



IPIA

Annual Highlights  
2010-2011

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# International Programs in Agriculture

## Message from the Director

The Purdue College of Agriculture (CoA) not only has great ideas, but also the international management capacity to deliver on those concepts around the world. For example, in 2010-2011 we completed the Advancing Afghan Agriculture Alliance (A4) project, with 59 young Afghans with new master's degrees in a range of agricultural disciplines back in classrooms in Afghanistan. With its partners Purdue Improved Cowpea Storage (PICS) demonstrations have been done in more than 29,000 villages in West and Central Africa. More than a quarter of CoA undergraduates have some kind of international experience during their time at Purdue. With more than 60 years of experience in international agriculture, CoA has the capacity to keep its commitments internationally.

The core of the CoA capacity to deliver on its international commitments is International Programs in Agriculture (IPIA). With a staff of only 13 in West Lafayette, IPIA coordinates CoA international activities in more than 60 countries. Whether it is getting a visa to Tajikistan or helping a Purdue faculty member ship research supplies to Nigeria, IPIA staff know how to get things done worldwide. They also can get things



done at Purdue. They are able to recruit and hire the kind of staff needed to be effective in Afghanistan. They worked to establish university-owned trademark protection for the PICS technology in Africa. IPIA helps Purdue Agriculture students, staff and faculty realize their international goals and aspirations.

The *2010-2011 Highlights* is a summary of international agriculture activity during the past year. If you are part of the Purdue Agriculture community, a long-time collaborator or a new partner, we hope that next year your international activities are outlined in the next edition of Highlights. Please contact us or the referenced departments if you have any questions or comments about CoA international activities.

*Jess Lowenberg-DeBoer*  
Associate Dean and Director of  
International Programs in Agriculture

## STUDY ABROAD

In 2010-11, 254 CoA students traveled to all parts of the world and studied on every continent except Antarctica.

Sixteen international exchange students came to Purdue for a semester or year. The students were from partner universities and their visit enabled our students to study at their home universities. Students studying at Purdue were from Sweden, Ireland, Austria, England, Wales, Australia and Germany. IPIA also hosted seven students from Japan for one month, which included a two-week stay with host farm families. While at Purdue they visited agribusinesses, cultural sites and a few classes.

Thanks to the generosity of supporters, scholarships and grants totaling \$19,500 were awarded through IPIA to agriculture students who participated in a



long-term program of eight weeks or longer.

International Agriculture Ambassadors were busy again in the past year. In addition to talking with students in the classroom and helping with visitors to

IPIA, they again sponsored a float in the Purdue Homecoming parade, and hosted an international food festival during International Week and a booth at the annual Spring Fest. Ambassadors for 2011-12 are:

- Thomas Atchley, Agricultural Economics
- Ashtin Balzer, Agriculture Education
- Katherine Clemons, Animal Sciences
- Colleen Hartel, Forestry and Natural Resources
- Betheny Moore, Biochemistry
- Patricia Peng, Forestry and Natural Resources
- Joshua Price, Agricultural Economics
- Shalyse Tindell, Animal Sciences
- Alexis Zobel, Biochemistry

## INTERNATIONAL EXTENSION

International Extension had a successful year, with nine Purdue Extension educators and Jim Murren, International Extension program coordinator, having worked abroad. In August 2010, George Okantey and Amanda Bailey conducted Train-the-Trainer programs in Ghana for the Purdue Improved Cowpea Storage (PICS) project. J.W. Fansler, Scott Monroe, Ed Farris, Amy Thompson, Stacy Clupper and Carmen DeRusha facilitated U.S. Agency for International Development (USAID) Farmer-to-Farmer workshops in Turrialba, Costa Rica, with a small organic farmer's association. Gonzalee Martin traveled to South Africa on a Farmer-to-Farmer project that involved assisting table grape growers in developing management plans.

The Purdue Extension Global Awareness Team (PEGAT) received a small grant from the Indiana Humanities Council to teach and share a global food curriculum with communities across the state, focusing on food production and consumption around the world. Formed in August 2010, PEGAT's goal is to assist in building globally aware communities that have the knowledge, skills and attitude to adapt to cultural and economic change.

## REGIONAL INTERNATIONAL PARTNERSHIP EFFORTS

**Asia:** K.G. Raghothama, associate director of International Programs in Agriculture, took a leadership role in the CoA collaboration efforts in Asia. In April, President France Córdova; Arden Bement, director of the Global Policy Research Institute; Mike Brzezinski, dean of International Programs; Holly Wang, professor of Agriculture Economics; and Raghothama visited China Agriculture University (CAU) to inaugurate the CAU-Purdue Joint Research Center. Raghothama also visited Northwest Agriculture and Forestry University in Yangling to promote joint research and educational activities. He participated in the Dean's Conference at Nanjing Agriculture University and met with senior leadership at Zhejiang University and Zhejiang Academy of Agriculture Sciences.

Raghothama also visited three entities in India — Punjab Agriculture University in Ludhiana, Indian Agriculture Research Institute, New Delhi, and University of Agriculture Sciences at Bangalore — to promote collaborations.

**Latin America:** The 2010-2011 program saw a relaunch of Purdue Agriculture's activities in Latin America. In addition to the activities in Costa Rica outlined in the International Extension section of this report, links in Brazil, Mexico and Chile were renewed. In October 2010, Adriela Fernandez, IPIA Latin America coordinator, and J. Lowenberg-DeBoer, visited Brazil and Chile. In Brazil, they had meetings at the Federal University of Vicosa (UFV), and two campuses of the University of Sao Paulo (USP). In Chile they met with faculty at the Catholic University and the University of Chile. In April 2011 five Chilean researchers came to Purdue to discuss joint research efforts and student exchange.

Sixteen Brazilian scientists and administrators participated in the Frontiers in Bioenergy Symposium on the Purdue campus in May 2011. The group included seven faculty members from the Federal University of Vicosa (UFV). During the visit Dean Jay Akridge signed a letter of intent with the Minas Gerais State Research and Development Foundation (FAPEMG) to further collaborative research efforts.

## INTERDISCIPLINARY INTERNATIONAL EFFORTS

### Advancing Afghan Agriculture Alliance (A4) and Other Related Activities

[www.purdue.edu/afghanistan](http://www.purdue.edu/afghanistan)

The Agriculture Afghanistan Team, led by Kevin McNamara (Agricultural Economics), won the 2011 CoA Team Award. The heart of Purdue Afghanistan activities has been A4, with core funding by USAID. It has partnered with faculties of agriculture at Kabul University, Herat University, Balkh University and Nangarhar University to train young faculty, upgrade curriculum and develop closer links to the agricultural sector. A4 has had a major impact on the quality of agricultural higher education in Afghanistan. For example, at last count there were 59 Afghan faculty members with new master's degrees back in classrooms in Afghan colleges of agriculture. Some of these students received their degrees at Purdue and others through Purdue partner universities in India.



In addition to A4, other Purdue development efforts included mentoring midcareer visiting Afghan faculty; advising Afghan Merit Scholars (AMS) in master's programs; providing short-term technical assistance/training in Afghanistan; and conducting pre-deployment training for National Guard Agribusiness Development Teams (ADTs) going to Afghanistan to work in agricultural outreach, and involving eight departments and the Purdue University School of Veterinary Medicine.

Synergies arising from the Purdue Agriculture Afghanistan efforts have led to new opportunities, including the negotiation of a

\$32 million human capacity building program with USAID. In the fall of 2010, the U.S. Department of State approached the Afghanistan Team about hosting a dozen junior faculty scholars from various Afghan universities. Because of the success of that program, in early 2011 the State Department discussed the option of an annual program at Purdue. A \$12 million proposal is under consideration by the USDA Food for Progress Program to fund the degree and short-term training of more Afghan students in the U.S. and India.

### Kenya – AMPATH

Stephen Weller (Horticulture and Landscape Architecture) supervised Pamela Obura, associate director of agriculture programs with Academic Model Providing Access to Healthcare (AMPATH), as they continued their work with resource-poor farmer clients in western Kenya near Eldoret. They worked to identify, develop and disseminate best management practices that promote appropriate technologies and environmentally sound agricultural production. In the past year Obura engaged in capacity building of AMPATH's agricultural Extension staff and smallholder farmers in western Kenya in the following areas:

- Appropriate cereal legume intercropping.
- Soil fertility improvement and conservation practices, including on-farm demonstrations.
- Integration of African leafy vegetables into existing farming systems.

This project also is developing a database of soil fertility and cropping practices research to help generate improved outreach programs for AMPATH farmers.

### Purdue Improved Cowpea Storage (PICS)

<http://www.ag.purdue.edu/ipia/pics>

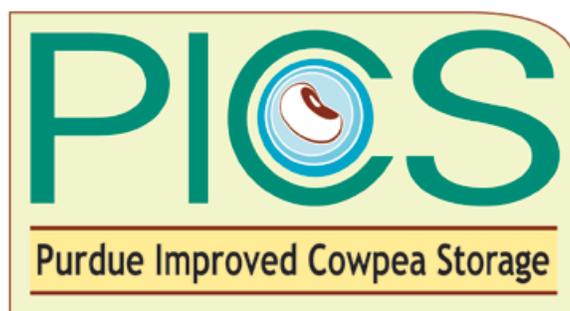
Purdue University and its partners implemented PICS project activities in all 10 targeted countries (Ghana, Cameroon, Senegal, Chad, Niger, Nigeria, Mali, Togo, Benin and Burkina Faso). By the end of the fourth year, the project reached more than 29,000 villages, exceeding the target of 28,000 villages by June 2012. PICS has been viewed by many governments as an effective technology and impact-oriented project that addresses food security challenges, and reduces risks associated with the overuse and misuse of pesticides on cowpea during storage. Additional Extension agents have been trained in several countries to spread the technology beyond villages targeted by the PICS project.

PICS bags continue to be produced by several manufacturers in West Africa. PICS has worked with six manufacturers, 10 distributors and an estimated 1,000 vendors to produce and sell more than 1.55 million bags in the last four years. PICS bag manufacturing has gone relatively well but development of the distribution system remains the bottleneck. Impact assessment studies conducted in Burkina



Faso and Niger show that the key constraint to adoption is the availability of bags in rural communities. Despite these challenges, the PICS supply chain is transitioning from project activity to private sector business. To overcome some of the challenges, PICS is sensitizing vendors through capacity building and participation in media activities. Media continue to play an important role in reinforcing PICS messages and in supporting PICS vendors who market the bags. Cell phone videos, in addition to TV where available, have proved to be effective tools for visual learning in rural Africa.

During the 2011 cowpea season, PICS will implement outreach activities in 1,700 villages in Senegal and Chad. And in all countries, PICS will continue to strengthen the supply chain by organizing market demonstrations, training vendors, and building awareness among members of the cowpea value chain, including NGOs, cereal banks, farmer-based organizations, etc., through commercial messages, live/interactive talk shows and other media activities.



PICS research will continue under the Purdue Improved Crops Storage (PICS2) project, through a \$1 million grant awarded to Purdue University by the Bill and Melinda Gates Foundation. PICS2 partners include the National Agricultural Research Institute of Niger in Maradi and the International Center for Insect Physiology and Ecology in Nairobi, Kenya. Project activities were launched at Purdue in mid-July 2011,

with the participation of African scientists and a representative of the Gates Foundation. PICS2 focuses on the use of PICS bags to store crops other than cowpea, including maize, sorghum and dry beans.

In May 2011, PICS was named a "Best Practice" by INTERACTION, a consortium of NGOs. The award was based on evidence of success, cost-effectiveness, equitable outcomes for women and men, sustainability and adaptability. The PICS project was one of five award winners chosen from more than 60 applicants. This allowed greater exposure to PICS by the broader NGO community.

## COLLABORATIVE RESEARCH SUPPORT PROGRAMS (CRSPs)

### AquaFish CRSP

Kwamena Quagrainie (Agricultural Economics) continued to lead the Purdue project, which involved three studies:

- Consumer preferences and trends in the demand for tilapia (*Oreochromis niloticus*) and African catfish (*Clarias gariepinus*) products in Kenya, Tanzania and Ghana. Francis Darko, AGEC master's student, has completed an analysis examining consumer preference for farmed tilapia versus wild-capture tilapia. The results suggest that consumers generally do not prefer farmed tilapia, except for those residing in urban areas.
- Assessing the state of female participation in the fish value chain in Kenya, identifying opportunities and constraints to improving their welfare and training women in fish value participation to identify points of intervention. Leah Ndanga, AGEC master's student, traveled to Kenya in June 2011 to gather data for this study and currently is analyzing the data to examine benefits and costs of intervention points for women in the fish value chain.
- Assessing the effects of Aquaculture CRSP and AquaFish CRSP initiatives and activities on aquaculture development in Kenya. Philip Munyua, AGEC master's student, traveled to Kenya in June 2011 to collect data. Analysis of the data is ongoing, with the objective of examining any changes in productivity and efficiencies with the adoption of Aquaculture CRSP and AquaFish CRSP technologies, and other initiatives in fish production.

### Assets and Market Access (AMA) BASIS CRSP

Gerald Shively (Agricultural Economics) continued his involvement with the AMA BASIS CRSP. During summer 2011 he wrapped up research conducted under the AMA BASIS CRSP, including completion of two master's graduates in Agricultural Economics from Malawi. As part of his BASIS CRSP activities he participated in a Center for International Forestry Research-sponsored workshop at



the University of East Anglia in the United Kingdom in June, and contributed to a panel discussion on "Poverty and Forests" at the Royal Society in London.

### Horticultural CRSP

Stephen Weller (Horticulture and Landscape Architecture) and Maria Marshall (Agricultural Economics) continued as PIs on the Horticulture CRSP Immediate Impact Project, Indigenous African Leafy Vegetables (ALV) for Enhancing Livelihood Security of Small-holder Farmers in Kenya. This project was borne out of a partnership between Purdue and AMPATH, a cooperative university based Kenyan organization headed by Indiana University School of Medicine and Moi University School of Medicine in Eldoret, which works on a comprehensive approach to the HIV/AIDS epidemic in Kenya. This project focused on improving rural livelihoods through the investigation and promotion of new germplasm of several nutritiously rich indigenous ALV that are an important part of the ethnic diets of rural Kenyans (amaranth, spider plant and African nightshade), and improved marketing knowledge at the local level.

To improve the quality, researchers established demonstration plots with a wide range of improved varieties at Kenya Agriculture Research Institute and Moi University, and worked with farmers to identify local varietal preferences. The most favorably reviewed varieties were distributed to participating farmers for further evaluation. Farmers also were trained in basic production practices, including seeding, bed formation, seed saving and storage, rainy season cultivation techniques and basic harvesting and postharvest handling, to ensure ALV quality in the markets. Of the approximately 285 participating farmers, more than 80 percent now cultivate ALV. Follow up surveys have shown that people prefer the taste and larger leaves of the new varieties that were identified over the course of the project. This project ended July 2011 after 18 months of funding, but to capitalize on the momentum and connections built, collaborators submitted a new proposal and wait word on its funding.

### Integrated Pest Management (IPM) CRSP

Stephen Weller (Horticulture and Landscape Architecture) and Rick Foster (Entomology), working with partners in Honduras, reported several significant activities and accomplishments this past year. Research has developed diagnostic keys for major viruses that affect Solanaceous crops. A new problem becoming widespread in Honduras is the insect-borne disease of potato, Zebra chip, which is devastating the Honduran potato industry. Research has focused on developing better diagnostic keys for Zebra chip and determining the insect/disease cycle important in the transfer of this pest to potato. Research specifics involve improved pest management practices, sanitation in germplasm and determination of potato cultivars and cultivation practices that minimize Zebra chip effects. Nematode research has involved using cowpea cultivars as a rotation crop to reduce nematode numbers in subsequent sweet potato crops. Also, research has begun on cultural and chemical methods to minimize the effect of purple nutsedge in Honduran horticulture enterprises. The annual IPM CRSP Latin America region meeting was held in Santo Domingo, Dominican Republic, May 3-6 and was attended by

Weller and scientists from Guatemala, Honduras, Ecuador, Dominican Republic and the United States.

### Global Nutrition CRSP

Gerald Shively (Agricultural Economics) launched new activities under the Global Nutrition CRSP. This work, which will be funded 2011-2014, will be conducted in Nepal and Uganda and focus on food security issues, including interventions aimed at improving maternal and child health in those “Feed-the-Future” countries.

### Sorghum, Millet and Other Grain CRSP (INTSORMIL)

Purdue faculty members Gebisa Ejeta, Bruce Hamaker, John Sanders and Mitch Tuinstra are INTSORMIL investigators in sub-Saharan Africa. Highlights of research and capacity building activities follow.

Bruce Hamaker (Food Science) traveled five times to West Africa, principally Mali, as part of his USAID INTSORMIL project activities. He and collaborators in Mali and Senegal are involved in transferring appropriate cereal processing technologies to the region by assisting partner processing entrepreneurs and setting up incubation centers. Trips were made to the Mopti/Gao area to assess, further train, and solve entrepreneur partner processing unit problems. Six of the seven units are functional, with millet and sorghum product processing under way, and products in the marketplace. In June the Incubation Centre at IER/LTA Sotuba became fully functional. The first workshop at the Incubation Centre demonstrated equipment capability. Participants were from the Bamako area, including two INTSORMIL processing partners and IICEM processing partners from Bamako and Sikasso.

John Sanders (Agricultural Economics) continued to be involved in INTSORMIL activities focused on getting agricultural technologies from the experiment station and onto farms. His project has three components: introducing new millet and sorghum technologies; introducing new marketing strategies; and developing farmers' associations. The new technologies focused on new cultivars, inorganic fertilizers and water retention. There was a five-point marketing strategy aimed at increasing value added and moderating or eliminating the three sources of price collapses experienced by food staples in developing countries. Institutional development of the farmers' associations was designed to turn them into marketing co-ops able to get higher product prices and lower input prices for their members. These associations also would engage in storage, facilitate bank lending to member farmers and establish network connections with product buyers and input dealers. This project has moved from a pilot project to a nationwide scaling-up process in Mali with USAID Mission financing. This past year activities have been reinitiated in Niger and Senegal and begun in Burkina Faso with McKnight Foundation and INTSORMIL financing.

Mitch Tuinstra (Agronomy) continued on the project titled, Developing Sorghum with Improved Grain Quality, Agronomic Performance and Resistance to Biotic and Abiotic Stresses. The overarching objective of this project is to develop and deploy genetic technologies that improve sorghum production, performance and value

through plant breeding. Graduate students and visiting scientists with interests in crop improvement and molecular biology are being hosted for short-term and graduate training at Purdue.

Recent field trials in Nigeria, Niger, Burkina Faso and Mali showed that a technology package that combines hybrid seeds and herbicide seed treatments to improve Striga resistance has great potential for increasing grain yields of sorghum in the region. Tuinstra and his team are working with researchers at IAR-Nigeria, farmers, the public and private seed sector, and regulatory agencies to commercialize this technology in West Africa. In more fundamental genetic research studies, the sorghum genome sequence is being used as a tool to identify allelic variation in genes that influence specific grain quality or crop production traits. These experiments were used to identify stable *dw3* alleles of sorghum and a DNA marker system to control height mutants in commercial sorghum parent lines and hybrids. Forward and reverse genetic selection strategies are being used to evaluate the potential for manipulating HCN production in sorghum. Numerous mutations were discovered that impaired dhuririn biosynthesis or catabolism. Development of dhuririn-free sorghum forages has the potential to replace corn and other forage crops that have lower water use efficiency characteristics.

The Mali Training Program, managed by IPIA, has successfully assisted all five Mali students' admission to their respective master's programs at three U.S. universities. The final two students, Aly Ahamadou and Mamadou Dembele, completed their English Language Program at West Texas A&M University (WTAMU) in May 2011. They then were admitted to WTAMU Graduate School in June 2011 to pursue their non-thesis master's degrees in business and economics in the Department of Agricultural Sciences. Lal Almas, their major professor, reported both students started classes in June. Short-term plant breeding trainee, Abocar Oumar Toure, completed his two-month training at Purdue with Mitch Tuinstra in September 2010. Plans call for the final short-term crop production trainee, Abdoul Wahab Toure, to visit Kansas State to work with Vara Prasad and Scott Staggenborg on crop physiology, and production research activities on sorghum and soybean.

## NEWS OF THE DEPARTMENTS

### Agricultural and Biological Engineering

*Indrajeet Chaubey* presented a paper titled, “Improving the Simulation of Biofuel Crop Sustainability Assessment Using SWAT Model” at the International SWAT Conference and Workshop held in Toledo, Spain, June 13-17. He also served on the Conference Scientific Advisory Committee.

In September 2010, Chaubey was invited to attend the joint US-China Workshop on Energy, Ecosystems, and Environment in China, to continue discussion on furthering collaborations with Chinese counterparts.

Chaubey traveled to Colombia in October 2010 to attend a series of meetings with various Colombian universities. The Purdue team consisted of Chaubey, Dean Leah Jamieson, Arden Bement, Arvind

Raman, Jean Paul Allain and Carolyn Percifield. The team visited three universities — Universidad Nacional De Colombia, Universidad de los Andes and Pontificia Universidad Javeriana in Bogota. The team presented Purdue's vision for collaboration in the broad area of nano and biotechnology. Chaubey led discussions in the area of biotechnology and sustainability. The discussions resulted in a Memorandum of Understanding being signed between Purdue University, Colciencias (NSF equivalent in Colombia), Colombia Ministry of Education and Colfuturo.

**Al Heber** attended the Greenhouse Gases and Animal Agriculture Conference in Banff, Alberta, Canada, Oct. 3-8, 2010.

**Klein Ileleji** has been engaged with both the State Key Lab for Clean Energy Utilization (CEU) and the College of Biosystems Engineering and Food Science at Zhejiang University (ZJU) since 2006. He served as an advisor to graduate student Hongde Yu of ZJU. Yu graduated in April 2011 researching the logistics of biomass for power generation in China.

Ileleji continued to work on the collaborative research project supported by the Chinese government as one of the foreign experts in the area of biomass logistics. Ileleji was at ZJU for about three weeks in the summer, and his graduate student, Isaac Serbin, spent three months (June-August 2010) in China as a visiting student researcher working on biomass logistics.

Ileleji served as co-PI of a consortium of three land-grant universities (Purdue, Oklahoma State University and University of Kentucky), to build capacity in commodity storage in Ghana by training stored products managers and personnel on best practices in stored grain management. A successful training program of 49 people — primarily stored grain managers in Kumasi — was held in March 2011.

**Monika Ivantysynova** received a Doctor Honoris Causa degree from her alma mater, the Slovak University of Technology in Bratislava, on Oct. 20, 2010. The degree was awarded for her outstanding lifetime achievements in fluid power and dedication to the university.

The Mexico initiative within Global Engineering Programs concluded the first year of activity in the fall of 2010. **Rabi H. Mohtar** led a team that included ABE faculty **Keith Cherkauer** and **Indrajeet Chaubey** on a visit during fall break. The team met with scientists and administrators from Universidad Autonoma Chapingo, Universidad Nacional Autonoma de Mexico (UNAM), Universidad Autonoma Metropolitana (UAM) and Colegio de Postgraduados de Chapingo. In addition to initiating opportunities for undergraduate student, grad student and faculty exchanges, the team also identified three primary areas for research: sustainable energy, risk management of natural and man-made disasters, and food-water-energy security. UNAM and GEP have established modest seed funding opportunities. More information can be found at <https://globalhub.org/groups/purduemexicoworkshop/overview>.

**Rabi H. Mohtar** was invited to launch the Qatar Environment and Energy Research Institute. Scientists and researchers at the Institute will be coordinating efforts at local universities in the

Education City and National labs. The goal of the Institute is to ensure the sustainable development of Qatar through providing a diversity of sources for accessing energy, while protecting the environment of Qatar by consistently supplying cleaner and safer energy. The members of the Institute will explore promising science and research topics in environmental and energy areas such as nanomaterials, fuel cells, reservoir modeling, chemical separation technology and large energy storage. Research programs include water quality and conservation, renewable energy, built environment, nanotechnology, nanoscience, materials science, air quality and climate change, and water desalination. Rabi and his family departed for this opportunity on Jan. 8, 2011.

The National AgrAbility Project (NAP) staffed a display at the 2011 FICCDAT/RESNA Conference in Toronto, Ontario, Canada, June 5-8, 2011. **Steve Swain**, assistive technology specialist for NAP, staffed the display in addition to conducting a workshop on "Evaluating Agricultural Equipment for Secondary Injury Hazards."

### Agricultural Economics

**Phil Abbott** and graduate student Ce Wu worked with the Central Institute for Economic Management (CIEM) in Vietnam on a project funded by the University of Copenhagen and Danida (the Danish aid agency). Their research focused on the linkages between international trade and economic development that have contributed to rapid growth and significant poverty reduction in Vietnam.

**Freddie Barnard** traveled to China during the summer of 2011 on a 12-day trip coordinated by First Farmers Bank and Trust of Converse, Ind. The trip included agricultural bankers, trade group representatives and agricultural producers. The 15-person group evaluated business opportunities in China.

**W. Scott Downey**, from the Center for Food and Agricultural Business, hosted a group of U.S. cooperative leaders in Argentina as part of the LEAP program. About 40 leaders toured production, processing and marketing facilities to gain a better understanding of how the retail function differs in that part of the world.

Downey visited Beijing in May 2011 to lead a weeklong sales management workshop for an international group of 37 sales managers from National Oilwell Varco, a leader in the oil and gas industry. Sugato Chakravarty (Consumer Science and Retailing), Paul Wang (Northwestern University) and Stacey Schetzle (Ball State University) also were instructors in the program. While in Beijing, Downey made a presentation to students and faculty at China Agricultural University, and met with colleagues from Beihang University and Tsinghua University to discuss collaborative research projects.

**Raymond Florax** delivered a one-week training workshop on new methods, models and applications in spatial econometrics at the Joint Research Centre (JRC) of the European Commission, Institute for Prospective Technological Studies (IPTS) in Sevilla, Spain. He also gave a key lecture on agricultural productivity at China Agricultural University in Beijing and an invited lecture at the University of Innsbruck, Faculty of Economics and Statistics.

Florax, together with Peter Mulder, a visiting assistant professor from the Department of Spatial Economics of the VU University, Amsterdam, has been involved in joint research on energy economics, and regional productivity and economic growth.

**Allan Gray** led students of the Purdue-IU MS-MBA in Food and Agribusiness Management program on a trip to Argentina for a weeklong international residency in May 2011. Accompanied by professor Marshall Martin, as well as program manager Luanna DeMay, students explored the similarities and differences in farming and agribusiness practices between the United States and Argentina.

During the past year, **Thomas Hertel** served as president of the Agricultural and Applied Economics Association. In this capacity he delivered his presidential address on the topic “Global Supply and Demand for Land in 2050: A Perfect Storm?” in a variety of venues, including the AAEA meetings in Denver, the Distinguished Fellows Address at the meetings of the Australian Agricultural and Resource Economics Society, The World Bank, and a University-wide lecture at Cornell University.

Hertel also served as co-chair of the 14th Annual Conference on Global Economic Analysis, hosted by the University of Venice and Fondazione Eni Enrico Mattei (FEEM). In addition, Hertel organized the kickoff workshop for a two-year pilot project titled, GEOSHARE: Geospatial Open Source Hosting of Agriculture, Resource and Environmental Data. This workshop, hosted by Purdue, included 70 participants from universities, international institutions, U.S. government agencies and private sector representatives from around the world.

Hertel also presented a plenary address on “Climate Change, Agriculture and Poverty” at the annual meetings of the International Agricultural Research Consortium, held on the campus of the University of Hohenheim in Germany.

**Kwamena Quagrainie** continued as PI for AquaFishCRSP projects. Summary highlights are found in the previous Collaborative Research Support Program section.

**John Lee** continued his wildlife research activities in Panama. In 2010, a trail camera study was completed in three national parks in the Panama Canal Zone. This study was conducted with wildlife and forestry faculty from Southern Illinois University. Results from the camera study have been used to document mammal species diversity and estimated populations within these protected areas.

**Paul Preckel** worked on a project titled: Increasing Electricity Trading and Environmental Sustainability in the Balkans. This effort targets analysis of the benefits of international trade in electricity (energy and capacity) in the Balkan countries of Macedonia, Montenegro, Albania and Kosovo. The long-term analysis focuses on investment in generating and transmission assets and the impact that trade has on the pattern of investment, as well as the cost (operating and maintenance plus capital) of electricity. The collaborating institutions are Rochester Institute of Technology and American University in Kosovo, as well as regional generation and transmission companies. A Purdue Global Policy Research Institute seed grant was

received to fund the development of a prototype model that will assess the benefits of regional cooperation, and serve as motivation for a follow-on project focused on developing the analytical capacity for evaluating alternative market structures in the region.

**John Sanders** continues to be involved in the INTSORMIL CRSP activities. Summary highlights are found in the previous Collaborative Research Support Program section.

**Juan Sesmero** presented two papers at the 2011 AARES (Australian Agricultural and Resource Economics Society) meetings in Melbourne, Australia, in February 2011. The papers were “Sustainability of Corn Stover for Biomass” and “Marketing Efficiency Among Corn Ethanol Plants.”

**Gerald Shively** served as the editor-in-chief of *Agricultural Economics*, the flagship journal of the International Association of Agricultural Economists, and as chair of the International Section of the Agricultural and Applied Economics Association. He continued his AMA BASIS CRSP work and is launching new activities under the Global Nutrition CRSP. Summary highlights are found in the previous Collaborative Research Support Program section.

**Wally Tyner** continued work on a research project in Morocco on the impacts of climate change on Moroccan agriculture. It is funded by the United Nations’ University World Institute for Development Economic Research (UNU-WIDER). The project culminated with an international conference in December 2011.

Tyner also has attended and presented papers at three international conferences this past year: GTAP in Venice, Italy; International Association of Energy Economics in Stockholm, Sweden; and OECD on long-term model needs for energy and climate change in Paris, France.

**Brigitte Waldorf** was invited to present her paper on “Attracting Global Talent and Then What? Overeducation of Immigrants in the U.S.” (co-authored with Julia Beckhusen and Raymond Florax) at the 2011 International Tinbergen Workshop on Innovation, Entrepreneurship and Regional Development in Amsterdam, The Netherlands, in May 2011.

**Terrie Walmsley**, director of the Center for Global Trade Analysis, participated in a workshop in Senegal for AGRODEP, a network aimed at supporting African economists in learning and using CGE models for analyzing trade and environmental issues. Walmsley was selected to be on the steering committee of this network.

Walmsley, Nelson Villoria, Badri Narayanan and Angel Aguiar taught a course on Global Trade Analysis, hosted by the United Nations Economic Commission for Africa (UNECA) in Ethiopia in April 2011. Walmsley also participated in meetings in Reunion and Vienna on the production of world input-output data.

**Hong (Holly) Wang** traveled with President Córdova to Tsinghua University and China Agriculture University for collaboration development in April 2011. In May, Wang and Chris Hurt led 12 Purdue students to seven cities in China for a study abroad program,

visiting farms and firms in energy, manufacturing and financial industries.

In June, Wang visited several Chinese provinces to collect field data for a food safety research project with her Purdue graduate student, David Ortega, and Chinese collaborators. They presented two papers at the Chinese Economists Society (CES) annual meeting in Beijing. Coming back in July, as the founding chair of the China Section under the Agricultural and Applied Economics Association (AAEA), she helped organize several sessions at its annual conference, including participants who traveled from China as paper presenters and sponsors.

In October 2010, Wang, as a co-editor for *China Agricultural Economic Review* (CAER), helped organize the CAER-IFPRI annual conference in Beijing, China, and presented a paper. She also gave an invited talk at the CES 25th Anniversary Presidential Forum in Tianjin, China, in December as a past CES president.

### Agronomy

**Rich Grant** was on sabbatical in fall 2010 as a visiting researcher and Helmholtz Association Fellow at the Institute for Meteorology and Climatology Research, Atmospheric Environmental Research Division, Karlsruhe Institute of Technology in Garmisch-Partenkirchen, Germany. He was collaborating on a N<sub>2</sub>O emission study conducted in Germany and gave two invited lectures at the Institute on micrometeorological approaches to trace gas emissions measurement. In fall 2011 he gave an invited talk on tuneable diode laser applications at the conference FLAIR 2011-Field Laser Applications in Industry and Research in Murnau, Germany, and a poster on N<sub>2</sub>O emissions made in the U.S. at the 3rd Science Conference of the European Union Integrated Land Ecosystem-Atmosphere Processes Study (iLEAPS) in Garmisch-Partenkirchen, Germany.

**Jianxin Ma** was an invited plenary speaker at the 41st Annual Symposium of the Korean Society of Breeding Science, held in July 2010 in Daejeon, Korea. In January 2011, he was chair of the transposable elements workshop in the International Plant and Animal Genome Conference, San Diego, Calif. Ma also traveled to China in May 2011 and presented invited seminars at China Agricultural University (Beijing), Northwestern A&F University (Yangling), Qingdao Agricultural University (Qingdao), Shandong University (Jinan) and Chinese Academy of Agricultural Sciences.

**Cindy Nakatsu**, **Diane Stott** and **Darrell Schulze** hosted Lamine Traore, Borlaug Fellow from the Institute of Rural Economy in Bamako, Mali, from April through June. Traore studied the genetics and mechanisms of phosphate-solubilizing soil microorganisms and participated in a five-day field tour of Indiana.

Schulze also worked with Claudio Columbo from the University of Molise in Campobasso, Italy. Columbo spent June through August in the Agronomy Department as part of his sabbatical leave. He worked on the mineralogy of soils formed in volcanic parent materials in the Matese Mountains of southern Italy and participated in a five-day tour of Indiana.

In May 2011, **Phillip Owens** hosted the first international meeting of an International Union of Soil Scientists working group to develop the Universal Soil Classification System. This new classification system would be a stand-alone system, which would combine the knowledge from all international classification systems into one universal classification system. With the ever-increasing communication between scientists globally, there is a greater need for a common language to communicate soil information. At this initial meeting, Purdue hosted 18 scientists from around the world. The project is supported by the USDA-NRCS Soil Survey.

Owens is one of four U.S. soil scientists to be appointed as a member of the U.S. team for the North America Node of the Globalsoilmap.net project. The global soil map is a Bill and Melinda Gates Foundation-funded project to map soil properties for all land surfaces at a 90 m-resolution. The world is divided into nodes, where each group will be responsible for mapping each node. This project will map soil properties, including soil depth, texture, carbon, and will aid in developing and protecting soil resources.

In spring 2011, **Lori Snyder** started her service-learning project with her Maymester course. Her students visited the Finca Pangola Farms located in Costa Rica, where the students worked with the owner to take soil and water samples and identify the primary and secondary forest plants and animals. In addition, Snyder published her first Tropical Plant Species field Extension booklet, which her students utilized during the Maymester course. Snyder's class was a partnership with John Patterson (Animal Sciences) and Daphene Koch (Building Construction Management). The curriculum included service-learning projects related to sustainable environments and building construction, while improving and stabilizing essential community structures. The students trained locals to sustain a healthy environment dealing with animal health and environmental sustainability. Snyder also hosted a visiting scholar, Jorge Barreantes Blanco, from San Carlos Institute of Costa Rica.

**Mitch Tuinstra** coordinates international research and education programs focusing on maize and sorghum crop improvement. He was a keynote speaker for the Crop Improvement, Idiotyping, and Modeling of African Cropping Systems to Climate Change Conference held at Hohenheim University in Stuttgart, Germany, in February 2011. He visited collaborative research trials with CIMMYT-Asia in Hyderabad, India, in May, to launch a project studying heat stress tolerance in maize, and continues to be involved in the INTSORMIL CRSP activities. Summary highlights are found in the previous Collaborative Research Support Program section.

**George Van Scoyoc** and Kevin McNamara (Agricultural Economics) taught AGRY 399 Advancement in Afghanistan Course for a third time. With an enrollment of 12 students, this course continues to be very popular.

The Agronomy Department is the lead department on a USDA International Science and Education grant focused on internationalizing crop, soil and environmental science curricula. Partners include Ivy Tech Community College, Moi University in Eldoret, Kenya, and the University of Fort Hare in Alice, South Africa. Faculty

participants at Purdue include *Darrell Schulze*, *George Van Scoyoc*, *Brad Joern*, *Phillip Owens*, *Lori Snyder*, *Diane Stott*, *Sylvie Brouder* and *Melba Crawford*. The following activities are part of this project:

A three-credit course, African Development Activities, was taught for the first time in spring 2011. Twelve students were enrolled at Purdue and 14 students participated at the University of Fort Hare, and numerous faculty participated from the four previously mentioned partner institutions. Class sessions were conducted using Adobe Connect and Skype, so that participants in Indiana, South Africa and Kenya could interact in real time via the Internet. The course examined the agricultural, cultural, economic, environmental and social aspects of sub-Saharan Africa, with an emphasis on agricultural development activities in Kenya and South Africa.

In June 2011, the Agronomy Department hosted a two-day workshop on Internationalizing the Curriculum, followed by a five-day field tour. Participants included four faculty members from Moi University, two from the University of Fort Hare and two from Ivy Tech Community College, as well as numerous Purdue faculty, graduate students and staff. The workshop explored how the partner universities could work together to provide international perspectives and experiences for their students. The five-day field tour highlighted the breadth of production agriculture in Indiana and included tours of both large and small farming operations and agriculturally oriented businesses.

### Animal Sciences

*Layi Adeola* gave talks at Sichuan Agricultural University in Ya'an, China, and visited the Tie Qi Li Shi group, presenting seminars in Mianyang and Cheng Du, China. He also visited the University of Ibadan and University of Agriculture in Abeokuta, Nigeria, to discuss possible collaborations, graduate student training and visiting scientist exchange. Adeola attended the British Poultry Science and the British Society of Animal Science meetings in Nottingham, England.

*Kolapo Ajuwon* was invited to the National Taiwan University, Taipei, to explore avenues to strengthen the student exchange programs and presented a talk to students and faculty of the Department of Animal Science and Technology. Ajuwon also visited the National Ilan University in Taiwan and China Agricultural University, Beijing, and the University of Queensland, Brisbane, Australia, as part of Purdue's team to explore collaborative opportunities with scientists.

*Todd Applegate* received the biennial "Biomin Research and Innovation Network" (BRAIN) Research Award at the World Nutrition Forum in Salzburg, Austria. He traveled to China at the invitation of Maple Leaf Farms and presented invited talks at Nanjing Agricultural University in Nanjing, Sichuan Agricultural University in Ya'an, and Shandong Agricultural University in Taiwan.

In March, Applegate, along with *Heng-wei Cheng*, *Scott Radcliffe* and two graduate students, visited Zhejiang University, College of Animal Sciences, for discussions centered on development of graduate student exchanges between Purdue and Zhejiang. In the

summer they hosted 10 undergraduates and two graduate students from Zhejiang University and two undergraduate students from the University of Taiwan.

The USDA-ARS Animal Welfare Unit and adjunct professors in Animal Science, *Heng-wei Cheng*, *Susan Eicher* and *Don Lay*, hosted two Chinese scientists in July to discuss potential research.

*Ryan Cabot* visited with study abroad officers at Swedish University of Agricultural Sciences-Uppsala, Sweden; University of Natural Resources and Applied Life Sciences in Vienna, Austria; and the University of Copenhagen, Faculty of Life Sciences in Frederiksberg, Denmark, on behalf of IPIA to discover ways for Purdue students to attend semester-long study abroad opportunities. Cabot, along with Tim Kerr (Office of Academic Programs) and Kara Hartmann (IPIA) participated as AGR49300, Agriculture in Ireland, faculty sponsor and group chaperones. He also gave invited presentations in Copenhagen, Denmark; Berlin, Germany; and Brighton, United Kingdom.

*Shawn Donkin* and *Scott Radcliffe* traveled to China Agricultural University to strengthen relationships and establish bilateral exchange programs for graduate students and faculty that will promote research and teaching collaborations. Donkin was invited to give a presentation at the 8th Sino-U.S. Dairy Nutrition and Management Symposium in Hohhot, Inner Mongolia, China, and traveled with University of Wisconsin Babcock Institute Director Karen Nielsen and Extension faculty members. He made a second trip to China Agricultural University to provide instruction on nutritional physiology research techniques for dairy cattle, lead discussions on graduate ruminant nutrition courses and discuss graduate-level instructional collaborations. Donkin traveled to Bern, Switzerland, to present research findings at the International Congress on Farm Animal Endocrinology, which was made available globally through a webinar format, and was an invited speaker at the 62nd Annual European Association for Animal Production meetings in Stavanger, Norway.

*Paul Ebner* and *Mark Russell* led an undergraduate service-learning trip to Romania in conjunction with Heifer International, an organization that provides livestock and education for the care and production of livestock, to impoverished communities around the world.

*Amy Lossie* and her graduate students presented a research paper at the International Mammalian Genome Society in Crete, Greece, outlining her discovery and characterization of 92 non-coding RNAs that demonstrate the potential to control maternal-fetal interactions during embryonic development.

*John Patterson*, *Lori Snyder* (Agronomy) and *Daphne Koch* (Biochemistry) led a service-learning course to Costa Rica during Maymester 2011.

### Biochemistry

*Clint Chapple* traveled to Banff, Alberta, Canada, in July 2010 to attend the Second Banff Conference on Plant Metabolism.

**David Krogmann** traveled to the National University and the Centro de Investigación y Estudios in Mexico City, Mexico, in April 2011. There he used a new million-dollar mass spectrometer to learn the amino acid sequences of cytochrome C6S and their homologs.

In December 2010, **Andy Tao** traveled to Academia Sinica in Taipei City, Taiwan, where he gave a seminar titled, “Novel Proteomic Strategies to Identify Kinase Substrates and Substrate Specificity.” He continued on to visit National Taiwan University, YangMing University and Taipei University of Sciences and Technology. Tao traveled to Hangzhou, China, in May 2011 to give a talk at the International Conference on Proteomics and Translational Medicine titled, “Novel Proteomic Tools to Study Molecular Signaling.”

### Botany and Plant Pathology

**Jody Banks** was an invited speaker at the 25th New Phytologist/Colston Research Society Symposium at the University of Bristol in the United Kingdom in September 2010. In October 2010 she was invited to speak at The Plant Cell Meets Italy, Gargnano, Italy. She also is doing collaborative work with Mitsuyasu Hasebe at National Institute for Basic Biology in Japan and John Bowman, Monash, at the University of Australia.

**Janna Beckerman** and **Stephen Goodwin** were co-mentors for Pablo Chong, a USDA-FAS Scientific Exchange Scholar from Ecuador. Chong worked with Beckerman and Goodwin for eight weeks on new techniques for fungicide resistance screening and genotypic analysis.

**Nick Carpita** taught a summer course on bioenergy at the University of Copenhagen in June 2010. He spoke at the XIIth Cell Wall Meeting in Oporto, Portugal, in July 2010. In August 2010 he was an invited speaker at the 2nd Annual Pan-American Congress on Plant and Bioenergy in São Pedro, Brazil. In September 2010, Carpita presented three special workshop lectures on bioenergy for the Biochemical Society of Brazil in Ubatuba. Carpita is a member of the Science and Impact Advisory Board for the BBSRC Sustainable Bioenergy Centre (BSBE), London, United Kingdom. He is doing collaborative research with Marcos Buckeridge, University of Sao Paulo, Brazil; George Haughn at the University of British Columbia, Canada; Marcello Lenucci, University of Salento, Italy; Peter Ulvskov, KVL, Denmark; and Tamara Western from McGill University, Canada.

**Zhixiang Chen** was an invited speaker at Zhejiang University of Sciences and Technology, China, in June 2010, and in July at the College of Agriculture and Biotechnology. In November 2010, Chen was an invited speaker at Shandong University and at the College of Life Sciences at Zhejiang University in China. He is doing collaborative research with Jingquan Yu at Zhejiang University, China, and Xiping Xu's group at Zhongshan University in China.

**Ray Martyn** continued his collaborative research with Roni Cohen in Israel.

**Tesfaye Mengiste** spoke at the Bill and Melinda Gates Foundation Symposium in Addis Ababa, Ethiopia, in August 2010. He is doing collaborative research with Ortrun Scheid from the Mendel

Institute of Molecular Plant Biology in Vienna, Austria; Fengming Song, Department of Plant Protection, Zhejiang University, Hangzhou, China; and Herbert Hirt, Mendel Institute of Molecular Plant Biology in Vienna, Austria.

**Mary Alice Webb** continued collaborative research with Lijun Wang and Wen Jun Zhang from Huazhong Agricultural University, Wuhan, China.

**Jin-Rong Xu** was an invited speaker on two occasions in July 2010 at Nanjing Agricultural University, and he made a presentation at the Annual Chinese Phytopathological Society meeting in Xiamen, Fujiang Province, China. In September 2010 he made a presentation at the Symposium of Molecular Interactions between Plants and Pathogens in Yangling, Shaanxi Province, China. Xu continued collaborative research with Marc-Henri Lebrun, Bayer CropSciences, Lyon, France; Zhan-Sheng Kang, Northwest Agricultural and Forestry University, Yangling, China; Youliang Peng, China Agricultural University; Nicholas Talbot, University of Exeter in the United Kingdom; and Zhonghua Wang from Fu-Jian Agricultural and Forestry University, China.

### Entomology

**Christian Oseto** served as an instructor for a study abroad program in Costa Rica in May and June 2011. He worked with three indigenous groups in various locations of Costa Rica as part of a service learning project, studying sustainability practices.

**Steve Yaninek** served as a host supervisor and mentor for a graduate student from Egypt all year. In April 2011, Yaninek went to Niger, Africa, to Niamey and the surrounding region as a collaborator and site visitor. Traveling to rural villages, he visited both rural and urban markets to evaluate the adoption and impact of PICS technology. He also visited with colleagues from ICRISAT-Niamey regarding drip-irrigated vegetable production collaborations.

In April 2011, Yaninek made his way to Benin, Africa, to Cotonou and the surrounding region as a collaborator and site visitor. He visited various markets to evaluate the adoption and impact of PICS technology. Continuing his African visit into May, Yaninek traveled to Kenya, and the areas of Nairobi, Eldoret and Kakamega. He met scientists, development professionals and outreach specialists interested in African Indigenous Vegetables (AIV), to learn about local expertise and identify current activities in AIV production as part of the Purdue-Moi Partnership. Yaninek also serves as co-supervisor and mentor of a graduate student from Kenya.

In June, Yaninek participated as a member of the Purdue team that hosted a workshop on Internationalizing the Curriculum, with participants from Kenya, South Africa and Mali, and hosted a visitor from Moi University, to work on collaborative project data, plan new field research activities and draft a new grant proposal.

### Food Science

International Food Technology Center (IFTC) was established in July 2010 with funding from the U.S. Department of Agriculture. Betty

Bugusu was hired as the managing director in August 2010 and it became an official center of Purdue University in November 2010. The Center's goal is to promote growth in production, reduce food losses and advance food security, especially in developing countries. Its mission is to expand markets and reduce losses for local food crops. The Center held two consultative meetings, internally at Purdue and externally with stakeholders from private, public and multilateral institutions. The organizations represented included U.S. Agency for International Development (USAID), U.S. Department of Agriculture, U.S. Department of Commerce, the World Bank, Food and Agriculture Organization, the International Food Policy Research Institute, Institute of Food Technologists and the Inter-American Institute for Cooperation on Agriculture.

The Center currently is contributing to an ongoing project in Mali funded by the USAID-Mission in Mali, to establish enterprises for sorghum and millet processing using an incubation model concept. The incubation concept is designed to provide startup entrepreneurs with a supportive environment of equipment, services and resources offered at minimal or no cost.

IFTC received a \$24,479 seed grant from the Purdue University Global Policy Research Institute, to conduct a needs assessment study to collect preliminary data for development of markets for local farmers in East Africa. The data collected from this study will be used to develop a grant proposal for external funding, to mobilize available and/or develop new processing technologies to expand markets for local farmers. The study was conducted in the summer of 2011.

**Arun Bhunia** gave three invited talks on biosensor technologies on foodborne pathogen detection at international conferences and universities in Czech Republic, Brazil and India. He also taught short courses on food safety, foodborne pathogens and biosensor technologies to scientists and students at Federal University of Goias (UFG), Goiania, Brazil, in March and Central Institute of Post-Harvest Engineering & Technology (CIPHET), Ludhiana, Punjab, India, in May.

**Christian Butzke, Mario Ferruzzi** and Bruce Bordelon (Horticulture and Landscape Architecture) traveled to Chile and Argentina in August 2010 supported by an IPIA grant to prepare the Purdue Wine Grape Team's international Extension course "South America for Wine Professionals," which commenced during grape harvest in March 2011.

Butzke hosted a visiting faculty member from China Agricultural University's enology program in Beijing, Xiuqin Wang, who worked for one year on color pigment profiles of local grape varieties.

**Carlos M. Corvalan** co-authored a paper, with P. Sojka (Mechanical Engineering), O. Campanella (Agricultural and Biological Engineering) and graduate student Alexis Dechelette, titled, "An experimental investigation of surfactant-laden non-Newtonian jet breakup," which was presented at the 23rd International Conference on Liquid Atomization and Spray Systems (ILASS) in Brno, Czech Republic, in September 2010. This research was part of

the diffusion activities for USDA-funded multidisciplinary research on the mitigation of agricultural air pollutants.

Corvalan was invited to develop a collaborative partnership with Georgios Yannakakis, IT University of Copenhagen, Denmark, and Vasilis Valdramidis, School of Agriculture, Food Science and Veterinary Medicine, University College Dublin, Ireland, to enhance processes for inactivation of microorganisms, taking into account cumulative cell damage or progressive cell adaptation caused by previous thermal stresses.

**Mario Ferruzzi** spent two weeks in Bari, Italy, working with researchers at the Italian National Research Council's Institute for the Science of Food Production (ISPA) on olive polyphenol characterization, bioavailability and metabolism. He presented an invited talk, titled, "Research at the Interface of Food Science and Nutrition: Perspectives on Polyphenol Bioavailability" at the Istituto di Scienze delle Produzioni Alimentari (ISPA) in Bari, Italy, July 2011.

**Bruce Hamaker** continued his USAID INTSORMIL processing project activities in West Africa. He also was an invited speaker at the 10th International Hydrocolloids Conference in Shanghai, China; the IUFoST World Congress of Food Sciences in Cape Town, South Africa; and the 16th Gums & Stabilizers for the Food Industry Conference in Wageningen, The Netherlands.

**Kevin Keener** was an invited participant in the NATO-Advanced Research Workshop on Plasma for Bio-Decontamination, Medicine, and Food Security. The workshop was held in Jasna, Slovakia, March 15-18, 2011. Keener gave an oral presentation on his in-package ionization research, titled, "Decontamination of *Bacillus subtilis* spores in a sealed package using a non-thermal plasma system." A paper on the research was authored by Keener, J.L. Jensen, V.P. Valdramidis, E. Byrne, J. Connolly, J.P. Mosnier and P.J. Cullen. Workshop website:

<http://enviro.fmph.uniba.sk/nato/html/documents.html>.

**Kee-Hong Kim** established international research collaborations with Ki Won Lee, Department of Food Biotechnology, Seoul National University, Korea, who has expertise in dietary chemoprevention.

Kim participated in the Purdue Summer Research Opportunities Program (SROP) 2011 as a mentor for Jendrick Pagan (Department of Biology, University of Puerto Rico). Pagan was trained at Purdue from June to July 2011.

**Andrea Liceaga** was an invited speaker/member for the Food Safety International Network (FSIN) workshops in Mexico City, November 2010 and July 2011. FSIN provides technical solutions, training, consulting, auditing and certification schemes to food safety professionals worldwide in the areas of food safety and quality. Each year, FSIN assists more than 200 companies and organizations worldwide and provides training to more than 1,000 members (FSIN, 2011). Liceaga's participation allowed her to impart a three-day workshop to the food industry on Sensory Evaluation Techniques & Applications. The workshop is offered once or twice a year through the FSIN: [www.safefoodnetwork.com](http://www.safefoodnetwork.com).

**Lisa Mauer** served as a member of the thesis advisory committee for a PhD student at Changmai University in Thailand. This student visited her laboratory for a year, then returned to Thailand to complete her research activities. They have several joint publications, and the student will defend her dissertation in September 2011.

Mauer also has an ongoing research project sponsored by Nestle, Switzerland, which supports a postdoc researcher on water-solids interactions.

Mauer served as a member of the organizing committee for the Sixth International Forum on Food Safety and the 2011 Annual Meeting of the MOST-USDA Joint Research Center for Food Safety, to be held in Shanghai, China, in September 2011.

### Forestry and Natural Resources

**John Bickham**, U.S. team leader for Purdue, was in attendance at the meeting in Washington, D.C., when Purdue received one of six new U.S.-China EcoPartnerships, along with the University of Tennessee, Oak Ridge National Laboratory and the Chinese Academy of Sciences. President Córdova signed the agreement for Purdue in Washington, D.C., on May 10, 2011. Purdue will lead the EcoPartnership, which grew from the UT-based China-U.S. Joint Research Center for Ecosystem and Environmental Change (JRCEEC).

**Jeffrey Dukes** gave several international presentations this past year. They included talks for researchers and graduate students at the Institute of Ecology and Botany, Hungarian Academy of Sciences, Vácrátót, Hungary; a side panel presentation on “The Rising Challenges from Invasive Pests and Diseases in a Climate Changed World” at the U.N. Framework Convention on Climate Change COP 16 Meeting in Cancun, Mexico; and invited guest lectures at Fudan University, Shanghai, China. Also as PI of the INTERFACE research coordination network, Dukes organized a joint meeting with INTERFACE (U.S.) and CLIMMANI (E.U.) participants on “Nutrient constraints on the net carbon balance” in Keflavík, Iceland.

**Barney Dunning’s** FNR 460 – International Issues in Natural Resources – was held in Canada for the first time. The course was based at the University of New Brunswick, Fredericton, NB, and included visits to sites in Prince Edward Island and Nova Scotia. Ten

Purdue students were joined by 10 from North Carolina State University and the Swedish University of Agricultural Sciences (SLU). **Tomas Hook**, **Mike Saunders** and Dunning participated in the course. In addition, Dunning received an \$8,000 grant from the Canadian government to help Purdue students participate in the class. The grant was used to pay for student airfares.

**Reuben Goforth** led 10 Purdue students to Costa Rica in March 2011 on a study abroad trip. The group included six FNR students and four biology students.

**Eva Haviarova** and **Carl Eckelman** were involved in a school furniture technology transfer project through Mugla University in Turkey, as a training center for efforts in the Middle East (Afghanistan). They also supervised post docs or visiting scholars from Turkey universities working on the wood composite furniture-related research.

**Rick Meilan** gave the keynote address at an international conference co-sponsored by the FAO and the International Poplar Commission at Orvieto, Italy, and presented at departmental seminars at the University of Tuscia, Viterbo, Italy, and the University of Concepción, Chile. Meilan also reviewed the research program at Genomica Forestal (<http://www.genomicaforestal.cl/>) in Concepción, Chile.

**Charles Michler** chaired the Agricultural Research Evaluation panel for the Portuguese National Science Foundation meeting July 2010 in Lisbon, Portugal.

**Bryan Pijanowski** gave the keynote address at the World Congress on Wildlife Conservation in MesoAmerica, held in San Jose, Costa Rica, October 2010. He also presented a research paper on soundscape ecology and worked on analyzing soundscape recordings from the station in La Selva, Costa Rica.

**Paula M. Pijut** served as associate editor and member of the editorial board for two international journals, *Plant Cell Tissue and Organ Culture: Journal of Plant Biotechnology and Propagation of Ornamental Plants*. Pijut also served as an advisory board member for Trees for Life™, a public and private partnership between Gilgit Baltistan (GB) and Walkabout Development Solutions International (WDSI), LLC. WDSI is based in Washington, D.C., and the Maryland area, and tackles the tasks of reforestation in the context of building viable enterprises that employ people, produce career ladders and introduce best practices and innovative technologies. Trees For Life™ will expand over time into a major reforestation and afforestation program in GB, providing thousands of jobs and spawning self-sustaining enterprises in the forest value chain, which helps meet the sustainable economic development goals of GB.

In February 2011 **Maria Sepulveda** gave an invited talk to the Department of Biology, Mahidol University, Thailand, titled, “Use of Omic Techniques in Aquatic Toxicology.” Sepulveda supervised four international PhD students/post doc researchers from Egypt, India and Thailand on their various research projects.

**Guofan Shao** presented at two international meetings this past year. In July 2010 he had a poster presentation at GEOBIA 2010 — “Geographic Object-Based Image Analysis” in Ghent, Belgium;



and in December 2010 an oral presentation at the 2010 International Congress on “Urban Environment,” in Xiamen, China. Shao also supervises three graduate students from China.

**Rob Swihart** collaborated on a manuscript detailing effects of human harvesting of Korean pine cones on wildlife in and outside of Changbai Mountain Nature Reserve in Changbai Mountain, China.

**Keith Woeste** traveled to Northwest A&F University in Shaanxi, China, to participate in their invited lecture series. November 29 to Dec. 13, 2010, Woeste presented a series of 12 lectures on the research and mission of Purdue’s Hardwood Tree Improvement and Regeneration Center (HTIRC). He also supervised a PhD student who finished his program and is now a collaborator and faculty member at Northwest A&F.

**Hao Zhang** received two invitations to speak at international meetings. He presented at the Symposium on Spatio-Temporal Statistical Modeling held November 2010 in Tokyo, Japan, and in June 2011 at an economics and environment forum in Wuhan, China, sponsored by Hubei Province, China.

**Pat Zollner** co-authored a book chapter accepted for publication, “Evaluating translocations of martens, sables, and fishers: Testing model predictions with field data,” with researchers from England, Russia and Japan: Powell, R.A., J.C. Lewis, B. Slough, S. Brainerd, N.R. Jordan, A. Abramov, V. Monakhov, P.A. Zollner, and T. Murakami. The chapter appears in *Biology and Conservation of Martens, Sables and Fishers: A New Synthesis*, K.B. Aubry, W.J. Zielinski, M.G. Raphael, G. Proulx, and S.W. Buskirk, eds. Cornell University Press, New York.

## Horticulture and Landscape Architecture

**Bruce Bordelon**, Christian Butzke (Food Science) and Mario Ferruzzi (Food Science) visited the major wine regions of Chile and Argentina in August 2010, to organize a study abroad class and Extension study tour. Their study abroad class was then offered in March 2011, but enrollment did not meet the minimum requirement. They plan to lead an Extension study tour for 20 commercial winemakers from Indiana, Michigan, Missouri and Florida in March 2012.

**Natalia Dudareva** served as a member of the EuroVOL review panel at European Science Foundation, Strasbourg, France, 2010. She was an invited speaker at the 2nd International Conference on Plant Metabolism, June 30-July 3, 2011, Qingdao, China, and at the University of Neuchâtel, Institute of Biology, Neuchâtel, Switzerland, in October 2010. She hosted Vinod Chhokar from the Guru Jambheshwar University of Science & Technology, Hisar, India, who received a BOYSCAST fellowship and spent one year as a visiting scientist in her laboratory from August 2010 to August 2011; and Marcos Egea Gutiérrez-Cortines and Julia Weiss from the Technical University of Cartagena, Spain, who spent their sabbatical in her laboratory from May 29-Aug. 31, 2011.

**Peter Hirst** presented a poster at the 28th International Horticultural Congress held in Lisbon, Portugal, in August 2010. In September

2010 Hirst was an invited speaker at the 1st International Apple Conference, sponsored by Northwest A&F University in China. He also was invited to present a research seminar to faculty and students in the Department of Horticulture at China Agricultural University in Beijing. Hirst also was an invited speaker at the British Columbia Tree Fruit Horticultural Symposium, Kelowna, BC, Canada, in March 2011. He returned to China in June and co-taught a course, Horticulture and Biotechnology at China Agricultural University, and gave an invited research seminar at Northwest A&F University.

**Jules Janick** remained active with the International Society of Horticultural Sciences, serving as board member, director of publications and science editor for *Chronica Horticulturae*. Janick also served as colloquium chair and presenter at the 28th International Horticultural Congress held in Lisbon, Portugal.

In October 2010, he was a Dr. Honoris Causa recipient from the University of Agricultural Sciences and Veterinary Medicine Cluj Napoca, Romania. Janick also visited Southwest University in Chongqing, China, and attended the 5th National Symposium on Loquat, Shimian.

**Angus Murphy** was a co-organizer of Frontiers in Bioenergy Symposium, with emphasis on Brazil-U.S. collaborations, and continued several international collaborations with faculty worldwide. These included the Biotechnology Institute at Universidad Nacional Autonoma de Mexico (IBT-UNAM) Cuernavaca, Mexico, which focused on plant development and architecture (multiple investigators); Institute for Experimental Botany, Prague, Czech Republic (multiple investigators); University of Glasgow, Scotland (John Christie); University of Fribourg, Switzerland (Markus Geisler); University of Gent, The Netherlands (Jir Frmil and Eva Benkova); University of Nottingham, United Kingdom (Ranjan Swarup); and the University of Osaka, Japan (Ken-ichiro Hayashi).

**Wendy Peer’s** research focused on small molecules and M1 and M 24 metalloproteases that regulate the cell cycle, cell signaling, and cell identity, as well as the roles of small molecules in human health. These basic research questions have real-world applications in molecular-assisted breeding for food and biofuels. In 2010-2011, she was invited to present her work at several conferences, including Society for Experimental Biology, Glasgow, Scotland, and the First International Plant Protease Conference in Hemavan, Sweden.

**K. G. Raghothama** was an invited guest at Taiwan Agriculture Research Institute and visited Taiwan National University and National Chung Hsing University. He also traveled to Bangladesh to present seminars at Dacca University in Dhaka and Bangladesh Agricultural University in Mymensingh. As associate director of International Programs in Agriculture, he was active in developing Asia partnerships discussed in the previous Regional International Partnership Efforts section.

**Stephen Weller** visited India in November/December 2010 to attend two weed management conferences, where he presented talks on weed management in cropping systems. The invited talks were:

“Adoption of Diverse Weed Management: A key Approach for Sustainable Agriculture,” presented at the XIX National Symposium on Resource Management; “Approaches Towards Livelihood Security,” University of Agriculture Sciences, Bengaluru, Karnataka, India, Dec. 2-4, 2010; and “Genetically Engineered Herbicide Tolerant Crops for Weed Management – A Global Overview and Perspectives,” presented at The National Conference on Challenges in Weed Management in Agro-Ecosystems, Present Status and Future Strategies, Nov. 30-Dec. 1, 2010, Tamil Nadu Agriculture University, Coimbatore, India.

Weller was the supervisor of a master’s student from Afghanistan, Mohammad Iqbal Habibi, who graduated in May 2011; and was part of the Purdue faculty team training Indiana National Guardsman units before their deployment to Afghanistan. He continued his work on the IPM CRSP project in Central America and the Horticulture CRSP project in Kenya, and has made two trips to Honduras and three trips to Kenya in the past year.

### Youth Development and Agricultural Education

**Allen Talbert**, along with **Levon Esters**, co-led a group of 15 Purdue students on a Maymester 2011 study abroad to Jamaica. This is the sixth time for this experience. Students completed two courses: Exploring Teaching as a Career, and Multiculturalism and Education. Students explored Jamaican agriculture and education systems, while experiencing a different culture from that of rural Indiana.

Talbert also developed a book, titled, *Methodology Guidebook for Afghanistan Agriculture Teachers*. The guidebook was designed to assist Afghan agriculture teachers in using previously developed curriculum materials, preparing their own lesson plans, and

incorporating newer methodologies into their teaching. The guidebook was submitted to People in Need (PIN) for translation into Pashtu and Dari.

**Jerry Peters** presented pedagogical and leadership workshops for the Afghan Junior Faculty Development Program, a project of the Bureau of Educational and Cultural Affairs (ECA), U.S. Department of State. He also presented a workshop on adult education to the Indiana National Guard Afghan Agriculture Development Team that will be deployed to Afghanistan late 2011. Peters traveled to Jamaica to establish connections for a summer 2012 study abroad trip for graduate students and secondary agricultural science and business teachers.

**Colleen Brady** and **Mark Tucker** served as major professors for two Malawian graduate students, funded by a \$120,000 Michigan State/USAID Initiative for Long-Term Training and Capacity Building (UILTCB) grant. Brady and Tucker will travel to Malawi in 2012 to oversee their thesis research in Extension education and agricultural communication.

**Mark Tucker** and **Roger Tormoehlen**, working with a former Chinese doctoral student Jiajiang Peng, began developing a China Maymester study abroad course that will be offered in May 2012. The course will focus on China’s educational system, both formal and informal.

**Lee Stanish** and the several youth educators in Extension Areas II and IX hosted 19 Polish youth and nine Polish officials for two and a half weeks in June 2010. The Polish visitors spent two days on the Purdue campus, a day in Indianapolis and two days in Chicago, with the rest of the time spent with their host 4-H families.

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## PURDUE AGRICULTURE



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