

International Programs in Agriculture



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

Mission Statement

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 whose purposes serve these goals.

Honduras. IPIA successfully completed the initial phase of the USAID-funded linkage project with Cornell University and Zamorano College in Honduras. The project theme for the two year activity was “Higher Education Partners for Development in Honduras.” Efforts to sustain project activities in natural resource management, micro-enterprise development, community-based rural development, tourism, and curriculum improvement continue through a leadership group that has been formed. Further details can be viewed at:

<http://www.zamorano.edu.hn/alo/>



Zamorano College — Honduras



National Holiday Parade — Brazil

Brazil. A group of faculty from the Department of Agronomy and the Department of Horticulture and Landscape Architecture participated in the successful development of a McKnight Foundation proposal to improve phosphorus efficiency in low-phosphorus soils in Brazil and sub-Saharan Africa. Leadership for this project comes from the Brazilian national agricultural research organization (EMBRAPA) through their station in Sete Lagoas with whom Purdue has a longstanding relationship. As part of this project, important partnerships have been arranged with scientists in Kenya (Moi University) and at Cornell University. Administrative support is being provided by IPIA and the School's Agricultural Research Programs office.

Gaza and the West Bank. IPIA has received a grant from USAID through the United States-Palestinian Linkages (UPLINK) program to work with three institutions in Gaza

and the West Bank (Palestinian Authority) over the next two years. The focus of our UPLINK project, one of seven funded nationally, is to develop an M.S. degree program (including both curriculum and applied research elements) in water resource management to be offered through the partner universities in the region. In addition, the UPLINK partners will develop training and capacity-building support programs for Palestinian Water Authority personnel. They will also work as a team to strengthen public outreach and education programs on environmental and health issues relative to water management. 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 (Nablus) as well as the Palestinian Water Authority join IU/Gaza and Purdue University in program development and implementation.

Jordan Water Resources Project. A consortium of universities in Jordan and the United States, including the Purdue University School of Agriculture under the leadership of IPIA, has completed the first year of a multi-year USAID-funded cooperative agreement to work with collaborators in the Jordan Ministry of Water and Irrigation.

The project, entitled “Skills Enhancement and Support to Decision-Makers in Jordan’s Water Sector,” is under the leadership of Washington State University (the lead United States institution). During the first year of the project, scientists from Purdue completed training/technical assistance modules focused on domestic water supply and quality; wastewater treatment; and water pollution management. Year two of the project will involve Purdue/Agriculture faculty in additional training in water quality protection and advanced GIS-based applications to water resource management.



School children — Embu, Kenya

Building African Scientific and Institutional Capacity (BASIC)

Project. IPIA is the co-recipient (with the University of California, Davis) of a university linkage grant from USAID through the International Livestock Research Institute (ILRI) in Ethiopia to begin the implementation of a new activity known as BASIC. BASIC is a planned long term, continent-wide program with three goals: 1) to increase the retention, replacement, and expertise of African agricultural university and national research staff through advanced training using emerging technology to enhance research and teaching capabilities; 2) to strengthen the globalization of U.S. universities by engaging faculty and graduate students in course development, teaching, and research in support of BASIC; 3) to increase the research collaborations among the international research community, African universities, and U.S. universities.

BASIC was launched at a workshop in Addis Ababa, Ethiopia hosted by ILRI in February 2001. The workshop was attended by senior administrators from key African universities in Kenya, Uganda, Tanzania, Ethiopia, and Sudan, as well as invited representatives of the land-grant university system in the United States.

China. IPIA-led programs in China, supported by a gift from Professor *emeritus* John Tse, grew dramatically during the past year. The gift has permitted IPIA to formalize a unique partnership with the Beijing office of Winrock International, a private non-profit organization devoted to global development and poverty alleviation. The Winrock partnership provides Purdue Agriculture with a permanent, credible presence in China, and it has permitted us to multiply the gift through leveraged funds to support activities there.

This past year, IPIA was awarded funds from the USDA Emerging Markets Program to support a series of training “schools” attended by 350 feed industry professionals in China on optimization of swine feed formulation. Training leadership was provided by scientists in the Department of Animal Sciences. Through the Center for Food and Agricultural Business (CFAB) in the Department of Agricultural Economics, an inventory management training program was presented to approximately 40 Chinese supermarket managers. The Winrock partnership opened opportunities for Purdue Agriculture with the municipal government of Hangzhou (near Shanghai). Two delegations from Hangzhou visited Purdue Agriculture during the past year, one with interests in food safety issues as they relate to international trade and a second group with interests in meat processing. The Hangzhou government sponsored the travel of one Purdue staff member to China to participate in a planning workshop on issues of food safety and pesticide residue management relative to international trade. IPIA is cooperating with the Department of Agricultural Economics in the initial development of a certificate program in agribusiness education. A grant from the Starr Foundation to Winrock supported the early developmental phase of this program and supported travel of one faculty member to China this past year for a workshop to begin program development.

Additional China activities continue on topics related to forest conservation, energy conservation, student exchange, and new town planning. During early 2001, Purdue joined, as one of 12 founding members, the “Consortium of U.S. Universities and Institutes in Cooperation with China for Agriculture.” The Consortium is designed to further enhance activities of mutual interest in agricultural science and technology development.

Collaborative Research Support Programs. Purdue continues to be actively engaged in the USAID-supported Collaborative Research Support Program (CRSP) working with scientists in 17 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; 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 2000-2001 year are listed in the following section.



Masai group — Tanzania

CRSP Highlights

Integrated Pest Management (IPM) CRSP operates through a site committee structure in Central America with Guatemala as the prime site. Substantive discussions were carried forward with Nicaragua and the Ministry of Agriculture in Honduras to establish MOUs in these countries during FY 2000.

Science-based production and pre-inspection policies that lead to reduced pesticide usage and decreased product rejections at U.S. ports-of-entry continue to be the major focus of IPM CRSP. Capacity to undertake IPM research within the collaborating institutions and among the individual collaborators has been a serious constraint to the implementation of good management practices in the non-traditional agricultural export (NTAE) sector of Central America. Currently, the IPM CRSP has a “critical mass” of trained field technicians capable of addressing pest management problems using applied science-based protocols.

Based on the IPM CRSP’s success, the government of Guatemala has given preliminary approval for the development of an NTAE supply consolidation, pre-inspection, and forward distribution center in the Chimaltenango region where it will serve over 1,500 small producers.

In addition, the Department of Agricultural Economics is involved in Bangladesh where work continues on measuring the potential on-farm impacts of IPM for commercial vegetable producers.

In the Philippines, the **Sustainable Agriculture and Natural Resource Management (SANREM) CRSP** is working to improve economic and environmental policy planning at local, provincial, and national levels. Among the tools Purdue Agriculture is developing is a landscape scale policy simulation model.

Peanut CRSP. Diets containing peanuts reduce cardiovascular disease risk factors. However, before recommendations for increased consumption can be made, it is necessary to understand peanut influence on energy balance. One chronic feeding study was carried out to determine the effects of regular peanut consumption on diet composition, serum lipids, magnesium, and homocysteine concentrations under different conditions of peanut intake. Appetitive indices, energy expenditure, body weight, and hedonics were also measured. The findings demonstrated that regular peanut consumption lowers serum triacylglycerol concentration, augments consumption of nutrients associated with reduced cardiovascular risk (e.g., folate, magnesium) and increases serum magnesium concentration. Despite being energy dense, peanuts have a high satiety value, and chronic ingestion evokes strong dietary compensation and little change in energy balance.

Other Peanut CRSP work focused on the effects of peanut oil consumption on appetite, glycemic response, and food choice. Recent evidence suggests differential satiety effects of fatty acids. Two human studies yielded mixed results. A study was undertaken to explore this effect using peanut oil, canola oil (both rich sources of unsaturated, especially mono-unsaturated, fatty acids), and butter, a rich source of saturated fatty acids. The findings did not reveal a differential appetitive, glycemic, or dietary response to these fat sources. This raises questions about the role of fats in peanuts as regulators of energy balance. Future studies will explore other attributes, such as the fiber or protein content, as modulators of feeding.



Because of marked cultural differences in the use of peanut products and a need to be sensitive to them if peanut consumption is to be increased, a new collaboration was initiated with the Universidade Federal de Viçosa in Brazil. Future studies will permit comparisons in outcome variables (e.g., plasma lipid profiles, food choice, appetite) between individuals in the U.S., Ghana, and Brazil that should aid in the development of acceptable products in each region.

The West African Regional Program of the Bean/Cowpea CRSP is focusing on cowpea marketing. Studies have shown that low-income African consumers are very sensitive to cowpea grain quality, with a clear premium for larger grain size and discounts for insect damage (especially that caused by bruchids). The information on consumer preferences is being incorporated into the criteria used in CRSP, International Institute for Tropical Agriculture (IITA), and other cowpea breeding programs.

Bean/Cowpea/Cameroon CRSP. Purdue University led the organization of an international workshop/symposium on the genetic improvement of cowpea that was held in Dakar, Senegal, 8 – 12 January 2001. The meeting was supported by funds from the Rockefeller Foundation, Bean/Cowpea CRSP, ISRA/Senegal, the International Institute for Tropical Agriculture (IITA), and the Food and Agricultural Organization (FAO). Nearly 50 scientists, administrators, stakeholders, and donors were in attendance. The central focus was the genetic improvement of cowpea, an orphan crop of vital importance to over 200 million African women and men farmers and consumers.

Insects are the primary constraint to cowpea production and consumption. Traditional approaches involving breeding and screening have not been and will not be adequate for addressing some of the primary problems of insects in cowpea. The Dakar meeting took a comprehensive approach in addressing all of the constraints to implementation of biotechnology as a tool to combat the insect pests of cowpea in West Africa, including policy, biosafety, public information, commercialization and breeding. A steering committee was formed as a result of the symposium and has since been named the Network for the Genetic Improvement of Cowpea in Africa (NGICA). Larry Murdock, Purdue University, and Idah Sithole-Niang at the University of Zimbabwe, were elected as co-chairs.

Bean/Cowpea/Costa Rica/CRSP. The Purdue component of the nutrition and utilization group is beginning work to optimize a commercial process for making a bean-corn snack food product. This nutritionally balanced, high-protein food has the potential for increasing bean utilization. The initial work is being done in cooperation with a small U.S. company, which will then be transferred to collaborators at the University of Costa Rica, for extension to food processing companies in Central America.

International Sorghum and Millet (INTSORMIL) CRSP. The Niger program was expanded to a regional program in West Africa to include Burkina Faso and Nigeria to transfer technologies among these countries. The overall goals of this interdisciplinary and multi-institutional program are to improve production systems for millet and sorghum and to stimulate entrepreneurial processing of these products toward a sustainable growth in marketable products and animal feed.

The **Horn of Africa (HOA)** program of the INTSORMIL CRSP, which is active in Eritrea, Ethiopia, Uganda and Kenya, reports the following items relative to research in the past year:

At the invitation of the Inter-Governmental Authority on Development (IGAD), INTSORMIL/HOA conducted a major study to identify potential technologies that alleviate problems associated with growing crops in drought prone environments and to assess probable technical, social, and economic constraints and bottlenecks to the development and adoption of drought tolerant crop cultivars. IGAD covers seven countries in the Horn of Africa region (Djibouti, Eritrea, Ethiopia, Kenya, Sudan, Uganda, and Somalia) that regularly experience food shortages triggered primarily by drought but also by degradation of the environment caused by growing population pressure.

The INTSORMIL leadership is planning a workshop in 2002 to gather stakeholders from the region to discuss these findings and to provide input into the formulation of a project on the development and adoption of improved management practices for drought tolerant crop varieties. This study was financed under the Greater Horn of Africa Initiative of the United States Agency for International Development.

Working with the Association for Strengthening Agricultural Research in East and Central Africa (ASARECA), INTSORMIL provided the leadership to revitalize the defunct East and Central African Sorghum and Millet network (ECARSAM) as a forum for scientific interaction among sorghum and millet research scientists in the region. The network had folded because of lack of financial support; however a grant proposal developed by National Agricultural Research Services (NARS) with significant input from INTSORMIL has now been funded by the European Community. Following notice of this financial award, INTSORMIL/HOA organized a workshop late in 2000 to develop plans for implementation of planned network activities for scientists in the region. This network is expected to facilitate interaction among sorghum and millet research and development agencies operating in the Horn of Africa region.

The socio-economics program of the **Natural Resource Management INTERCRSP** East Group (Niger, Burkina Faso, Cameroon, and Tchad) focused on the potential for using velvet bean (*Mucuna puriens*) as a cover crop and livestock feed. Early results by a Purdue University M.S. student indicate that farmers prefer grain legumes like cowpea for these purposes because of their ability to produce a marketable product and at the same time provide livestock forage and erosion control.

Academic Programs

Although once thought of as primarily an extracurricular activity, study abroad has gained new academic significance. Students and employers are recognizing the great value of 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 resumes but they also learn about the rest of the world while acquiring essential cross-cultural skills.

Study abroad and internship programs. Purdue agriculture students can now choose from 21 study abroad and internship programs in 18 countries, including a new program at the Royal Danish Veterinary and Agricultural University in Copenhagen (KVL). A second new program, partially funded by the U.S. Department of Education, was launched this year by the Department of Horticulture and Landscape Architecture. Known as HORTECUS, this exchange permits horticulture



students to study at the Technological Educational Institute of Crete; University of Hanover (Germany); the Hogeschool in Delft, Netherlands; or at KVL in Denmark.

Partial support for study abroad programs comes from \$20,000 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 Agricultural and Biological Engineering, Animal Sciences, Forestry and Natural Resources, and Horticulture and Landscape Architecture now offer their own department-based study abroad grants for students studying overseas.

During the past year, 86 students participated in a study abroad program or an internship experience. Some 73 Agriculture graduates in 2000-2001 (nearly 14 percent of the 529 graduates) completed an overseas program prior to graduation, the highest percentage of participation in study abroad programs of any School at Purdue University. During this same period, 11 students completed requirements for the School of Agriculture's International Studies Minor. The School of Agriculture also hosted 31 exchange students from Japan, England, Australia, Sweden, France, Ireland, Mexico, and New Zealand during the past year.



Student Interns and staff — Indiana Department of Commerce, Tokyo, Japan

Extension and Outreach

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

Extension International Workshop. IPIA, in collaboration with the Purdue Extension director's office, organized a two-day International Extension Workshop in the fall of 2000. The goals of the workshop, which was attended by more than 40 Extension educators from throughout the state of Indiana, were to discern a vision and rationale for internationalization of Purdue's Extension programs in an era of globalization and to establish agreed upon goals and priorities for the state in this part of the university's mission. At the end of the workshop, a proactive plan for a focused internationalization effort was developed and the next steps were identified for putting the plan into action.

Among identified priorities is the creation of a new position in IPIA to focus on internationalization of Extension. In addition, there was broad agreement that there is a need for in-service training to build educators' capacity to develop internationally-oriented programs, to improve communication with educators about appropriate international opportunities, to recognize and affirm the value of international activities as a part of professional growth, to understand and engage in the international dimension of domestic activities, and to find the resources to permit these priorities to occur. An important step in this direction is the 2001 Annual Extension Conference theme of "Globalization."

Global curriculum development. The development of a Web-based high school curriculum to highlight global-local connections that affect students and their families is nearing completion. Designed as a series of modules, set in Moldova, Honduras, and Ethiopia, the curriculum permits students to work at their own pace on the lessons. Purdue, through the Schools of Agriculture (IPIA) and Education, has contributed to the design of this curriculum under the leadership of international program staff at Indiana University and the National FFA organization. Funding support has been provided through a two-year grant from USAID. The final phase of the project, which will be accomplished in the fall of 2001, is the introduction and dissemination of the curriculum to teachers across the United States.

News from IPIA

Global Consortium of Higher Education and Research for Agriculture (GCHERA). The Global Consortium, which was launched at an inaugural meeting in Amsterdam in July 1999, has expanded to include nearly 400 members from research and education institutions worldwide. Purdue University President Martin C. Jischke served as the founding President of the consortium for the period 1998 to 2001. The Secretariat for GCHERA moved to Purdue's IPIA office when Dr. Jischke became President of Purdue University in August 2000. IPIA provided the administrative and organizational support for the July 2001 Global Conference in San Francisco – a conference attended by approximately 200 people from more than 50

countries. Featured speakers included prominent agricultural education and research leaders from India, New Zealand, Kenya, Ukraine, Taiwan, and the United States. In addition to the IPIA role with the consortium, IPIA also provides administrative support to a leadership development component of GCHERA, the I-HELP Program. Twenty I-HELP Fellows will be placed at Purdue University and Iowa State University for part of the 2001/02 academic year.

Indiana Humanities Council. The International Affairs and Programs office of the Indiana Humanities Council funded IPIA to send a faculty member to France this past year. The purpose of this trip was to develop a plan for a partnership exchange program with French farmers and agricultural leaders on the topic of trans-Atlantic diversity and commonality in agriculture. A professor from the



The Sphinx and Great Pyramid — Egypt

(Ecole Supérieure d'Agriculture de PURPAN), met in Toulouse. Participants examined current issues impacting agricultural research, education, and outreach relevant to university roles in society. In addition to Purdue, participants also came from two other U.S. land-grant universities (Illinois, Kansas State), as well as from Wageningen University in the Netherlands and the host institution in France.

Russia program continues to expand. As a follow-on to a successful series of four student exchanges with Novgorod State University in Russia, the U.S. Department of State awarded the School of Agriculture (IPIA) funds to permit ten rural Russian women to spend three weeks in the United States to participate in a series of leadership development activities on the Purdue campus, in Indianapolis, and in Washington, D.C. Each participant received a mini-grant to underwrite the cost of carrying out a community development project in her home community upon returning to Russia.

The School of Agriculture was saddened by the untimely death of **Dr. John Axtell** in early December 2000. Dr. Axtell, Lynn Distinguished Professor of Agronomy, was a widely admired sorghum breeder who made enormous contributions to global sorghum production. He played a lead role for many years in the Purdue component of the INTSORMIL CRSP with significant achievements particularly in West Africa, where he collaborated with sorghum breeders in Niger. John will be greatly missed by all of us.

D. Woods Thomas Memorial Scholarship in International Studies. This year the D. Woods Thomas Memorial Scholarship in International Studies was awarded to V. Steven Green, Department of Agronomy. Green's research involves the study of microbial activities related to the carbon cycle in soils from the Cerrado region of Brazil.

IPIA international seminar series. Global agricultural development issues formed the central theme for the 11 seminars sponsored by IPIA/IP this year. President Martin Jischke was among the featured members of the Purdue faculty who led seminars. Off-campus speakers included scientists and educators from China, Ethiopia, India, Netherlands, Panama, South Africa, and Ukraine.

IPIA guest apartment in campus International Center. The IPIA guest apartment housed 20 guests from 13 different countries this year. The apartment is a low-cost service provided by IPIA to help departments host their international visitors.

Host Family Participation: A total of 13 Indiana families hosted international exchange students from Japan and Ireland. Host families provided room and board, an environment for cultural exchange, and an opportunity for students to strengthen their English skills.

School of Agriculture visitors. During 2000 – 2001 IPIA hosted 116 visitors from 25 countries.



IPIA Staff

David Sammons, Director
 Michael Stitsworth, Associate Director
 Lowell Hardin, Assistant Director
 Sally Ashlock, Assistant to the Director
 Zina Breschinsky, Eastern Europe and NIS Specialist
 Jody Geller, Secretary, CRSPs
 Katy Ibrahim, Administrative Assistant, CRSPs
 Prudie Miller, International Students and Visitors Coordinator
 Janet Schwanke, Secretary/Receptionist
 Linda Vallade, International Academic Programs Specialist

Office Contacts:

Telephone: (765) 494-6876
 FAX: (765) 494-9613
 International Programs in Agriculture
 Room 26 - AGAD
 Purdue University
 West Lafayette, IN
 47907-1168

<http://www.agriculture.purdue.edu/ipia>



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