



**AgEcon** SEARCH  
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search  
<http://ageconsearch.umn.edu>  
[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

## RESEARCH IN ECONOMICS AND RURAL SOCIOLOGY

### **ETHICAL QUESTIONS: FROM THE LEGITIMACY OF TRANSGENICS, THROUGH THE RAISON D'ETRE OF GMOs, TO THE RESPONSIBILITY OF THEIR ADVOCATES**

Genetic engineering is presented as a major scientific and technological revolution. This fact, according to its promoters, is what gives it its legitimacy. But it is also why some people fear it. The former do not hesitate in using a Promethean rhetoric. The latter's fears, however, are just as valid. But examining scientific controversies and observing the emergent debate on GMOs lead one to assert that transgenics, sophisticated tinkering with uncertain results, involves playing with natural processes. Therefore, it is neither without emphasis nor without belief in the superpower of genetics that this engineering has become, for some, a technical revolution ensuring an unprecedented control of nature and, for others, a problematic and artificial transformation of the living organisms that could have serious consequences. Rather, I would consider it as a "technological bluff" that the "genetics-are-all myth" makes convincing.

If we admit, as Henri Atlan does, that all is not in the gene, neither the Promethean rhetoric of scientists nor the hyperbolic fear of the insane demiurge can be justified by the "genetic program" metaphor. There is no longer any reason to consider that the genome must *not* be tampered with. If one abandons the "genetics-are-all myth", transgenics, which was first a laboratory technology, appears to be legitimate engineering. What poses problems, then, is when this technology steps beyond the scientific research field and GMOs are likely to be marketed and spread quickly across the world. It implies shifting the question of the legitimacy of transgenics to the *raison d'être* of GMOs, and then to the responsibility of those who promote them, taking into account the consequences of their spreading on a large scale.

#### **The *raison d'être* of GMOs: questions about the extension of patentability**

As to the existence of GMOs, what poses a problem is their finality, especially, the possibility for a few industries to acquire an oligopoly position thanks to an extension of the field of patentability.

In European law, the patent is applicable to creations but not to discoveries. With the development of biotechnologies (and that of micro-computing), we have seen a considerable extension of the field of patentability. Most molecular biologists mean no harm by it. Every DNA sequence is a molecule: as such, for them, it is possible to be patented as soon as some of its functional properties have been established. But population geneticists tend to assimilate DNA sequences to bits of information. To decipher such pieces of information would become a discovery and thus, no matter for patenting.

If the legitimacy of the extension of patentability is being debated and overlaps epistemic controversies, its consequences are well enough known to invite to caution. As shown by Pierre-Benoît Joly and Bertrand Hervieu (2003), the multiplicity of patents can result in impeding the spread of knowledge as well as innovation. As a matter of fact, a DNA sequence seldom controls one single cellular function (reversely, various sequences are generally involved in a same proteinaceous synthesis). It only requires one registered patent of a well-known function, so that any use of any other function of the same sequence becomes automatically dependant of the former patent. The ability, granted to laboratories, start-ups or firms to append their signature on genomes because of these dependency phenomena, leads to important transaction costs able to impede R & D.

#### **The responsibility of GMOs promoters**

If the question is neither of prohibiting GMOs, nor of authorizing them without any restrictions, we find ourselves in the realm of permission which implies assessing, individually, the consequences of their circulation. This question has chiefly been focused on environmental and sanitary risks.

The problem as to GMOs behaviour in the environment and in the bodies that absorb them is that it is largely unknown. Since risks are assumed to exist but are poorly delimited, then it is legitimate to submit the trading of GMOs to an obligation of reducing the uncertainty as to their sanitary

and environmental effects (Larrère, R. 2001). Hence, the application of the precautionary principle (PP) which amounts to the suspension of the decision to introduce an innovation, long enough to reduce any uncertainty as to any possible risk (or to restrict it with preventive measures not knowing, yet, whether they are necessary). This interval of time, however, is also that of developing scientific controversy about hazards. This obligation of knowing (and knowing what one still ignores) invites scientific research institutions to complete their research work on biotechnologies with inquiries able to identify risks and evaluate them. As such, the application of the PP can restore a balance between the different branches of biological research.

Finally, the application of the precautionary principle (PP) has led to a new definition of the assessment. Henceforth, it should be less a question of sticking to what has been scientifically validated than bringing scientific controversies into the public arena. It is a matter of initiating a deliberation on any acceptable risks in a progressive and debated state of knowledge. Hence the institutional developments like forums, consensus conferences and citizen conferences (already held quite widely in Northern Europe).

Introducing laypersons to the evaluation of technological innovations has been much debated. How can ordinary, unqualified citizens have the necessary understanding to give an opinion on complicated technological matters and on genetic research about which they know nothing? Such assertions have been challenged by Pierre-Benoît Joly (2001) and Claire Marris (2001). The whole debate surrounding GMOs (through the citizen conference and the focus groups organised by Claire Marris) has shown the ability of laypersons, with their own knowledge and with information given by a much debated and interdisciplinary

expertise, to take up an issue and express opinions, quite far removed from those that could have sprung from their so-called “irrational fear” of technological revolution.

Moreover, these experiments have shown the importance of enlarging the debate and of going beyond an assessment of the consequences in terms of risks and benefits, in order to take into account all the effects of the conception and diffusion of GMOs.

It is not usual for innovations to be spread, once the normal resistances are overcome, in a world which would be quite ready to welcome them. One may even argue that, from the moment they were designed, GMOs have always been inextricably linked to a socio-technical system that has developed together. Would we talk of GMOs if, intensified by the hopes aroused by transgenics, there had not been a concentration of the variety selection in a very small number of agro-chemistry firms? If there had not been a problematic expansion of the field of patentability at the same time? Considering the pressures on the European Union, one may wonder whether the lack of labelling was an implicit condition for the development of GMOs. To these world transformations associated with innovation are combined those resulting from large-scale diffusion (focus on a variety selection of a limited range of species; dependency of producers and consumers on a firm's strategy; the difficult co-existence between fields “with” or “without” GMOs, etc.). The question is whether these transformations are dependant on the context in which GMOs have been developed, or whether they cannot be disassociated from it and structured into a kind of “combined environment”.

Be that as it may, it is justifiable to ask citizens – beyond any normal environmental or sanitary risk considered acceptable – whether they are willing to live in a world having undergone such transformation.

Raphaël Larrère, INRA – SAE2/TSV Ivry  
[larrere@ivry.inra.fr](mailto:larrere@ivry.inra.fr)

#### For more information

**Joly, P.B. ; Hervieu, B. (2003).** La marchandisation du vivant : pour une mutualisation des recherches en génomique. *Futuribles*, n°292, pp 5-29

**Joly, P.B. (2001).** Les OGM entre la science et le public ? Quatre modèles pour la gouvernance de l'innovation et des risques. *Economie Rurale*, n°266 pp 11-29

**Larrère, R. (2001).** *Organismes génétiquement modifiés*. In : Dictionnaire d'éthique et de philosophie morale, M. Canto-Sperber (éd.), PUF, Paris, pp 1129-1132.

**Marris, C. (2001).** La perception des OGM par le public : remise en cause de quelques idées reçues. *Economie rurale*, n° 266, pp 58-79