The citizens of Indiana expect Purdue University to help them cope with a changing world. They expect Purdue graduates to be aware of the world beyond our borders. They want help in adapting their businesses to the rapidly changing global economic climate. They look to Purdue as a leader in making the world a safer and more prosperous place for all. Fortunately, Purdue International Programs in Agriculture (IPIA) has a history of responding to these challenges and continues to struggle everyday to stay ahead of globalization trends. In the international arena, it is not enough to just keep up. If we are not ahead of the wave, we may be forever behind.

These first five years of the 21st century have brought tumultuous change in the international arena. The events of September 11, 2001, Afghanistan, and Iraq reminded us of the resentments that ferment and sometime erupt in extreme acts. The Indian Ocean Tsunami and countless other natural disasters caution us to remember the power of nature.

The United Nations Food and Agriculture organization estimates that over 800 million people suffer from lack of food, and some five million children die every year because of malnourishment. Certainly, globalization is changing the way we do business, and negotiations in the World Trade Organization (WTO) may drastically alter the agricultural policy that the United States and other industrialized countries have used to protect their farmers for the last 50 years.

IPIA Annual Highlights 2004-2005 summarizes Purdue Agriculture’s efforts to stay ahead in this challenging environment. For example, over 23 percent of undergraduate students in Purdue Agriculture take time during their education to study abroad and to see the world from a more global perspective. In 2005, Purdue initiated a partnership with the Tropical Agricultural Research and Higher Education Center (CATIE) in Costa Rica to enhance cross-cultural understanding, build relationships between Indiana and Central American agribusinesses, and do market research. Purdue is involved in six of the nine Collaborative Research Support Programs (CRSPs) funded by the U.S. Agency for International Development (USAID) for the common benefit of agriculture in the developing countries of Africa, Asia, and Latin America, as well as in the United States. As you read Highlights remember that these are summaries. If you need more information, please contact us or the originating department.

Jess Lowenberg-DeBoer, Interim Director
Applegate, animal sciences; and Jess Lowenberg-DeBoer, agricultural economics; participated in a workshop on HIV/AIDS, Nutrition and Agriculture in Eldoret, Kenya, in March, 2005. They developed proposals during the workshop for better identifying the nutritional needs of HIV positive people and agricultural strategies for producing the needed food.

**Egypt.** Purdue University is a partner of the Midwest Universities Consortium for International Activities (MUCIA) project in Egypt, led by the University of Illinois. This four year project titled “Institutional Linkage Cooperative Agreement for Egypt Agricultural Exports and Rural Incomes” (AERI) has three primary components: 1) capacity building through higher education reforms, 2) strengthening the public-private linkages/partnerships, and 3) strengthen biotechnology research capacity and understanding. Four Purdue faculty from agricultural economics and horticulture have been a part of the action teams addressing the three components since the projects start in September, 2003. Other U.S. partner institutions include The Ohio State University, University of Minnesota, University of Florida, Lincoln University, and Chemonics International.

During the past year (July 2004 – June 2005) Purdue faculty made five short-term visits to Egypt to participate in biotechnology research symposia and grant assessment, biotechnology Egyptian policy and protocol study, public-private linkage business planning workshops, and capacity building curriculum workshops. The project is using the “train the trainer” approach so the content and approaches will be passed along to fellow faculty and industry leaders in subsequent workshops.

In addition, Purdue and three other MUCIA partner institutions conducted a U.S. Leadership Study Tour for the upper level officials of four Egyptian universities and private industries. This study tour was a part of the capacity building component and focused on educational reform and curriculum change. Deans and department heads from Cairo University, Minia University, Assiut University, and Fayoum University, as well as private sector leaders on the AERI Steering Committee made up the Egyptian delegation of 20. The Purdue study tour program presented sessions on the role and process of teaching evaluations, competency-based education approach, using technology in education, expanding education through service learning; and the Center for Agribusiness.

**Bulgaria.** Zheko Kounev, Purdue Animal Disease Diagnostic Laboratory (ADDL), and Jess Lowenberg-DeBoer (IPIA) visited five agricultural universities in Bulgaria in June, 2005, to discuss the potential for collaboration. They visited the University of Trakia, Stara Zagora, which is known for its animal science and veterinary medicine programs; University of Plovdiv, Plovdiv, famous for agronomy and viticulture; University of Rousse, Rousse, known for agricultural engineering; the D. Tsenove Academy of Economics, Svishtov; and the University of Forestry in Sofia. One area of mutual interest is capacity building in Extension programs.

**Horticultural Assessment.** Purdue was a partner in the USAID assessment of the need for research and technology transfer in the domain of horticultural crops for developing countries. Other partners were University of California Davis, Michigan State University, the World Vegetable Center (AWDC), and the University of Hawaii. The central activities of the assessment were organized in three regional meetings: Africa, Asia, and Latin America. Steve Weller, horticulture, was the contact person for Purdue and participated in all the meetings. Jess Lowenberg-DeBoer participated in the Africa meeting in Arusha, Tanzania. Kevin McNamara, agricultural economics, participated in the Latin America meeting in Honduras. K.G. Raghothama, horticulture, attended the Asia & Middle East meeting in Cairo, Egypt. Based on the results of the assessment, USAID is considering a CRSP focused on horticultural crops.

**Costa Rica.** The establishment by Memorandum of Understanding (MOU) of the institutional relationship between Purdue and Tropical Agricultural Research and Higher Education Center (CATIE), Turrialba, Costa Rica, in 2000, has led to numerous activities. William L. Hoover, professor of forestry and natural resources, is responsible for coordination between the institutions, including supervision of Tamara Benjam in’s half-time FNR position at CATIE. Having a Purdue employee at CATIE has made many programs possible because of her knowledge of both institutions and relieving faculty at CATIE of the uncompensated burden of arranging visits and coordinating activities. Hoover and Ralph Nicholson, botany and plant pathology, provided internship for a CATIE graduate student to study at Purdue for one semester. Benjamin provided internships for two forestry and natural resources undergraduate students to do research projects at CATIE. Douglass Jacobs, forestry and natural resources has an ongoing cooperative project for evaluating hardwood timber plantations in Costa Rica. Chris Oseto, director of the University Honors Program and Kevin Gibson, professor of botany and plant pathology, conducted a Maymester course on tropical biodiversity in agricultural and forested landscapes. Scott Jackson, agronomy and Jeff Stuart, entomology, taught a genetics and molecular biology short course at CATIE for scientists from...
Central America. Carlos Navaro, CATIE professor of tree genetics visited Purdue to initiate the development of a tropical hardwood genetics center in cooperation with Purdue’s Hardwood Tree Improvement and Regeneration Center. Norman Borlaug Fellows from CATIE studied at Purdue under Linda Mason, entomology, and Rabi Mohtar, agricultural and biological engineering. Cliff Sadof, entomology, has developed and received funding for a research project to be conducted while on sabbatical at CATIE that will focus on the phytosanitary treatment of tropical plants exported from Costa Rica.

**Ecuador Service Learning Project.** Pam Morris, Roger Tormoehlen, and Mark Russell traveled to Quito, Ecuador, in November, 2004, to establish relationships with The University of Central Ecuador (http://www.ucentral.edu.ec/) and Maquita Cushunchic Comercializando Como Hermanos Foundation (Shake Hands and Do Business as Friends [MCCH]) http://www.fundmcch.com.ec/) and to set up locations for service learning projects in Salinas de Bolivar. This visit set the stage for two new courses for 2006.

In follow-up, three faculty members, Pam Morris, youth development and agricultural education; Kim Wilson, landscape architecture; and Klein Ileleji, agricultural and biological engineering, traveled to Ecuador in June of 2005 with five students. The trip focused on developing a service-learning experience to be offered for the first time during Maymester 2006. The team traveled to different communities throughout the country to identify a community partner where students will be working on specific on-going projects every Maymester. Tumbabrio, a village located about 50 miles north of the capital, Quito, with a population of 1603, was selected. Some of the projects include an irrigation system, town revitalization, and ecotourism.

Potential projects identified for agricultural and biological engineering (ABE), and agricultural systems management (ASM) students will be incorporated as part of the senior capstone design course in ABE and ASM, and will be conducted by students from across the College of Agriculture. The overall initiative is an interdepartmental effort to develop an international service-learning course involving agricultural and biological engineering, youth development and agricultural education, animal science, and horticulture and landscape architecture.

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**CRSP Highlights**

**Collaborative Research Support Programs (CRSPs) are funded by the United States Agency for International Development (USAID) to link agricultural research, outreach, and education in the United States and developing countries. CRSPs are structured to provide benefits to developing countries. In the United States, Purdue agriculture is involved in six of the nine CRSPs, more than any other U.S. university.**

**BEAN/COWPEA CRSP** – Purdue faculty have Bean/Cowpea CRSP activities in both Africa and Latin America.

**Marketing Beans and Cowpeas in Africa.** Joan Fulton and Jess Lowenberg-DeBoer, Department of Agricultural Economics, and other collaborators in Senegal and Niger collected data that showed consumers are willing to pay for cowpeas that have a higher sugar content and require less cooking time. Cowpea market data from Mali, Ghana, and Nigeria confirmed that most consumers want larger cowpea grain size, but preferences for grain color and surface texture vary widely. Larger grain size is a consistent theme in market data for beans in Tanzania, Malawi, and Mozambique.

**Women Entrepreneurs.** Joan Fulton and collaborators from Niger and Senegal looked at why some women selling cowpea-based foods in those countries develop successful businesses while others do not. One of the key issues is the amount of labor required for traditional cowpea processing methods. Fulton is working with food scientists from the University of Georgia and the University of Ghana Legon to identify labor saving alternatives.

**Economic Impact of Cowpea Research.** In 2005, Jess Lowenberg-DeBoer and his students collected data on the adoption of non-chemical cowpea storage technologies developed by the Bean/Cowpea CRSP and the potential consumer and producer benefit of a cowpea genetically modified for insect resistance. Cowpea
producers were interviewed about their storage practices in Senegal, Mali, Burkina Faso, Benin, Niger, Nigeria, and Cameroon. The storage of cowpea in air-tight, heavy-duty plastic bags developed by Larry Murdock and colleagues in Cameroon in the 1980s was found to have been adopted in all the countries surveyed.

**Pest Resistant Cowpeas.** Larry Murdock, Department of Entomology, is principal investigator of the Bean/Cowpea CRSP project on molecular genetic improvement of cowpeas for growers and consumers, and a related project funded by USAID/Washington through the International Institute of Tropical Agriculture (IITA) dealing with biosafety and biodiversity related to Bt cowpea.

Murdock continues as co-chair of the Network of the Genetic Improvement of Cowpea for Africa (NGICA), a group he helped found in Dakar, Senegal, in 2001. In pursuit of the goals of the above projects and in connection with NGICA, highlights are as follows:

- Murdock organized a meeting on biosafety, biodiversity, and integrated resistance management in Niamey, Niger, on September 11-13, 2004. Plans were made to organize a network of light traps to monitor the distribution and abundance of the legume pod borer, Maruca vitrata; and to provide training on the susceptibility of Maruca populations to a series of Bt proteins. They discussed research to describe gene flow from cultivated to wild cowpea and means to reduce or eliminate it.

- Murdock and NGICA helped organize a meeting on Marker Assisted Selection (MAS) in cowpea held in Accra, Ghana, Nov. 15-18, 2004, together with the African Agriculture Technology Foundation (AATF). The Accra meeting laid the basis for a new project on MAS in cowpea. The Kirkhouse Trust, headed by Sir Ed Southern, expressed strong interest in the MAS arena.

- Barry Pittendrigh, Larry Murdock, Department of Entomology, and Joseph Huesing (of Monsanto) spent four days with scientists of INERA-Burkina Faso to coordinate plans for a revised CRSP project that includes light trapping of Maruca, characterization of Maruca populations with microsatellite markers, as well as plan for the development of a feeding bioassay with Maruca in Burkina Faso. Pittendrigh, Murdock, and Huesing also attended a one and one-half day workshop on Bt cowpea sponsored by AATF.

- Murdock and Pittendrigh of Purdue and Keyan Salzman of Texas A&M University received a USDA-NRI CSREES Multi-State Multi-Institutional grant to study the proteomics and genomics of the cowpea weevil digestive tract when the insect ingests anti-nutritional factors. The work seeks to discover new vulnerabilities in the cowpea weevil digestive tract that could be exploited for control of this world-wide pest. It will shed light on how insects respond to dietary challenges at the level of gene expression and protein accumulation.

- Murdock and several colleagues at Purdue and other universities and institutions in Africa received a grant to help breeders select for cowpea sweetness and to assist economists in measuring consumer preferences for cowpea sweetness.

**Value-Added Bean-based Products.** Suzanne Nielsen, Department of Food Science; and Ana Bonilla, University of Costa Rica; will focus on value-added bean-based products for the United States and Central America. Nielsen’s graduate student, Cynthia Machado, who has a degree in Food Technology from the Pan-American School of Agriculture, Zamorano, Honduras, is developing a bean-corn tortilla product that she will test by sensory evaluation at Zamorano. She also is studying the antioxidant activity of beans, because of their health benefits.
INTERNATIONAL MILLET AND SORGHUM (INTSORMIL) CRSP. Purdue INTSORMIL researchers have activities in both Eastern and Western Africa.

Marketing Millet and Sorghum. John Sanders, Department of Agronomy, is working with farmer organizations, national research institutes, and non-governmental organizations in several West African countries to introduce new sorghum and millet technologies (new cultivars, inorganic fertilizers, and better cultural practices). A principal component of the activities is to introduce a five point plan of new marketing strategies so that the prices received by farmers are higher, and farmers can make money on the increased input levels. Improved marketing strategies will accelerate technology introduction and increase farmers’ incomes. Sanders is working with food and feed processors so that they can obtain larger quantities of cleaner grains. Food scientists associated with the program from both the NARS and the United States are also helping the processors develop with technical inputs and training.

Millet and Sorghum Processing. In its first year of implementing the new INTSORMIL, six-country program in West Africa, the coordinator for this activity, Bruce Hamaker, Department of Food Science, made several trips to West Africa. He traveled to Bamako, Mali, in November to participate in the Sorghum and Millet Marketing and Processing Workshop sponsored by USAID/West Africa Region under the leadership of John Sanders, economist on the INTSORMIL program. In December, Hamaker traveled to Ouagadougou, Burkina Faso, for the crop utilization working group. This working group consisted of Aboubacar Ndoye, a food scientist from the Food Technology Institute (ITA) in Senegal and coordinator of this working group, and other INTSORMIL collaborators from other INTSORMIL collaborating countries including Mali, Niger, Nigeria, Ghana, and Burkina Faso. This was to follow through on a new regional project on expanding markets for sorghum and millet through high-quality processed products. This regional, interdisciplinary program collaborates with national institutes and universities with a total of ten subcontracts in six countries.

Sorghum Breeding/Production. This program in East Africa is focused on promoting a package of agronomic practices to increase production and to link with market development to gain profitability of farm activities. Significant results were obtained in Ethiopia by the Ethiopian Agricultural Research Organization (EARO). An extensive on-farm evaluation of an integrated striga management (ISM) package was conducted in four striga endemic regions of Ethiopia during three (2002-2004) crop seasons. It included striga resistant sorghum varieties developed at Purdue, a soil moisture conservation measure, and nitrogen fertilization. The primary objective was to evaluate, through farmer-participatory approach, the effect of combining multiple control options in reducing crop damage caused by striga. Secondary objectives were to promote wide use of resistant sorghum cultivars and to catalyze the establishment of an informal community-based seed multiplication and distribution of resistant sorghums. To date, over 100,000 farmers have benefited from this activity. Farmers in all four regions gave an overwhelmingly positive evaluation of the efficacy of the ISM package in reducing infestation and increasing sorghum yield. Many are engaged in seed production, selling seed to neighbors. In Ethiopia as well as Tanzania and Eritrea where the ISM technology has been promoted in a pilot project, business interests have emerged from both bakeries and breweries that could use uniform grain of sorghum for these products.

INTEGRATED PEST MANAGEMENT (IPM) CRSP. Purdue Horticulture faculty have IPM CRSP activities in both West Africa and Central America focusing on various vegetable crops.

West Africa. Ricky Foster, Department of Entomology, continued his participation in the IPM CRSP project in West Africa, with additional funds provided by the USAID mission in Mali. The primary focus of the project the past year has been the management of the whitefly vectored virus complex on tomatoes. This virus has devastated the tomato industry in West Africa. The strategy for management contains five aspects: selection of resistant/tolerant varieties; maintaining a two month virus host free period throughout the growing region prior to planting; production of healthy plants through proper horticultural practices; judicious use of insecticides for vector control; and destruction of crop residue immediately after completion of harvest. The project will be expanded to several other tomato producing regions in Mali, as well as to the neighboring countries of Benin, Burkina Faso, Cote D’Ivoire, Ghana, Niger, Senegal, and Togo.

Central America. The Integrated Pest Management (IPM) CRSP effort continues to aid Guatemala and Honduras to maintain and increase regional competitiveness and trade expansion in the non-traditional agricultural export (NTAE) sector. The IPM CRSP has been instrumental in developing NTAE production strategies and production protocols that manage pests in these crops while reducing the use of chemicals. Production practices developed are the basis upon which pre-clearance programs and policies are established. This past year a pre-clearance production and postharvest handling manual was developed for Guatemala and will be distributed to growers, handlers, and processors of snow peas. In addition, training programs begun in 2004 were continued. Collectively, the collaborative research activities and training over the past years have helped reduce grower reliance on chemical pest control methods, improved economic returns to growers and enhanced the socioeconomic welfare of NTAE households.
The IPM CRSP research has expanded its activities into Honduras with collaborative activities being established among the Honduran Agricultural Research Foundation (FHIA) Zamorano College, and the Universidad del Valle in Guatemala City, Purdue University, and the University of Arizona. This research has concentrated on the molecular and visual identification of viral diseases affecting solanaceous and cucurbitaceous crops grown locally with special emphasis on gemini-viruses that are important limiting factors in vegetable cropping systems in Honduras and Guatemala. Viral disease diagnostic bulletins are the initial result of this research, but a long-term goal involves developing viral resistance in crop germplasm that will result in reduced reliance on chemicals and increased opportunities for export of these horticultural crops that meet SPS requirements.

PEANUT CRSP. Rick Mattes, Department of Foods and Nutrition, College of Consumer and Family Science, works with colleagues in Ghana and Brazil. In the United States, data collection has just been completed on a study exploring the health effects of including peanuts into the diet at different times of the day (i.e., snacking versus with a meal). In Ghana, work was completed on a study on the efficiency of energy absorption from peanuts. Progress was made on a study parallel to the one completed in the United States. Work in Brazil focused on the energy absorption study. The meal patterning study will be undertaken in the coming year. These projects have provided training to five graduate students. One student transitioned to a doctoral program at Emery University. Two students have been employed in the food industry, one student is working at a basic research institute, and the remaining student is still working toward her initial degree. Five original research manuscripts have been written, two have been submitted to peer-reviewed journals, and three will be submitted shortly.

SUSTAINABLE AGRICULTURE AND NATURAL RESOURCE MANAGEMENT (SANREM) CRSP. Jerry Shively, Department of Agricultural Economics, currently serves as the chairperson of the SANREM Technical Committee. During the past year he completed a book (co-edited with Ian Coxhead, University of Wisconsin) that documents research conducted in the Philippines during SANREM Phase II. The book, *Land Use Change in Tropical Watersheds: Evidence, Causes and Remedies*, will be published later this year by Center for Agrcultural Business International. Shively’s current research focuses on several aspects of natural resource management in Vietnam, where he works closely with colleagues from Nong Lam University in Ho Chi Minh City.

**News from International Programs in Agriculture (IPIA)**

**New Staff in IPIA. Jess Lowenberg-DeBoer**, agricultural economics, took over as interim director of IPIA in September, 2004. He is responsible for the office until September, 2006, when Dave Sammons returns from a temporary assignment with USAID in Washington as the University Liaison for the agency. Lowenberg-DeBoer has been involved in IPIA activities as a faculty member since 1987 when he sent his first graduate student to conduct research in West Africa. In 1988, he and his family moved to the West African country of Niger, where he served as the economist and team leader on the Purdue managed Niger Applied Agricultural Research Project. When he returned from Niger in 1992, he became campus coordinator for a similar project in Burkina Faso. He has been West Africa Regional Facilitator for the Bean/Cowpea CRSP since 1996.

**Jon Dillow** joined IPIA in August, 2005, as International Academic Programs Specialist. He works with both incoming foreign exchange students and Purdue students traveling abroad. Dillow received a Masters degree in Education in May, 2005, and worked in the Purdue university-wide International Programs office while a graduate student. He is originally from Martinsville, Indiana.

**Goodbyes.** People are always coming and going at IPIA. Exchange students come. Purdue students go on study abroad programs. Faculty travel for research. Sometimes we also need to say goodbye to staff members who have found opportunities elsewhere. In June, 2005, **Barbara Martin**, international academic programs specialist, left IPIA for a position with the Purdue Graduate School.

**AGRIDAYS** is a farmer exchange program between France and Indiana. In June, 2005, a group of 11 Indiana farmers, from six farms, traveled to northern France. They stayed with French farm families, visited local business, and learned about efforts to develop alternative rural enterprises. AGRIDAYS was initiated in 2000 with joint funding by the Indiana Humanities Council Grant and the French American Foundation-Paris. The first exchange was held in March, 2002, when four French agriculturalists visited Indiana and conducted a symposium and visited agriculture research facilities and production farms. The 2003 visit was held in November, 2003, when about 18 Indiana agriculturalists traveled to Paris and Toulouse, France. In September, 2004, a similar group of French agriculturists traveled in southern and central Indiana. They spent two nights with an Indiana farm family. Associate Dean Jess Lowenberg-DeBoer, Professor Emeritus Chris J. Johannsen, and Professor Al York are providing the Indiana leadership, and Professors Jean-Paul Charvet and Sophie Devienne, University of Paris, are providing the French leadership.
Extension and Outreach

The International Extension Program Coordinator, Kelli Selby, focused her efforts for the statewide Extension system on the following:

1. Initiating new opportunities to enhance the ability of Extension educators to provide improved service to underserved audiences in Indiana.

2. Identifying and initiating opportunities to better position Indiana farmers and businesses in cooperation with Indiana state government to compete in the global marketplace.

3. Providing intercultural opportunities and resources for Extension educators to build confidence and competence in working with diverse audiences at home and abroad.

These efforts brought in new grants and support from counties and administration.

Staff Development Programs. The M.E.E.T. on Common Ground: Speaking Up for Respect in the Workplace program is a key program at all area and district Extension meetings. The program is thoughtful, straightforward, and provides practical skills for people to create a respectful and inclusive workplace. Internet video conferencing lunch discussions showcased the following topics:

- Experiences from an International Extension Conference in Ireland
- Building Culturally Diverse Audiences
- Working with Diverse Religious Audiences
- International Extension Opportunities
- Diverse 4-H & Youth Programs
- International Programming with Homemaker Clubs
- Indiana Ag Leadership International Experiences
- Service Learning in Ecuador

Cultural Competence and Global Competitiveness: An Educational Approach. Purdue Extension was awarded a USDA-CSREES International Science and Education grant to create a new international course, travel, and research opportunity. It is a two-part program designed to increase cross-cultural understanding and agribusiness networks between Indiana and Central America. Purdue partnered with the Tropical Agricultural Research and Higher Education Center (CATIE), a regional center in Costa Rica dedicated to research and graduate education in agriculture and the management, for conservation and sustainable use of natural resources. The project team includes various faculty from academic departments in the College of Agriculture.

During the spring 2006 distance education course, participants will learn the importance of cross-cultural understanding, building relationships with Indiana agribusinesses, and market research. Although the summer travel program is not required, the spring distance education course serves as an introduction for the trip.

Before the June 22 – July 2, 2006, travel program, participants will be partnered with Indiana agribusinesses. Each participant will then represent an Indiana business as a market researcher and conduct research for that company using skills obtained in the spring course. Upon return, students will create a report to help companies gain perspective about market potentials, barriers and issues surrounding international trade.

International Extension Curriculum. In 2003, Purdue received a grant from the USDA-CSREES “National Initiative to Internationalize Extension” to create a national, Web-based staff development curriculum. To accomplish this task, Purdue partnered with Iowa State University, Ohio State University, and Florida A&M University. The curriculum was officially launched in late summer of 2004, and it has been used throughout the state and nation for professional development and graduate education. It is available online at http://www.ces.purdue.edu/iec. Modules include:
Extension Educator Experiences Abroad. Seven Extension educators participated in international Extension assignments in Russia, Moldova, Uganda, Nicaragua, and El Salvador through partnerships with Winrock International, ACDI/VOCA, and Citizens Network for Foreign Affairs. Prior to their departure, they learn about their host country and determine how their local communities will benefit from their participation. Educators are encouraged to share their experience in their communities through presentations, news articles, and normal Extension programming. They can check out resources such as tablet computers, digital cameras, power adapters, IP video cameras, language software, and language phrase books. The educators donate their time and unique skills, while the sponsoring organizations, in collaboration with local host organizations, cover all logistical expenses, including airfare, lodging, meals, local transportation, and other project-related costs. The educator can participate without taking vacation time from work.

Master Gardeners Experience England. Twenty-six Master Gardeners traveled to England in May, 2005, with Dr. Mike Dana and Rosie Lerner. Participants made numerous presentations regarding their experiences in the gardens of England. Because of the tremendous interest in the program, it will again be conducted in July 2006 and may expand to other locations in the future.

Poland to Indiana 4-H Exchange. Nineteen Polish 4-H members and eleven 4-H Adult Advisors, leaders, and government officials visited Indiana 4-H families in Wells, Allen, Whitley, and DeKalb Counties during their two week stay. Leadership for this exchange project included Roger Sherer (Wells County), Barb Thuma, (Allen County), Cindy Barnett (Whitley County), as well as retired Extension personnel, Mary Schuman and Nancy Schuman.

National Recognition. Purdue Extension was awarded the 2005 Agency/Institution Award from the National Association for Multicultural Education for its work with international and multicultural programs across Indiana. Their work includes a resource Web site, http://www.ces.purdue.edu/iace/ for Extension staff, in-depth training of intercultural liaisons, minority internships to focus on reaching diverse clientele in our communities, and a variety of other programs and trainings.

Latino Community Learning Centers. Through an exciting endeavor with Monterrey Tech University, the Mexican Consulate, and the Indiana Higher Education Telecommunication System (IHETS), four community learning centers are opening in Frankfort, Indianapolis, Washington, and Albion to serve the continuing educational needs of Spanish-speaking residents. Spanish-speaking residents will be able to visit these centers and complete Internet-based courses related to computers, health, literacy, families, safety, and business. These centers are supported by a grant from the Indiana Rural Development Council.
Study Abroad

The mission of agriculture study abroad is to help prepare agriculture students for the global nature of agriculture by increasing opportunities for undergraduate participation in study abroad, overseas internships, and international studies. Student participants in these programs not only build their resumes, but also acquire valuable cross-cultural skills. Study Abroad is rapidly moving from the academic margins to the core of U.S. higher education. It is no different within the College of Agriculture at Purdue University.

Overview

In 2004-05, Agriculture students chose from 28 study abroad programs involving 26 institutions in 21 countries. Purdue agriculture continues to send large numbers of our students overseas. Over 165 students participated in a study abroad experience in the past year, in 19 countries. Over 23 percent of College of Agriculture graduates have participated in an international study abroad experience — the highest percentage of all the colleges and schools at Purdue. During the same period two students completed the requirements for the International Studies Minor. The College of Agriculture hosted 26 exchange students from Sweden, Japan, Denmark, Netherlands, Ireland, Germany, Austria, France, England, Wales, and Australia. Under a new exchange agreement, the first student studied at the University of Agricultural Sciences (BOKU), Vienna, Austria.

Short-Term Study Abroad

The College continues to expand its short-term study abroad offerings as their popularity increases.

Twenty-seven students participated in the one-credit spring break course in Ireland, while additional 23 participated in a new Italy spring-break course. The Italy course will be offered again in 2006 and in opposite years, Ireland will be offered. Also in 2006, IPIA plans to offer a spring break course in Honduras, partnering with Zamorano, the institution with whom we also have a full-term summer program.

With the College of Liberal Arts, 17 students were provided the opportunity to study in Russia focusing on marketing systems. The Department of Botany and Plant Pathology taught a three-credit course that attracted seven students in Trinidad and Tobago studying ecological issues. Twenty-four students traveled to China for a course offered by the Departments of Animal Science and Food Science that focused on the Chinese food and animal industries. Another 18 students studied organic agricultural systems in France and England in a course through the Departments of Entomology, Agronomy, and Horticulture and Landscape Architecture. The Department of Forestry and Natural Resources taught a course in which five students participated in Sweden, Denmark, Austria, and Germany. The Department of Youth Development and Agriculture Education in cooperation with the College of Education offered a course in Jamaica, while the Department of Horticulture and Landscape Architecture in cooperation with the College of Liberal Arts offered a course in Italy.

In 2006, short-term courses will take students to Poland and the Czech Republic, England, Brazil, Costa Rica, China, South Africa, and Ecuador.

Scholarships

Through the generosity of many, we continue to offer College of Agriculture students who participate in a long-term study abroad programs, grants and scholarships. Partial support is provided by the Purdue Agricultural Alumni Association, the Purdue Agricultural Alumni Trust Fund, the Walter Puglsey Memorial Endowment, the T. Kenny Phan Study Abroad Scholarship, the Horizon Trust endowment, and an endowment established by former agriculture Dean Robert Thompson and Karin Thompson.

In addition, the Departments of Agricultural and Biological Engineering, Agronomy, Animal Sciences, Biochemistry, Botany and Plant Pathology, Entomology, Food Science, Forestry and Natural Resources, and Horticulture and Landscape Architecture offer their own study abroad grants for students studying overseas.
Annual Highlights 2004-2005

News from the Departments

Purdue Agriculture integrates international activities into the daily activities of faculty, staff, and students. IPIA facilitates these international activities, especially when they are interdisciplinary and would be hard for any one department to manage. Even so, core international activities occur in departments. The following show some illustrative examples. For more information please contact the originating department.

Agricultural and Biological Engineering (ABE)

For more information contact Becky Peer at peerb@purdue.edu • 765-494-1162

Argentina. Grain Operations & Quality Management Workshop. The Post-Harvest Education & Research Center (Dirk Maier, Klein Ileleji, Raj Hulasare, and Dan Ess (ABE); Charles Woloshuk, botany and plant pathology; Linda Mason, entomology; Bob Nielsen, agronomy; and Corinne Alexander, agricultural economics) hosted a group of Argentine grain industry professionals in October, 2004. The group was hosted by the Grain Elevator & Processing Society (GEAPS) and traveled in the United States and Canada for two weeks visiting numerous grain companies and equipment and service suppliers.

Austria. Rabi Mohtar made two presentations at the European Geosciences Union General Assembly held in Vienna, Austria, on April 24-29, 2005. The presentations were titled, “Estimating Soil Hydraulic Parameters Using the Pedostructure Concept”, and “Modeling Soil-Water Dynamics for Diverse Environmental Needs.”

Belgium. Bernie Engel visited KU Leuven in Belgium, January 8-12, 2005, to work with faculty on the Purdue-Leuven joint graduate program on Earth Observation (remote sensing and GIS). In this program, students from both Leuven and Purdue start the fall semester at Purdue in a common set of courses, complete the second semester at KU Leuven in a common set of courses, and then finish their research at either Purdue or KU Leuven. ABE students Patrick Gies and Joseph Quansah will be participating in the program. Faculty members from KU Leuven visited Purdue January 23-26, 2005, to meet with faculty members involved in the Earth Observation program.

Brazil. In December the Post-Harvest Education & Research Center hosted a group of eight Brazilian government and university officials for a five-day workshop on Grain Storage Facilities Certification. Group members were from the Ministry of Agriculture in Brasilia that is responsible for Livestock and Food Supply (2), Brazilian Strategic Grain Reserve (2); the Ministry of Development, Industry and Foreign Trade in Brasilia that is responsible for Standardization and Industrial Quality (2); and the National Grain Storage Training Center (2) of the University of Viscosa (Minas Gerais). The workshop was organized by Dirk Maier.

China. Dennis Flanagan and Jim Frankenberger spent two weeks in China (Nov. 4-10) conducting a six day WEPP model training workshop at Northwest Sci-Tech Agriculture and Forestry University in Yangling, Shaanxi, China. On November 12, they conducted a half-day seminar at Beijing Normal University. Flanagan also hosted Qinke Yang from the Institute of Soil and Water Conservation, Chinese Academy of Science, Yangling, Shaanxi, China.

France. The Organization for Economic Cooperation and Development (OECD) hosted Rabi Mohtar for nine weeks this summer at Girad, Montpellier, France, to work on soil water characterization and modeling.

Germany. ABE Graduate Seminars hosted Werner Mühbauer, professor emeritus, University of Hohenheim, Stuttgart, Germany, on February 14, 2005. Mühbauer shared information about the University of Hohenheim, its research and graduate educational programs, as well as highlights of his extensive research experience in agricultural engineering in the tropics and subtropics that has ranged from machine systems, irrigation systems, energy systems, post-harvest crop preservation (including solar drying), and food processing. After the seminar, Mühbauer gave an additional lecture to students in ASM 591G Advanced Topics of Post-Harvest Operations for Grains and Oilseeds.

India. Ganesan Narsimhan chaired two sessions on food and pharmaceuticals at the Joint AIChE-IIChE meeting held in Mumbai, India, in December, 2004.


Italy. Albert Heber attended the SAE-ICES conference in Rome Italy, June 11-15, 2005. He presented papers related to biofiltration research for NASA.


Tunisia. Rabi Mohtar chaired the International Workshop on Watershed Management in Dry Areas: Challenges & Opportunities November 4-6, 2005, in Tunis, Tunisia.
Belgium. A joint M.S. program was initiated in 1999 between the Katholieke Universiteit Leuven, Belgium, and Purdue University. The program focuses on Earth Observation technology (i.e., remote sensing, geographic information and decision support systems, and global positioning systems) and its applications in terrestrial systems modeling (i.e., vegetation studies, land use assessment and planning, coastal and river management, and erosion and pollution monitoring). Students began in fall semester by completing five courses at Purdue and then taking five courses during the spring semester at Leuven. Seven students have completed their degrees with seven more working on their research. Over 40 applications were received for the 2005-06 Class.

India. Dev Niyogi and his staff participated in the Indo-U.S. Science and Technology Forum to develop a collaborative research program between the United States and India for weather and climate modeling. Visiting scientists came to the Indiana State Climate Office from the Indian Institute of Technology, New Delhi, and the Indian Institute of Technology, Kharagpur, to collaborate on satellite data assimilation in improving crop models and tropical storm synthesis.

Panama. The International Center for Sustainable Development (CIDES) has been organized in Panama. Recently it has been recognized by the Panamanian government. The goals are to provide mechanisms for integrating the social, technical, economic, and scientific aspects of sustainability. In addition to research projects, CIDES will coordinate educational programs and courses at both the undergraduate and graduate level. James Vorst serves on the CIDES Board of Directors and is working to initiate both educational and research projects in association with CIDES.

Afghanistan. Kevin McNamara is in Afghanistan working with the Afghan Ministry of Higher Education on a capacity building program for agriculture education. The project, funded with $4.2 million in monetized funds from USDA, focuses on faculty and staff development, facility rehabilitation, and curriculum development in agriculture colleges in Kabul and four other cities. The effort is also fostering a collaborative relationship between the Ministry of Higher Education and the Ministry of Agriculture. McNamara will be in Afghanistan for six months.

Agricultural Economics
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Afghanistan. Will Masters is being funded by USAID to work on the deployment of agricultural biotechnology in Africa. His work focuses on impact assessment, priority setting, and incentives for technology dissemination, most notably, an effort to introduce prize payments proportional to the economic value of adopted techniques. Updated papers and presentations are available online at www.agecon.purdue.edu/staff/masters; the prizes proposal is detailed at www.earth.columbia.edu/cgds/prizes.

Australia. Gerald Shively returned from an international sabbatical this past year during which he had an appointment as Honorary Fellow at the University of Melbourne (Australia) where he worked with colleagues in the Asian Economics Centre within the Department of Economics. He has continued work on several activities in the Southeast Asian region, including SANREM-supported research on smallholder coffee and cocoa production in the Central Highlands of Vietnam, and NSF-supported work on deforestation and agricultural labor markets in the Philippines. He completed an ALO-supported project on curriculum design at Nong Lam University in Ho Chi Minh City. He also completed a book (co-edited with Ian Coxhead, University of Wisconsin) based on research in the Philippines. The book, Land Use Change in Tropical Watersheds: Evidence, Causes, and Remedies will be published by CAB International later this year.

Cameroon. Philip Abbott heads a project on the impacts of innovations in marketing and trade on smallholder cocoa farmers in West Africa. That effort is funded by International Institute for Tropical Agriculture’s (IITA) Sustainable Tree Crops Program (STCP) and directly supports STCP’s Trade and Information Systems Project (TISP). TISP serves to backstop marketing functions in each of STCP’s national pilot projects and to carry out regional level functions where economies of scale give it a comparative advantage. Purdue activities involve design of the TISP project and its subsequent impact assessment. His research examined the competitiveness of the cocoa supply chain, innovations to add traceability to the cocoa supply chain, the impact of privatization on African cocoa sectors, the economics of privatized fair trade and foreign aid initiatives, and cocoa policy concerns of West African governments.
Egypt. Maria Marshall is part of a multidisciplinary team of inter- and intra-university faculty and Extension specialists involved in a program titled Agricultural Exports and Rural Incomes (AERI). The mission of this program is to increase rural incomes in southern (upper) Egypt. These efforts are supported by funds from USAID. As part of this four-year project, Marshall has developed and delivered several two-week workshops in Cairo and Minia on how to write a business plan and manage a small business. Workshop participants are members of various Egyptian agencies, university faculty, Agricultural Cooperative Development International and Volunteers in Overseas Cooperative Assistance (ACDI-VOCA) and Cooperative for American Relief Everywhere (CARE) specialists, and small horticultural and livestock producers. ACDI-VOCA and CARE specialists will in turn deliver the workshop and give technical assistance to small producers throughout southern Egypt who have formed horticultural and livestock cooperatives. University faculty will make workshop lectures part of their agribusiness classes.

Europe. In April, 2005, John Connor presented papers on cartels at two conferences in Europe, one for invited researchers on cartels and one for antitrust regulators. As a result of those presentations, he was extended an invitation to present research to a seminar at the European Commission’s Directorate-General for Competition (DG-COMP) in Brussels later in 2005. DG-COMP is the European Union’s equivalent of the Antitrust Division of the U.S. Department of Justice.

Honduras. In October, 2004, the Center for Agricultural Business organized two days of intensive and comprehensive programming for Kenneth Hoadley, Rector of the Zamorano University, with Purdue administrators, faculty, and professional staff. The purpose of the program was to discuss shared interests in several key areas and to discuss how to share academic and staff capacities for a stronger force in international programming. Topics of the program focused on entrepreneurship, agribusiness case study development, agribusiness management development programming, food safety programming, and distance-delivered programming. The program involved administrators, faculty, and professional staff from Academic Programs, and the Departments of Agricultural Economics, Food Science, Entomology, Botany and Plant Pathology, Horticulture and Landscape Architecture, and International Programs in Agriculture.

Morocco. On July 1, 2005, the Morocco – U.S. Free Trade Agreement (FTA) came into effect. Wally Tyner played an important role in providing economic analysis for the negotiations. This past year, he has been assisting with implementation issues. The domestic policy reforms that accompany the FTA are essential if Morocco is to achieve the potential gains from the FTA. Tyner has been working on reforms in tariffs, domestic marketing, market information systems, and other areas.

Sweden. Jess Lowenberg-DeBoer presented a paper on the profitability of GPS Auto-Guidance for crop production at the 5th European Conference on Precision Agriculture in Uppsala, Sweden, in June, 2005. He works closely with Wilhelm Nell, University of the Free State, Bloemfontein, South Africa; Rodolfo Bongiovanni, Institute for Agricultural Technology (INTA), Argentina; and Evandro Mantovani, Brazilian Agricultural Research Corporation (EMBRAPA), Brazil, on the economics of precision agriculture in their countries.

Center for Global Trade Analysis. Terrie Walmsley is part of the Center for Global Trade Analysis, the university-based home for GTAP (Global Trade Analysis Project), a global network of researchers and policy makers conducting quantitative analysis of international policy issues. The aim of the project is to improve the quality of global economy-wide analysis through education and develop analytical data bases, economic models, and innovative methodologies. These efforts are supported by funds from 23 international and national organizations. This year Betina Dimaranan, Robert McDougall, and others at the center produced the sixth version of the GTAP Data Base covering 87 regions and 57 commodities. Huey-Lin Lee and Walmsley also developed models and data bases that can be used to examine issues related to land-use and climate change, and international labor migration. The center held a conference in Lübeck, Germany, and a course at the University of Crete in Greece.

Center for Food and Agricultural Business (CAB). CAB in collaboration with INCAE presented “World Agriculture...the new realities” to an audience of 50 agribusiness managers from countries of Central America on the campus of Zamorano, Honduras. On participant commented: “This illustrates that many of the challenges faced by agribusiness managers in Central America are similar to those of the United States and probably around the world.” CAB collaborated with INCAE and Zamorano, two internationally recognized institutions in the area of agribusiness masters and MBA-level education (INCAE), and undergraduate education in food and agriculture production (Zamorano.) CAB delivered custom-tailored lectures, a case study with presentations and de-brief, and interactive discussion segments for the INCAE Food and Agribusiness Seminar. CAB’s role was to enhance the understanding of the rapidly changing agricultural marketplace and to broaden perspectives of agriculture’s challenges and opportunities for the near future. The audience was drawn primarily from alumni of Zamorano and INCAE, who currently lead farm and agribusiness firms as well as representatives from credit and lending institutions, and government officials.
Botswana. Layi Adeola traveled to Gaborone, Botswana, for review of education programs, research programs, and livestock research facilities.

Bulgaria. As a follow up to a 2004 training program for dairy farmers in Bulgaria, Mike Schutz contributed three articles on genetic improvement, assessing cow hygiene, and lameness to the 2005 issues of Bulgarian Dairy Farmers Project Newsletter.

China. Heng-wei Cheng hosted the visit of Prof. Jin Peihua, the Executive Dean of College of Animal Sciences, Zhejiang University, China, for cooperation in research and student exchanges between Purdue University and Zhejiang University in March, 2005. Allan Schinckel met with 11 Chinese swine genetics faculty who visited Purdue University to discuss the implementation of swine genetic evaluation programs. The group was traveling as guests of the U.S. Grains Council and later visited the National Swine Registry offices in West Lafayette where the Swine Testing and Genetic Evaluation System (STAGES) program, developed at Purdue, has been implemented. Zoltan Machaty gave a talk on the production of transgenic pigs by nuclear transfer at the Danish Institute of Agricultural Sciences in Tjele, Denmark, in January, 2005. John Patterson, Todd Applegate, and Susan Eicher traveled to Beijing (CAAS), Lanzhou (CAAS), and Nanjing Agricultural University, China, October 23-November 5, 2005, on a USDA Foreign Ag Service Grant to present research interests and to develop collaborative research on Traditional Chinese Medicines in livestock. They are hosting Fucun Guo, from Lanzhou, China, for six months to further those developments.

China, Poland, Slovakia, and the Czech Republic. Mark Russell assisted with the planning and development of the Animal Sciences course, ANSC 294, Exploring International Animal Agriculture of China, Maymester, 2005, and Poland, Slovakia, Czech Republic, 2006.

China. John C. Forrest, professor emeritus of animal sciences; Terry Stewart, professor of animal sciences; and Kirby Hayes, professor of food science, organized a three-week study of Food and Animal Sciences in China. During Maymester they accompanied 23 students from the College of Agriculture to China. Students started their studies during the spring semester when they prepared fact sheets on both agricultural and cultural topics. During their 20 days in China, they learned through a wide range of events including, meetings with the U.S. Grains Council and the American Soybean Association, Wellhope Feed Company, Mei-Nong Flavorings Company, Nestle’s R&D Facility, Animal and Food Science Faculty at the Chinese Agricultural University, Northwest Agroforestry University and Zhejiang University, and the Chinese Academy of Agricultural Science. Students also learned about Chinese history and culture through events such as walking the Great Wall and seeing the TerraCotta Army at Xian, standing on Tienanmen Square and on the banks of the Hangpu River, visiting with a family that has raised tea for over 40 generations, eating a wide range of Chinese cuisines, and just being on the streets of Beijing, Xian, Hangzhou, and Shanghai. The trip was concluded with a seminar presentation to over 125 friends and family.


**Animal Science continued**


**Norway.** Paul Collodi gave an invited talk at the Norwegian Forum on Transgenic Animals in Oslo in February and spent one week visiting Peter Alestrom’s lab at the Norwegian School of Veterinary Medicine in Oslo. In June, Alestrom and his postdoctoral research associate, Jethro Holder, visited Purdue’s lab for two weeks to learn embryonic stem cell culture methods.

**Romania.** Mark Russell hosted delegations of Romanian veterinarians (December, 2004) and Romanian agribusiness leaders (June, 2005).


**Spain.** Todd Applegate presented “Safety and Nutrition: Latest Tendencies and Opportunities for Poultry Production” at the Poultry Nutrition Symposium, Segovia, Spain.

**Netherlands.** Layi Adeola spent one week at a conference on pig and poultry growth at Ithala Game Reserve organized by University of Kwazulu-Natal. He explored collaborative research and scientist exchange opportunities with researchers at Irene and Venda.

**Biochemistry**

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**Australia.** Henry Weiner spent six months as a Distinguished Fellow of the Institute for Advanced Study at La Trobe University (Melbourne, Australia). In addition to pursuing collaborative research interests with La Trobe faculty, he presented four talks, two in the biochemistry department at La Trobe, one at the Institute for Advanced Study, and one at the Bendigo regional campus. Weiner also organized the international meeting on the Enzymology and Molecular Biology of Carbonyl Metabolism held in Burlington, Vermont, in July, 2004. Scientists from more than 12 different countries attended.

**Europe.** Sandra Rossie presented research seminars at the University of Manchester Faculty of Biology (Manchester, Great Britain), University of Marburg, Department of Biology Neuroscience section (Marburg, Germany), and the Institute of Chemical Kinetics and Combustion, Siberian Branch of the Russian Academy of Sciences (Novosibirsk, Russian Federation). At the Institute of Chemical Kinetics, she met with several faculty to discuss possible collaborative studies of a protein called PP5 that plays important roles in the central nervous system and cancer.

**Germany.** James Forney was an invited speaker at the annual meeting of the Germany Society of Protozoology held at Berg Lichtenberg, Pfalz, Germany, in March of 2005. His host was Helmut Schmidt, who is the president of Kaiserslautern University, Kaiserslautern, Germany.

**Mexico.** David Krogmann is actively involved in collaborative research with Carlos Gomez Lojero at the Instituto Poltecnico National in Mexico City. Krogmann again offered his three week short course, “How to Write a Scientific Paper in English” at the Instituto Fisiologia Celuar, Universidad Nacional Autonoma de Mexico in Mexico City.

**Argentina.** In March, 2005, Don Huber was invited to present his research on sugarcane disease at the 14th Latin-American Congress of Plant Pathology in Cordoba, Argentina. He subsequently met with sugarcane growers in Tucuman and northern Argentina. Research to combat the sugarcane decline phenomenon that reduces yields 50 percent by the third ratoon crop and predisposes plants to ratoon stunt, mosaic, rust, and red streak is critical to producers in the region. Huber is in the process of developing the necessary research and demonstration plots (ongoing interaction) that will be important in managing this important disease.

**Brazil.** Greg Shaner, Department of Botany and Plant Pathology, and Shawn Conley, Department of Agronomy, spent two weeks during mid-February in Brazil looking at soybean rust. They traveled from Sao Paulo to Minaus, visiting many farms along the way. Through direct observation and from discussions with farmers and plant pathologists, they were able...
to learn a lot about field and lab diagnosis of the disease and management with fungicides. In a sort of international activity in reverse, Tadashi Yorinori, a soybean pathologist from Brazil (who accompanied this group in Brazil), came to Indiana this summer and gave presentations to farmers at four of Purdue's research farms; Agronomy Center for Research and Education (ACRE), Davis Purdue Agriculture Center (DPAC), South East Purdue Agriculture Center (SE PAC), and South West Purdue Agriculture Center (SWPAC).

Nick Carpita, Department of Botany & Plant Pathology, and Wilfred Vermerris, Departments Agronomy and Agricultural & Biological Engineering, received funding from U.S. National Science Foundation for research on biofuel production from crop residues, particularly from maize and other grasses. Their research is in collaboration with several Brazil scientists (Marcos Buckeridge, University of São Paulo, and Eugênio Ulian, Sugarcane Technology Center (Centro de Tecnologia Canavera) and additional expertise and technical support of Mark Davis, National Renewable Energy Lab, Golden, Colorado. The team is working to mine maize and sugarcane genetic resources to uncover determinants of carbohydrate production, lignin production, and carbohydrate-lignin interactions that potentially impact saccharification potential for biofuel production. The knowledge base acquired could consequently impact improvements in nutrient availability in forage grasses for ruminant animals.

Don Huber is working in collaboration with T. Yamada, POTAFOs, Brazil, and Volker Romheld, Hoenheim, Germany, working with Tamara Benjamin, FNR (CATIE), Luis Canas, (The Ohio State), and Carlos Bogran to develop a pilot project with red ginger flower growers that will be funded by USDA FAS SCRP.

Entomology
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Costa Rica. Clifford Sadof has been traveling back and forth from Centro Agronómico Tropical de Investigación y Enseñanza (CATIE) to develop an international research team to address pest management issues on ornamental crops bound for export from Costa Rica. His research group is working on both live plants and cut flowers. Sadof and his colleagues, Carlos Bogran (Ph.D. ’98) of Texas and Luis Canas of The Ohio State University, just received a USDA FAS SCRP grant to work on mealybug pests of red ginger. Sadof went to Costa Rica in May of 2005 to discuss the development of a pest management program for exporters of ornamental crops. He has been to develop a practical, effective control of Citrus Variegated Chlorosis caused by the Xylella fastidiosa bacterium. This disease is not present in the United States, and the pathogen is on the U.S. Select Pathogens List of bioterrorism concern (also accidental introduction). The control system being developed is based on scientific principles developed over the years from Huber’s research on soilborne diseases. An annual review and update of the project was conducted in Brazil, in February, 2005.

Europe. Don Huber’s international activities included participation in international workshop “Crosstalks” in Germany, a seminar presentation in England, and a visit with Technical Group of Phosyn Company at Pocklington, England, to discuss challenges in micronutrient application to evaluate various approaches to improve micronutrient amendment for glyphosate-resistant soybeans and other crops in order to improve yield and quality as well as off-set the predisposition to soilborne diseases.

France. In June, 2005, Jin-Rong Xu visited the research group lead by Marc-Henri Lebrun at Bayer CropScience in Lyon, France. Xu gave a seminar on infection-related morphogenesis in Magnaporthe grisea.

Russia. Don Huber met with several Russian plant pathologists in April and June of 2005 to continue ongoing discussions regarding their consolidation of biological cultures, upgrading of research and greenhouse facilities, and the development of cooperative research programs that can be of mutual benefit to both countries.

India. Jeff Stuart participated in a programmatic review of the Plant Resistance Group at the International Centre for Genetic Engineering and Biotechnology (ICGEB) in New Delhi, India, from February 4 through February 10, 2005. He gave seminar presentations and interacted with Indian collaborators on Hessian fly/Asian rice gall midge comparative genetics at Kakatiya University, Warangal, India, February 11, 2005, Directorate of Rice Research (DRR), Hyderabad, India, February 14, 2005.
Entomology continued


Western Europe. C. Richard Edwards continues to work with colleagues in 20 European countries on the development of sampling protocols and management schemes for the western corn rootworm (WCR), Diabrotica virgifera virgifera LeConte. He is spending the summers of 2005 and 2006 in northern Italy working with Italian colleagues on studies to compare different trap types in an effort to improve the farmer’s ability to determine when economic populations of WCR are present. In addition, he is working on alternatives to synthetic organic insecticides for WCR adult control. This is in conjunction not only with Italian colleagues, but also Dow AgroSciences. It has global implications. He also is co-convener of the IOBC International Working Group on Ostrinia and Other Maize Pests, which includes WCR. He presided over the Diabrotica Sub-Section of this group at a meeting in Bratislava, Slovak Republic, in February, 2005. Additionally, he and two colleagues from Europe edited the first international book related to WCR, which was released in January, 2005.

Food Science

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China. The Department of Food Science had three major efforts in China over the past year: a sabbatical leave, lecture tour, and study abroad program for undergraduate students. LiFu Chen spent his sabbatical leave of August, 2004, through February, 2005, in China, primarily at Zhe Jiang University, Hang Zhou City, and the Zhe Jiang Province. Chen observed the Chinese food supply chain and food safety issues, and then offered suggestions for improvement to the Dean of the School of Bio-System and Food Science at Zhe Jiang University. Chen taught a course, Food Technologist to Entrepreneur, at the university. Bruce Hamaker taught classes in starch and cereal chemistry and technology at Southern Yangtze University in Wuxi, Jiangsu, China, in October, 2004. Hamaker was invited as Director of the Whistler Center for Carbohydrate Research. He has a visiting scientist in his laboratory from the same university. Suzanne Nielsen was invited to visit Southern Yangtze University in Wuxi, Jiangsu, China, in November, 2004, to give three lectures related to her teaching area of expertise, food analysis. A faculty member at that university was the translator of her Food Analysis textbook into Chinese. Nielsen’s talks were on carbohydrate analysis, innovations, and trends in food analysis, and analytical methods for quality control of food products. While in China, Nielsen also attended a Food Summit in Beijing, sponsored by the Institute of Food Technologists (IFT) in the United States and China IFT. Kirby Hayes worked with Terry Stewart and John Forrest of the Department of Animal Sciences to lead the Maymester study abroad program to China for 24 undergraduate students. See entry under Animal Sciences for details.

Italy. Mario Ferruzzi, along with Linda Vallade in IPIA, led a group of Purdue students for a spring break study abroad program to Italy. While there, the group visited the Barilla pasta factory, vineyards, and cellars of the Cantina Crocini in Montpuciano, and a Prosciutto (Parma Ham) processing factory in Parma. The students kept detailed journals of their travels.

Thailand. Five Ph.D. students from Thailand universities are doing part of the research toward their degrees in the laboratories of food science faculty at Purdue. James BeMiller, Carlos Corvalan, Mario Ferruzzi, Bruce Hamaker, and Bruce Watkins are helping supervise the research of these students, most of who have done their degree coursework at their home university in Thailand.
Kazakhstan. Andrew DeWoody has worked with colleagues at Princeton University, the National Aviary, Pittsburgh, and the Naurzum State Nature Preserve, Kazakhstan, to study how loyal eagles are to their mates. DNA paternity tests done using feathers from adult eagles and their chicks showed that the eagles were 100 percent faithful to their mates. Their work is part of a larger study funded by the Wildlife Conservation Society to protect four endangered eagle species that live in the Naurzum Reserve.

Egypt. January, 2005, Avtar Handa, a member of the Agricultural Exports and Rural Incomes (AERI) Biotechnology team, along with Mary Ann Lila, University of Illinois, and Richard Litz, University of Florida, visited Egypt to conduct site visits and assesses the progress made by the recipient of first round of the biotechnology research grants. The team visited Agriculture Genetic Engineering Research Institute (AGERI), National Center of Research (NRC), Applied Center for Entomatology, Agrofood and PICO to meet with the principal investigators. The team evaluated and ranked 42 new proposals that were submitted for the second round of biotechnology grants. The team also met with Asif Chudry, U.S. Counselor for Agricultural Affair in Cairo. As part of the Biotechnology Symposia conducted by the Biotechnology team at AGERI, Handa presented a talk entitled “Molecular Engineering of Fruit to Modify Pectin Chemistry.”

England. An international educational opportunity is now available for Purdue Master Gardeners. In a first of its kind program, Michael Dana and Rosie Lerner of the Department of Horticulture and Landscape Architecture developed and taught a garden and garden history course in England in May for Master Gardeners. Twenty-two Master Gardeners (and four guests) from 12 counties participated in the 13-day course that included the study of garden forms from the 16th to the 20th centuries. The Royal Horticultural Society’s world famous Chelsea Flower Show in London concluded the program. The Master Gardener participants received advanced training credit for the course and all planned to share their experiences and knowledge gained with local audiences in their home counties.

France. Jules Janick presented a seminar to l’Institut National de la Recherche Agronomique (INRA - National Institute for Agricultural Research) in Avignon and is also cooperating with INRA on in a study of crop iconography. The iconography project, including researchers from INRA, Israel, and Cucurbit Network USA, involves the search for iconography and related texts of horticultural plants from antiquity to the 18th century, with the concentration on solanaceous and cucurbitaceous crops to start. A database of images from 16th century printed herbals and Renaissance and Medieval art is being developed.

Sri Lanka. Linda Prokopy’s graduate student, Roshni Nuggehalli, traveled to Sri Lanka this summer for her Masters research on a community tropical forest biodiversity conservation project. The project is implemented by the United Nations Development Program (UNDP) in villages surrounding a recently declared UNESCO Man and Biosphere Reserve (MAB) in southwestern Sri Lanka. She spent three months living in two project villages interviewing local participants and project managers. She focused on women’s roles and co-management issues. Her research was partially funded by a Frederick N. Andrews Grant from the Graduate School.

India. Kashchandra Raghothama and Avtar Handa are co-principal investigators of a three-year USAID-ALO sponsored project titled “Partnering with Higher Education in India for Improving Nutritional Quality of Food by Biotechnology Approaches.” This was a busy year for the partners, Purdue University and University of Agricultural Sciences, Bangalore, India. Marshall Martin delivered two talks and visited villages adapted by Indian partners. In June, Avtar Handa and Raghothama spent a week working with Indian collaborators in Bangalore. This visit was highlighted by seminars, participatory activity in villages, meeting the industry leaders and university administrators. The horticulture and landscape architecture department also hosted five Indian partners of the project in the summer of 2005. Theertha Prasad (biotechnology), Vijayalakshmi (food and nutrition), Nagaraj (agriculture economics), Gangadharappa (agriculture Extension) and Thulasidas (agriculture engineering) participated in research activities, presented seminars and interacted with faculty from different departments at Purdue. HLA also hosted P.G. Chengappa (Director of Instruction, UAS, Bangalore) at Purdue in 2004. This higher education partnership between two universities has already made significant progress in research, education, and outreach activities in India. An international symposium on “Biotechnology Approaches for Alleviating Malnutrition and Human Health” is planned for January 9-11, 2006, at Bangalore, India. Details about the symposium and project activities can be viewed at the dedicated website www.nutritionforall.org
Afghanistan. Allen Talbert hosted a group of five visiting Afghan professors for a day in early March. This group was brought to the United States through a grant from the Academic Liaison Office (ALO) to Purdue University. Their focus was on secondary and vocational education. Talbert took the group to visit vocational agriculture programs in high schools and the National Future Farmer of America headquarters in Indianapolis.

Jamaica. This past year Mark Balschweid has been involved in collaborating with the College of Agriculture, Science, and Education (CASE) in Port Antonio, Jamaica. This collaboration has resulted in a Memorandum of Understanding (MOU) that serves to guide the relationship between Purdue University and CASE. The CASE institution is the equivalent of Jamaica’s land grant institution and takes the leadership in teaching and research in agricultural science and related areas. In addition, with the help of a Fulbright Fellowship, Balschweid is spending the 2005-06 academic year on sabbatical from Purdue University. He is teaching and conducting research in the Agricultural Education program at CASE. In May, 2005, B. Allen Talbert and Balschweid led a group of 13 Purdue University agricultural education sophomores on a Maymester Study Abroad to CASE where they examined Jamaican high school agricultural education in a setting very diverse from typical Indiana secondary schools. With the assistance of a PRF International Travel Grant, Balschweid presented a paper this past summer entitled “Designing Vocational Education for a Changing World: Teaching Academic Standards Within a Vocational Context” at the 12th International Conference on Learning in Granada, Spain.

Japanese Exchange Program. In the summer 2004, the Department of Youth Development and Agricultural Education, hosted 50 youth and six chaperons through the 4-H exchange program with Japan. These youth came from two Japanese partners, LABO and Meiji Gakuin High School. The student delegates and chaperons were engaged in a month-long homestay in Indiana, with host families located around the state. Homestays usually begin the last week of July and run through mid-August, with a departure picnic bringing closure to the experience.

Middle East. Jerry Peters, professor in the Department of Youth Development and Agricultural Education, has been collaborating with the Indiana Center for Cultural Exchange on several U.S. State Department funded projects. Peters provided the youth leadership development component for the United States Summer Institute on Youth Leadership and American Life for the Middle East Partnership Initiative and Bureau of Educational and Cultural Affairs, USPORT Lebanon, and USPORT Kyrgyzstan.

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