Co-existence in maize supply chains in Spain and Switzerland

Bernadette Oehen[1], Montserrat Costa-Font[2], Marion Morgner[1], José M. Gil[2], Matthias Stolze[1]

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Abstract

The debate about co-existence usually focuses on the situation of neighbouring farms. Organic producers take the position that co-existence affects the whole supply chain. Therefore, this paper compares the maize grain supply chains in Switzerland and Spain in order to identify which factors influence the segregation of genetically modified (GM) maize from non-GM maize, and discusses how organic production copes with the challenge of GM maize. Considerable differences exist between Spain and Switzerland with regard to grain maize as a component of animal feed. In Spain, where GM maize is grown, it is the feed industry that defines standards in the supply chains. Since the trading co-operatives are unable to supply GM-free maize, independent and separate infrastructures have been developed for a GM-free maize supply (e.g. for maize starch). In Switzerland, the retailers define quality standards for suppliers, and these standards exclude the use of GM plants for feed. Therefore, the feed industry has to segregate GM from non-GM feed.

Introduction

In November 2005, the Swiss people voted for a 5-year moratorium on genetically modified (GM) crops. For the duration of this moratorium farmers are not permitted to grow genetically modified organisms (GMOs). While the import of some specific GM food and feed products[3] is permitted, these products need to be declared. Due to the GM-free strategies of the Swiss retail sector, the question of co-existence in Switzerland has been a rather hypothetical one up until now. However, the situation could change completely once the moratorium has expired, and GM crops could be introduced into Swiss agriculture. GM crops have already been introduced in Spain. Thus, the experience gained with co-existence within maize supply chains in Spain may be significant for the Swiss organic sector if the current moratorium is not extended.

Building on research conducted as a part of the EU-funded CO-EXTRA project, the aim of this paper is to compare co-existence strategies for genetically modified and non-genetically modified conventional and organic maize products in Switzerland and Spain. The paper focuses on the situation with regard to collection points, transportation, milling and retail. The production level is not included.

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[1] Research Institute of Organic Agriculture FiBL, 5070 Frick, Switzerland, www.fibl.org

[2] The Centre for Research in Agro-Food Economics and Development (CREDA), Polytechnic University of Catalunya (UPC) Avinguda del Canal Olimpic s/n08860-Castelldefels (Barcelona)

[3] Approval in Switzerland: Maize: Bt11, Bt 176, Mon 810/; Soy Ready Soy; Maize gluten for feed: all traits approved in the European Union, Canada and USA.

Materials and methods

The results are based on a case study of Swiss and Spanish maize supply chains. For the purposes of this case study, the supply chain starts when the product leaves the farm (collection points) and ends at the retailer. A series of key informant interviews were conducted in 2006 with actors in the maize supply chains. These included operators of collecting points (elevators), dryers, feed mills, animal feed manufacturers and the retailers. The interviews took about 3-4 hours each. The information presented is backed up with data from official statistics.

Results

Maize is one of the most important feed crops in Switzerland. In 2004, 18,816 hectares of grain maize were planted. Of these, 290 hectares were grown organically. To date, no GM maize has been produced in Switzerland. In Spain, GM maize has been grown since 1998. The share of GM crops currently amounts to barely 0.3% of the total agricultural area (MAPA 2006), while 2.9% of the agricultural area is managed organically (Willer et al. 2006). Overall, 60,000 hectares of GM maize are cultivated in Spain (MAPA 2006). In Catalonia the share of GM maize amounts to more than 50% of all maize production. In contrast to this, the total share of GM maize in the EU is 0.5 % (Transgen 2006).

To ensure GM-free products, the Swiss agricultural sector has implemented a process-oriented quality management system. The driving force behind its implementation are the retailers and the Swiss Farmers' Union. The overall strategy is to ensure the supply of non-GM products for both food and feed. For example, the labels 'Suisse Garantie' (milk, cheese), 'M 7 Punkte Plan' (meat) or 'Coop Natura Plan' (meat) exclude GM-feed components during production.

In the food sector, the responsibility to deliver GM-free products lies with the supply side, in particular with importers, exporters and exporting farmers. Up until now, the price difference between GM and non-GM material has been negligible for the food processors. As a result, prices for the final product do not differ either. Unlike in the food sector, feed importers have the advantage that Switzerland collects custom duties for feed imports and that the higher price for GM-free feed imports is absorbed by these duties.

In Switzerland, where no GM maize has been planted up to now, the critical issues are Grain maize imports and the supply chain infrastructure (transport) in which domestic and imported grain maize is dealt with in parallel. A further critical issue exists with regard to the processing level. Here, it is possible for maize by-products from food industries and imports to enter the supply chain. For instance, imported maize starch and gluten could be produced from GM maize.

Grain maize for organic farms is imported by the same companies that import conventional feed, but delivery takes place in specific containers to avoid GM-specific contamination. As no GM food or GM feed is traded in Switzerland, there is zero risk of GM contamination after importation. For organic producers, who are bound by law to avoid GMOs, maize supply is clear and transparent.

As far as maize supply chains in Spain are concerned, the situation is quite different. Due to the fact that GM maize is grown in Spain, we found that there is a greater risk of admixture. Indeed, the critical issues with regard to admixture and contamination are not only transport but also collecting points, such as elevators, drying centers, transfer points and storage facilities. A further important difference between Spain and

Switzerland is that the Spanish feed industry does not require GM-free maize for their feed products, as products from animals fed with GM-feed do not need to be labelled. Due to the fact that 78% of maize in Spain goes into the feed mill industry, the trading co-operatives are not forced to guarantee a GM-free supply of maize. These trading cooperatives control about 95% of Spanish maize production and run the majority of the collecting points and drying centres.

Discussion

While GM-free strategies were found to predominate in the Swiss food and feed sector, bulk maize production for feed and the subsequent supply chain levels are unable to guarantee a GM-free supply of maize in Spain. Two questions may be relevant for discussion against this background:

1. Is the Swiss process-oriented strategy effective?
2. How is the supply of guaranteed GM-free maize organised in Spain?

Reviewing the governmental and private laboratory results of the Swiss feed industry controls, we found that the share of adventitious traces of GMOs in animal feed has been decreasing over the last 4 years (Wüthrich et al. 2006). Thus, in Switzerland, the current process-oriented GM-free strategy is working effectively.

We have no information in the CO-EXTRA project regarding organic maize growers in Spain or contamination of organic maize with GM-maize. However, information about GM contamination and segregation has been gathered and made available by several NGOs in Spain (Greenpeace 2006). A survey conducted by the NGOs on organic and conventional farms during 2005 shows that there is GM contamination from seeds or adjacent fields in organic (and conventional) maize harvests. Unlike in Switzerland, there is no independent system to monitor GMOs in food and feed. It is thus not possible to analyse data in the way Wüthrich et al. (2006) did for Switzerland.

The Swiss retailers' GM-free strategy is a consequence of Swiss citizens refusing GM food. Indeed, GfS (2003) showed that 53% of Swiss citizens refuse GM, while 27% have a positive attitude towards genetic technology. Ten years of public debate on GMOs finally led to the GM moratorium by referendum - showing the clear position of the Swiss people against GM. As a consequence, Swiss retailers will continue their GM-free strategy as long as there is no change in public opinion towards GMOs.

Whereas in Switzerland consumers are asking for GMO-free food, 75% of people in Spain, according to Euro barometer survey on biotechnology, are optimistic with regard to biotechnology. They have one of the highest outright and risk-tolerant support for GM food in all the 25 member states of the European Union (Gaskell et al. 2006).

Most of the GM maize produced in Spain is used for feed. Neither the Spanish nor Swiss legislation requires livestock products (milk, meat) produced using GM feedstuff to be labelled as GM food. Therefore, it is not transparent to consumers whether a livestock product is produced using GM feed or not. For soya, Teuscher et al. (2006) report how a sustainable soybean supply chain was established in Switzerland after consumers pressed the food industry to exclude GM soybeans from their products. This soya is used for privately labelled livestock products in Switzerland.

The Spanish starch industry (wet milling), which supplies the European food industries, is asking for guaranteed GM-free maize because the EU regulation on

genetically modified food and feed requires labeling for starch derived from GM maize. Up until now, the food industry has preferred to avoid labelling GM products. To guarantee a GM-free maize supply, the starch industry is pursuing two different strategies: i) import of certified GM-free maize, particularly from France, and ii) contracting independent Spanish farmers who do not deliver to the trading co-operatives. The entire chain of production and transport is monitored (field level, harvest, transport). Furthermore, the transport is done completely through the wet milling industry in order to minimise commingling of GM and non GM harvests.

Conclusion

In our investigation, there are two major conclusions to draw: The more important is, that the supply chain leader has the most powerful position in the supply chain and is thus able to set the parameters for the up- and downstream supply chain partners. We can conclude from our study that in Spain the feed industry is the most powerful actor within the supply chain, whereas in Switzerland the retailers occupy this position.

In addition to this fact co-existence is a reality in Spain whereas it is rather hypothetical in Switzerland. Whereas in Switzerland organic producers benefit from the overall GM-free market strategy, organic farmers in Spain have to organise their supply chain among themselves in order to ensure that organic products are GM-free.

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