TO COMMERCIALIZE OR NOT TO COMMERCIALIZE GENETICALLY MODIFIED CROPS IN THE EU ENVIRONMENT

Linde Inghelbrecht[1,2], Joost Dessein[1,2], Guido Van Huylenbroeck[1]

[1] Department of Agricultural Economics, Ghent University, Belgium
[2] Social Sciences Unit, Institute for Agricultural and Fisheries Research, Belgium

Abstract

Purpose The paper analyzes the decision-making process on whether or not to commercialize genetically modified (GM) crops in the current EU environment, for several agriculture industry sectors. This cross-industry analysis provides us insights in the (future) market dynamics of GM crop (applications) in the EU environment.

Methods Agribusiness stakeholders of six agricultural industry sectors were interviewed on their GM policy, using a semi-structured interview guide. This data were analyzed by content analysis.

Principal results The cross-industry analysis on GM policies between companies belonging to the same and to different agriculture industry sectors, unveils several alignments of common central arguments in their decision-making processes that precede this actual GM business policy. Accordingly, three strong hypothetical policy congruities were identified, between (1) the agricultural biotechnology and compound feed industry, who's policies are motivated by their conviction that GM imports are a by-default reality in the EU, (2) between NGO's and the organic industry, who's policy is driven by their pursued agricultural ideals (that oppose both to the current (globalizing) agricultural system and to GM crops as they reinforce this system), and (3) between all the food actors, who's GM business policy is primarily motivated from a (black-or-white) marketing consideration. Finally, our insights (1) highlight the "talking at cross-purposes" in the GM debate between different agriculture industry sectors, and (2) unveil several underlying reasons for the locked-in situation with GM crops in the current EU environment.

Keywords: business perspectives, agribusiness, genetically modified crop, EU environment

1. Introduction

Discussions about agricultural innovations increasingly polarized over the last 50 years, which is indeed the case for the discussion about genetically modified (GM) crops in the EU environment. In the GM discussion, this polarization is (partially) explained by actors' different views on 'naturalness' and 'the portrayal of nature' as these moral concepts influence the moral acceptance or rejection of the agricultural innovation (Van Haperen et al, 2012).

Besides the moral discussion about GM crops, agricultural biotechnology enters into multiple other discussions. Ranging from discussions about world trade, patenting of life forms, the role of science in society, to the future of the common agricultural policy, the vertical integration in the food chain, and beyond (Gaskell, Bauer 2001). Accordingly, agricultural biotechnology can be considered as a high impact innovation. These are innovations "that set the whole system of society in movement. They influence economy, threaten values, and mandate to recalibrate and sometimes reformulate goals" COGEM (2004).

Acknowledgements: Linde Inghelbrecht thanks the FWO (Research Foundation – Flanders) for a pre-doctoral fellowship at Ghent University.

However, in our current 21st century society, it is not obliged that agricultural innovations become successfully implemented. Especially, because the foundations of the system and the society itself are often questioned, such as: do we pursue or oppose to a globalizing agriculture?; do we accept a vertical power distribution in our food supply chains (is this really what we mean by freedom of choice)?; do we accept public-private partnerships in fundamental research-funding?; etc. These ethical concerns are not directly (nor solely) related to GM crop (applications) *as such*, but need a socially accepted and clear answer before we can move forward with the GM debate in the EU. As there is not a socially and political accepted univocal answer to these questions, there is a strong need to study this innovation throughout the value chain. Moreover, innovation has to occur at all points along the value chain before the innovation becomes effectively implemented (Vanclay *et al*, 2013). In this regard, Wield *et al* (2013) argue that the emergence and constraint of innovation in bio-economy (which includes agricultural biotechnology) mainly depends on the interactions between three main sets of actors, being (1) innovators (scientist, technologists, industry), (2) policy-makers and regulation (including government and the emerging new institutions of governance) and (3) the public and stakeholder groups (such as advocacy organizations). However, only little research is done to obtain an in-depth understanding of the incentives that are driving the agribusiness decision-making processes on GM crops (although much attention is paid to the lessons learned from the social issues of agricultural biotechnology, as to inhibit repetition of these "mistakes" to closely-related innovation such as nanotechnology).

In particular, this study focusses on the decision-making processes of the agribusiness stakeholders to commercialize (or not) GM crops in the EU environment. Firstly, this paper questions if, and to what extent, we can identify common central arguments in the decision-making processes of companies that belong to the same agriculture industry sector. Secondly, we compare the decision-makings on GM crops between different agribusiness industries and look into what is needed to affect their decision-making process. These renewing insights can learn us more about the current stalemate in the debate on GM crop (applications) in the EU and provide some insights in the (future) market dynamics of GM crops in the EU environment.

2. Methodology

2.1. Stakeholder sampling

Forty semi-structured interviews were performed with agribusiness stakeholders of different agriculture industry sectors, interviewing both individual companies and the national plus European federations of the sectors. The following sectors were selected: (1) the agricultural biotechnology industry, (2) compound feed industry, (3) potato industry (both the fresh market and industrial processing industries (chips and fries)), (4) food processing and food marketing industries, and (5) finally the organic industry. Although we acknowledge that NGO's have no direct commercial interest in GM crop (applications), these stakeholders were also included in the sample because many companies addressed them as being essential stakeholders for their GM business decision. Sampling occurred in Flanders (Belgium), but the companies' scope were either national, European or worldwide.

2.2. Data-analysis

The data were analyzed by content analysis (Stemler, 2001). Our analysis focused on the common central aspects in the decision-making processes of companies that belong to the same industry, even though here were also some intrasectoral argument differences. The analysis relied on the analytical framework presented by Inghelbrecht *et al* (Submitted), which unveils the main important aspects in companies' decision-making processes on whether or not to commercialize GM crops in the EU environment. In the next step of the analysis, we have compared the central aspects in the decision-making processes of different agribusiness industries. This cross-industry analysis revealed three strong hypothetical alignments in the decision-makings of our different industry sectors: between (1) the agricultural biotechnology and compound feed industry, (2) NGO's and the organic industry, and (3) between the food manufacturing processors, retailers and companies in the potato industry ("food actors").

3. Results

The cross-industry analysis unveils strong hypothetical (read not institutionalized) alignments in the decision-making processes of (1) the agricultural biotechnology industry and the compound feed industry, (2) between NGO's and the organic industry, and (3) amongst the food actors. Each hypothetical alignment is very briefly discussed in the three following subparagraphs.

3.1. First hypothetical alignment

The decision-making process of the agricultural biotechnology industry to apply for GM crop authorizations for imports in food and feed in the EU, and the decision-making process of the compound feed industry to process GM crops in their feed as part of "Certified Responsible Animal Feed" (BEMEFA, 2011a; BEMEFA, 2011b), are similar in the way that both assess agriculture as being inherently globalizing. This agricultural perspective holds a free world-wide flux of raw materials and considers imports simply as an economic reality. GM imports are therefore seen as a by-default reality in the EU. Furthermore, both industries also doubt about the future ability of the EU to maintain its non-GM raw material demand, because the EU is attributed only a declined power in a global GM crop trading world. Moreover, both industries' decision-making process is strongly affected by their perception on the EU GM crop regulation and the experienced restrictions it imposes. These industries do, however, differ in their value judgment of GM crop (applications): the compound feed industry processes GM crops on a 'by-default' but not on a 'by-interest' basis, contrary to the agricultural biotechnology industry.

3.2. Second hypothetical alignment

The decision-making processes of NGO's and the organic industry cohere in their perception on agriculture *as such*, because both pursue agro-ecological agricultural ideals (depicted as opposed to GM crops). Both consider the EU to be perfectly feasible to maintain a systematic non-GM raw material demand (taking into account some adaptation, such as a decreased meat consumption). Contrary to NGO's - which do not have any direct product relationship with GM crops - the organic industry has a strong commercial fear on the development of organic agriculture if GM crops come into practice more extensively in the EU (in essence being an economic incentive).

3.3. Third hypothetical alignment

The decision-making processes of food actors on whether or not to commercialize GM crops is characterized by a high degree of direct commercial fear on GM crop processing and/or commercialization. They approach GM crops primarily as a marketing issue. Several food actors also had a risk-perception on GM crops from an agricultural perspective and few were skeptical on whether the EU can maintain its non-GM raw material demand in the future. Nevertheless, these risk-perceptions were subordinated to their risk-perception on (indirect) GM marketing, because of expected negative consumer and/or NGO (read societal) responses.

4. Discussion

A cross-industry analysis of different agribusiness industries' decision-making process on (not) commercializing GM crops in the current EU environment, unveils various congruities of common central arguments which motivate their eventual GM business policy.

The agricultural biotechnology industry and the compound feed industry (first hypothetical alignment) assess GM crops from a globalizing agricultural perspective and consider GM imports simply needed in EU agriculture. However, the agricultural biotechnology industry assigns a strong marketing potential to GM crops in the EU, but their perceived political structural barriers discontinue further investments in GM trait and/or crop R&D for particular cultivation in the EU. Their dissenting marketing orientation on markets outside the EU (with some spillover effect to the EU the highest), is a consequence of the high level of uncertainty on obtaining return of investments guarantees and is a consequence of the highly unpredictable regulatory GM crop environment in the EU (Nadolnyak, 2007).

NGO's and the organic industry (second hypothetical alignment, yet in the GM debate merely intertwined) oppose to GM crop (applications) from an agricultural point of view. This view is endorsed by their perception that the EU is powerful enough to control its non-GM raw material demand. The latter somehow contradicts with the forecasted difficulties to maintain a (future) non-GM raw material demand in the EU, due to (1) the import-dependency of the EU on several raw-materials (such as soy); (2) the slow GM crop authorization procedure in the EU, which disturbs the free flux of raw materials worldwide, and due to (3) the enhanced risks on sourcing non-GM raw materials in the EU that are contaminated with not (yet) EU authorized GM crop traces (Stein, Rodriguez Cerezo, 2010a; Stein, Rodriguez Cerezo, 2010b; von Witzke, Noleppa, 2010). Moreover, the organic industry also has a strong marketing incentive to oppose to GM crop (applications), as also Apel (2010) explains by concluding that the organic industry has the largest economic incentive to restrict all GM crop applications from the market.

In essence, stakeholders of the first and second hypothetical alignment judge GM crops primarily from an agricultural (ideal) point of view, yet from completely opposing perceptions. They reform the discussion about GM crop (applications) to a discussion about agricultural ideals *as such*.

Controversially, food manufacturing processors, retailers and stakeholders in the potato industry (third hypothetical alignment) primarily approach GM crops from a black-or-white choice marketing point of view (which is also applicable to the organic industry), adding additional complexity to the different values that ground the ongoing discussion about GM crop (applications) in the EU.

These insights enables us to understand why different (agribusiness) stakeholders in the GM debate talk at cross-purposes, as their decision-making process is essentially driven from different perceptions and lines of thoughts, and is driven from different sets of basic and pursued values.

5. Conclusions

In this cross-industry analysis, three strong hypothetical GM policy congruities were identified between different agricultural industry sectors. These different points of view reduce the discussion about GM crops to merely a discussion about agricultural ideals *as such* or to a simple marketing theme. Apparently, GM policy alignments between agribusiness industries form more easily when both assess GM crops as a raw material (in the case of the agricultural biotechnology and compound feed industries) or if they assess GM crops simply as being a part of an end product (in the case of the food actors). These insights offer understanding of why different agribusiness stakeholders in the GM debate talk at cross-purposes, as their decision-making process is driven from different perceptions and different sets of pursued values. If we talk about GM crops, what are we really talking about?

The results of this case-study analysis are mainly exploratory and descriptive in nature, making all extrapolation of the results speculative. Nonetheless, the analysis learns us more about the current stalemate in the debate on GM crop (applications) in the EU and provides some insights in the (future) market dynamics of GM crops in the EU environment (from an agribusiness point of view).

6. References

Apel A., 2010. "The costly benefits of opposing agricultural biotechnology", *New Biotechnology,* Vol. 27, No. 5, pp. 635-640.

BEMEFA, 2011a. "The Production and Delivery of Compound feed making use of Certified Socially Responsible Soy", available at: www.bemefa.be/Download.ashx?ID=84664 (accessed 31 March 2013).

BEMEFA, 2011b. "Responsible soy: Greenwashing or Truly Responsible?", available at: www.bemefa.be/Download.ashx?ID=82039 (accessed 31 March 2013).

Busch L., 2007. "Performing the economy, performing science: from neoclassical to supply chain models in the agrifood sector", *Economy and Society*, Vol. 36 No. 3, pp. 437-466.

Busch L., 2011. "The private governance of food: equitable exchange or bizarre bazaar?", *Agriculture and Human Values*, Vol. 28 No. 3, pp. 345-352.

COGEM, 2004. "De Farm Scale Evaluations geëvalueerd", The Hague, The Netherlands.

Gaskell G., Bauer M.W., 2001. "Biotechnology 1996-1999 : the years of controversy", *Science Museum Press*, London, UK.

Inghelbrecht L., Dessein J., Van Huylenbroeck G., (Submitted), "Agribusiness perspectives on commercializing GM crops and ingredients", Contact: Linde.Inghelbrecht@Ugent.be

Nadolnyak D., Miranda M.J., Sheldon I., 2011. "Genetically modified crops as real options: Identifying regional and country-specific differences", *International Journal of Industrial Organization,* Vol. 29 No. 4, pp. 455-463.

Stemler S., 2001. "An Overview of Content Analysis", *Practical Assessment, Research and Evaluation,* Vol. 7 No. 17.

Stein A.J., Rodriguez Cerezo E., 2010a. "International trade and the global pipeline of new GM crops", *Nature Biotechnology,* Vol. 28 No. 1, pp. 23-25.

Stein A.J., Rodríguez Cerezo E., 2010b. "Low-level presence of new GM crops: an issue on the rise for countries where they lack approval", *AgBioForum*, Vol. 13 No. 2, pp. 173-182.

Vanclay F.M., Russell A.W., Kimber J., 2013. "Enhancing innovation in agriculture at the policy level: The potential contribution of Technology Assessment", *Land Use Policy*, Vol. 31, pp. 406-411.

Van Haperen P.F., Gremmen B., Jacobs J., 2012. "Reconstruction of the Ethical Debate on Naturalness in Discussions About Plant-Biotechnology", *Journal of Agricultural & Environmental Ethics,* Vol. 25 No. 6, pp. 797-812.

von Witzke H., Noleppa S., 2010. "EU agricultural production and trade: Can more efficiency prevent increasing 'land-grabbing' outside of Europe?", Humboldt Uversity Berlin and Agripol, 36 pp., available at: http://www.appg-agscience.org.uk/linkedfiles/Final_Report_Opera.pdf (accessed 31 March 2013).

Wield D., Hanlin R., Mittra J., Smith J., 2013. "Twenty-first century bioeconomy: Global challenges of biological knowledge for health and agriculture", *Science and Public Policy*, Vol. 40 No. 1, pp. 17-24.