FOOD INDUSTRY WORKSHOP RECOMMENDATIONS

Recommendations to help create new market opportunities for agricultural biotechnology products include:

- *Increased Public Input and Awareness: It was agreed that most importantly, increased public input and awareness must occur. Consumers must be kept informed and provide input in areas such as directions for public research for biotechnology products and processes, regulatory progress and issues, and methods for prevention of unintended consequences resulting from use of these products.*
- *Ensure That Industry Take Clear Responsibility for Risk: Participants also recommended that some mechanism be established for industry to better internalize the risk and establish improved accountability should negative consequences occur, such as the medical device industry in the case of breast implants.*
- *Establish Competitive Research Consortia: Establishment of competitive research consortia to share and leverage knowledge and expertise was felt to be a recommendation that would be successful for the industrial development of new products and processes.*
- *Allocate Monies to Examine Social, Ethical, and Legal Issues: Several participants felt that public and private research and development should include an allocation of monies to examine the social, ethical, and legal issues surrounding the topic, as is being done in the Human Genome Project.*

In preparing for a new model of agriculture and food production, the question of what the farming model will look like in 15-20 years needs to be considered. Will it be more highly industrialized with a small number of multinational conglomerates controlling agriculture and producing the bulk of the food supply? Will the small-to medium-size farming operation survive and thrive? Participants expressed the view that farmers can best prepare for the future by:

- *Staying Informed: Farmers must educate themselves on the technologies available as well as the political and regulatory climate that exists, and keep up to date on current and anticipated impacts and opportunities.*
- *Get Involved: The voice of the farming community is becoming unified and will gain effectiveness as the numbers of those involved increases. Participation in the political and developmental process is a necessity.*

- *Consider Alternatives: If vertical integration does occur, farmers must be prepared to seek alternative ways to survive and thrive. These include teaming up to form co-ops or other partnership operations that can compete with large industry, and developing production and distribution alternatives such as community shared agriculture (CSA) and organic farming.*

The Pharmaceutical Industry Workshop explored similar issues but concentrated on the newly emerging relationship between agriculture and the industry and the special problems of dealing with emerging markets, possible consumer concerns over agriculturally based pharmaceuticals, and the economic implications of bridging the gap that has existed between agriculture and pharmaceuticals.

PHARMACEUTICAL INDUSTRY WORKSHOP RECOMMENDATIONS

The group's recommendations include:

- *Develop educational instruments to improve the level of awareness in the public, the media, the farming community, and the pharmaceutical, food processing, and retailing industries.*
- *Information materials must describe the intent, benefits, risks, and risk management mechanisms.*
- *Regulatory change should be considered to meet increasing consumer demands for access to the functional food category.*
- *NABC member institutions should promote workshops and other related activities for dialogue between the agri-food and health care communities, academics, and the public.*
- *Participation of industry representatives at NABC meetings should be encouraged.*
- *NABC member institutions should encourage graduate students and post docs to attend NABC meetings by covering their costs.*

Participants in the Environmental and Energy Workshop discussed the ramifications of both immediate and long-term examples of harnessing agricultural biotechnology to new environmental and energy-efficiency objectives. They also explored the public's willingness to change lifestyles to improve the environment and the numerous economic issues that will affect the expanded connections between agriculture and this rapidly growing sector.

Environment and Energy Industry Recommendations

Recommendations to help create new market opportunities for agricultural biotechnology products that are beneficial to society include:

- *Develop strategies that represent a balance of broad perspectives based on inputs from the major stakeholders (public interest groups, industry, government, scientific community, farmers).*
- *Encourage government to take the lead in framing an approach to developing novel products (e.g. alternative fuels to replace petroleum-based fuels) that reflects long-term considerations, taking into account implications for the economy, the environment, national security, and other relevant issues.*
- *Develop educational programs at all levels from K-12 to professional schools and continuing education — emphasizing critical thinking, systems frameworks, full cost accounting and life cycle analysis, societal trade-offs (both current and intergenerational), and communication of complex issues in science and technology.*

Recommendations to use public opinion most effectively to shape decisions about new products via biotechnology include:

- *Develop a two-way system of education and communication on public issues, involving citizens' advisory groups early in the process, and giving the public a greater sense of control over the decision-making process.*
- *Devise new mechanisms to convene together diverse sectors (e.g. farmers, environmentalists, consumers, etc.) with a neutral convener in a community-based setting*
- *Document success stories and highlight positive benefits to society on environmental and energy-related products, and organize a balanced presentation of facts and societal trade-offs.*
- *Conduct more research on how to communicate with the public and how to bridge the gap between information and attitudes and behavior.*
- *Prioritize what products should come on-line first.*

A number of measures can be taken to better prepare farmers for new opportunities in this time of transition.

- *They can better inform themselves by taking advantage of educational opportunities and by becoming computer literate to be in a position to receive electronically transmitted information and use computer-based technology.*

- *The extension system needs to be broadened to encompass an expanded client base and to include new technology and production and marketing opportunities.*
- *Farmers should join with industrialists, financial institutions, environmentalists, consumer groups, universities and government — to develop a vision for the new agriculture and set a national agenda that takes into account broad views of benefits and costs to the industry and to society.*
- *Farmers should develop cooperatives for investment in new technologies and to create new products (e.g. Ocean Spray, Ontario Federation of Agriculture); such cooperatives may have a greater chance than large corporations with consumer acceptance of new and novel products.*

Finally, the Group identified new partnerships that need to forged.

- *Agricultural cooperatives need to be formed, facilitated by government and universities, and focused on new visions and common goals.*
- *Alliances need to be formed among farmers, industry, environmentalists, and consumer groups in neutral settings provided by universities and the nonprofit sector.*
- *Universities and farmers need to develop new relationships for research and extension based on new realities and market-driven strategies.*
- *New industry/government partnerships need to be formed that are incentive-driven, that facilitate technology assessment and transfer, and that maintain access to technology and capital by small/independent farmers as well as large corporations.*

In summing up the conference, Paul Thompson, of Texas A&M University, stressed the importance of trust in achieving a positive synergy between industry and public interest organizations. For this to work, both parties must accept the fact that they each have power but that it can only be exercised with constraint. Paul underlined the role of NABC conferences in facilitating "reflection over science and its impact on our future." He projected a hopeful future for this meeting's novel products.

For readers unable to benefit directly through participation in the give-and-take of these workshops, the reports, on pages (23–44), provide an overview of the multiple facets of the issues that were discussed. In the best of worlds, these reports will serve as a springboard for wider dialogues about exciting yet challenging Novel Products and New Partnerships.