
Social and Economic Dimensions of Sustainability

Q&A

MODERATOR: LELAND GLENNA

Glenna: I was a pastor before I became an academic, and in my sermon training as Lutheran pastor I was taught to point out that no one should feel morally superior. We all know that the public is somewhat misinformed, in fact they actually are wrong about a lot of things. But I will just suggest that we are, too. All of us in this room are just as ill informed on many topics. Maybe we think we know a little bit more about this particular subject, but at any given time we are also misinformed. The discussion yesterday, the back and forth about regulations, indicates there is more ideology in this room than I think we might like to admit.

R. Roush, Penn State: I want to make a comment about Rick Welsh's suggestion to move the registration process into food additives area. Oils, for example, don't have food additives. They don't have any GMO component. It doesn't solve the problems, and unfortunately the really good ideas you had have all failed summarily in trying to persuade anybody. They are good ideas, but we have already tried them. The bigger issue with turning this thing around is that we need to be more aggressive in knocking the likes of Chipotle off their perch every time they make misleading statements. There has been a consumer revolt against the anti-vaccinators, right? I'm wondering if there are lessons from that we can hitch ourselves to in trying to point out that this is an anti-science movement.

Welsh: I have to agree. I don't think we should try to relax the IP. The damage tolerance for projects that are being worked on but are not widely commercialized yet gives them staying power. I just saw a recent study on willingness to pay for transgenics. It was close, but the point is someone is looking at it.

R. Roush: I have had debates with several anti-GM campaigners and told them about mutation breeding, so they wanted to start regulating that too now. Their very clear response was that no matter what technology is used, if it's not traditional it is not acceptable. Look at the consumer trial a few months ago, a vitamin A trial that is not connected with any multinational company, that does have consumer benefits even though they are disputed, and it was destroyed in the Philippines at the same time as somebody started chopping down papaya trees in Hawaii that have been there for years. In Australia we actually worked on an arrangement with Monsanto where farmers can keep seed. There were good reasons for it since it helped to avoid weed seed being moved around seed plots. Anti-GM groups rejected and didn't even accept that it was worth considering. Isn't that fundamentally what is driving it?

Welsh: You are right and you are not right, because there are groups who will never agree, no matter what you do. When I talked to the Union of Concerned Scientists, I asked what they wanted, and they told me that one way to improve the situation would be to treat it as a food additive. That is where that came from. But I know you don't accept it, and I conceded in my talk that going that route might not make any difference at all. I am just saying that part of my talk was based on rhetorical frames being used as a way for discussing resistance. And I am speculating about some approaches that might untangle things.

Heisey: I wanted to throw out one little thing, but I don't know if this will work for Rick Roush, either. One of my daughters has Type 1 diabetes. Genetic engineering basically keeps her alive, so you could ask if anti-GE folks want us to go back to using pig stomach insulin for treatment of that disease.

R. Roush: The response to that is, that is a choice a person can make for themselves, but GM food has been forced on the consumer. You don't seem to split many people off. I accept what you are saying, but I am looking for even bigger wedges.

W. Kerr, University of Saskatchewan: I spend a lot of time in Europe eating, and I see a psychological perspective. If I were to ask Europeans if they would eat GMOs, a universal no would be the reply, and I would become a social pariah if I were to actually admit that I would eat them. Rick, does it eventually get to the point of this acute social dimension?

Hallman: There are a couple of things I want to say about this. There is a major difference between the European and the American view of GMOs. We actually did some cross-cultural work a number of years ago in which we did face-to-face interviews with school teachers in the US and in Germany, and we essentially had a set of open-ended questions. At one point we described an apple that that would not brown as quickly. This was ten years ago. The American school teachers by and large said, "Oh, that's really interesting, when can we buy that?" The response from the German teachers was essentially, "What's wrong with what we already have?" And that pretty much sums up the viewpoints of the two societies. A second issue is that there is a social dimension to this. People define their identities by the kinds of choices they make. It was Brillat-Savarin who said in 1826 that you are what you eat. That is so true. People are identifying themselves as vegetarians, as vegans, as organic.

It becomes a lifestyle decision, not simply “What are we going to have for dinner tonight?” The third thing is the differences between US and EU production. It appears as though Americans and Europeans have a different sense of the division between agriculture and nature. If you ever had an opportunity to do hiking in Germany or France or England, you know that many of those countries have laws that will allow you to cross a farmer’s field in order to continue hiking. So you have this unsettling experience as an American of coming up to a gate with a very large bovine staring at you, and signs in eight languages: “Please Close the Gate.” You walk across the field, the cow of course doesn’t move because it has seen a zillion tourists go past, you come to the other side and there’s another sign that asks you to close the gate. If you ask Americans where they go to recreate, to experience nature, they will by and large tell you they go to a park, which is a place set aside, separate from agriculture. In the European Union agriculture is set in the middle of nature. It is part of nature. And I think that that really strongly affects the way that people think about this.

R. Giroux, Cargill: This question is for Steven Palacios. I think a lot of what you said is not a wet blanket. I think it is an emerging reality for companies and US consumers and so I am very much interested in the idea of migrating the frame. From your perspective, what are the key levers that will help migrate that frame? All those are your customers and they are our customers. So when we talk to them about non-GMO solutions for example, we always try to frame it as a trade-off. Do we ask if we are going to go non-GM or are we going to trade off our sustainability goals, which one is more important to you? Do you have other examples?

Palacios: I think that is exactly the way to think of it. In the Chipotle example they traded off GMO for non-GMO. They didn’t trade off herbicide. They didn’t trade off insecticide. So what was the trade-off? The trade-off was nominal. The trade-off was emotional, and for what purpose? The purpose was to give a perception without validating it through any practice. From my perspective, pointing out what those trade-offs are and their situational context is exactly the way to go. Having one-sided discussion about whether it is bad or good is a losing proposition in GMO’s history. It is my opinion that you need to pick your starting point. You say this is what GMO is providing versus an alternative way of growing and this is what GMO is providing versus an alternative way of marketing. This way you allow someone to have an educated discussion and debate. That to me is the correct path. It has to be contextual. Going back to the vaccination comment as an example: You pick the best and most popular examples people can intuitively understand to start that discussion. Then, all of a sudden, the discussion starts to change. At least I hope so.

S. Fleischer, Penn State: I agree with the speakers that the anti-GMO movement is sophisticated, is well developed, has a long history, and is quite successful. I would like to learn more about them. What is their strategic planning? They don’t decide on these targets at random. There seems to be more anti-GMO discussion aimed at certain aspects of potential biotech than others. For example, I don’t hear a lot about anti-GM cotton or biofuels, and potentially trees. So why are they doing what they are doing from a strategic point of view? Is it important to their financial bottom line? Do they have reasons why

they aim at certain targets versus others? And a second follow-up question is how might that influence innovation and development of products that might prove to be useful?

Welsh: Primarily, all the groups I communicate with, talk to, and have done research on are really not focused on genes. They are aimed at particular corporate actors and an industry they see as out of step, as wanting to control the food supply in ways that benefit the industry and not the consumer. You don't eat cotton, you wear it. It is harder to make the argument that this is somehow going to penetrate through me and damage me. It is much easier to take aim at the fish gene or the tomato. That is the most effective strategy. Do most consumers who eat organic do it for environmental reasons? No. They do it for health reasons, real or not. That is their motivation.

B. Gwinn, Ohio State: Early on in the conversation I spoke about public investment in research. A quick calculation: If you take corn and bean acres across this nation, pick 1% of the variable costs you end up with of about \$2–5 an acre, that would be \$350,000,000–\$500,000,000. If you could get producers to invest an additional \$5 per acre into research, that would provide an enormous amount of research dollars. Any suggestions as to where or how you might encourage that amount of public investment into research?

Heisey: I will respond and some of the other speakers might have other ideas. This again reminds me of cultural differences. In this country we have a long history of producer check-offs for market. We think that we need to spend our dollars on selling our product. In countries like Australia there has been a fairly long history of check-offs for research of the type that you suggest. I think it is certainly a direction that is well worth going. Some other economists, Julian Alstan and Richard Brey in Canada, have looked at how we can move toward supporting more research, and it should definitely be on the policy agenda.

M. Smith, Cornell University: I wanted to thank you all because this is a fascinating panel. I get to give a lot of public talks about genetically engineered crops, and I use results from several of you up there on the podium, so I thank you personally. As a professor at a land grant university, I view my role as helping to educate people, telling them what we know about this technology, what it is, what impact it has had, what we don't know, rather than telling them what to think. But every time I listen to this kind of a discussion, or when I recently listened to one of our faculty members talk about risk communication, the message I get is that more information is just not relevant and not useful. I find that very discouraging, but the invitations to speak just keep coming in. So why should I bother to do it? For somebody who is really a plant breeder, what is it we should be doing to try and help that portion of the public who isn't yet crystallized on this issue? I know what I have got to tell people who already have crystallized their thinking. That's pretty apparent. But what is it that's useful for the rest of them?

Palacios: I think for a generalist audience of that nature a certain level of education will bring benefit because now you are introducing a different understanding. Then you need to take those examples and put them into a practical trade-off analysis. We could do this or we could do that. We chose to do this for these reasons and these benefits. Use examples

that are familiar to an average person, that are experienced by an average person. Part of the anti-GMO success is picking on things that every day people use in the course of their lives and saying, “You don’t want to spread that hummus on that particular cracker.”

Hallman: I absolutely agree with Steven that a certain amount of information is important—it is just not enough. That is what we are saying for most populations. Part of the discussion has to be about values. We are both in land grant universities. A hundred years ago, when people were much closer to the farm and hybridization was taking place, it was actually on the front page of newspapers, because people understood that an increase in yield or insect resistance was a big deal for farmers’ livelihoods. People don’t understand that anymore. So the discussion first has to come down to what we all agree on are problems worth solving. The next question is, are they worth solving by using GMOs, or nanotech, or synthetic biology, or any other technology applied to agriculture? We are not actually having that discussion about the basic values, the basic problems that need to be solved. We are just telling them to trust us, that it is safe, that we are solving the problem this way.

Glenna: Dave Mortenson talked yesterday about the bioethics discussion here on campus, how packed it was, and how philosophers argue that you need to start with cases that are based on values. Putting it in a philosopher’s perspective, you start with those cases to draw people in and ask what the fundamental ethical challenge here is. Then we can have a conversation. And within that context, people’s values change. People’s knowledge adjusts. It is really a very different way of thinking about education. This is why philosophy courses are so much fun, even though most sociologists think ethicists are kind of dry. It is a different way of looking at our approach, and it really came through in that bioethics talk. As Dave pointed out, it was standing room only and there were more people online. It was a very exciting feeling in the whole room.

C. Keene, Penn State: This question is specifically for Bill, but if others have thoughts on it I definitely want to hear them. Thinking about affect, emotional engagement and response: As an American in this room, you probably have eaten GMOs in the last 20 years, or even a lot of them for 20 years, and if you don’t know anything about it, that could sound really scary, especially if the message is very easily accessed. I was wondering if that is something that can be mitigated

Hallman: That is a really, really good question I don’t have a really good answer for. Twenty years ago I was saying and writing that I thought we needed to be much more transparent about getting GMO ingredients into the marketplace. The bet then was that if we simply didn’t tell people and allowed them to eat it they would be fine with that. I argued then that that might actually backfire. If people learn that they have been eating something they didn’t know they were eating, that might be very troubling to them. And I showed you on one of those slides that there is a significant set of the population who already believes, for example, that a lot of the gluten allergies out there are because of GMO wheat, which of course isn’t on the market. One of the other things I research

besides attitudes to GMOs is attitudes to such claims and people's explanations for them. They will take whatever is the largest thing on the horizon in their experience, and they will ascribe their symptoms to that particular thing. So it is not at all surprising that when people learn they have been eating GMOs for a really long time they ascribe their problems to that. We tried to get USDA money to actually study that question and have not been successful thus far.

R. Connolly, Penn State: I think, Bill, you may have answered part of my question already. Your graph with all the different foods that could potentially be GMO and most people got it wrong reminded me of a poster I saw in a grocery store circular advertising their “non-GMO strawberries.” How is that even legal?

Hallman: It is actually not.

R. Connolly: Exactly, but would GMO labeling possibly just shut people up, and what would that look like in the marketplace, considering that there are currently only about nine possible ingredients that would apply to. How would that look?

Hallman: We are asking USDA to give us the money to take a look at this. There are a number of labeling and post-labeling schemes in at least 36 states. Each has different language, a variety of different terms, and a variety of different products that they would apply it to. It will be interesting to see what will happen if a number of them pass. How will people react? I think it will depend on what the particular products are. From an affective reaction, I would think that when people are purchasing products because of their particular health benefits—or their perceived health benefits—non-GMO might in fact be more important than if they are buying snack cakes, because no one is under the illusion that Twinkies are good for your health. So what if they are GMO-free or if they contain GMOs? I think there will be different labels, either claiming non-GMO or stating that the food contains GMO.

C. Mallory-Smith, Oregon State University: I want to follow up on the comment about growing opposition among scientists, and so I would like to know what you are basing that on?

Welsh: I don't know if it is growing opposition as much as it is seeing the tea leaves or moving in a different direction. I am basing that statement on my experiences as editor of *Renewable Agriculture and Food Systems*, formerly the *American Journal of Alternative Agriculture*, which has been acquired by Cambridge University Press, and now our submissions are going off the charts. I am adding associate editors all the time, and people interested in reviewing papers, and these are all very well published mainstream scientists. Our impact is growing very quickly for an ag journal. We are not anti-biotech by any means. My people in the organic community say that I am soft on biotech. Our journal generally looks at different approaches to agricultural production. It is almost entirely focused on production, things like soil quality, nutrient content, cover crops, biodiversity, crop diversity, all these kinds of approaches, and there just are not that many biotech publications you can publish in. That is what I am basing my statement on.

A. Ponce de León, University of Minnesota: I have a question for Bill. You showed us statistical data on perceptions or level of knowledge in our population. Have you also analyzed statistics on cost levels and perceptions? I would like to put the question to all of you if this is a good time to revisit discussion about the level of education that we are providing to our youth, not necessarily for influencing decisions but at least for providing basic information?

Hallman: The answer is yes, we have looked at demographic predictors of public opinion and who knows what. Not surprisingly, men claim to know more about almost everything. I can show you the data: If you follow up with real questions about real science, they don't actually know much more than their spouses. In terms of age, it is not exactly what you would expect. People who say that they are most actively avoiding GMOs tend to be in the middle of the age spectrum, especially parents with children. People who are older and younger seem to be more open to GMOs. If Steven indicated that he was a wet blanket, I am going to be the fire extinguisher. I do research in risk perception and risk communication, not just about GMOs but about lots of other things like nanotechnology and toxicology, and because I sit on an FDA panel I deal with drugs and medical devices. I am asked frequently to talk about risk perception. I am usually on the last panel, because, as we all know, that is where the social scientists should go in case anyone needs to catch their plane. And generally speaking there is a lot of talk from the scientific community that we need to get our particular science into the classroom. If people just understood the facts, everything would be fine. The truth is, that is not the way it works. And good luck trying to get anything into a curriculum. Those of us who have extension appointments will tell you it is nigh impossible to do that. Curriculums are very well regulated. There are teachers who want to teach things on their own who can't actually do it. And pretty much every science wants to be introduced in the classroom. So if you are a chemist and there is a toxicology issue, the solution of course is to teach kids more chemistry. If you are a biologist you want them to know more biology. I've done work on electromagnetic fields because physicists want kids to learn more about how electricity works. The truth is, we can't simply turn students into mini-experts in every scientific field. We have to figure out ways to communicate with the public outside that line.

Glenna: Let me shift away from knowledge and education. Why should we trust scientists? Why should we trust the publicists? Why should we trust the regulatory agencies? We heard yesterday about herbicide resistance. Scientists were sounding the alarm about herbicide resistance to glyphosate for years. The regulatory agency just pushed the agenda through. We now have resistant weeds. Why should the public trust anything we say or anything regulators say?

Welsh: We have been talking mostly about how we are going to convince people to stop thinking how they are thinking. I believe that is not going to work. We also need to take a look at some of the things we scientists say. I was reading the NRC Report on Ag Biotech 2010, and what struck me was the variability and uncertainty in yield increases around the world from biotech crops and how difficult it was to tell if there were increases and

where they occurred, and a lot of variables seemed to go into that. It gave me pause, and I thought that it is going to be hard to make a “feed the world” argument based on the numbers being published by the National Research Council.

M. Kahn, Washington State: Just a follow-up on some earlier discussions. When the labeling initiative was put on the ballot in the State of Washington, alcohol was specifically excluded. As a scientist, it seemed to me that high-fructose corn syrup from GMO and non-GMO is pretty much identical, whereas I can imagine the bourbon from GMO might be different because of the secondary products in bourbon from non-GMO. But the anti-GMO groups had made a strategic decision not to engage the alcohol market in the discussion. They had exempted alcohol from this. So in retrospect I think that if the people who were against GMO labeling in Washington had insisted that you apply uniform standards—if GMO corn is no good in one place, then it should be no good in Maker’s Mark—then you would have changed the way in which that went to the ballot. And I think one has to get back into the details of how these questions are phrased in order to understand just exactly where people are coming from.

Hallman: I would propose the task of a taste testing of GMO bourbon.