CCUR affiliates awarded Grow Iowa Values Fund grants

Mike Krapfl, News Service

A grant from the Grow Iowa Values Fund, a state economic development program, will help advance four CCUR-affiliated projects on the Iowa State University campus. Iowa lawmakers agreed in 2005 to appropriate $5 million per year for 10 years to support economic development programs and research projects at Iowa’s Regent universities. This year’s funding was cut by 20 percent to provide additional state money for flood relief.

This is the fourth time Iowa State has awarded competitive grants from the Grow Iowa Values Fund. The grants are to go to research projects with high potential to boost the state’s economic development efforts. The grants in this year’s competition total $945,246 and range from $25,121 to $171,499.

Center for Crops Utilization Research affiliates with projects awarded Grow Iowa Values Fund grants at Iowa State this year are:

$143,814 to Atul Kelkar, professor of mechanical engineering; and Brent Shanks, professor of chemical and biological engineering. They’re working with Innovative Energy Solutions Inc. of

New CCUR pilot plant manager hired

Dr. Hui Wang started duties as pilot plant manager on December 1, 2008. He comes to Center for Crops Utilization Research from Dr. Toni Wang’s lab where he was a postdoctoral research associate working on food and biobased products technologies.

Wang has five years of food processing experience with Nestle, Ting Hsin International Group, and Goodman Fielder International. His recent work experience includes one year as research and development manager at Pioneer Snacks in Mankato, Minnesota, and one year as postdoctoral research associate conducting research on the development of new corn biorefining strategies, modified soybean protein, and biorenewable wax materials. Wang has 10 publications and four intellectual property disclosures.

“I am very excited about this new job,” said Wang. “My short-term goal is to offer value-enhanced services to anybody interested in using CCUR facilities, whether they are university faculty members or industrial clients. My long-term goal is to help build CCUR into a world-class platform where engineers, scientists, and entrepreneurs can work side-by-side to develop and commercialize new technologies, adding value to the bountiful harvests of Iowa and beyond. I am itching to get my hands dirty.”

Wang has a B.S. in Food Engineering from the Ocean University of China, Qingdao, Shandong, China; an M.S. in Food Science, Tianjin University of Science and Technology, Tianjin, China; and a Ph.D. in Food Science from Iowa State University where he studied soy protein processing.

When not working, Wang likes to do woodworking, gardening, and camping. He also enjoys driving in the countryside or visiting old towns to see prairie style architecture. Wang lives in Des Moines.

If you have an interest in using the CCUR pilot plant facilities, please contact Dr. Wang at 515-294-3572 or huiwang@iastate.edu.
A conference on the traceability and supply chain management of agricultural commodity products will take place June 9-10, 2009, at the Renaissance Savery Hotel in Des Moines, Iowa. The conference is designed to be a solutions-based meeting highlighting the state-of-the-art in the traceability of bulk commodity goods, including livestock, grains, and fresh produce. Conference topics will focus on:

- Risks and rewards of adopting traceability in business operations
- Standards, legislative actions, and other compliance factors related to traceability
- Tools and strategies to assist businesses in the implementation of traceability protocols

The conference is jointly sponsored by Center for Crops Utilization Research’s Iowa Grain Quality Initiative, the Iowa Beef Center, and Extension’s Value-Added Agriculture Program. Registration will open in March.
Discovery network program features college faculty

Iowa State University experts were highlighted in the Discovery Channel network show “How Things Work: Corn” that aired November 14 and was rerun on January 10. The show examines the history, uses and future of corn in an hour-long look at one of Iowa's greatest resources and the country’s most versatile crop that can be turned into everything from fuel to plastic to life-saving medicine. The show uses Iowa State experts to explore the genetic secrets, high-tech labs and hard work that go into transforming this crop into a modern miracle.

Larry Johnson, director of the Center for Crops Utilization Research; Kendall Lamkey, chair of the Agronomy Department; Pat Schnable, associate director of the Plant Sciences Institute; and Mark Millard, curator at the Plant Introduction Station all help explain the history and role of corn and how it continues to evolve during the hour-long program. The series examines everyday phenomena and explains the history and future of them and how they affect everyday life. Video clips from the show can be viewed online.

Fluorescent corn components suggest processing improvements

Ed Adcock and Brian Meyer, Agriculture and Life Sciences Communication Service

Researchers at Iowa State University have used a Nobel Prize-winning genetic technology to expand the understanding of milling corn.

When corn is milled, or ground, its three primary tissues combine. That complicates matters for end-users who want separate parts, such as the protein- and oil-rich part for feed or the starch for making alcohol.

If only the embryo, starch-rich endosperm or the pericarp covering the kernel could be made to stand out in the ground corn it would be easier to select the tissues of interest. Scientists did just that by developing tissue markers for transgenic corn lines using green fluorescent protein (GFP).

Geneticist Paul Scott, who works in the U.S. Department of Agriculture’s Agricultural Research Service (ARS) Corn Insects and Crop Genetics Research Unit located at Iowa State; Lawrence Johnson, director of the Center for Crops Utilization Research; Kan Wang, director of the Plant Transformation Facility; Charles Glatz, professor of chemical and biological engineering and former interdepartmental genetics graduate student Colin Shepherd, teamed up for the corn project.

“We developed a tool to allow us, for the first time, to quantify directly the amounts of germ (embryo) and endosperm in milled products,” Johnson said.

Previously, an analysis was indirect; based on oil content. Researchers assumed that most of the oil is in the embryo. The direct measurement using the GFP technology made it possible to more accurately measure contamination of these tissues in the different milled products.

“Once you have a means to measure the different parts then you could use the data to improve the

REG researching algae oil for biodiesel

The Des Moines Register featured a story about the Renewable Energy Group (REG), a Center for Crops Utilization Research industry incubator resident. The story highlighted REG's new process that extracts oil from algae for use in the production of biodiesel. Glen Meier manages the group conducting the algae research at CCUR. REG estimates the process is three to five years away from providing the oil necessary to make enough biodiesel to supply the nation's trucking industry. REG owns biodiesel plants in Ralston and Newton, Iowa, and operates plants at Algona, Farley, Wall Lake, and Washington, Iowa, as well as in Glenville, Minnesota, and Houston, Texas.
Quisenberry named Iowa State vice president for research and economic development

Annette Hacker, News Service

Sharron Quisenberry, professor of entomology and dean of the College of Agriculture and Life Sciences at Virginia Tech, Blacksburg, is Iowa State University's new vice president for research and economic development.

Quisenberry will join ISU on April 1, 2009. She succeeds John Brighton, who retired from the university last spring. Ted Okiishi, professor emeritus of mechanical engineering, has served as interim vice president for research and economic development.

“Sharron Quisenberry brings outstanding vision and talent to the position of vice president for research and economic development,” said ISU Executive Vice President and Provost Elizabeth Hoffman. “We are very excited she will be coming back to the Iowa State family.”

Quisenberry has been agriculture dean at Virginia Tech since 2003. Previously, she was dean of agriculture, director of the Montana Agricultural Experiment Station, and professor of entomology at Montana State University, Bozeman. From 1995 to 1999, Quisenberry headed the Department of Entomology at the University of Nebraska, Lincoln. She also has served on the faculty of the University of Idaho, Moscow; and Louisiana State University, Baton Rouge. She was an assistant professor of entomology at Iowa State from 1980 to 1982.

In 2002, Quisenberry was appointed by President George W. Bush to serve on the Board for International Food and Agriculture Development, a position she held through 2007. Quisenberry is internationally recognized as an expert on plant-insect interactions and plant resistance to insects. She is a fellow and past president of the Entomological Society of America.

Quisenberry received a B.S. Ed. degree in biology (1966) from Truman State University, Kirksville, Mo.; a master of arts in environmental biology (1975) from Hood College, Frederick, Md.; and a master of science (1977) and doctorate (1980) in entomology from the University of Missouri – Columbia.

Bioprocessing Team receives IWA award

The International Water Association has awarded a research team led by Hans van Leeuwen, a professor of civil, construction and environmental engineering and CCUR affiliate, an Honour Award for Applied Research as part of the association’s Project Innovation Award Program. The research team is focused on using fungi to clean up and improve the dry-grind ethanol production process. Other researchers working on the project are Mary Rasmussen, a graduate student in environmental engineering and biorenewable resources and technology; Anthony L. Pometto III, former Iowa State professor of food science and human nutrition who is now department chair of food science and human nutrition at Clemson University; and Samir Khanal, a former Iowa State research assistant professor who is now an assistant professor of molecular biosciences and bioengineering at the University of Hawai‘i at Manoa. They were honored during the International Water Association World Water Congress in Vienna, Austria, on September 10.

van Leeuwen receives the Applied Research Grand Honour Award for his research group’s project, Value-added products from dry-grind corn ethanol stillage by fungal processing introduction.
Bioeconomy debate is the highlight of the Biobased Industry Outlook Conference

MaryAnn Sherman, Bioeconomy Institute

The 6th annual Biobased Industry Outlook Conference at Iowa State University on September 7–10 once again attracted over 700 participants and provided a great opportunity to discuss current research, collaborate on issues facing advanced biobased products and explore climate change adaptation and mitigation innovations.

In addition to track sessions and field tours, the highlight of the conference was the point/
counterpoint plenary session focused on competing processing technologies for producing biofuels; the advantages and disadvantages of food versus non-food feedstocks; and the impact of biofuels on climate change.

When it comes to competing theories and data...

Montalbo-Lomboy and Shrestha receive Iowa State University Research Excellence Awards

Graduate students Melissa Montalbo-Lomboy, Biorenewable Resources and Technology, and Prachand Shrestha, civil, construction, and environmental engineering, each received an Iowa State University Research Excellence Award at fall graduation. The award recognizes graduate students at the time of their graduation for outstanding research accomplishments as documented in their dissertations. The intent of this program is to recognize up to 10% of graduating students who have submitted theses and dissertations. Only eight of these awards were given at last fall’s commencement. Montalbo-Lomboy’s major professors are CCUR affiliates David Grewell, agricultural and biosystems engineering, and Hans van Leeuwen, CCEE, and Shrestha’s major professors are CCUR affiliates van Leeuwen and Tony Pometto, food science and human nutrition.

Bioactive dietary peptides seminar

The Center for Crops Utilization Research and the Department of Food Science and Human Nutrition hosted a seminar given by Dr. Elvira de Mejia, associate professor, Department of Food Science and Human Nutrition, University of Illinois Urbana-Champaign. She presented Chemistry and biology of bioactive dietary peptides on August 12 in the CCUR Technology Transfer Theatre.

Update from Ghana

Tammi Martin, former Center for Crops Utilization Research administrative specialist, began teaching in mid-September for her Peace Corps assignment. She was assigned to teach Information and Communications Technology to freshman and sophomores. Visit Tammi and Chris’ blog to read more about their Peace Corps experience.
MyNetResearch.com recently announced the winners of its inaugural MyNetResearch Doctoral Award Competition. Winners were selected based on the most outstanding and innovative research proposals with the potential to lead to advancements in the authors’ respective fields of study.

Prachand Shrestha, a graduate student in civil, construction, and environmental engineering at Iowa State University, was one of three winners for his research proposal Bio-mimicry: Wood-Rot Fungal Saccharification of Cellulose for Bioethanol. Shrestha receives 2008 MyNetResearch Doctoral Students Award Production. Shrestha’s major professor is Center for Crops Utilization Research affiliate Dr. Hans van Leeuwen. Each winner received a $1,000 research stipend and one year’s free premium membership to MyNetResearch.

“The review committee was impressed by the high caliber of proposals from which we had to select,” said Dr. Simmers, Professor of Management at Saint Joseph's University, a member of the review board. “These awards recognize the best of the 45 submissions. We congratulate the doctoral students and their thesis advisors.”

Iowa State students and staff attend International Diffuse Reflectance Conference

Allison Burgers, food science and human nutrition; Lidia Esteve, agricultural and biosystems Engineering (ABE); and Benoit Igne, industrial and Agricultural Technology were awarded travel scholarships by the Council on Near Infrared Spectroscopy to attend the 14th International Diffuse Reflectance Conference in Chambersburg, Pennsylvania. All three are graduate students with Charles Hurburgh, professor of ABE and Center for Crops Utilization Research affiliate.

Igne and Hurburgh placed second in the graduate student division of the poster competition with Particle Swarm Optimization for Variable Selection – A Strong Competitor to Genetic Algorithms. Connie Hardy, Value-Added Agriculture Extension; Glen Rippke, ABE; and Hurburgh were awarded second place in the scientist division of the poster competition with Methods of Calibrating NIRS Sensors when Biological Parameters are Correlated: The Case of Maize Amino Acids.
Chad Laux, Gretchen Mosher, and Charles Hurburgh were the recipients of the 2008 Best Conference Paper given at the annual meeting of the National Association of Industrial Technologists for the paper *Food traceability using quality management systems to meet the Food and Drug Administration Bioterrorism Act of 2002*. The Best Conference Paper undergoes two levels of peer-review and is chosen as the outstanding paper from over 275 initial proposal submissions. The award was presented at the November meeting in Nashville, Tennessee. The paper accompanied a presentation on the same topic given by Laux and Mosher at the conference. Laux was a Ph.D. student with Hurburgh, Center for Crops Utilization Research affiliate and ABE professor. Laux is currently a visiting assistant professor at Purdue University’s Anderson campus. Mosher is a doctoral student in industrial and agricultural technology with Hurburgh.

**Students awarded prizes in Borlaug poster competition**

Jovin Hasjim, graduate student of food science and human nutrition, and Maitri Thakur, graduate student of agricultural and biosystems engineering, were awarded prizes at the Seventh Annual Norman Borlaug Lectureship Poster Competition for Graduate and Undergraduate Students. Hasjim placed first in the graduate student division and received $200 for his poster *Properties and health benefits of a novel resistant starch*. Thakur placed third in the graduate student division and received $75 for her poster *Ensuring food safety through traceability system database modeling in the United States grain supply chain*. Hasjim and Thakur are students with Center for Crops Utilization Research affiliates Jay-lin Jane, FSHN, and Charles Hurburgh, ABE, respectively. Funds for the competition are provided by the Colleges of Agriculture and Life Sciences, Human Sciences and Liberal Arts and Sciences.
CCUR Industry/Stakeholder Advisory Board meets

The Center for Crops Utilization Research Industry/Stakeholder Advisory Board Meeting took place October 6, 2008. The board saw presentations by CCUR affiliated faculty members Sam Beattie, food science and human nutrition, about oleaginous yeast fermentation; Basil Nikolau, biochemistry, biophysics, and molecular biology, about the Plant Sciences Institute biorenewables initiative; and Hans van Leeuwen, civil, construction, and environmental engineering, about the fungal fermentation of thin stillage from dry-grind ethanol production. Chia-Wei Chang, Proliant, gave an overview Proliant's use of the CCUR industry incubator to successfully commercialize new products. The board also reviewed CCUR's past and planned operations as well as the strategic plan.

Contract and Grants


Bio-fuels unit operations course development, Branson Ultrasonics, $3,000, D. Grewell, T. Brumm, and C. Hurburgh.

Soy protein plastics formulation development to reduce water solubility, United Soybean Board, $60,000, D. Grewell, and M. Kessler.

Protein polymer product development, Grow Iowa Values Fund, $78,452, D. Grewell, M. Kessler, K. Rajan, W. Graves, and H. Van Auken.


Protein polymer product development, Creative Composites, $20,000, D. Grewell, M. Kessler, K. Rajan, W. Graves, and H. Van Auken.


Resistant and Slowly Digestible Starch from Cornstarch through Ingredient Processing, Grain Processing Corporation, $40,000, J. Jane.


Integral valorization of bioproduction research and curriculum consortium, University of Arkansas, $14,120, L. Johnson and R. Raman.

Mycotoxin Risks Associated with Ethanol Co-Products from Conventional vs Biotechnology-Derived Corn Grain, USDA, $378,000, G. Munkvold and A. Pometto.

Oil recovery from corn fermentation by-products, FEC Solutions, $7,000, T. Wang, L. Johnson, and A. Pometto.

CCUR Visitors

Ashland, Inc., August 19.


Meg Speer, recipient of the Iowa State Alumni Association National Service Award, and Nancy and Rich Degner, recipients of the George Washington Carver Distinguished Service Award, College of Agriculture and Life Sciences, October 24.

The Barilla Group, November 11.

Northern Technologies International, Inc., December 5.

Kemin Industries, December 12.

AgVentures Alliance, LLC, December 24.

Hungarian University faculty, former Minister of Agriculture, and large scale farm producers, December 30.
about the roles of various types of plant-based fuels in replacing petroleum and reducing greenhouse gases, balancing the demands of feeding the world’s burgeoning population with its appetite for energy raises the stakes for producing, processing marketing and transporting environmentally green biofuels without diverting land from food crops.

The robust debate is just what Iowa State needs to take the lead on the world stage in biorenewable research, according to Monday’s point/counterpoint plenary session moderator, Robert C. Brown, Iowa State University Anson Marston distinguished professor in Engineering, Iowa Farm Bureau Bioeconomy Institute director and director of the Center for Sustainable Environmental Technologies.

According to Brown, “the issues raised at Monday’s plenary session showcased the Bioeconomy Institutes' strategic plan to advance the use of biorenewable resources for the production of chemicals, fuel, materials and energy, while moving toward economic, environmental and social sustainability.”

Brown said, “ISU’s biorenewable initiatives such as the recently announced National Science Foundation Engineering Research Center in Biorenewable Chemicals; the College of Agriculture and Life Science's New Century Farm, and the new Biobased Industries Center, will address the critical business and policy issues facing the emerging bioeconomy.”

Center for Crops Utilization Research was a conference sponsor and co-hosted the event. For additional information regarding the Biobased Industry Outlook Conference visit www.bioeconomyconference.org.

New Century Farm construction update

Construction is well under way at the New Century Farm. The Biomass Processing Facility is expected to be ready for occupancy in May. The Harvesting, Storage and Transportation Facility will be completed in March.

New Century Farm presentations

Larry Johnson gave presentations about the New Century Farm to the Waterloo Rotary Club on September 29 and the Iowa Corn Growers Joint Boards on December 17.