

NOTE: This is from a series of pieces for SEED magazine about the roots of Europe's supposed "scientific disconnect" over GM crops. The contributors are Pamela Ronald, a pro-GM plant geneticist, Raj Patel, author of *Stuffed and Starved*, Nina Fedoroff, the pro-GM science and technology adviser to the US Secretary of State, Noel Kingsbury, a pro-GM horticulturalist and writer, and Tom Philpott whose perceptive piece we've reproduced below.

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### **Scientific Consensus on GM is an Illusion**

Tom Philpott

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[p://seedmagazine.com/content/article/scientific\\_flip-flop/](http://seedmagazine.com/content/article/scientific_flip-flop/)

The assumption is that a global scientific consensus has formed around the value of patent-protected transgenic crops, analogous to the general agreement around human-induced climate change. Yet that is clearly false.

Let's start by looking at the International Assessment of Agricultural Knowledge, Science, and Technology for Development (IAASTD), a three-year project to assess the role of agricultural knowledge, science, and technology in reducing hunger and poverty, improving rural livelihoods, and facilitating environmentally, socially, and economically sustainable development.

Widely compared to the Intergovernmental Panel on Climate Change (IPCC), which definitively established a scientific consensus around climate change on its release in 2007, the IAASTD engaged 400 scientists from around the globe under the aegis of the World Bank and the UN's Food and Agriculture Organization. According to the Executive Summary of the Synthesis Report, the effort was originally "stimulated by discussions at the World Bank with the private sector and nongovernmental organizations (NGOs) on the state of scientific understanding of biotechnology and more specifically transgenics."

If transgenic-crop technology had captured the broad approval of the global agricultural-science community, here was the place to show it. But what happened? According to the Executive Summary of the Synthesis Report:

"Assessment of biotechnology is lagging behind development; information can be anecdotal and contradictory, and uncertainty on benefits and harms is unavoidable. There is a wide range of perspectives on the environmental, human health and economic risks and benefits of modern biotechnology; many of these risks are as yet unknown."

"The application of modern biotechnology outside containment, such as the use of genetically modified (GM) crops, is much more contentious [than biotechnology within containment, e.g., industrial enzymes]. For example, data based on some years and some GM crops indicate highly variable 10 to 33 percent yield gains in some places and yield declines in others."

The report goes on to call for a whole new framework for crop-biotechnology research—an implicit rebuke to the current one:

"Biotechnologies should be used to maintain local expertise and germplasm so that the capacity for further research resides within the local community. Such R&D would put much needed emphasis onto participatory breeding projects and agroecology."

Thus, whereas the IPCC revealed broad agreement among the global scientific community around climate change, the IAASTD—arguably the "IPCC of agriculture" - showed deep ambivalence among scientists over transgenic crops.

The real question becomes: How can serious publications like Seed claim that skepticism toward GMOs reflects a "scientific flip-flop"? To be sure, the illusion of a broad consensus holds sway in the United States, and the IAASTD has clearly failed to correct it. The US media greeted its release with near-complete silence - in stark contrast to its reception in the European media.

So, how did this spectral scientific consensus for GMOs come into being? In a two-part article called "The Genetic Engineering of Food and The Failure of Science," recently published as a "work in progress" by the peer-reviewed International Journal of the Sociology of Food and Agriculture, the agroecologist Don Lotter ventures to answer this.

Lotter's paper traces the history of the rise of plant transgenics, convincingly arguing that political and economic power, not scientific rigor, have driven the technology's ascent. He shows that the hyper-liberal US regulatory regime around GMOs stems not from an overwhelming weight of evidence, but rather from close, often revolving-door ties between the industry and US administrations dating back to Reagan. Take the assumption that transgenic foods have been proven to have no ill effects on human health. Far from being exhaustively studied, it turns out, that question has been largely ignored—left by US regulators to be sorted out by the industry itself. When there have been long-term trials by independent researchers, the results have hardly been comforting.

For example, writes Lotter:

"In a 2008 report (Velimirov et al., 2008) of research commissioned by the Austrian government, a long-term animal feeding experiment showed significant reproductive problems in transgenic corn-fed rats when all groups were subject to multiple birth cycles, a regimen that has not hitherto been examined in feeding studies comparing transgenic and non-transgenic foods."

<http://www.ijisaf.org/archive/16/1/lotter1.pdf>

Thus in the first-ever multi-generational study of the effects of GMO food, evidence of serious reproductive trouble comes to light: reduced birth weight and fertility. If the reproductive system can be viewed as a proxy for broad health, then the Austrian study raises serious questions about the effects of consuming foods derived from transgenic crops—i.e., upwards of 70 percent of the products found on U.S. supermarket shelves. Yet, as in the case of the IAASTD, the Austrian study dropped with a thud by the US media.

The Austrian results raise an obvious question: why did the first multigenerational study of the health effects of GMOs emerge more than a decade after their broad introduction in the United

States? Lotter devotes the second half of his paper, "Academic Capitalism and the Loss of Scientific Integrity," to answering that question.

Lotter traces the generally blase approach to GMO research to "the restructuring of research university science programs in the past 25 years from a non-proprietary 'public goods' approach to one based on dependence on private industry." He teases out the following ramifications:

- \*tolerance by the scientific community of bias against and mistreatment of non-compliant scientists whose work results in negative findings for transgenics, including editorial decisions by peer-reviewed journals, as well as tolerance of biotechnology industry manipulation of the information environment

- \*monopolization of the make-up of expert scientific bodies on transgenics by pro-industry scientists with vested interests in transgenics

- \*deficient scientific protocols, bias, and possible fraud in industry-sponsored and industry-conducted safety testing of transgenic foods

- \*increasing politically and commercially driven manipulation of science within federal regulatory bodies such as the FDA

Lotter delivers well-documented examples to support each of those charges. He shows, for example, that the USDA dispersed \$1.8 billion for crop biotechnology research to universities between 1992 and 2002, of which one percent (\$18 million) went to "risk-related research." He cites another peer-reviewed study showing that university biotech research has "overwhelmingly been targeted at plants and traits that are of interest to the largest firms," and that "research on non-proprietary solutions which benefit the wider public has been lacking...This arena should be central to the mission of universities and other non-profit research institutions."

It's worth noting that the IAASTD points out similar concerns in the industry-dominated research agendas at public universities:

"An emphasis on modern biotechnology without ensuring adequate support for other agricultural research can alter education and training programs and reduce the number of professionals in other core agricultural sciences. This situation can be self-reinforcing since today's students define tomorrow's educational and training opportunities."

A recent event reported by the New York Times illustrates the lack of independence - and thus, arguably, rigor—that surrounds too much GMO research. A group of 23 US scientists signed a letter to the EPA declaring that, "No truly independent research [on GMOs] can be legally conducted on many critical questions." The Times reported that because of draconian intellectual property laws, scientists can't grow GMO crops for research purposes without gaining permission from the corporations that own the germplasm—permission which is sometimes denied or granted only on condition that the companies can review findings before publication.

Stunningly, "The researchers ... withheld their names [from the EPA letter] because they feared being cut off from research by the companies," The Times reports.

So this is the sort of scientific consensus around GMOs that environmentalist should bow to—one literally based on fear among tenured faculty?

Ultimately, scientific responses to the advent of climate change and the rise of GMOs make a poor comparison. The consensus around climate change developed in spite of a multi-decade campaign by some of the globe's most powerful and lucrative industries—the petroleum and coal giants—to protect markets worth hundreds of billions of dollars. The consensus around GMOs—or at least the specter of one—arose through the lobbying and support of an industry desperate to protect its own multibillion-dollar investments. I predict this bought-and-paid-for consensus will prove short-lived.

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