



Readings

Description

Part of unit 3 of the [Course on Genomics Ethics and Society](#), this section provides readings on transgenic crops, climate change, and environmental justice.

Body

Week 1

1. **Hansson, S. O., & Joelsson, K. (2013). Crop biotechnology for the environment? *Journal of Agricultural and Environmental Ethics*, 26, 759-770.**
2. **Thompson, P. B., & Hannah, W. (2008). Food and agricultural biotechnology: A summary and analysis of ethical concerns. *Advances in Biochemical Engineering/Biotechnology*, 111, 229-264.**

This week's readings introduce a variety of different social and ethical issues raised by GM crops and agricultural biotechnology. When you have completed these readings, you should have a good grasp of some of the main issues at stake here, and also where some of the principal ethical conflicts are located.

Reading 1: Thompson and Hannah provide an overview of the different ethical concerns raised by GM crops, considering these in light of broader philosophical and social issues raised by new technologies more generally. They argue that the debate about agricultural biotechnology is complex, closely related to broader ideas about risk and uncertainty in technology, and can't simply be represented in terms of two opposing viewpoints (for instance, as "humanitarian benefit" versus

“unnaturalness”).)

Questions for Reflection: Thompson and Hannah

- a) Thompson and Hannah argue that “risk-governance” approaches to biotechnology are vulnerable to criticisms that stress individual rights (p.233). This is a key ethical problem raised by agricultural biotechnology (and indeed by many forms of genetics/genomics). First, make sure that you understand exactly how this conflict between risk-governance and individual rights arises. Try to identify some examples other than that of allergens discussed here. How do you think policy-makers should make decisions in cases where the interests of the many conflict with the rights of a few?
- b) How do Thompson and Hannah think that agricultural biotechnology might be relevant to social justice? Do you agree with them?
- c) On p. 245, Thompson and Hannah discuss claims that biotechnology is “unnatural” and therefore problematic. What do you think about these kinds of claims?

Reading 2: Hansson and Joelsson (2013) argue for an unusual, specific, and controversial thesis: that, contrary to popular arguments especially found within continental Europe, agricultural biotechnology should be regarded as beneficial, both to the environment and to human health. They argue, in particular, that anyone with pro-environmental goals should not be opposed to agricultural biotechnology in principle, but rather should be interested in developing it in the right ways.

Questions for Reflection: Hansson and Joelsson

- a) Hansson and Joelsson are mainly concerned with the potential benefits of agricultural biotechnology. Do you think that they take the risks seriously enough?
- b) Hansson and Joelsson don’t explicitly discuss how the benefits of GM crops might affect social justice. What effects do you think changes such as increased yield, reduced pesticide, and reduced tillage might have in terms of social justice?
- c) Overall, was this paper persuasive? What issues that were omitted do you think should have been discussed? Do you think the authors’ account of the

potential health and environmental benefits of GM crops is plausible?

Week 2

1. **McAfee, K. (2008). Beyond techno-science: Transgenic maize in the fight over Mexico's future. *Geoforum*, 39, 148-160.**
2. **Mercer, K. L., & Wainwright, J. D. (2008). Gene flow from transgenic maize to landraces in Mexico: An analysis. *Agriculture, Ecosystem and Environment*, 123, 109-115.**

One of the central arguments made by Professor Wendy Jepson in the learning materials for this module is that the process of development and adoption — or otherwise — of GM crops varies widely by nation. There are significant differences between nations in terms of the kind of crop being grown, the social, economic, and environmental impacts the crop might have, and the agricultural, social, political and business frameworks for crop research, GM governance, and public protest. The two readings here look at the particular case of GM crops in Mexico. Some of the supplementary readings concern Brazil and Argentina, where rather different political and social processes have been involved.

Reading 1: McAfee discusses the social and cultural importance of maize in Mexico, particularly in the wake of the moratorium placed on transgenic maize in Mexico by the North American Free Trade Agreement (NAFTA). She discusses the Commission on Environmental Cooperation's (CEC) inclusion of social and cultural impacts in its study of the effects of transgenic maize in Mexico, and how this study sparked broader debates over the role of social impacts in risk analysis. She encourages an increased focus on food sovereignty for Mexico: the idea that food and agricultural policy in Mexico should be controlled not by corporations or other nations but by the people who live and grow crops in Mexico.

Questions for Reflection: McAfee

- a) What was novel about the CEC's analysis of GM maize?
- b) What do you think about the claim, made by some organizations in the U.S., that the CEC's analysis was not "sound science"?

c) On pp. 157-158, McAfee discusses different reasons to support food sovereignty, or local control of food practices and policies. What do you think about these claims?

Reading 2: Mercer and Wainwright review evidence for the presence of transgenes in Mexican maize. They argue that the nature of farmer practices and evolutionary processes of maize make it difficult to detect transgenes. When detected, however, they argue that certain farmer practices and evolutionary processes can be manipulated in order to reduce transgenes.

Questions for Reflection: Mercer and Wainwright

a) Why do gene flow, gene drift, and gene selection make it difficult to detect transgenes?

b) On pp. 112-113, Mercer and Wainwright discuss two problems with the argument for “decontaminating” crops of transgenic elements. Can you think of any other problems with the decontamination argument?

c) Look at Mercer and Wainwright’s proposals on pp. 113-114 for reducing transgenes. Do these seem plausible to you? Can you think of other possible methods for reducing transgenes?

Recommended Supplementary Readings

These readings explore many of the same topics covered in the main readings, but in greater detail and in different contexts. **Graduate students should read at least two of these papers in addition to the readings above.** Fitting (2010), McAfee (2004), McAfee (2008), and Otero (2008) discuss the social and cultural impacts of GM crops, as well as the broader assumptions often made when conducting risk assessments of GM crops. McAfee (2003), Fitting (2008), and Mercer, Perales, and Wainwright (2012) provide further analysis of transgenic maize in Mexico. The other articles look at the particular cases of GM crops in Argentina and Mexico. For Argentina, see Leguizamón (2014) and Teubal (2008). For Brazil, see Jepson et al. (2009) and Peschard (2012).

1. Fitting, K. (2010). Corn and the hybrid nation. In *The struggle for maize* (pp. 75-116). Durham, NC: Duke University Press.

2. Leguizamón, A. (2014). Modifying Argentina: GM soy and socio-environmental change. *Geoforum*, 53, 149-160.
3. McAfee, K. (2003). Corn culture and dangerous DNA: Real and imagined consequences of maize transgene flow in Oaxaca. *Journal of Latin American Geography*, 2, 18-42.
4. McAfee, K. (2004). Geographies of risk and difference in crop genetic engineering. *Geographical Review*, 94, 80-106.
5. Mercer, K. L., Perales, H. R., & Wainwright, J. D. (2012). Climate change and the transgenic adaptation strategy: Smallholder livelihoods, climate justice, and maize landraces in Mexico. *Global Environmental Change*, 22, 495-504.
6. Otero, G. (Ed.) (2008). *Food for the few: Neoliberal globalism and biotechnology in Latin America*. Austin, TX: University of Texas Press.
 - Ch. 1. Otero, G. Neoliberal globalism and the biotechnology revolution: Economic and historical context.
 - Ch. 3. McAfee, K. Exporting crop biotechnology: The myth of molecular miracles.
 - Ch. 6. Fitting, E. Importing corn, exporting labor: The neoliberal corn regime, GMOs, and the erosion of Mexican biodiversity.
 - Ch. 8. Teubal, M. Genetically modified soybeans and the crisis of Argentina's agricultural model.
 - Ch. 9. Jepson, W., et al. Brazilian biotechnology governance: Consensus and conflict over genetically modified crops.
7. Peschard, K. (2012). Unexpected discontent: exploring new developments in Brazil's transgenics controversy. *Canadian Journal of Development Studies*, 33, 326-337.

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Rights

Use of Materials on the OEC

Resource Type

Instructor Materials

Topics

Climate Change
Controversies

Environmental Justice
Sustainability

Discipline(s)

Genetics and Genomics
Life and Environmental Sciences