newsletter

Commingling and green biotechnology

The more strains of genetically modified seed that come onto the market, the more likely it becomes that they will contaminate or be mixed up with other types of seed. If the accidentally commingled types have not been approved for use or the "contamination" is not declared, claims for compensation are inevitable.

Introduction

Genetically modified (GM) plants have been grown as crops since 1996. Most of the "green biotechnology" plants commercially available today are designed to be resistant to common pests or parasites or tolerant to specific herbicides. Ideally, a farmer who plants GM seed no longer has to use pesticides or, in the latter case, can spread a broad-band herbicide soon after planting to give the shoots a head start over weeds in the vicinity.

More being planted worldwide

Use of GM plants is increasing exponentially worldwide. In only seven years, the area planted with GM crops has increased about tenfold and it continues to increase by a double-digit percentage every year. In 2004, 8.25 million farmers grew GM crops on a total of 81 million hectares in 17 countries around the globe; 90% of these users are smallholders in developing countries. In terms of the proportion of the overall agricultural area dedicated to GM crops, the following countries are the biggest users: the US (59%), Argentina (20%), Canada and Brazil (6% each). China (5%) and India (400% increase in GM cotton in 2004) are showing strong expansion. In Europe, Spain and Romania currently have significant local percentages of GM crops. At less than 1 000 hectares, the area dedicated to GM maize in Germany is practically negligible.

Cultivation of GM crops is still limited to just a few types (soy, maize, rape and cotton). As soon as genetically modified versions of other crops such as rice, wheat or potatoes appear on the market, however, another massive expansion is possible. In China, experiments with GM rice are highly advanced.

An example: Bt maize

A common GM crop is Bt maize, obtained by introducing an extra gene from the soil bacterium *Bacillus thuringiensis* (Bt). This extra gene enables the maize plant to produce a specific protein that kills certain larvae such as that of the European corn borer (*Pyrausta nubilalis*) and so protects the plant against these phytophagous pests. The Bt protein is harmless to other organisms. Like other proteins, it is broken down in the gastro-intestinal tract.

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There are a number of varieties of Bt maize, such as Bt 10 and Bt 11. Several cases of unauthorised cross-over have been reported:

Bt-11, Bt-10

In the US, Bt 11 maize has been approved for cultivation and for use as food and animal feed since 1996. Up to now, the EU only allows it to be imported; the application for authorisation to plant Bt 11 in the EU is still pending. The maize strain Bt 10 differs from Bt 11 mainly by having an extra antibiotics-resistant gene. This "ampicillin gene" was introduced for technical reasons as a marker in the development phase; it is no longer active in the plant itself. Since the Bt 10 strain was not intended to be further developed, Bt 10 was never submitted for global approval. The reason for this was fears that the plant's ampicillin resistance could be transferred to bacteria. This theoretical possibility could constitute a threat to human life and health, although the probability of this happening is thought to be very low.

Contamination of Bt 11 with Bt 10

In December 2004, a seed producer discovered by chance that some Bt 11 seed stock had been tainted with Bt 10 seeds. It is thought that several hundred tons of Bt 10 maize have been exported from the US unrecognised since 2001. Bt 10 maize also found its way to Europe in a small part of the harvest, mainly to Spain and France. Since Bt 10 maize has not been authorised anywhere in the world, and until recently there was no validated test method for identifying Bt 10 contamination, the EU initially banned the import of maize strains that could have been commingled with Bt 10 maize.

According to the cognisant supervisory authorities in the US (EPA, FDA, USDA), there has never been any danger to human health; harm to the environment is also considered highly unlikely. The company responsible for the mix-up was fined and obliged to fund a conference on compliance with industrial standards in the cultivation of GM crops. In the meantime, all crops and seed inventories tainted with Bt 10 have been identified and destroyed or otherwise isolated. The scale of any claims for damages triggered by the EU's ban on imports remains to be seen.

Cross-over of GM maize in Bavaria

In June 2005, small amounts of the transgenic maize line MON810 were found in fields sowed with conventional maize in Bavaria, Germany. Although MON810 has passed the European approval procedure, the lack of a valid limit for adventitious contamination of seed inventories and the failure to label the GM content meant that the fields planted had to be ploughed over. The farmers affected are to receive compensation from the seed manufacturer.

The StarLink incident

The most prominent example of inadvertent marketing of unauthorised genetically modified maize is the StarLink incident. StarLink maize is another Bt strain. The Bt protein in this variant differs from ordinary Bt protein in that it stays stable longer in the human digestive tract and is not quickly broken down. As this Bt protein is thought to have a high probability of causing allergies, StarLink maize has been approved only for use as animal feed. However, since it is impossible to separate the production chains for human food and animal feed with absolute reliability, at some stage StarLink maize nevertheless appeared in food for human consumption. About 300 different products containing maize in some form had to be recalled, although nobody's health was harmed.

The huge maize inventories still in storage in silos were bought back and used as animal feed.

In this case, not only the manufacturer of StarLink but also businesses along the entire value creation chain were involved in this large-scale recall campaign: the economic losses, including those of the seed manufacturer, the farmers, the mill operators, the food processors and the wholesale merchants added up to over USD 1 billion. The insurers picked up a substantial share of this tab.

Information for the underwriter

As these few examples show, there are any number of possible causes of contamination, cross-breeding and simple mix-ups. As an increasing number of different GM crops achieve ever greater market penetration, the probability of unintended cross-overs rises. Claims for compensation for harm suffered as a result could be brought not only on the grounds of deficits in quality and risk management, but also of different statutory regulations and limits around the world or of approvals that are valid only for individual countries. The consumers' right to buy products that are entirely free from GM ingredients of any kind only adds to the liability risk. Insurers are well advised to pay due attention to these aspects in their risk assessments – and this applies particularly to potential commingling losses. Commingling can be caused – and, indeed, influenced – by any of the various players in the value creation chain, and the occurrence of losses as a result of commingling is by no means always fortuitous and unavoidable.

For this reason, it is always advisable to perform a technical risk assessment on risks involving a GM exposure, and in that context to examine the potential for commingling and the associated recall costs or other claims-related expenses. The result of this risk assessment should then be used as the basis for the underwriter's decision.

Literature

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