The cover illustrates US and Canadian biosources—corn, perennial grasses and woody crops—for conversion to liquid transportation fuel in rurally located biorefineries. The relative sizes of the photographs of the crops, corn at 25% and biomass crops at 75%, depict their expected relative future importance when commercial technology is fully operational for biomass feedstocks. All of the biofuel sources recycle carbon, but, as indicated by arrow size, the perennial low-input biomass crops are more efficient than is high-input corn. The CO₂ “roof” represents the greenhouse-gas effect.

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The Biorefinery in New York, Lyonsdale Biomass LLC, Lyons Falls, NY. Photograph courtesy of Catalyst Renewables Corp.
Agricultural Biofuels:
Technology, Sustainability and Profitability

Proceedings of the nineteenth annual conference of the National Agricultural Biotechnology Council, hosted by South Dakota State University, Brookings, SD, May 22–24, 2007

Edited by
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Published by the
National Agricultural Biotechnology Council
Ithaca, New York 14853
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Library of Congress Control Number: 2008922322
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NABC Report 6, Agricultural Biotechnology and The Public Good (1994)
NABC Report 13, Genetically Modified Food and the Consumer (2001)
ACKNOWLEDGMENTS

NABC’s nineteenth annual meeting—Agricultural Biofuels: Technology, Sustainability and Profitability—was hosted by John Kirby at South Dakota State University (SDSU), Brookings, SD, with administrative assistance from Kevin Kephart and Gary Lemme, to all of whom we are most grateful for a highly successful conference.

Thanks are due to the members of the organizing committee1 for an excellent agenda and first-rate choice of speakers: Janean Caugherty, Ken Daschiell, Jim Doolittle, Bill Gibbons, Van Kelley, John Kirby Padu Krishnan, Kasiviswamanathan Muthukumarapannan, Jennifer Pickard, Kurt Rosentrater, Sandy Rusten and Emery Tschetter.

Seamless operation of the proceedings resulted from the excellent efforts of the following:

Banquet and Luncheon Master of Ceremonies  Gary Lemme.

Moderators  Ken Daschiell, Van Kelly and John Kirby.


Workshop Recorders  Theron Cooper, Basil Dalaly, Jose Gonzalez, Jim Julson, Joan Kreitlow, Tyler Remund, Lisa Tenlep and Tom West.

Drivers  Abby Bartosh, Vyku Ganesan, Derek Hereen, Brett Hofer, Chenchiah Marella, Josh McCarthy, Nick Michael, Louis Muench, Tim Nath, Sri Pasikanti and Seth Swanson.

Agricultural Heritage Museum/Auditorium and Audio-Visual Support/Photography/Program and Signage/Registration  Janean Caugherty, Smita Chandraa, Liz Christianson, Wendy Cradduck, Barb Hartinger, Bill Lee, Jay Meyers, Paul Mobley, Terry Molengraaf, Andrea Olson and Emery Tschetter.

Tours  Jena Carsrud, Ken Dashiell, Wade French, Darrell Grandbois, Mike Hoium, Kraig Kruger, Mike Lockrem, Jeff Loutsch, Ryan McMillan, Sharon Nichols, Chad Nielson, Deb Patterson, Joe Pikul, Max Pravecek, Annette Redepenning, Walter Riedel, Angela Rohweder, Kurt Rosentrater, Rylene Telkamp and Meredith Thompson.

Barbecue  Amanda Knorr, Tanner Machado, Josh McCarthy, Louis Muench, Tim Nath and Jenny Thurlow.

Thanks go to ICM, the North Central Sun Grant, South Dakota Certified Beef, the South Dakota Corn Council, the South Dakota Pork Producers Council, POEt and VeraSun for defraying costs of meals and refreshments, and to USDA-ARS for programmatic support. And we owe a debt of gratitude to Susanne Lipari for guidance and assistance behind the scenes.

On behalf of NABC, we thank Tony Shelton for exemplary leadership as NABC’s chair for 2006–2007.

Ralph W.F. Hardy  Allan Eaglesham
President  Executive Director
NABC  NABC

December 2007

1RWFH and AE also served on the organizing committee.
When the National Agricultural Biotechnology Council was established in 1988, its goals were the early identification of agricultural biotechnology issues and their discussion in an open forum; the safe efficacious and equitable development of the products and processes of agricultural biotechnology; and the development of public-policy recommendations. Today, with a membership (page v) that includes most of the leading not-for-profit agricultural research and educational institutions in Canada and the United States, NABC continues to strive to identify and consider in open forum the major issues, and provide all stakeholders—including representatives from academia, government, industry, public-interest groups and farming—the opportunity to speak, to listen, and to learn. Through its meetings, NABC has addressed topics of major current concern (see page v): sustainable agriculture in 1989; food safety and nutritional quality (1990); social issues (1991); animal biotechnology (1992); risk (1993); public good (1994); gene ownership (1995); novel products and partnerships (1996); challenged environments (1997); gene escape and pest resistance (1998); food security (1999); the future biobased economy (2000); genetically modified food (2001); integration of agriculture, medicine and food for human health (2002); societal acceptance of biotechnology (2003); international issues (2004); human and environmental health (2005); and economic growth (2006).

In 1998, the NABC council issued a *Vision Statement* for agriculture and agricultural research in the twenty-first century. It envisions improved food, feed, and fiber, but most importantly sees agriculture expanding into energy, chemicals, and materials. This bio-based economy, balanced with a reduced fossil-based economy, is projected to contribute to national security, sustainability, minimization of global climate change, expanded farmer-market opportunities, and rural development. In 2000, the NABC’s twelfth annual meeting, hosted by the University of Florida, Gainesville, in Orlando, FL, focused on these opportunities. It was the first discussion to explore benefits from, and concerns about, the biobased economy. From that meeting grew the annual *World Congress on Industrial Biotechnology and Bioprocessing: Linking Biotechnology, Chemistry and Agriculture to Create New Value Chains*, the fourth of which convened also in Orlando, March 21–24, 2007, co-organized and sponsored by the Biotechnology Industry Organization, the American Chemical Society and NABC. And in 2007, NABC issued *Agriculture and Forestry for Energy, Chemicals and Materials: The Road Forward*, an updated and expanded version of the *Vision Statement* that describes opportunities for agriculture and forestry to be the basis for a hybrid bio-/petro-based economy with 100+ billion gallons of transportation fuel and value-added chemicals and materials produced from domestic biomass, and a structure for attainment.

Biofuels—currently a hot media topic—provided the focus for NABC’s nineteenth annual meeting. Hosted by South Dakota State University, *Agricultural Biofuels: Tech-
The NABC-19 plenary presentations—eighteen in all—addressed underpinning and ancillary issues of the production of transportation fuels from agricultural and forestry biomass nationally and internationally, including agronomic sustainability, impact on food production, technological constraints, co-products, and economic and policy issues. The modules were titled as follows.

- **Sustainability: Impacts and Issues**
- **Technology: Biomass, Fuels and Co-Products**
- **Economics and Sustainability**

Leaders from academia, industry, dairy farming, federal agencies, and public-activist groups shared their views with an even more diverse group of attendees. In all, 110 delegates participated. As is traditional for NABC meetings, participants convened also in smaller breakout groups to discuss issues raised in the foregoing plenary sessions and to make recommendations to policymakers.

Plenary and breakout sessions were held on the afternoon of May 22 and on the mornings of May 23 and 24, and the afternoon of May 23 was devoted to excursions by bus. Participants had the opportunity to visit a 2,000-head dairy-farm biodigester in Milbank, the VeraSun ethanol plant in Aurora, the USDA-ARS North Central Agricultural Research Laboratory in Brookings, or the Farm Service Agency’s Natural Resources Conservation Service Farm in Brookings. There was strong consensus that the tours were enjoyable as well as instructive, demonstrating the 2007 reality of biofuels and related activities.

To increase graduate-student participation at NABC conferences, the *Student Voice at NABC* initiative was launched in Brookings. NABC offered $500 grants to one graduate student delegate (GSD) from each member institution to assist with travel and lodging expenses, with the registration fee waived. The GSDs were expected to attend all NABC-19 sessions and workshops and meet as a group on the evening of May 23 to identify current and emerging issues in agricultural biotechnology, including biofuels.

This volume contains summaries of the plenary/banquet/luncheon presentations and of the workshop discussions, provides full transcripts of Q&A exchanges involving the speakers and audience members and the *Student Voice* report.

In 2008, NABC 20—*Reshaping American Agriculture to Meet Its Biofuel and Biomaterial Roles*—will be hosted by the Ohio State University in downtown Columbus, OH, June 3–5. This conference will further explore the “agricultural biofuels” theme of NABC 19 with examination of trends and policies; impact of using crops as renewable energy resources; and how to derive value from generated co-products. Keynote speakers will address four sessions followed by response panels presenting contrasting viewpoints:

- **Megatrends Reshaping American Agriculture**
- **Optimizing the Value of Co-Products/By-Products**
- **Enhancing Productivity of Biofeedstocks**
- **Policy Issues Impacting Agriculture and Bioenergy**

More information on NABC 20 may be obtained in the spring 2008 issue of *NABC News* (http://nabc.cals.cornell.edu/newsletter/NABCnews_current.pdf).
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