

BioEconomyUpdate

Winter 2006

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Volume 4.1

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Debate Sparks Discussion

In November 2005, Bruce Dale, professor of chemical engineering at Michigan State University, and Tad Patzek, professor of civil and environmental engineering at the University of California-Berkeley, debated the energy balance of ethanol and other biorenewable fuels at Iowa State University. The Forum on the Sustainability of Ethanol drew more than 200 people interested in learning more about the issues of biomass and biobased fuels.

The invited speakers both conduct research in the areas of biobased fuel production, but have differing opinions about the outcomes of using biobased fuels. Patzek is the author of two recent papers examining the thermodynamics of corn ethanol production and the sustainability of corn ethanol and soy biodiesel production, and is an ethanol critic. Dale, on the other hand, is involved in research that seeks to increase the efficiency of corn ethanol production.

Patzek opened the debate with a discussion of the energy balance of fossil and biorenewable fuel energy. According to him, ethanol has a negative energy balance and, therefore, will not solve the oil crisis. "Americans use 105 times the amount of energy we really need," he said. Rather, he



Bruce Dale (right) answers a question about the sustainability of ethanol.

explained, Americans need to practice energy conservation.

In response to Patzek's presentation, Dale agreed that the nation must become more efficient. However, he stated that not all fuels are equal and should not be considered equal when discussing energy balance. During his rebuttal, he promoted the idea of furthering research in using perennial grasses for biomass and continuing to conduct research and comparisons between biore-

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BIOWA Hires Ott as New Director



Michael Ott

BIOWA Development Association recently hired Michael Ott to serve as its Executive Director. He started his role on October 31, 2005, and fills the position which was temporarily held by Jill Euken, Iowa State University Extension.

As part of his new position, Ott is helping BIOWA reach their goals of creating at least ten regional biorefineries across the state by the year 2020, building five biobusinesses or expanding those in existence each year beginning in 2005, and providing investment opportunities for Iowans in these refineries and businesses.

Ott will be responsible for helping biobased companies partner with banks and venture capitalists to establish biorefineries in Iowa. He also will work to recruit new members and partnerships, and connect entrepreneurs with producers, lawyers, or accountants as needed.

"One example of a partnership I hope to establish is a company that uses egg shells to produce collagen, which can be used for lip enhancement injections or in cosmetics and pharmaceuticals," Ott explained. "This company recycles the egg shells that another

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Alliance Works for Economic Growth

In 2003, the Iowa Department of Economic Development commissioned a study by the Battelle Memorial Institute that resulted in a report which emphasized the incredible promise for Iowa's dominance in seven areas of plant, animal and human bioscience. Following the report, the Iowa Department of Economic Development formed the Biosciences Alliance of Iowa which is steering the development of the economic potential of these areas.

The seven bioscience platforms reinforce Iowa's status as a world provider of food, new ways to enhance human health, and new sources of energy. The Alliance has already begun to support four projects recommended for funding by both the business community and the universities.

The creation of a Human Nutrition Wellness Center at Iowa State University will allow existing Iowa companies, commodity groups and university researchers the opportunity to collaborate on projects to evaluate foods and nutritional supplements on human health.

A new High-Throughput Animal Model Facility at the University of Iowa will provide both large and small animal researchers at Iowa and Iowa State the op-

portunity to create and characterize animal models of human diseases.

The third investment by the Alliance is in equipment for the University of Iowa proteomics capabilities. A noted leader in the field, the University of Iowa has an opportunity to bring new companies to Iowa.

The final project approved for funding, in conjunction with ICM and Genencor International, is a feasibility study on the launching of a corn-based biorefinery in Iowa. The objective of this project is to build in Iowa the nation's first fully integrated, corn-based biorefinery. Such a biorefinery will turn corn starch, corn fiber, distillers dried grains and corn stover into ethanol and other biobased products.

For more information on the Biosciences Alliance of Iowa, contact Karen Merrick at (515) 242-4833 or karen.merrick@iowalifechanging.com.

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Ott Named BIOWA Executive Director

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company would previously have paid a substantial amount of money to dispose. It's an example of how one company's trash can be turned into a high-value product by another company," he said.

Ott is also charged with establishing ethanol and biodiesel biorefineries in Iowa. A biorefinery, as defined by BIOWA's Web site, www.biowa.us, is a synergistic cluster of biobased industries producing chemicals, fuels, power, products and materials.

BIOWA members can benefit from the partnerships that Ott is helping create, and increased membership in the organization will allow for more partnerships and, potentially, new job markets. BIOWA also serves members by establishing common healthcare and retirement packages so small companies can work together to secure preferential treatment usually reserved for larger companies.

Patzek and Dale Debate Energy

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newable and fossil fuels to make sound energy decisions.

Following the presentations and rebuttals, the audience was encouraged to ask questions and enter the debate. Numerous Iowa State students and others asked questions about the science that was presented and about new research programs in the area of biomass fuels.

"This forum was an important step toward the resolution of the issues surrounding energy balance and biorenewable fuels," Lawrence Johnson, director of the Center for Crops Utilization Research, said. "The resolution is important to our future and the future of energy in our country." Jean-Luc Jannink, assistant professor of agronomy at Iowa State, served with Johnson as moderators of the event.

The Forum on the Sustainability of Ethanol was co-sponsored by the Graduate Program in Sustainable Agriculture and the Office of Biorenewables Programs at Iowa State.

A Closer Look: McCord Consulting Group

Sam McCord, along with his wife Mary, is working to build marketplaces for biomass in the plastics industry. In fact, his consulting firm, McCord Consulting Group, Inc., was awarded a BioEconomy Working Group grant in 2005 to study the feasibility of blending switchgrass with plastic resins.

“Right now we have the business and marketing plan complete for this project and we are just entering the second round of testing,” he said. Upon receiving the grant, McCord worked with Randy Lewis of P.R. Lewis Consulting to conduct tests on how switchgrass behaves under certain conditions. Those tests produced a vast amount of information about switchgrass including that it can be used in polypropylene and polyethylene as an additive. “The grant was extremely useful in getting the testing started. However, we now need further testing to build on the information we currently have,” McCord said.

In order to find a testing firm to handle the second, and more intensive, round of research, McCord first looked at who uses plastics. Through a contact he has at Maytag, a large user of plastics, McCord was connected with the Matrixx Group in Evansville, Indiana. The group, according to its Web site, “supplies the plastics industry with high quality compound products.”

“I fully expect the Matrixx Group to take this research to a higher level,” McCord said. “We need a sound idea of the properties of switchgrass so we can begin



Switchgrass, shown here at harvest, may be the next filler used in plastics.

to develop specification sheets for manufacturers engaged in injection molding.” He considers this move to advanced testing a “huge step” toward meeting the goals of the project.

Ultimately, McCord hopes the project results in the specification sheets for plastics companies. The switchgrass being tested, and potentially kenaf, can work as filler for companies that create plastic products through injection molding. “This is really exciting. We have already found that the switchgrass has tendencies to work in molded plastics. We have also discovered that kenaf adds strength for thermoforming and extrusion methods,” McCord said.

In addition to lowering the costs of producing the plastics, using natural fibers such as switchgrass and kenaf can directly benefit the environment. “Currently, switchgrass is used in many farm applications including fighting erosion. By harvesting the switchgrass each year and processing it for use in plastics, we are giving the farmers another revenue stream,” McCord said.

In addition to McCord’s work with natural fibers, he is the Vice President of the Society of Plastics Engineers. This position has helped McCord connect with numerous organizations that are interested in using biomass in their plastics applications. “We have a number of potential clients who have approached me about this idea. Once the testing is done, we really can begin to move forward and get companies the materials they are asking for,” McCord said.

As the switchgrass project continues, and McCord’s business grows, he is looking forward to a prosperous year full of exciting projects. “We are preparing another proposal to continue the switchgrass work as well as expanding our business and client base.” He currently represents Prairie Land Enterprises, LC, and the Kenaf Growers Association.

Through his work with the kenaf organization, McCord is building a marketing plan for the fibrous crop to also be used as filler for plastics. “We really stay busy. Right now we are working with about five other consultants to share resources and meet our customers’ demands,” McCord said.

For more information about McCord Consulting Group, Inc., and its on-going projects, please visit the group’s Web page at <http://www.mccordgroup.com/>.

Project Supporters

The BioEconomy Working Group is a working group of the Value Chain Partnerships for Sustainable Agriculture (VCPSA) project funded by the W. K. Kellogg Foundation at Iowa State University. Financial support comes from five key partners: Leopold Center, Iowa Energy Center, NatureWorks, BIOVA, and the US Department of Energy.

Dartmouth Students Visit Iowa's Growing Bioeconomy

Students from Dartmouth College recently visited Iowa to learn more about the bioeconomy, biomass production and biofuels plants. While here, the group met with leaders of ethanol plants, spoke with experts regarding biomass production and processing, and toured a feedlot to discuss Distiller Dried Grains with Solubles.

"This was an exciting trip for these students. They are all very interested in biomass and the growing bioeconomy and they felt that Iowa was the place to learn more about this emerging field," Jill Euken, extension specialist said. "We were able to show them the full view of the bioeconomy from the biomass in the fields to the byproducts being used by cattle."



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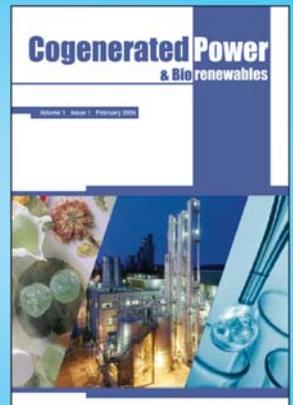
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Funding for the **BioEconomyUpdate** is provided by the W.K. Kellogg Foundation

BioEconomy Update

Facilitated by ISU Extension and CIRAS

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