COEXISTENCE OF GENETICALLY MODIFIED AND NON-GENETICALLY MODIFIED MAIZE:

MAKING THE POINT ON SCIENTIFIC EVIDENCE AND COMMERCIAL EXPERIENCE

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AIM OF THIS DOCUMENT

Coexistence is about how crops intended for different markets can be grown in the same area or locality without becoming mixed, and possibly compromising the economic value of each other. It refers to the ability of farmers to choose the production systems they prefer, whether it is conventional, organic or genetically modified (GM). Coexistence is not a safety issue but **strictly an economic question** that relates to the marketing of approved crops.

Since 2003, coexistence in Europe has been subjected to Regulation (EC) no. 1830/2003 that sets a labeling threshold of 0.9% for unintentional or the technically unavoidable ("adventitious") presence of GM material in harvested material or products from non-GM crops.

In addition, Recommendation 2003/556/EC provides guidelines for the development of national strategies and best practices that, where necessary, can be applied to keep products from non-GM fields below the labeling threshold. This recommendation specifically states that: "*Management measures for coexistence should reflect the best available scientific evidence on the probability and sources of admixture between GM and non-GM crops. They should permit the cultivation of GM and non-GM crops, whilst ensuring that non-GM crops remain below the legal thresholds for labeling and purity standards with respect to genetically modified food and feed and seeds, as defined by Community legislation.* "

Based on this recommendation, national strategies for coexistence are being developed across Europe[1]. However, some national legislation and proposals do not take into account scientific evidence and do not respect key principles for coexistence such as proportionality, fairness and consistency. This may impede the ability of farmers and downstream users to adopt and utilise GM crops, due to a greatly reduced financial and legal attractiveness.

The aim of this document is to summarize existing scientific evidence and commercial experience with coexistence in maize, the first and presently only GM crop planted in the European Union (EU). The paper focuses on adventitious presence in **harvested material**, which is the main product of relevance for farmers.

COEXISTENCE IN MAIZE

A large body of information from research and commercial experience is available on the mixing of neighbouring maize crops. In the field, adventitious presence of genes from one crop in another is mainly associated with cross fertilisation from (wind dispersed) pollen, although mixing from other sources (eg, seed impurities, planting and harvesting equipment) is possible. As maize pollen is fairly heavy, the vast majority is deposited within a short distance (in general within a maximum of 18 – 20 metres) of the emitter plants, minimising the chances of cross fertilisation occurring beyond this distance. Cross fertilisation rates further vary with time of planting, varietal differences, presence of volunteer maize plants from an earlier crop, temperature and humidity levels, wind, length of border and shape of the fields and the presence or absence of buffer crops and other barriers.

In terms of respecting the EU labelling threshold in harvested material, it is possible to draw on many years of practical experience with the production of specialty crops (e.g. waxy maize), research findings in

[1] Up to September 2006, Denmark, the Czech Republic, Portugal and the Netherlands had legislation or voluntary agreements in place. Some other EU Member States had developed draft proposals for coexistence.

numerous countries worldwide[2] and commercial experience with GM maize in Spain. All of this research and experience is consistent: adventitious presence levels below 0.9% can be and have been achieved through the application of good agricultural growing, harvesting and storage practices. These may include measures such as:

- **thorough cleaning of planting and harvesting equipment,**
- **varying the time of planting or using maize varieties with different flowering times,**
- **implementing isolation distances,**
- **and/or planting non-GM maize buffer rows around GM maize fields**.

Where a neighbouring non-GM field is at least 1 ha in size, an isolation distance of **20 - 25 metres** is sufficient to ensure purity levels in harvested material below the EU 0.9% labelling threshold. In certain cases, to take into account particular spatial conditions and agricultural practices (eg, small scale production systems, average field size smaller than half a hectare and/or long and narrow fields), the isolation distance may be extended to 50 metres. These separation distances may be reduced if the GM crop is surrounded by a **buffer consisting of non-GM maize plants**.

These practices have been successfully applied in Spain where, in 8 years of commercial GM maize planting, there have been no cases of litigation amongst farmers linked to adventitious presence in non-GM harvested material[3]. Over this period, the farming community and the downstream user sectors have been able to successfully produce and use both GM and non-GM products. This is especially evident in Aragon, where, despite the high penetration of GM maize[4], a major starch company using locally grown maize is able to satisfactorily provide certified non-GM products to the requirements of its customers. To date, no coexistence laws have been adopted in Spain; farmers rely on Good Agricultural Practices developed by APROSE and described in a brochure attached to each bag of GM maize. The guide referred to 25 metres of isolation distance or 4 buffer rows of non-GM maize in 2004 and 2005[5].

CONCLUSIONS

Evidence from both research and commercial practice shows that growers of GM, conventional and organic maize can coexist and maintain the integrity of their crops through the application of good agricultural growing, harvesting and storage practices.

Where GM maize farmers are located near growers who sell their crops into markets with a requirement for certified non-GM maize, **a separation distance of 20 - 25 metres (50 metres may sometimes be required to take into account particular spatial conditions or agricultural practices) or reduced separation distances if the GM crop is surrounded by buffer rows of non-GM maize plants** provides for effective coexistence. In some regions, delayed planting or the use of varieties with different flowering time represents additional useful coexistence tools at the level of individual fields.

[2] In Europe, research has been conducted for example in Spain, France, Portugal, Italy, Switzerland, Germany and the UK.

[3] Instances of GM adventitious presence in harvested material from non-GM/organic maize fields have occasionally been reported. These were generally below the 0.9% EU labelling threshold and/or without evidence of using certified conventional or organic seed.

[4] In 2005, approximately 29% of the maize grown in Aragon was GM.

[5] In 2006, the seed industry aligned itself to the draft coexistence legislation published by the Spanish government that refers to 50 m of isolation distance. This proposed increase in the isolation distance was however not driven by new scientific evidence.

This scientific evidence and commercial experience should be taken into account when developing national strategies for coexistence. These strategies should be proportional, fair and consistent with the Commission Recommendation 2003/556/EC.

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