seed that is produced (and needs to be controlled) is small in the context of millions of tons of agricultural commodities and the vast range of food products on the market.
- Europe has the potential to be largely self sufficient in the production of the most sensitive seeds such as maize. Thus, EU measures to maintain seed purity can benefit EU farmers and EU food producers on broad scale.

Due to the fact that the area used for seed production is only a small fraction of total agricultural land, it may be assumed that overall segregation costs for the whole food production chain can be kept smaller if the strictest measures are applied to seed production, where they are comparatively low-cost.

From data available it can be concluded that there are no general obstacles to implementation of specific measures protecting seed purity for crops such as maize in Europe. A different view would have to be taken regarding crop species such as oilseed rape, which are able to outcross and backcross over large distances and show a long period of (viable) seed dormancy.

Existing data show that costs for maintaining seed purity mainly emerge in the seed propagation phase, especially in regions where GE and non-GE crops are grown in close proximity. But despite extensive publications on co-existence, so far no targeted studies are available identifying exact costs and measures necessary to establish seed purity at low ('zero') thresholds for labelling of AP of authorised GE seeds. Such detailed and targeted studies would be a basic prerequisite for the EU decision making process.

It is not yet possible to answer all relevant questions on the presence of GE seed in non-GE seed, but this study has identified some of the most crucial points for further discussion and investigation. Among these is the possible establishment of legally binding rules based on the 'Polluter Pays' principle in the seed market, to apply to companies that introduce GE components into the agricultural sector and food chain.

Seed protection mechanisms could be accompanied by financial support from the EU budget. Support for seed purity can be justified since this is a risk management issue for reasons beyond the purely economic: the EU risk manager must be able to respond in the eventuality that new scientific evidence shows unexpected threats to human health and/or the environment. Mechanisms that allow for a withdrawal of GE seeds within a reasonable period of time must be in place. Also, traceability and monitoring requirements for GE plants as outlined in EU regulations depend upon seed purity.