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**Book Review: *Seeds, Science, and Struggle: The Global Politics of Transgenic Crops*,
by Abby Kinchy**

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running huge deficits and hamstrung by ideological gridlock and obsolete ideas.

As inspirational futurism suggesting possibilities of a better world for all, there are certainly many good budding ideas here that may bloom. As a forecast of what is likely, the subtitle *The Future Is Better Than You Think* (perhaps forced by the publisher) is over the top. The future *may* be better than we think if some of these game-changing technologies come to widespread fruition. But it is unlikely that all or even most of them will be realized, at least in the next twenty-five years. Not impossible, but not probable, either. Indeed, one of the subsections of Chapter 1 is titled *The Possibility of Abundance* (p. 9), which is plausible and restrained. (Note: For detailed and relatively restrained tech forecasts from an expert panel, see William Halal's www.TechCast.org.)

In any event, this book presents the techie side of the great "Pessimist–Optimist, Malthusian–Cornucopian" debate that has been with us for decades and will surely continue. Hopefully, the debate will grow even wider and deeper, with benefits to all.

—Michael Marien

Abby Kinchy. *Seeds, Science, and Struggle: The Global Politics of Transgenic Crops*. Cambridge, MA: The MIT Press, 2012. 240 pp. (hardcover). Price: \$44.00 ISBN: 978-0-262-01781-7.

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Keywords

agriculture, law, resources

Abby Kinchy, a social scientist working in the interdisciplinary field of Science and Technology Studies, has taken a critical look at the emerging industry of transgenic agriculture and its impact on specific major crops. The central question addressed is as follows: "What is the right way for governments to assess and regulate genetically engineered (GE, or transgenic) organisms that will be released into the environment?"

In the agricultural biotechnology industry, there are a wide range of cultural, economic, and ethical implications that cannot simply be reduced to scientific calculations of risk. The complex issues involved have generated major conflicts over intellectual property, organic standards, genetic diversity, global trade, corporate concentration, and the maintenance of food traditions.

The book's introductory chapter sets the background by defining GE crops. In genetic engineering, scientists directly manipulate an organism's DNA, the genetic information within every cell that allows living things to function, grow, and reproduce. In crop development, the goal is to have highly productive, weed- and pest-resistant seeds.

Kinchy focuses not on the politicization of the regulatory system but on the *scientization* of public debate about biotechnology and the *neoliberalization* that she posits constrain opportunities for public participation in decision making about agriculture.

Scientization is defined as the transformation of a social conflict into a debate, ostensibly separated from its social context, among scientific experts. *Neoliberalization* is a set of ideas and practices that have, to a great extent, become the widely accepted approach to how a state attempts to regulate its economy in most countries.

While most governments supposedly embrace the "free market" principle for the governance of agriculture, the reality is that the political and economic implications of biotechnology are often set aside in favor of science-based assessments of health and safety issues.

The author also traces the history of the "antibio-tech" activists who have been increasingly alert to incidents of genetic contamination since the late-1990s and are battling national and international institutions that insist on science-based decisions about GE crops.

The book details two of the most high-profile cases of contamination in the last decade. One primary concern is that GE crops can easily contaminate natural seed crops, resulting in legal actions against farmers who unknowingly produce crops with patent-protected characteristics, and that fees for patented seed are designed to restrain competition.

Labeling the broad issue as "genes out of place," the author, whose background is in sociology, grounds her findings in collected data, interviews, participant observations, archival research, and analyses of published documents.

The first case she cites is one where unapproved planting of transgenic material in traditional varieties of Mexican maize has been a raging issue since the late-1990s.

The second case is in Canada, where the contamination of canola crops with GE varieties sparked two precedent-setting legal struggles that pitted farmers and environmental activists against the biotechnology industry. (Canola is a variety of rapeseed developed by a Canadian state-sponsored program during the 1960s and 1970, to make its oil palatable for human consumption.)

Both cases involve Monsanto, a dominant global developer and producer of GE seeds, which began modifying seeds in the early-1980s. It is a leader in the development of engineered traits and applying them to seeds and herbicides, and already controls about 60 percent of the corn seed market in the United States.

Mexican environmental activists began to deal with the issue of GE crops in the late-1990s, starting with a campaign against the importation of GE maize from the U.S. Mexican farmers, with an agricultural tradition of diverse, natural maize production, were concerned about the potentially hazardous and disruptive impacts of GE products.

That concern created a coalition of peasant and environmental organizations asserted that the genetic contamination of native varieties constituted an attack on traditional cultures and indigenous communities' autonomy. Over time it has created a network of organizations calling itself a *petate* (the word for a woven mat made out of palm leaves). It symbolizes the dense network of people forming the base, or grassroots, of the movement in defense of native maize.

In examining the defense of maize across the last several decades, Kinchy reaches a number of conclusions.

First, activist-led monitoring is not merely concerned with establishing facts; it is also a process of consciousness-raising and solidarity formation. Second, the findings of activist-led monitoring projects affect the kinds of claims they make, which may not always be based exclusively on either scientific or political considerations.

Third, monitoring efforts that rely on scientific detection tools may not always be helpful in making "invisible risks" visible to the public. Fourth, disagreements among activists may lead to different segments or factions choosing different targets, such as legislative, judicial, cultural, and other institutions.

Finally, environmental monitoring is unlikely to have an impact on regulation or public policy where deep distrust and antagonism exist between challengers and the state. While maize activists in Mexico found opportunities to adapt scientific methods to serve broader struggles for indigenous autonomy and agricultural reforms, antibiotech activists have

found the judicial system to be far less receptive to questions about the social implications of transgenic crops. Kinchy labels this condition an "epistemic boomerang."

In the chapters that follow, Kinchy examines the Canadian controversies over GE canola. First, she focuses on the question of patents on transgenic material released into the environment, and then considers a specific case in which organic canola producers facing contamination of their crops pursued a class action lawsuit against biotechnology companies.

The case reported in detail was the case of *Monsanto v. Schmeiser*. Since the 1980s, the international governance of plant genetic resources has shifted from a common heritage system, which treated plant genetic resources as a commons, to a system that emphasizes sovereign and private property rights.

While the vast majority of North American farmers have accommodated themselves to the intellectual property system, adopting GE seeds and purchasing them annually from seed dealers, a small but influential set of opponents to this system evolved. To these were added genetic resource advocacy and consumer groups and environmental organizations as voices of dissent.

While *Monsanto v. Schmeiser* began as a biotechnology company's effort to exert its intellectual property rights against a seed contamination charge, it became an opportunity for activists to publicize the consequences of releasing GE crops into the environment. The case was settled out of court in 2008, with Monsanto agreeing to pay for the removal of its GE canola from Schmeisers' land.

The outcome led other Canadian organic farmers (a committee called the "Organic Agricultural Protection Fund" [OAPF]) to pursue a class action lawsuit against two biotechnology companies (Monsanto and Bayer)—accusing them of contaminating their crops to such an extent that organic canola became unmarketable. In effect, the farmers asked the courts to treat genes out of place as analogous to pollution, trespassing, or a nuisance.

The legal action begun in 2002 ended with a judicial ruling in 2005 that the OAPF did not have a case, and the terminology used in the judge's decision implied an unqualified acceptance of the safety of approved GE crops.

While this decision raised the question whether legal mobilization is an effective strategy for the antibiotech movement, it also helped mobilize a social movement, particularly for the purpose of articulating grievances and making rights-based claims. In Canada, this has caused a coalition of

environmental, consumer and farm-sector organizations from across the political spectrum to demand that Monsanto withdraw its application to market GE wheat in Canada. Monsanto agreed in 2004 to defer its field research and breeding of wheat.

While legal struggles are often long, costly, and fruitless, demonstrating that few political options exist for controlling GE crop use, Kinchy argues that they can contribute to the formation and mobilization of social protest movements.

In conclusion, Kinchy considers what actions might enable the impacts of technological change to be assessed differently in the future. Based on her studies, she identifies four main strategies that farmers and activists have used—widening the struggle to include international experts, carrying out research to assess impacts on civil society, scrutinizing the science behind GE crops in court, and using market-based tactics.

While challenges to GE crops so far have tended to reinforce regulatory conventions that privilege science-based claims, there are encouraging signs that science and technology are being opened up to public scrutiny in new ways. The persistence of social conflict over GE crops strongly suggests that it is time for governments to adopt new criteria for evaluating technology, and to reassess what is accomplished when considerations that are not easily categorized as scientific are ruled out.

“It is time for new “rules of the game” for the governance of technology, to reassess what is accomplished when we rule out considerations that are not easily categorized as scientific. (p. 164)”

[Note: Abby Kinchy underlines the hazards and shortcomings of dominant models of scientific risk governance and how they can marginalize alternative visions of the future. For transgenic crop agriculture, the author suggests that the social and ecological consequences are too critical and too complex to be left either to markets or experts alone.

This book offers a road map for those concerned with increasingly global societal impacts of actions by multinational corporations, the adequacy of existing regulatory systems, and the complicated

interrelationships among special interest groups, often involving a range of specific products and services]

—Peter F. Eder

Ramez Naam. *The Infinite Resource: The Power of Ideas on a Finite Planet*. Lebanon, NH: University Press of New England, 2012. 352 pp. \$29.95 (hardcover). ISBN: 978-1-61168-255-7 (\$28.99 Ebook, ISBN 978-1-61168-376-9).

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transhumanism, ideas as infinite resource

Our world may run low on oil, freshwater, farmland, and a host of other necessities of life, but it will never run low on the human capacity to innovate—and this last resource is what can save us, asserts acclaimed transhumanist author and speaker Ramez Naam in *The Infinite Resource*. He surmises that the many environmental and technological challenges confronting our species today are merely temporary, and explains how human ingenuity can create a dynamic pathway forward. He writes,

The human mind is the ultimate source of wealth. ... *If* we make the right choices to empower human minds and encourage innovation, to steer innovation toward the solutions for our planet’s problems, and to embrace the fruits that it offers, then the future will be one of almost unimaginable health, wealth, and well-being. (p. 316)

Our unique human capacity for acquiring knowledge and using it to better our existence has wrought phenomenal improvements in human life since the dawn of our species, but particularly in the last hundred years, according