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## *Past Successes, Future Prospects and Hurdles*

### *SESSION I Q&A*

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*Bob Seem:* The floor is open. Questions?

*Audience member:* For Alan Wood—did the USDA task force consider obesity?

*Alan Wood (Boyce Thompson Institute):* Obesity was mentioned as a problem that needs to be dealt with, but it was not one of the very specific things that we dealt with. It had to do with research in areas of health that we need more of in the agricultural sector. The USDA already has programs dealing with this. What we were looking at was something beyond current programs in agriculture. We felt that many issues are not being addressed. We were looking forward to the future in agriculture. And the future in agriculture is that we need to come up with new ways of doing business. We need to come up with new products and new technologies and understand where the competition lies. When we go to the grocery store, my wife always looks to see where things come from. Thirty years ago you didn't need to look at a label to know where something came from. The feeling on that committee was that US agriculture is going to move beyond food and fiber into other technologies, and that's where the future of agriculture really lies, the most promising part.

*Ralph Hardy (National Agricultural Biotechnology Council):* Let me add a comment. In 2002 the NABC meeting was held in Minneapolis and the focus was *Foods for Health*.<sup>1</sup> We made a start at looking at this area, the connect between agriculture, food, medicine

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<sup>1</sup>Eaglesham A Carlson C Hardy RWF (2002) NABC Report 14 on Foods For Health: Integrating Agriculture, Medicine and Food for Future Health, 340 pp. Ithaca, NY: National Agricultural Biotechnology Council.

and health. There have been other attempts to connect these, but they haven't "gelled" to the degree they should. We are going to need to maximize the food-input nutritional side to contain healthcare costs, which are soaring. At NABC, we see this as a focal point; a document is planned to help bring visibility to, and generate traction for, this important area. Efforts are ongoing in Canada in the same vein, because budgets are going to increasingly be cramped, be limited, by increasing healthcare costs if we don't deal with obesity, cardiovascular disease, diabetes, some cancers, in all of which, agriculture—through input—has a significant role to play.

*Keith Downey (Agriculture Canada):* Something that concerns me is the very high cost of regulation, yet we talk about the small crops that we are going to improve. If those small crops are to be grown in multiple countries then you have to go through that regulation time after time after time, and I see that as a major stumbling block for biotechnology exploitation in the near and long terms.

*Debbie Delmer (Rockefeller Foundation):* With regional harmonization discussions in Africa, people are beginning to realize that small countries just can't afford the delays and the costs. Part of the regional process would be accepting regulatory information that comes from other countries. Also very important for public-sector efforts is having the private sector share their information whenever they can. As I said, the more people deal with this the more sensible they become.

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*Peggy Lemaux (University of California at Berkeley):* In some ways California is a developing country in that we deal in so many smaller food crops. We grow 300 different crops. Of course public perception is also an issue, but as far as regulatory costs are concerned, there's no way the academic sector is going to play a role. I wish it were otherwise, but I don't see a way. We have worked on developing hypo-allergenic wheat—but go to your dean and say that \$3 million will do it. There's no way!

There is an issue regarding something that is eaten five times a day. How often are eggplant, papaya or artichokes, for example, eaten? I hope that we can get around that or the public sector will not play a direct role, and I think we should.

*Peter Welters (Phytowelt, Germany):* Deborah when you were talking about PIPRA<sup>2</sup>, you said that the Europeans are not in there and you want to get them in. Does that mean that the transgenic vectors you are constructing have no freedom to operate in Europe?

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<sup>2</sup>Public Intellectual Property Resource for Agriculture.

*Delmer:* I'm not sure if PIPRA has members in Europe. There have been enquiries about it from institutions in Europe. Discussions have been held with universities and public-sector institutions, so we will devote September 2006 Bellagio Conference to PIPRA. They may not join PIPRA, but they may use it as a model to form their own alliances or a consortium. PIPRA has a couple of Latin American members and one African, and is beginning to pick up some of the CGIAR<sup>3</sup> centers. The Europeans will have to decide whether their IP systems are so different that it would not work to put them together. It's at the discussion stage.

*Yongfei Zhang (Cornell University):* This is a question for Peggy. I'm interested to know what are the major concerns of the public and potato industry regarding GM potatoes? Do you see any signs of change for the near future?

*Lemaux:* It's difficult to know. It requires major players coming forward. A few have come forward and said, "We see a benefit and we're going to put them out there," then failed to follow through. When I first took this job in 1991 I said that the way to win people over is to get McDonald's to use genetically engineered potatoes as French fries. The little kids say, "Mommy we want fries," and she says, "No honey, it's GMO." Then they cry and she gets them the French fries and they're okay and they have ketchup with genetically engineered tomatoes and they are still okay. But the food companies were scared. At some point it's going to work out, but when it's going to happen, I don't know. And I don't know the potato industry like I know the cereal industry. Maybe someone else does.

*Dalia Abbas (University of Minnesota):* This question is for Ralph. How you would construct an economic model that can assess the cost and benefits of agricultural biotechnology? You mentioned it's an important phase. I'm trying to visualize inputs and outputs and I'm trying to find where are the barriers and what are the main inputs there?

*Ralph Hardy (National Agricultural Biotechnology Council):* Well most commercial products in the United States are based on traditional costs, not life-cycle costs. And so, what models that we have experience with have worked? What are their limitations? Where might we improve them? I also said that we need to refocus to maximize public good, not necessarily to maximize economic return to the inventing institute or to the inventor. The public paid for the research, therefore the public should benefit most from the research—that should be the priority.

We had a presentation a couple of years ago from the inventor of virus-resistant papaya<sup>4</sup> and that was an example that was totally done within the public sector. Surprisingly, the cost through the regulatory hoops was significantly less than a million dollars. That's one of the models that I'm surprised we haven't used more. What relevance does the papaya

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<sup>3</sup>Consultative Group on International Agricultural Research.

<sup>4</sup>Dennis Gonsalvez (2003) The papaya story: A special case or a generic approach? In: Eaglesham A *et al.* (eds.) NABC Report 15, Biotechnology: Science and Society at a Crossroad, 223–230. Ithaca, NY: National Agricultural Biotechnology Council.

story have? It is a small crop, with the research and commercialization within the public sector. They were able to get the genetic materials licensed in Hawaii. Why isn't that story relevant to some of these other areas?

*Lemaux:* Flax is another, done in Canada within the public sector. I've talked to both of those people—Dennis Gonsalves and Alan McHughen—and they believe it is possible. Things have changed. They weren't on the radar screen at the time. They talked to government officials and it went a lot easier. There might be a few other instances where they could get something like that through, but I don't know if it's going to be a generalized model.

*Delmer:* I think Dennis Gonsalves would say that they weren't much on the radar screen at that time. They went to Monsanto and said, "Hey, give us these rights, come on," and the IP negotiations weren't difficult. Regulatory restrictions were minimal for what they needed to do. Now Dennis wants approval to sell in Japan and he's had to jump through a lot more hoops. But he thinks—or thought—that he will be able to do it; I don't know where it stands now. Maybe Dr. Vijayaraghavan can say something about Indonesia and the Philippines—but the papaya is on the move there. They are optimistic for the Philippines where field trials are expected soon. As I said, there is a new wave. Maybe we've been through the worst.

*Ajay Garg (Cornell University):* Thomas Friedman was on CSPAN being interviewed on his book *The World is Flat*. Since the world is flat I am wondering if there is opportunity for transparency in this genetically modified business. Is it possible to bring together the leaders of agbiotech to achieve transparency in evaluating transgenic material? Can eminent scientists, irrespective of their countries, come together to critically evaluate the technology?

*Wood:* One of Friedman's points is that this type of thing is occurring because the world has gotten so small through communications. He doesn't deal specifically with agriculture, but it's easy to extrapolate from the examples that he gives for industry and academic institutions where exchange of information and resources has just gone wild in such a way that barriers between countries are being broken down. Within industries, one of which of course is the agriculture industry, in the past, we didn't think much about what was going on half way around the world. In contrast, in today's agriculture a smart farmer worries about what's going on around the world, and he has access to the information.

*Delmer:* One of the activities of the Gates Foundation is in putting money into five of the national academies of science in Africa, to try to strengthen the role of science in policy decisions in Africa in much the same way that our National Academies of Science serve as advisors to the government on many issues. That may be close to what you are suggesting. If the academies could be strengthened and their voices heard, it could well be of some help, particularly in these policy decisions.

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*Tony Shelton (Cornell University):* It's interesting that you mention *The World is Flat*. *Bt* cotton moved into India and Roundup Ready soybeans moved into South America because the world is flat. "Stealth" seeds, moved from one country to another, actually forced the regulatory agencies in those countries to address what at least the farmers wanted there. So, the world *is* flat and it's changing things in ways that cannot always be predicted.