CCUR and OBP host French scientist

The Center for Crops Utilization Research, Office of Biorenewables Programs and Biorenewable Resources and Technology Graduate Program hosted Dr. Carlos Vaca-Garcia, associate professor, National Polytechnic Institute of Toulouse, Toulouse, France. He presented a seminar titled Research in Toulouse on Vegetable Oil Derivatives for the Chemical Modification of Cellulosic Materials. Dr. Vaca-Garcia has special ties to Iowa State University through his collaboration with faculty at CCUR and the BRT graduate program on the EU-US exchange program titled Renewable Resources and Clean Technology.

Making new materials from renewable feedstocks such as soybean oils

Dejan D. Andjelkovic, a graduate student working with organic chemistry professor Richard Larock at Iowa State University, presented at the American Chemical Society’s national meeting in Washington, D.C. Andjelkovic was one of three presenters featured by Michael Freemantle in a Chemical and Engineering News article about the conference. Following are excerpts from the article.

Andjelkovic described how novel rubbers can be prepared from a renewable feedstock: soybean oil. “Recent years have witnessed an increasing interest in biomaterials derived from renewable resources,” he said. One of the major initiatives has focused on utilizing renewable and environmentally benign starting materials obtained from agricultural, animal, and microbial resources for the synthesis of a wide range of bioplastics. Deploying such biodegradable starting materials protects the environment by partially or completely substituting for petroleum-based inputs. Furthermore, Andjelkovic pointed out, polymers made from biorenewable materials have been shown to have properties that are comparable with or better than those of widely used industrial polymers.

“Soybean oil is available in large quantities from soybean oilseeds and represents one of the cheapest and most abundant annually renewable natural resources,” Andjelkovic said. “We have recently shown that a variety of promising new polymeric materials-ranging from soft rubbers to hard, tough, rigid plastics-can be prepared by cationic copolymerization of readily available soybean oils...
Biobased Industry Outlook Conference a success

Over 400 people attended the 2005 Biobased Industry Outlook Conference in Ames, Iowa, on August 29 and 30. The conference, Growing the Bioeconomy, provided participants with a firsthand look at the growing bioeconomy in Iowa and the Midwest. Keynote speakers included Iowa Governor Thomas Vilsack, US Congressman Tom Latham (R-Iowa), journalist and author Paul Roberts and Dartmouth College professor Lee Lynd. Breakout sessions allowed participants to learn about the opportunities for biorefineries, the marketing potential for biobased products and the potential for value-added products from a variety of feedstocks. The conference concluded with optional tours of the kenaf, flax and switchgrass plots at the Iowa State University Agronomy Fields. CCUR co-sponsored the conference.

Paul Roberts, journalist and author, presented the keynote address titled The End of Oil.

Lee Lynd, Dartmouth College, offered his view of biomass’ role in meeting U.S. energy needs.

Iowa State selects new College of Agriculture dean

Wendy Wintersteen, interim dean of Iowa State’s College of Agriculture and interim director of the Iowa Agriculture and Home Economics Experiment Station since August 2005, will permanently serve in these positions effective January 1, 2006.

Wintersteen was selected from a field of five finalists identified through a nationwide search. Labh Hira, dean of the College of Business, chaired the 20-member search committee.

“Dr. Wintersteen has been an exceptional faculty member and administrator in our College of Agriculture, and she will make an outstanding dean,” said Iowa State University President Gregory Geoffroy. “She is very knowledgeable about agriculture, and she has excellent relationships with people throughout the agricultural community. We’re extremely pleased that she has accepted this very important position for Iowa State University and for agriculture nationally.”

Wintersteen succeeds Catherine Woteki, who left ISU last July to become global director of scientific affairs for Mars Inc., McLean, Va.

Prior to becoming interim dean, Wintersteen was senior associate dean of the college and associate director of the experiment station from 2000 to 2005. In other ISU positions (1979 to 2000), Wintersteen was entomology professor; director of extension to agriculture and natural resources; coordinator of pesticide management and pesticide applicator training programs; and extension associate in the entomology department and two extension area offices. From 1989 to 1990, Wintersteen also was acting national pesticide education program leader for the USDA-Extension Service in Washington, D.C.

Wintersteen earned a bachelor of science degree in crop protection (1978) from Kansas State University, Manhattan; and a doctorate in entomology (1988) from Iowa State.

Debunking ag myths

The College of Agriculture and its students shine in “Ag School Confidential,” a feature about the modern face of agriculture education, in U.S. News and World Report’s “Best Colleges” issue.

See www.usnews.com/usnews/edu/college/articles/brief/06iowa_brief.php
Three Belgian students enroll at Iowa State

Krysta Nibe, Office of Biorenewables Programs

Three students from the University of Ghent in Belgium were enrolled for the fall semester in the Biorenewable Resources and Technology graduate program at Iowa State University. Dirk Aerts, Elke Vermoesen, and Miet de Baere were enrolled at Iowa State as a part of the EU/US Curriculum on Renewable Resources and Clean Technology program which was created as a result of a Fund for the Improvement of Postsecondary Education (FIPSE) of the U.S. Department of Education grant.

Upon their arrival in early August, the students were welcomed into laboratories which fit their research interests. Aerts and de Baere were conducting research in plant genetics and molecular biology and Vermoesen was studying environmental engineering. Aerts’ major professor was Basil Nikolau, professor in the Department of Biochemistry, Biophysics, and Molecular Biology. De Baere was working with Professor Eve Wurtele in the Department of Genetics, Development, and Cell Biology, and Vermosen was working with Tim Ellis, associate professor in the Department of Civil, Construction, and Environmental Engineering.

All three were taking courses in addition to their research projects. “The education system is different and the courses are more intensive,” de Baere noted. “The lab hours are much longer and there are more projects.”

Jane receives award from AACC International

Lani McKinney, Food Science and Human Nutrition

Dr. Jay-lin Jane, FSHN professor, has been awarded the 2005 Alsburg-French-Schoch Lectureship Award from AACC International, formerly the American Association of Cereal Chemists. This award, sponsored by the Corn Refiners Association, is the organization’s highest award given every two to four years in recognition of scientists who have made significant and superior contributions to fundamental starch science – specifically for Dr. Jane, the understanding of starch structures and properties. The award was presented to Jane at the association’s annual meeting in Orlando, FL on September 12, 2005.

Jane, whose research interests include biosynthesis of starch and chemical, physical, and enzymatic modification of starch; internal structures of starch granules; industrial utilization; and biodegradable plastics, has been a professor at Iowa State University since 1987. She received her Ph.D. from Iowa State University in 1984 with a major in biochemistry specializing in carbohydrates.

Dr. Jane’s former graduate students presented her with a congratulatory “research” poster where she is featured as the center of the starch structure with current photos of her former students and their families branching off. A personalized handwritten note is included from each of them. In addition, they created a Pringles jar printed with her picture and award. They then presented their former professor with a personalized version of the new product, Pringles Prints, Featuring her photo and other fun messages printed on Pringles chips. Messages printed specifically in her honor included:

• Iowa Starch University
• How many publications does Dr. Jane have? Reverse side: More than 130.
• Dr. Jane, congratulations on your outstanding achievement.
Johnson participates in international conferences

Dr. Lawrence Johnson, CCUR, was invited to attend and participate in three international conferences this fall.

Dr. Johnson presented the keynote address titled *Biobased Products and Biofuels from Americas Vast Reserves of Corn and Soybeans* at the Renewable Resources and Biorefineries International Conference at the University of Ghent in Ghent, Belgium, on September 19-21.

On September 25-26, Dr. Johnson attended the 26th World Congress and Exhibition of the International Society for Fat Research *Modern Aspects of Fats and Oils* and participated in AOCS/ISF discussion for establishing a new ISF constitution and business model in Prague, Czech Republic.

Dr. Johnson participated as a panel expert on Principal Factors Limiting the Development of Biorefineries at the European forum titled *Plants, Innovations, Industries* in Amiens, France, on November 30-December 2.

Iowa State receives biomass grant

The Office of Biorenewables Programs and the Center for Sustainable Environmental Technologies at Iowa State University have been notified that their project, Environmental Enhancement through Corn Stover Utilization, was selected to receive funding through the Biomass Research and Development Initiative, a joint effort of the USDA and the Department of Energy. The total value of the pending award is nearly $1.9 million. For more information see www.biorenew.iastate.edu.

Iowa State completes 2005 soybean quality survey

Since 1986, Iowa State University and the American Soybean Association have surveyed the quality of new crop soybeans. Tom Brumm, assistant professor, and Charles Hurburgh, professor, Agricultural and Biosystems Engineering, lead the project. U.S. soybean producers, representing 30 soybean production states provided 1,601 samples of 2005 crop soybeans for analysis. Samples were analyzed for protein and oil content.

The 2005 survey results were presented in China and Korea by Dr. Seth Naeve, Agronomy Extension, University of Minnesota and by Dr. Hurburgh in Japan and Taiwan.

Presentation of the survey results in November of each year is a major component of the American Soybean Association customer relations effort.

Survey results

The total U.S. soybean production in 2005 was nearly three billion bushels, despite isolated areas of drought. This was 5% lower than last year’s record production.

The 2005 U.S. soybean crop is lower in protein (34.9%) and significantly higher in oil (19.4%) than previous years. The variability in protein and oil content was similar to the long-term average variability. Processors should be able to meet target meal protein levels and benefit from higher oil yields.

The U.S. soybean crop, while lower in protein quantity than soybeans from other countries, has better protein quality, as measured by the amount of five essential amino acids.

The composition of foreign material in U.S. soybeans has changed since a 1991 study. The percentage of weed seed and dirt has decreased while the percentage of other crops has increased. Hurburgh attributes this primarily to the better weed control caused by Roundup Ready soybeans, which are planted on over 90% of acres.

The entire survey report can be found at: www.abe.iastate.edu/soysurvey
Dale and Patzek debate energy balance of ethanol

Krysta Nibe, Office of Biorenewables Programs

Recently, over 200 people filled the auditorium in Coover Hall at Iowa State University to hear 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, debate the energy balance of ethanol and other biorenewable 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.

The purpose of the forum, held on November 16, 2005, was to allow the audience to learn more about the issues of biomass and fuels. 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. He believes that Americans need to practice energy conservation as Americans use 105 times the amount of energy that is required.

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 biorenewable 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 other interested parties 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 and moderator of the forum, said. “The resolution is important to our future and the future of energy in our country.”

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 University.

Affiliated faculty return from administrative posts

The following CCUR-affiliated faculty returned from administrative posts to FSHN:

Dr. Suzanne Hendrich, FSHN professor, served seven years as associate dean of Undergraduate Programs and Educational Technology in the College of Family and Consumer Sciences. Her administrative position ended June 30 2005.

Dr. Anthony Pometto III, FSHN professor, led NASA FTCSC at Iowa State for five years. The center officially closed December 30, 2005.

Dr. Pamela White, FSHN University professor, completed her time as interim dean of the College of Family and Consumer Sciences in August 2005.

Dr. Deland Myers, FSHN professor, completed his appointment to a one-year internship in the College of Agriculture through the Vice President for Academic Affairs and Provost Office’s administrative intern program.
Payne is new Iowa State Extension leader

Jack M. Payne, vice president for University Extension at Utah State University, Logan, has been named vice provost for Extension and outreach at Iowa State University. He will begin his duties January 15, 2006.

Payne also is director of the Utah Cooperative Extension Service, dean of continuing education at Utah State and a tenured professor in the College of Natural Resources. He will succeed Vice Provost for Extension Stanley Johnson, who has held the position since 1996 and will retire in December.

As vice provost for Extension and outreach at Iowa State, Payne will serve as director of cooperative extension, which has programs in agriculture and natural resources, communities and economic development, families and 4-H youth development. The vice provost also administers University Extension, which includes business and industry programs and continuing education and communications services that provide delivery of off-campus credit and noncredit courses, conferences and continuing education offerings.

“Dr. Payne has exceptional experience as an Extension specialist, faculty member and administrator at several of the nation’s leading land-grant universities,” said Iowa State University President Gregory Geoffroy. “He also brings a wealth of experience in resource management from the private sector. He will be a great leader for Extension in Iowa, and we’re delighted to have him join Iowa State.”

Payne said he was attracted to the vice provost position at Iowa State because of the size, scope and diversity of the program, the quality of the people and the national leadership of ISU Extension, particularly in the areas of economic development and leadership.

“It is an honor to have this opportunity to be on the team of one of this nation’s leading public universities and its first land-grant institution,” Payne said.

New materials

From page 1

with styrene and divinylbenzene.” This approach, developed by Larock’s group, relies on the catalyst boron trifluoride diethyl etherate to initiate the cationic polymerization of the oil. To facilitate homogeneous copolymerization, the researchers modify the initiator with a fatty acid ester from Norway fish oil.

The approach can be used to copolymerize soybean oil triglyceride with dicyclopentadiene, a cheap, readily available comonomer. Dicyclopentadiene “is a good cross-linker that imparts rigidity to the resulting thermosetting materials,” Andjelkovic noted. “Our results show that the yield of the cross-linked polymers increases very slowly with increasing amounts of the dicyclopentadiene. All the copolymers formed appear as dark brown plastics with a slight odor. Almost all of them have glass-transition (softening) temperatures below ambient temperature and are therefore in their rubbery states.

“As much as 85% by weight of soybean oil is used for the synthesis of these biomaterials,” Andjelkovic added. “The results show that our approach offers a simple route toward a range of new and exciting biobased rubbery materials.”

CCUR Staff Additions

Jeni Maiers started September 2 as program assistant for CCUR and the Iowa Alliance for Cooperative Business Development.

Tammi Martin started part-time with CCUR in August.

Jordan Miller, student, Graphic Arts, has joined CCUR as a student hourly. He will focus on updating CCUR displays and exhibits.

Krysta Nibe, graduate student, English joined CCUR January 3. She will work on communications projects for CCUR biorenewables activities.
Awards and Honors

Pat Murphy has been awarded the 2006 College of Agriculture Outstanding Achievement in Research Award. It will be presented on January 18, 2006.

Jay-lin Jane has been awarded the 2006 College of Agriculture Excellence in International Agriculture Award. It will be presented on January 18, 2006.

The video Plot Harvester Clean-Out Procedures developed by Mark Hanna, ABE; Darren Jarboe, CCUR; and Jon Anderson, EMMS, received a Blue Ribbon Award in the American Society of Agricultural Engineers educational aids competition at the ASAE Annual Meeting and an Award of Excellence in the Educational Materials Award Program of the American Society of Agronomy at the ASA Annual Meeting.

Exchange students

From page 3

in Belgium from that in America,” de Baere said. “We usually take our classes and then spend a year in a laboratory at the university.” Each of the students is enrolled in Master’s degree program at the University of Ghent.

Vermoesen, de Baere, and Aerts all believe what they are learning about biorenewable resources will take them far in life. “Biorenewable resources are very important with the coming end of oil,” Vermoesen said. “We have known in Europe for some time that the end of oil is coming. We have been talking about that possibility for years. Therefore, biorenewable resources are going to become very important in the near future to provide energy, fuels and products,” de Baere said.

Upon finishing their Master’s degrees in Belgium, these three students have big plans for the future. de Baere is interested in possibly working toward a Ph.D. or studying abroad in France or Brazil. Aerts hopes to work with cell and gene technology either at a Ph.D. level or for a corporation. Vermoesen also hopes to possibly study or work abroad after she finishes her degree. They all hope to continue their studies and research in biorenewable resources.

The reasons driving Aerts, Vermoesen, and de Baere to enroll at Iowa State are as varied as they are. “I really wanted to improve my English skills,” Aerts said. De Baere decided immediately when approached with the idea of studying abroad. “I have always wanted to study abroad and this was a great opportunity to attend school in the United States,” she said. For Vermoesen, studying in Iowa has fulfilled her dreams of experiencing life in the United States and making new friends.

In addition to working closely with their supervising professors, the students met with Larry Johnson, director of the Center for Crops Utilization Research (CCUR) and the program contact person at Iowa State. “We really appreciate Larry Johnson. He has worked so closely with us to ensure we have everything we need while we are at Iowa State,” de Baere said. Vermoesen and Aerts echoed de Baere’s sentiments. “Larry has been really good to us. We are very lucky to have him here supporting our semester abroad,” Aerts said.

“This has been a really good experience for both the students and our BRT program,” Johnson said. “We have been fortunate to have these three outstanding students come to Iowa State this semester and we are looking forward to future exchanges.”

The students had the opportunity to travel during their stay in the U.S. Chicago was one of their stops.

The students were able to experience white water rafting in Colorado.
Grants and Contracts

Annual soybean quality survey, American Soybean Association, $30,000, T. Brumm and C. Hurburgh

Biotechnology Test Production, IA: Technologies to Purify and Recover Recombinant Proteins from Plants for Use as Therapeutics and Industrial Enzymes, USDA, $434,288, C. Glatz and L. Johnson

Development of Grain Storage and Materials Handling, Transport, and Processing Training Modules, USDA-APHIS Biotechnology Regulatory Services, $69,462, M. Hanna and D. Jarboe

Food Chain Economic Analysis, Part III, USDA, $369,442, C. Hurburgh and J. Lawrence

Iowa Grain Quality Initiative FY06, Extension 21 Grants, $161,320, C. Hurburgh

Iowa Grain Quality Initiative Support, Iowa Soybean Promotion Board, $25,000, C. Hurburgh

Select Yield and Quality, United Soybean Board, $46,350, C. Hurburgh

Soybean Quality Report for the U.S. Soybean Crop, American Soybean Association, $40,000, C. Hurburgh

Uniformity in Near Infrared Measurements of Soybean Quality Traits, United Soybean Board, $54,500, C. Hurburgh

Development and Value-Added Utilization of GEM Line Starch, USDA, $22,439, J. Jane.

Maximizing the Scope of Provisional Patent for Soy Protein Fractionation, Iowa State University Research Foundation, $24,916, L. Johnson

High hydrostatic pressure process parameters impact on soy components extractability and characteristics, USDA-NRI, $290,000, S. Jung

Technology Transfer and Commercialization of Soy Protein Hydrolysate for the Purpose of Facility Technology Transfer of Soy Protein-Based Adhesives, Iowa Soybean Promotion Board, $29,200, D. Myers

Metabolomics: A Functional Genomics Tool for Deciphering Functions of Arabidopsis Genes in the Context of Metabolic and Regulatory Networks, National Science Foundation, $1,000,000, B. Nikolau, E. Wurtele, J. Dickerson, P. Dixon, G. Kraus and N. Pohl

BULLETIN

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Director: Lawrence Johnson
Editor: Darren Jarboe
Layout: Jeni Maiers

To be added to our mailing list, e-mail ccur@iastate.edu.

On the web at: www.ccur.info.

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