GENETICALLY MODIFIED CROPS: THE FOOD INDUSTRY, PRODUCERS, CONSUMERS AND ENVIRONMENTALISTS

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Genetically modified crops have already induced major changes in agriculture. Nevertheless, controversies remain, within the scientific community and among the public, about the impact of biotechnology on farming, consumers, the environment, industry and society.

The future of biotechnology

Kalaitzandonakes asked whether biotechnology would transform the 40 per cent of the world's economy based on biological resources or whether it would simply wither and die. The current debate involves discussion about six 'Ps' – 'perversion, poisons, promiscuity, profit, power and proof – which by their presence or absence have raised serious public concerns. This is partly because the science is not yet equal to expectations. Single-gene transformations (for example, herbicide tolerance and insect resistance) are perceived to have delivered only limited public or consumer benefits. Output or quality trait transformation requires greater understanding of ways of coordinating multiple genes. Ultimately, genomics and bioinformatics may break the codes and enable technologies and products to develop sharply.

A major obstacle, however, is that fragmented, incomplete institutions are incapable of managing the attendant issues, with the result that private regulation remains in control. Bijman agreed with Kalaitzandonakes that institutions were very slow to change, noting a variety of different local and international experiences, distinct cultures and divergent power structures in the USA and EU which have led to different choices. Sylvie Bonny argued that a breakdown of trust in science, biotechnology, industry and governments has contributed to the divergent approaches. According to Beusmann, biotechnology has created an 'institutional vacuum', into which a number of agents have moved. In the EU, public interest groups, such as Greenpeace, have attempted to broaden the public choice debate, proposing that biotechnology is only one of the many technologies that could contribute to a future for agriculture that meets multifunctional needs. Jacques Loyat agreed, noting that the European Parliament, in particular, has used this issue as a means to increase its power

generally. Peter Feindt suggested that new models of public involvement, such as citizen juries, might be appropriate.

Phillips stated that Canada, as a major exporter but lacking any national champions in the biotechnology industry, provides some alternative approaches to the US/EU focus. The debate centres on the risks associated with novel traits, rather than those of technology as such, and is associated with efforts to build international consensus about regulatory standards and broaden public dialogue. Traditionally, this was done through such groups as Greenpeace, more recently through a major effort to develop a voluntary labelling system. The Canadian Advisory Committee has also broadened public dialogue. Bijman observed that in Europe 'people' believe that they can and should control the new technology, though greater acceptance of private management and regulation prevails in the United States.

Public–private partnerships

Phillips observed that extended intellectual property rights, while providing incentives for private research, have generated concerns about the freedom to operate among many public and private researchers. While monopolistic exploitation is possible, the greatest impediment to R&D and new partnerships may be the attendant costs of protecting and transferring proprietary technologies and information. Kalaitzandonakes presented evidence that the practices of public–private partnerships in the USA and EU vary markedly. US relationships tend to be bilateral, while EU-based partnerships are denser, with more multiple partners, often extending offshore. Recently, there has been some convergence between these models.

Concern that the public sector role may not be well defined in many partnerships was expressed by Bijman, leading to debate about possible 'public' activities that have been pushed out. Bonny pointed out that public sector scientists, connected with private programmes through contracts, may lose their objectivity, or at least be perceived to have done so by the public. As a result, there may be nobody who can act as an honest broker in public discussions. John Miranowski raised the question of the cost and availability of reliable information, which is effectively a 'public good' problem. Furthermore, a number of participants suggested that efforts may shift away from basic research in search of patents and profits. Phillips noted that the structure of the partnerships may matter most. Bilateral, fee-for-service partnerships can reduce the public good while pre-commercial, non-competitive research into platform technologies may enhance public benefits. Miranowski noted that some public institutions might be more effective than others. He suggested that the CGIAR system had significant potential to act as a partner/agent to transfer new technologies into developing countries. Beusmann concluded by stressing the need to use different models and approaches as a source of learning.

Industrial structure

Discussion of intellectual property rights inevitably extends into debate about industrial structure. Miranowski argued that strong patents are a type of insurance which can foster consolidation between companies (for example, Delta and Pine Land and Monsanto). Kalaitzandonakes, however, countered with the view that weak patents can actually be a spur to consolidation in the input sector. Nevertheless, he argued that, because the input industry represents only about 6 per cent of value added in the American agri-food industry, it is being driven by the increasingly oligopolistic retail sector. Bijman concurred, noting that, in the EU, four or five companies already control 50–60 per cent of the market. The rise in private labels, consumer concerns about product quality, output trait products and industrial protocols will continue to be the driving force with the prospect of there being only three global retailers in a few years (Ahold, Carrefour and Walmart).

The retail chains and the food processors will, therefore, determine the fate of GM crops. For instance, the Dutch dairy industry has signalled that it will reject GM feeds if there is consumer opposition. While Shiva Makki felt that this would not necessarily be a problem, Phillips argued that producers, especially those smaller operators outside the new chains, could lose. Bill Kerr noted that it is an already established trend. Kalaitzandonakes countered by suggesting that some farmers might win as a result of bilateral dependency in the chains. Miranowski also noted that chains are likely to be unstable, with few switching costs, which should provide more power to producers; he suggested that we should use game theory to determine which situation is likely to occur. Vinus Zachariasse argued that switching costs could rise if labelling for production and processing methods is implemented (for example, setting up and using audit systems has significant sunk costs).

Conclusions

Beusmann expressed the desire for better communications to build a new base for credibility. Bijman agreed, though he viewed the basic problem as one in which the new, global, biotechnology market has not been matched by effective global institutions. Kalaitzandonakes also agreed, but offered the observation that effective institutions will not be forthcoming quickly, with the result that market-based management will continue to organize the introduction and adoption of new technology.