

International Programs in Agriculture



“ . . . to promote and facilitate international activities in the School of Agriculture...”

Mission Statement

Message from the Director

It is probably unnecessary to assert that we live in a globalized world at a time when so much around us provides a daily reminder of this fact: a Brazilian wins the Indianapolis 500...more than a third of our nation's agricultural production is marketed overseas...the United States is one of the largest Spanish-speaking nations in the world...half of the cabinet ministers in Egypt's government are U.S. educated...a horse owned by a Saudi prince wins the Kentucky Derby. These and other “sound bytes” serve to remind us just how interconnected we are with people in other parts of the world. The September 11 tragedy further underscored this when we learned that citizens from more than 80 nations were listed among the casualties. We all saw the array of flags displayed at the official closing of the clean-up at “ground zero” in late May.

Increasingly, we must ask ourselves how we can appropriately respond to this global reality. Should we hunker down behind ever-higher walls and design ever more powerful airport metal detectors to insure our security? Or, should we embrace and prepare for this new world by applying those tools—science and education—that we know best how to use to strengthen our global competence as individuals and as a nation? Our answer must be the latter.

Science and education can and will contribute to making the world more secure by solving real human problems, enhancing mutual understanding among peoples and nations, and fostering a world without borders. Global competence—a significant university goal—is a prerequisite to making the claim that we are “educated.” International Programs in Agriculture (IPIA), now more than ever, is essential to our institutional leadership in a global society.

As you read the articles that follow, you will learn about the responses of the School's faculty, students, and staff to the call to use science and education to contribute to a better world.

David Sammons, Director

Research and Development Cooperation

International research activities contribute to global science as well as to the welfare of Indiana citizens and people around the world. With administrative support from International Programs in Agriculture, Purdue's School of Agriculture has been actively involved during the past year in multiple research and development activities to serve these goals.

China. IPIA-led programs in China, supported in part by a gift from Professor *emeritus* John Tse, have continued to thrive over the past year. Tse's gift permitted IPIA to formalize a unique partnership with the Beijing office of the Winrock International Institute for Agricultural Development, a private non-profit organization devoted to global development and poverty alleviation. The partnership provides Purdue Agriculture with a permanent, credible presence in China that has enabled us to multiply the original gift by leveraging funds which support multiple activities there.

Two USDA-funded programs are among our current activities in China: 1) a swine nutrition and management training program that has reached over 1000 feed industry professionals



Campus scene at Chinese Academy of Agricultural Sciences, Beijing, China.

in China, and 2) a training activity in inventory management technologies designed for Chinese supermarket managers. In addition, the Winrock partnership has opened new opportunities to work with the municipal government of Hangzhou on food safety issues in international trade. Additional initiatives on forest management and energy conservation continue, as well as numerous collaborations with faculty at several universities across China.

This past year, our Winrock partners and the Beijing Commerce Commission (BCC) launched a new initiative that focuses on retail business. Under the auspices of the BCC, Dr. Sandra S. Liu from Purdue's School of Consumer and Family Sciences presented a training workshop on trends and challenges in retailing to 60 senior managers of retail enterprises. This visit opens new opportunities for Purdue through a planned project entitled "Chinese Manager Retail Management Certificate Series" expected to be launched next year.

Purdue is a founding member of the "Consortium of U.S. Universities and Institutes in Cooperation with China for Agriculture." This consortium (UCCA) was organized to enhance joint activities in science and education among a group of leading American and Chinese agricultural universities. The consortium is planning a Chinese-American symposium in November 2002 in Yangling that will focus on the development of western China. Additionally, Purdue Agriculture, through our linkage with the USDA National Soil Erosion Research Laboratory on the West Lafayette campus, is engaged with a USDA/ARS initiative to organize a Sino-U.S. Center for Soil and Water Conservation and Environmental Protection. This new center was inaugurated at a ceremony in western China in May 2002. Additional conversations continue with USDA/ARS on the joint establishment of a sustainable grasslands center in China through a similar mechanism.

For the first time this year, IPIA, with leadership from the Department of Animal Sciences, offered a Maymester undergraduate study abroad program in China. Twenty participants visited universities, agricultural industries, and cultural sites over a four-week period, learning about animal agriculture in China along the way. Winrock assisted with much of the on-the-ground organizational support for this program.

Afghanistan. Responding to a request from Afghan educators for assistance with the rebuilding of Kabul University, Purdue organized a campus-level Afghanistan Steering Committee to explore ways to partner with that institution. Consultations with the Minister of Higher Education (Dr. Sharief Fayez) in February 2002 and the Deputy Minister (Dr. Maliha Zulfacar) in May 2002, both of whom visited Purdue, led to the identification of key priorities for the redevelopment process. The Schools of Agriculture, Engineering, and Technology will lead our engagement in this rebuilding process over the next decade in collaboration with university partners across the United States and Afghan colleagues. As funding becomes available, efforts will be directed at curriculum revision, community outreach, human capacity development, collaborative research, public administration, teacher training, reorganization of the nation's higher education system, and strengthening Kabul University's role in the rebuilding of Afghanistan.



Afghan markets—Kabul, Afghanistan.

Brazil. A McKnight Foundation grant awarded in 2001 provided funds for faculty members from the Departments of Agronomy and Horticulture and Landscape Architecture to pursue a research and technology transfer activity to improve phosphorous use efficiency in low-phosphorous soils worldwide. Led by the Brazilian national agricultural research organization (EMBRAPA), this project partners Purdue with scientists at Cornell University and Moi University (Kenya). A highlight of this past year was a workshop held in southern China at which problems with and technology for management of low-phosphorous soils were addressed.

Middle East and North Africa Water Resources Activities. Purdue Agriculture is quickly becoming a recognized leader in research and development activities focused on water resources in the Middle East and North Africa. Prominent among these activities is a USAID-funded project under the United States-Palestine Linkage (UPLINK) program. Through this project, Purdue Agriculture is assisting with the development of an M.S. degree program in water resources management to be offered by partner universities in the region. In addition, the UPLINK partners are developing training and capacity-building support programs for personnel in the Palestinian Water Authority (PWA). Islamic University of Gaza (IU/Gaza) is the lead institution in the Palestinian Authority. Water resource professionals from the University of Bethlehem and An-Najah University (Nabulus) as well as the PWA join IU/Gaza and Purdue University in program development and implementation. (Of note: Dr. Naim Iraki, an UPLINK partner from the University of Bethlehem, was recognized as a Distinguished Agricultural Alumnus by Purdue Agriculture in April 2002.)

Despite the unrest in the region, IPIA organized a face-to-face meeting of program participants in Amman, Jordan, in March 2002 to continue curriculum development, plan research priorities, and discuss key short-term training needs in the water sector. Further information about the curriculum can be viewed at the project Web site: <http://pasture.ecn.purdue.edu/~h2o>.



In addition to UPLINK, Purdue Agriculture completed the second year of a USAID-funded cooperative agreement to work on training and applied research activities with the Jordan Ministry of Water and Irrigation. The project, "Skills Enhancement and Support to Decision-Makers in Jordan's Water Sector," is led by Washington State University and includes several universities in Jordan as partners in addition to Ministry personnel. During the second year, training and technical assistance modules focused on domestic water supply and quality, wastewater treatment, water pollution management, advanced GIS-based applications to water resource management, and water pricing policy were presented. Negotiations continue with USAID regarding the organization and focus of efforts in year three.



Roman ruins at Jerash near Irbid, Jordan.

Additional water sector activities in the region (Lebanon and Tunisia), led by faculty in the Department of Agricultural and Biological Engineering, are described in the "News from the Departments" section.

Linkages to International Agricultural Research Centers. Through CRSP activities and other linkage arrangements, Purdue scientists are involved in collaborative research with several of the international agricultural research centers. These include the International Livestock Research Institute (ILRI) in Kenya and Ethiopia; the International Food Policy Research Institute (IFPRI) in Washington, D.C.; the International Center for Agricultural Research in the Dry Areas (ICARDA) in Syria; the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) in India; the International Institute for Tropical Agriculture (IITA) in Nigeria; and the International Center for Insect Physiology and Ecology (ICIPE) in Kenya. Increasingly, the centers and the university community are recognizing the mutual benefits that come from such partnerships.

Collaborative Research Support Programs. Purdue continues to be actively engaged in the USAID-supported Collaborative Research Support Program (CRSP) working with scientists in 22 countries around the world. At present, Purdue Agriculture is a partner in five CRSPs: International Sorghum and Millet (INTSORMIL) CRSP; Bean/Cowpea CRSP; Integrated Pest Management (IPM) CRSP; Peanut CRSP and Sustainable Agriculture and Natural Resources Management (SANREM) CRSP. Eighteen faculty and staff from nine academic departments in two schools (Agriculture, Consumer and Family Sciences) are affiliated with one or more of these CRSPs. In addition, the InterCRSP is a natural resource management project that aims to extend natural resource management technologies across CRSPs operating in West Africa. Some CRSP highlights for the 2001-2002 year follow:

CRSP Highlights

Integrated Pest Management (IPM) CRSP – Bangladesh. Purdue collaborative research seeks to discover the determinants of pest management decisions and the potential on-farm impacts of IPM practices for vegetable producers in rural and peri-urban settings. During May 2002, Dr. Md. Ismail Hossain from the Agricultural Economics division at the Bangladesh Agricultural Research Institute spent a week on the Purdue campus working on economic impact analysis for the CRSP.

Integrated Pest Management (IPM) CRSP – Central America. The major focus of this work is the development of science-based production practices and pre-inspection policies that lead to reduced pesticide usage and increased export market acceptance of non-traditional agricultural export (NTAE) crops such as snow peas and broccoli. As a result of these activities, the government of Guatemala approved and initiated development of an NTAE supply consolidation, pre-inspection, and forward distribution center in the Chimaltenango region. This center will serve over 1,500 small producers. Program expansions are focused upon market assessments and production research on new NTAE crops, such as papaya, and through the inclusion of additional countries in the region. A Memorandum of Understanding was signed with the Ministry of Agriculture in Honduras in 2001. The Honduran Agricultural Research Foundation (FHIA) and Zamorano College will take leadership roles in the Honduras research activities, which will focus on identifying plant virus pathogens and their epidemiology in cucurbits. Substantive discussions were carried forward with Nicaraguan research leaders and directed toward the establishment of an IPM CRSP partnership.

In a new research activity, one of the first of its kind, IPM CRSP researchers in collaboration with the Food and Agricultural Organization (FAO) of the United Nations, the Institute of Nutrition for Central America and Panama (INCAP), and the Government of Guatemala are evaluating the health impact of IPM in adopter households in the NTAE sector of Guatemala.

Sustainable Agriculture and Natural Resource Management (SANREM) CRSP. Purdue CRSP collaborator, Dr. Gerald Shively, worked with colleagues from the Philippines to refine a computer-based model of agricultural land use. The goal is to assess the potential economic and environmental impacts of economic policy changes. During the past year, Vietnamese Professor Dang Thanh Ha, from the faculty of economics at the University of Agriculture and Forestry (UAF) in Ho Chi Minh City, spent a

week at Purdue to work with this model. Dr. Shively made a reciprocal visit to UAF and conducted a three-day training course on economic-environmental modeling for faculty from Agronomy, Economics, Fisheries, Forestry, and Rural Development.

Peanut CRSP. Results of current research under this CRSP contribute to public health policies that promote peanut consumption worldwide. The acute appetitive and dietary responses of Ghanaians and Americans to peanuts, peanut butter, and other foods have been compared. The researchers reported on the chronic effects of peanut consumption. Research results demonstrate that peanut consumption is associated with increased dietary intake of magnesium, vitamin E, and folate, all of which may help to reduce cardiovascular disease risk. Findings from this work and a parallel trial in Ghana were presented at the Experimental Biology meeting held in New Orleans in April 2002 in a special symposium on the health effects of nuts. The Purdue CRSP scientist also conducted a trial on the acute effects of peanut oil consumption on appetitive sensations and diet, work that was also presented at the Experimental Biology meeting. CRSP funding helped to equip a laboratory and build local collaborations that will strengthen the capacity of young scientists to conduct independent clinical studies in Ghana in the future. The Purdue component of the Peanut CRSP has also formalized an agreement with the *Universidade Federal de Viçosa*, Brazil. Collaborators from Ghana and Brazil visited Purdue in March to develop designs for several future studies.

Bean/Cowpea CRSP – Biotechnology. The Rockefeller Foundation awarded Purdue \$20,000 to organize a global workshop for researchers working on the genetic transformation of cowpea. The meeting will be held October 31 to November 2, 2002 in Naples, Italy. A new Purdue-based project on molecular and genetic improvement of cowpea was selected for inclusion in the new five-year Bean/Cowpea CRSP. Purdue scientists are leading research on the genetic transformation of cowpea and on the identification of optimal Bt genes for insect resistance. International collaborators from the University of Zimbabwe and the Savannah Agricultural Research Station, Tamale, Ghana, are working on genetic transformation of cowpea and resistance management issues.

Bean/Cowpea CRSP – Africa. Under Purdue's leadership, the Bean/Cowpea CRSP expanded its marketing research to eastern and southern Africa. Pilot activities have been initiated in Mozambique, Tanzania, and Malawi in collaboration with the University of the Free State in South Africa. The initial focus of these activities is to identify the barriers to greater trade in common bean in that region and to measure consumer preferences for various bean characteristics (e.g., size, color). Similar marketing research for cowpea continues in West Africa.



Children at primary school in Kenya.

Bean/Cowpea CRSP – Central America. The recent CRSP focus on the development of value-added bean-based products encouraged Purdue researchers to work on bean-based granola bars and granola cereal. These products are formulated to enhance protein, fat, fiber, and folic acid content in the diets of consumers. Sensory evaluation tests at Purdue University, Zamorano College, and in rural Honduran villages have shown the products to be very acceptable.

International Sorghum and Millet (INTSORMIL) CRSP. The INTSORMIL Niger program has expanded to include three programs in Nigeria, two programs in Burkina Faso, and one program in Niger, the lead country for the region. These programs span a range of efforts from production to consumption, including research on crop improvement, crop protection, crop production,

economics, and food quality. Because of the expanded activities in the region, the program has been renamed the INTSORMIL West Africa/Eastern Regional Program.

INTSORMIL – The Horn of Africa. This component of the CRSP has active programs in Ethiopia, Eritrea, Kenya, and Uganda. A new Memorandum of Understanding is being negotiated between INTSORMIL and the Tanzania Ministry of Agriculture and Food Security. For the past 15 years, this program has invested significant resources in cultivar development.

A new research approach on the control of *Striga* (a parasitic weed impeding sorghum production in the region) has been developed by INTSORMIL scientists. The research has produced unique solutions to this seemingly intractable agricultural problem through the development of new *Striga*-resistant sorghum cultivars. To date, this is the only research-derived high-yielding *Striga*-resistant sorghum available for large-scale cultivation and use by subsistence farmers in *Striga* endemic areas. A principal outcome of this effort in the region is an official public release in Sudan in 1995 of eight improved sorghum varieties with resistance to *Striga* and drought. Extended testing of these resistant sorghum varieties in Niger, Mali, Burkina Faso, Ethiopia, and Kenya is in progress to



provide the essential performance data for the possible release of the improved varieties in these countries as well. Additional support to this effort has been provided by the USAID Office of Famine and Disaster Relief for work with World Vision Relief & Development, Inc. in the testing and dissemination of nuclear seed of these improved *Striga* resistant sorghum cultivars into 12 additional African countries.

Further diffusion and adoption of these varieties by farmers has been limited by a lack of seed production and distribution facilities in many of the target countries. The problem of seed production and availability is particularly severe in Ethiopia and Eritrea despite significant interest in the new varieties in these countries.

InterCRSP. The Purdue-led Natural Resource Management InterCRSP project has pioneered an integrative site approach in Niger, Burkina Faso, Cameroon, and Tchad, in partnership with Alabama A&M University; it will be adapted in all participating nations in West Africa. The integrative site approach consists of identifying on-farm research sites in several countries with similar agroecological conditions and facilitating exchange of information and technologies among African researchers working at each site. During the current InterCRSP phase, cover crops and other soil conservation technologies for the Sahel have been developed and disseminated.

Academic Programs

Once thought of as primarily an extracurricular activity, study abroad has gained new academic significance in recent years. Students and employers are placing greater importance on international experiences in response to increased globalization. As a result, study abroad is moving from the academic margins to the core of U.S. higher education. Student participants in these programs not only build their resumés but also learn about the rest of the world while acquiring essential cross-cultural skills.

Study Abroad and Internship Programs. Purdue agriculture students may choose from 27 study abroad and internship programs, involving 25 institutions in 21 countries. During the past year, 119 students participated in study abroad programs or internship experiences in 14 countries—a record number, which represents a 40 percent increase in participation from the previous year. Some 73 Agriculture graduates in 2001-2002 (over 14 percent of the 513 graduates) completed an overseas program prior to graduation. During this same period, 7 students completed requirements for the International Studies Minor in the School of Agriculture.

Maymester Programs. In addition to the usual summer, semester, and year-long study abroad opportunities, two Maymester study abroad courses were offered for the first time this year. The Department of Animal Sciences taught a three-credit course in China focused on animal agriculture that attracted 20 students. An additional 28 students studied the history of the British landscape in regions of the United Kingdom in a course offered by the Department of Horticulture and Landscape Architecture in cooperation with the Department of History in the School of Liberal Arts. In 2003, planned Maymester courses will take students to Brazil, Poland, Russia, and Western Europe. In addition, Purdue Agriculture will pilot a Spring Break international travel course to Honduras in March 2003 in cooperation with Purdue's partner institution, Zamorano College.

Study Abroad Financial Support. Partial support for study abroad programs comes from \$22,000 in scholarships provided by the Purdue Agricultural Alumni Association, the Purdue Agricultural Alumni Trust Fund, Elanco Animal Health, the Walter Pugsley Memorial Endowment, and an endowment established by former Agriculture Dean Robert Thompson and Karin Thompson. In addition, the Departments of Agriculture and Biological Engineering, Forestry and Natural Resources, and Horticulture and Landscape Architecture also offer study abroad grants for their students studying overseas.

International Exchange Students. A total of 30 international exchange students from 10 different countries (Japan, England, Scotland, Wales, Australia, Sweden, Denmark, France, Ireland, and Mexico) studied agriculture at Purdue during the past year. Sixteen students spent one semester on campus living in the dorms and attending classes. The other 14, from Japan and Ireland, were hosted by 11 Indiana families. Host families provided room and board, an environment for cultural exchange, and an opportunity for non-English speaking students to strengthen their English language skills.



Study abroad students with Purdue and Zamorano College staff meet the Honorable Frank Almaguer, U.S. Ambassador to Honduras.

Extension and Outreach

The development and application of Extension methodology in the international arena is increasingly a focus of IPIA, the Purdue University Cooperative Extension Service, and partner countries around the world. IPIA initiated work through Extension to educate local citizenry about the important stake that Indiana has in the global economy. IPIA's outreach effort also includes programs with public schools across the United States.

Extension International. Efforts continue to strengthen the international thrust of the state's Extension system. Underscoring the importance of this dimension of Extension, the theme "Globalization" was selected for the 2001 Purdue Extension Professional Development Conference. IPIA assisted the planning committee in organizing the event. Plenary speakers as well as break-out group leaders from Purdue University, the University of California-Davis, and The Ohio State University were featured. The conference explored the meaning and implications of globalization at the individual and community level in addition to the challenges and the opportunities that globalization presents for Extension. More than 350 county educators, campus specialists, and Purdue staff attended the conference.

Global Curriculum for High School Students. Purdue University's Schools of Agriculture and Education in cooperation with Indiana University and the National FFA Global Leadership Program completed a globally-focused high school curriculum in 2001. Funded by USAID, the unique, Web-based curriculum introduces students to aspects of agriculture, trade, and culture in an international context. The curriculum follows two "virtual" FFA members as they learn about agriculture and related global issues impacting citizens of Moldova, Honduras, and Ethiopia. The curriculum can be viewed on the Web at <http://www.ffa.org/scenarios/>. It is also available on a CD-ROM by contacting National FFA at (317) 802-4220 or by email: global@ffa.org.

News from IPIA

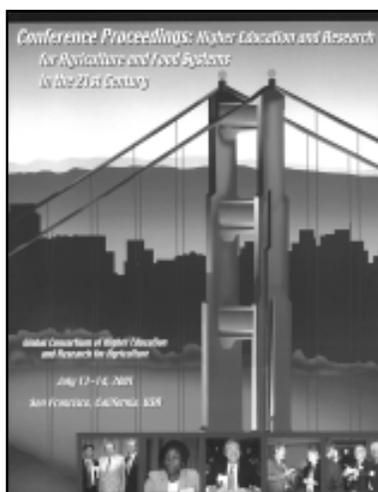
Euro League. Purdue is a member of a new consortium organized by a group of six leading European agricultural universities in 2001, following visits by Euro League representatives to Purdue and a number of other North American universities. The inaugural meeting of the full Euro League will be held in the Netherlands in October 2002. The purpose of the consortium is to facilitate student and faculty exchanges among the member institutions in Europe, Canada, and the United States and to further cooperation in education and research.

France. Our relationship with France continues to expand. In summer 2001, a faculty delegation traveled to our partner university in Toulouse (*Ecole Supérieure d'Agriculture de PURPAN*) to participate in an international conference on the theme: "Agricultural Status and Trends in Modern Society: Comparative Issues in the USA and Europe." While in Toulouse, the group had the opportunity to meet with eight Purdue undergraduates attending a summer study abroad program at the university.

In March 2002, through a program sponsored by the Indiana Humanities Council and the French American Foundation-Paris, four French agricultural leaders (two professors, two farmers) visited Purdue to launch a new exchange program (AGRIDAYS). The purpose of this program is to exchange views on issues of agricultural importance to both sides and to strengthen mutual understanding. A core feature of the March 2002 exchange was a public symposium, "The Politics and Promise of Agriculture in France and in America: A Comparative Perspective" that resulted in a published *Proceedings* (available on request from IPIA). A reciprocal exchange, which will send Indiana agricultural educators and leaders to France, is scheduled to take place in the summer of 2003.

Global Consortium of Higher Education and Research for Agriculture (GCHERA).

The Global Consortium, led by Purdue's President Martin Jischke in his capacity as President of GCHERA, met in San Francisco in July 2001 for its biennial conference. The GCHERA Secretariat, based in IPIA, provided the administrative and organizational support for the conference, which was attended by more than 200 agricultural research and education leaders from some 50 countries. Speakers from India, Kenya, New Zealand, Taiwan, Ukraine, and the United States addressed the Conference theme "Higher Education and Research for Agriculture and Food Systems in the 21st Century." (Copies of the conference *Proceedings* are available on request from IPIA.) At the conclusion of the conference, the GCHERA leadership was transferred to the National Agricultural University of Ukraine in Kiev. The Director of IPIA joined discussions in Kiev in May 2002 to assist in the initial phases of planning for the next global conference scheduled to be held in Kiev in September or October 2003.





The goal of GCHERA is to provide a forum to strengthen the world's agricultural research and education leadership in order to address global problems of food security and environmental sustainability. Part of the consortium's leadership development component is accomplished through a fellowship program known as I-HELP (International Higher Education Loan Program), which provides modest loans to rising agricultural leaders to allow them to travel to other GCHERA member universities for periods of approximately three months. Senior counterparts of the I-HELP Fellows at the host institution mentor them during this period to strengthen their technical skills and leadership capabilities. Purdue Agriculture hosted seven I-HELP Fellows, including two each from China, Tanzania, and Ukraine, and one from Latvia, from August to November 2001. Faculty in the Departments of Agricultural Economics, Agronomy, Animal Sciences, Biochemistry, Food Science, and Forestry and Natural Resources mentored the Fellows. IPIA provided administrative support to the 2001 I-HELP Fellowship Program at Purdue and convened a weekly seminar on leadership in agricultural higher education and research.

Vietnam. IPIA, in cooperation with the Departments of Animal Sciences and Agricultural Economics, opened a dialogue with two universities in Vietnam, including Cantho University in the Mekong Delta and the University of Agriculture and Forestry in Ho Chi Minh City. In both instances, Purdue seeks partnerships in research and education around themes of common interest. Proposals to fund these collaborations are under development.

D. Woods Thomas Memorial Scholarship in International Studies. This year the D. Woods Thomas Memorial Scholarship in International Studies was awarded to Giselle Maurer, Department of Food Science. Ms. Maurer's research involves the sensory evaluation of value-added bean-based products in Latin America. Congratulations to Giselle.

IPIA guest apartment in campus International Center.

The IPIA guest apartment housed 13 guests from 12 different countries this year. The apartment is a low-cost service provided by IPIA to help departments host their international visitors.

School of Agriculture visitors. During 2001 – 2002 IPIA hosted 47 international visitors from 22 countries.

IPIA Staff. Lonni Kucik joined the staff of IPIA in August 2001 as an administrative professional to support the IPM CRSP and other collaborative research activities. In October 2001, with the departure of Sally Ashlock to join President Jischke's staff, Lonni became administrative assistant to the Director of IPIA. Previous to joining IPIA, Lonni had worked for many years in the Department of Horticulture and Landscape Architecture. Please welcome Lonni to IPIA!



Floating market on the Mekong River, Cantho, Vietnam.



Faculty group at the University of Agriculture & Forestry, Vietnam.

News from the Departments

Much important international activity is based in departments within the School of Agriculture. Sometimes support comes from IPIA, but often such activities are led by faculty within the respective departments who have special interests and the capacity to develop such programs independently. Each department has been invited to submit highlights of their international activity for inclusion in this publication. A sampling to illustrate the breadth and diversity of departmentally-based international activities follows. For more complete information, contact the department directly.

► Agricultural Economics

Impact of Cocoa Marketing and Trade Innovations in West Africa. Structural reforms in Côte d'Ivoire, Ghana, Cameroon, and Nigeria have eliminated parastatal marketing boards for cocoa. New institutions have arisen to replace the services of those agencies. These reforms, and the resulting new institutions, have affected market competitiveness, returns to African governments, product quality, and prices of cocoa received by farmers. Child labor and the environmental impacts of cocoa farming are additional concerns. New initiatives have been proposed to address these concerns. Departmental faculty members Drs. Philip Abbott and William Masters are collaborating with the Sustainable Tree Crops Program (STCP) of the International Institute of Tropical Agriculture (IITA) and USAID to determine how new and evolving cocoa marketing institutions will affect incentives to farmers, welfare of African cocoa exporters, cocoa quality, and the functioning of international cocoa markets. Initial efforts have identified key issues in the role of new marketing institutions relative to cocoa production and trade, and have presented a conceptual framework for assessing the economic and social impacts of those institutions. Abbott and Masters have also drafted an impact assessment framework that will be used in the evaluation, design, and implementation of STCP pilot projects in West Africa. Survey research to determine the magnitude of incentives required to elicit higher quality cocoa production from farmers is in progress. Additional studies on cocoa marketing chain linkages, cocoa cooperatives, conditioning stations, and public marketing agencies are planned to help the region sell higher quality cocoa in export markets.

Agricultural Growth and Development in Mali. Department Head, Dr. Wally Tyner, in the role of chief of party, led a USAID-funded project to help the Mali Mission develop its strategic plan for agricultural growth and development for the next decade. The principal objectives of the Malian government and USAID are increased economic growth and poverty reduction. To achieve these objectives in Mali, investments in agriculture are absolutely essential. The major recommendations were that the mission should focus on activities that will increase productivity and reduce risk in the very difficult Malian environment. Specific recommendations included: strategic investments in increased irrigation in regions that will be most profitable; demonstration activities to couple water retention technologies with improved seeds and fertilizer use to attain the goal of wider use of improved varieties and strengthened private sector participation in seed distribution; establishment of risk sharing and equity funds aimed at reducing risk for investors in processing and input production activities in Mali; and technical assistance in livestock feeding and feed quality improvement.



Main administration building at the Federal University of Viçosa, Brazil.

Site-Specific Management Center (SSMC). The SSMC, based in the department under the leadership of Dr. Jess Lowenberg-DeBoer, has active collaboration with precision agriculture researchers in Germany, Brazil, Argentina, and South Africa. Ntsikane Matela, a graduate student affiliated with the Center, was awarded the University Senate medal for the best Masters thesis at the University of the Free State, Bloemfontein, South Africa. The thesis focused on the adoption of precision farming technology by commercial farmers in South Africa. Additional international work through the Center included on-farm research in Argentina in collaboration with the national agricultural research institute. The results of this research were instrumental in the development of statistical techniques for understanding yield monitor data for mechanical combines, a key element in site-specific management.



Tanzania HIV/AIDS. Tanzania is characterized by a mature HIV/AIDS epidemic of medium severity (relative to other countries in the southern and eastern Africa region), thus making it a good choice for studies on the impact of the pandemic on labor markets. The current overall HIV prevalence rate, at about 8 percent of the adult population, is high enough to warrant concern about economic impacts in general and labor market impacts in particular. A study led by Dr. Channing Arndt emphasizes the impact of AIDS on human capital, the most obvious impact resulting from the deaths of skilled people. In addition, AIDS has implications for rates of human capital accumulation since human capital pools are already low. If HIV/AIDS causes rates of human capital accumulation to be lowered for prolonged periods, the impacts could be profound in both the agricultural and non-agricultural sectors. The pandemic threatens to lower rates of human capital accumulation through both supply (infection and death amongst educational leaders) and demand (fewer children moving through the school system as a result of orphaning) effects. A study is being led by Dr. Arndt to assess the implications of HIV/AIDS for human capital accumulation through decreases in the progression of children through the educational system in the country. The hypothesis to be tested is that HIV/AIDS increases the probability that young Tanzanians will drop out of school early and transition into the unskilled labor force, thus diminishing the growth of the skilled labor pool and decreasing the pool of people needed for economic growth and national development.

World Bank Rural Development Strategy. Purdue assisted the World Bank Rural Development department in the creation of its new rural development strategy. Each World Bank region developed its own plan that became the foundation for the central plan to be used as a guide for World Bank rural development activities for at least the next five years. Dr. Wally Tyner was principal author of the plan for the Middle East and North Africa region. He also assisted the Bank in establishing a common framework for all the plans and in elaborating the main elements of the rural development strategy known as “Reaching the Rural Poor.”

Cold Chain Management Training for Latin America. The Center for Food and Agricultural Business (CFAB) teamed up with faculty in the Food Science Department to provide a week-long training program in Cold Chain Management for Cochran Fellows from Mexico, Costa Rica, and South America. Funded by USDA/Foreign Agricultural Service, the program focused on the management of perishable products (fresh, cold, and frozen) through the supply chain. The Fellows were food company managers responsible for the safe handling of cold food products through the chain for delivery to consumers. The program’s success helped launch two additional USDA-funded cold chain management training workshops for Latin America and the Caribbean; one for restaurateurs and a second for buyers of food and beverage products. The program was led by Dr. Frank Dooley, and included Drs. Rich Linton and Suzanne Nielsen from the Department of Food Science.

► **Agricultural and Biological Engineering**

The department has emerged as a leader in international research and education related to water resources and water quality protection. In recent years, several water resource and water quality initiatives in the Middle East have evolved in which departmental faculty play key roles. Two of these projects (Jordan, Gaza/West Bank) are described in the **Research and Development Cooperation** section of this publication. Two other departmentally-based water resource projects are described below:

Lebanon – American University of Beirut (AUB). Dr. Rabi Mohtar is collaborating with AUB on two water management research projects in the country. The first project, “Optimal Siting of Test Wells for Contaminant Characterization in Groundwater,” explores the use of optimization algorithms for contaminant characterization and remediation of ground water (for further details see: <http://pasture.ecn.purdue.edu/~mohtar/research.htm#2>).

The results of a second project, “Hydrologic Analysis of Dry Marginal Watersheds in Northeast Lebanon,” were implemented by a local development association to increase the capture of water for beneficial uses. This work is further described at: <http://pasture.ecn.purdue.edu/~mohtar/research.htm#3>.

Tunisia. This USDA-supported activity in Tunisia was launched in March 2002 in cooperation with the *Institut des Régions Arides* (IRA) in southern Tunisia. The pilot program, which also links Purdue with the International Center for Agricultural Research in the Dry Areas (ICARDA) in Syria, is devoted to watershed modeling, water conservation, and water allocation under water limiting conditions.



Administration building at Institut des Régions Arides, Tunisia.

► **Agronomy**

In addition to active participation in the INTSORMIL CRSP (see **CRSP Highlights**), faculty members have also contributed to the School's initiative in Costa Rica with CATIE (*Centro Agronomico Tropical de Investigacion y Enseñanza*) described further under the entry from Forestry and Natural Resources. Dr. Chris Johannsen was a major contributor to a French agricultural exchange program funded by the Indiana Humanities Council and the French American Foundation-Paris. The program is further discussed in **News from IPIA**.

► **Animal Sciences**

In addition to the training program in China described in **Research and Development Cooperation**, the department provided pioneering leadership to the new Maymester study abroad program in China described in **Academic Programs**. The department has also contributed to a wide array of additional international activities, highlights of which are detailed below.



Animal Sciences study abroad group in China.

Bangladesh. Dr. Todd Applegate led implementation of manure management training in Bangladesh as part of a USAID/Winrock International sponsored project. Included were evaluations of current poultry manure handling and management capabilities and an environmental assessment. In addition, Dr. Applegate contributed to training activities on use of poultry manure as an organic fertilizer, demonstration projects on use of poultry manure in crop production, effective storage of ensiled manure, and poultry nutrient management in feed formulation.

Brazil. Drs. Patricia Hester and Diane Moody collaborated with an EMBRAPA scientist in Brazil on research on osteoporosis in chickens. EMBRAPA has fully financed a Ph.D. student in the department, Helenice Mazzuco, to study poultry science. The Brazilian collaborator, Dr. Monica Ledur, will be visiting the Department of Animal Sciences in October 2003.

Nigeria. Dr. Todd Applegate collaborated with a scientist at Louisiana Southern University – Shreveport on a USAID/Winrock International sponsored project aimed at developing low-cost diet formulations for poultry producers utilizing non-conventional feed ingredients. The goals were to reduce the cost of poultry feeds while maintaining quality and to ease the competition between man and livestock for the same feed ingredients. Broiler chickens are undergoing a field experiment to validate the growth and cost effectiveness of the new diets.



Graduate students Charles Bormann and Jason Swain work with the game capture unit at Kruger Park, South Africa.

students will also work in collaboration with the South African Center for Conservation and Research at the Johannesburg Zoological Gardens. Earlier, Dr. Krisher served as a visiting scientist at this center and was accompanied by two graduate students who worked in Kruger National Park with the game capture unit to obtain sperm and/or oocytes for basic physiological research.

South Africa. Dr. Rebecca Krisher participated as a visiting scientist at the Wildlife Breeding Resource Center (WBRC), a working group of the Endangered Wildlife Trust (EWT) in Pretoria, South Africa, in May-June, 2002. Two of her graduate students will spend a total of six months working at the WBRC conducting basic research in gamete physiology, fertilization, and early embryonic development in exotic bovid species (including cape buffalo, eland, kudu, springbok, hartebeest, and gemsbok). The goal is to successfully mature oocytes, fertilize these oocytes, and produce embryos entirely in vitro. These embryos will be cryopreserved and banked for future use in preserving and maintaining healthy genetic populations of wildlife both in the range country and in captive breeding situations. During this period, the



Thailand. Dr. William Muir, supported by a grant from USAID, is conducting research on gene flow in genetically engineered Tilapia and the consequences for fish biodiversity in Thailand.

Tunisia. The department is hosting Dr. Jamel Rekhis, a faculty member from the Tunisian School of Veterinary Medicine, as a Fulbright Scholar for 2002/03.

► **Biochemistry**

Mexico. Professor *emeritus* Dr. David Kroggmann instructed Mexican graduate students in English technical writing at the *Universidad Nacional Autónoma de México* (UNAM) in Mexico City in February. The students worked through the drafts of scientific papers which were then edited by the instructor. Their edited works are suitable for submission to journals such as *Journal of Biological Chemistry*. This professor, who has a working knowledge of Spanish, has been teaching in Mexico occasionally for 15 years.

► **Botany and Plant Pathology**

Egypt. A flourishing partnership with the Faculty of Science at Ain Shams University (ASU) near Cairo culminated this year with the inauguration of the Foda-Coolbaugh electronic library within the Department of Botany there, named in part to honor Purdue Professor Ron Coolbaugh (Botany and Plant Pathology). The ceremony, held in January 2002, recognized both Dr. Foda (ASU) and Dr. Coolbaugh for their significant contributions to the plant sciences. The idea of developing a library was first proposed in 1998 when a visiting ASU faculty member met with Purdue counterparts in West Lafayette. Subsequently, Professor Nancy Hewison, Purdue Libraries, visited ASU and provided assistance in the plans for developing the library. Since then, with coordination provided by Dr. Coolbaugh, Purdue faculty members have sent dozens of boxes of scientific journals and also arranged for reduced cost subscriptions to several. In addition, arrangements have been made for electronic versions of some of them at reduced or no cost to ASU. This library is one of several important outcomes of the continuing collaboration between faculty from ASU and Purdue University.



ASU Professor Sayed Khalifa presents Purdue Professor Ron Coolbaugh with a plaque honoring him and ASU Professor Foda for their significant contributions to the plant sciences.

► **Entomology**

Kenya and Ghana. A group based in the Entomology Department and led by Drs. Larry Murdock and Barry Pittendrigh, working with African collaborators, was awarded a grant of \$300,000 by USAID to carry out research on cowpea and their insect pests in Kenya and Ghana. Research goals are to understand gene flow between cultivated and wild cowpea plants, to develop a detailed understanding of the biology and behavior of a major field pest of cowpea, the legume pod borer, and to carry out studies on a storage pest, the cowpea weevil. The new understanding will help provide the basis for assessing possible consequences for cowpea diversity if transgenic cowpea expressing the Bt gene are deployed in Africa and will also create the foundation for a resistance management plan to maximize the useful life of any field-deployed Bt gene. The project will be administered through IITA, the International Institute of Tropical Agriculture, headquartered in Nigeria.

Strategic Planning. The department's newly developed strategic plan includes this objective: to become a leading science-based resource center focused on integrating and transferring pest management technologies into crop development objectives in both public and private sector institutions overseas. The department recognizes its unique opportunity and leadership responsibility in the globalization of entomological research, technology transfer, and education. It is committed to international development and cooperation to help solve problems, build on knowledge bases, and increase capacity to address and deal with pest and production issues. Most of the current and planned international activities fall into one of the following broad areas: integrated pest management; application of biotechnology to pest management; IPM and rural development; and market-driven implementation/technology transfer. The full text of the department's strategic plan for international engagement is available from the department office in Smith Hall.

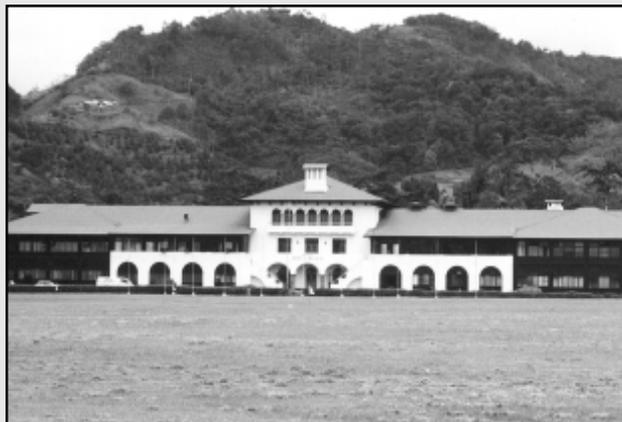
► **Food Science**

Faculty members are active in the Bean/Cowpea and INTSORMIL CRSPs, reported elsewhere in this publication under **CRSP Highlights**. In addition, faculty have contributed to the establishment of a "Better Processing Control School" in Thailand. This is an FDA-mandated workshop required for importing low-acid canned foods into the United States. Faculty have also lectured at several industries and universities throughout the world during the past year.

► Forestry and Natural Resources

Costa Rica. A new activity has been launched with *Centro Agronomico Tropical de Investigacion y Enseñanza (CATIE)* under the leadership of the Department of Forestry and Natural Resources (Dr. Dennis LeMaster) in collaboration with IPIA. The goal is to join our respective graduate programs in a way that will strengthen and broaden offerings in aspects of tropical forestry, ecology, biodiversity, and agriculture.

A draft agreement has been developed to help with program implementation. Department Heads from Agricultural Economics, Agronomy, Animal Sciences, Botany and Plant Pathology, and Forestry and Natural Resources, and the Director of IPIA traveled to Costa Rica in February 2002 to visit CATIE and review areas for future collaboration. In June 2002, a faculty delegation from the Departments of Agronomy, Botany and Plant Pathology, and Entomology visited CATIE to continue program development.



Main administration building at CATIE, Costa Rica.

► 4-H and Youth

A local exchange student, whose program is administered through the Department of 4-H and Youth, was among those attending the Close Up Foundation Civic Education Workshop in Washington D.C. February 24-March 2. Natasha Utesheva, a Future Leaders Exchange student from Uzbekistan staying with Monticello residents Dave and Sandy Neireiter, was one of 120 FLEX (Future Leaders Exchange) students chosen to travel to the nation's capital to attend the conference.

► Horticulture and Landscape Architecture

Central America. As reported under **CRSP Highlights** in this publication, this department provides the leadership for the IPM CRSP project in Central America.

Maymester. Faculty in the department provided leadership to one of the two pioneering Maymester study abroad programs offered for the first time this year. The Maymester program is described under **Academic Programs**.



Purdue students who participated in an intensive four-week Maymester study abroad course based in Corsham, England.



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