Dr. William J. Hoover relinquished his position as Head of the Department of Grain Science and Industry in 1976 to become President of the American Institute of Baking when the Institute moved from Chicago to Manhattan, Kansas. Dr. Charles Deyoe served as Acting Head from the fall of 1976 until the spring of 1977. During that time a national search for the Head position was conducted. Dr. Deyoe was one of three candidates interviewed for the position. He was named to the position in June 1977. Dr. Deyoe had joined the staff in 1962 as Assistant Professor to strengthen the nutritional and biochemical aspects of the newly established feed technology program. Dr. Deyoe obtained his B.S. degree in Animal Science at Kansas State University and his MS. and Ph.D. degrees in Animal Nutrition and Biochemistry at Texas A&M University in 1959 and was an Assistant Professor of Poultry Science at that institution before moving to Kansas State University.

The Food and Feed Grain Institute had already been created and Dr. Deyoe, in addition to becoming Department Head, became Director of the Institute and later was also named Director of the International Grains Program established by the Kansas Legislature in 1978.

STAFF POSITIONS

Dr. Deyoe inherited the following staff members from Dr. Shellenberger’s and Dr. Hoover’s terms as Department Head: Professors Farrell, Hoseney, Johnson, Lineback, Pfost, Ponte, Schoeff, Tsen, Ward, and Wilcox; Associate Professors Eustace, Robinson, Seib, and Wetzel; Assistant Professors Balding and Bates; and Instructor Pedersen.

The faculty in 1984 included Professors Balding, Deyoe, Eustace, Hoseney, Hugo, McEllhiney, Ponte, Schoeff, Seib, Tsen, Wetzel, and Wilcox; Associate Professors Behnke and Wingfield; Assistant Professors Davis and Faubion; Instructors Curran, Posner, C. Stevens, and H. Stevens. Between 1976 and 1984, two staff members passed away, namely, Dr. Johnson and Dr. Robinson. Two staff members reached retirement age, namely, Professors Farrell and Ward. Professor Lineback resigned to become Head of the Food Science Department at Pennsylvania State University; Dr. Pfost resigned to become associated with Development, Planning and Research Associates Incorporated of Manhattan, Kansas; and Dr. Bates resigned to establish L.S.S. Products, a consulting firm in Manhattan, Kansas.

STAFF APPOINTMENTS

By 1985 the following additions, in alphabetical order, had been made to the departmental staff.
Instructor Steve Curran joined the Grain Science staff in 1976. He was employed by General Mills in Chicago, Illinois. Both his B.S. and M.S. degrees were obtained from Kansas State University where he majored in milling technology.

Arthur B. Davis joined the staff in 1980 as Assistant Professor. Dr. Davis obtained his B.S. degree in Animal Science and his M.S. and Ph.D. degrees in Grain Science from Kansas State University. He was Group Leader in Cereal Technology at the American Institute of Baking, Manhattan, before joining the staff.

Dr. Jon M. Faubion joined the staff in 1982 as an Assistant Professor. He obtained his B.S. degree in Biological Science in 1973 from Kansas State University and his Ph.D. degree in Grain Science from the same institution. He was Assistant Professor in the Department of Soil and Crop Science at Texas A& M University previous to coming to Kansas State University.

Dr. Cornelius Hugo was Assistant Professor and Project Coordinator for the Food and Feed Grain Institute. He obtained his B.S. and Ph.D. degrees in Agricultural Economics from Kansas State University.

Dr. Carol Klopfenstein was appointed to the staff in 1983 as Assistant Professor after serving several years as a graduate assistant in the department. She obtained her B.S. and M.S. degrees from Pennsylvania State University and a Ph.D. from Kansas State University.

Mr. Nicolaas Konijnendijk joined the staff in 1984 as Associate Director of the International Grains Program. Mr. Konijnendijk was employed by Wheat Associates in Rotterdam the Netherlands before joining the staff.

Professor Robert R. McEllhiney joined the staff in 1979 to be associated with the department’s feed technology program. Professor McEllhiney obtained his B.S. degree from Purdue University and his M.S. degree from Indiana University. He was Director of Production, Engineering and Quality Control for ConAgra, Omaha, Nebraska before moving to Manhattan. He had been employed previously by the Albers Milling Company in several locations.

Mr. Elieser Posner joined the staff as Assistant Professor in 1983. He obtained his B.S. and MS. degrees in the Grain Science Department and had extensive flour mill operation experiences in both Israel and the United States.

Mr. Carl Stevens obtained his B.S. and M.S. degrees from Kansas State University and joined the staff as an Instructor in 1977 to be associated with the feed technology program. He was employed by Land O’ Lakes, Fort Dodge, Iowa as an Operations Manager from 1974 to 1977.

Instructor Henry Stevens joined the staff in 1983 to be associated with the International Grains Program. One B.S. degree in Grain Science was obtained from Kansas State University and another B.S. degree was obtained in Metallurgical Engineering from Virginia Poly tech Institute. Instructor Stevens was employed by General Mills, Los Angeles, California before joining Kansas State University.
Mr. John Wingfield obtained his B.S. and M.S. degrees from Kansas State University. He joined the staff as an Instructor in 1977 and became Associate Professor in 1980. He was Vice President of Production for the Continental Mills, Portland, Oregon before moving to Manhattan.

A given in academia is that there are continuous changes as people retire, move to other challenges, or as budget reductions result in loss of funding and positions. In 1991-92 the faculty was; Charles Deyoe, Professor, Department Head, Director of IGP and FFGI; Professors James Balding, Keith Behnke, R. Carl Hoseney, Robert McEllhiney, John Pedersen, Joseph Ponte, Robert Schoeff, Paul Seib, Charles Walker, and David Wetzel; Associate Professors Jon Faubion, Ekramul Haque, Carol Klopfenstein, and Elieser Posner; Assistant Professor Steven Curran; Instructors Jeffery Qwirtz, P. V. Reddy, and Robert Pudden, Associate Director IGP Roger Johnson, and Research Associates Paul Neumann, and Carl Reed.

STUDENT ENROLLMENT

Enrollments in the three curricula of the department in the fall of 1984 were as follows:

- Milling Science and Management: 77 students
- Feed Science and Management: 46 students
- Bakery Science and Management: 53 students

There were a total of 62 graduate students enrolled in the Grain Science Department and five students enrolled in Food Science and Industry. Most Grain Science faculty were a part of the inter-departmental graduate program associated with Food Science, and thus were in a position to advise students in both programs.

In 1992 enrollments in the three programs were:

- Milling Science and Management: 111 students
- Feed Science and Management: 34 students
- Bakery Science and Management: 30 students

There were 37 master’s degree graduate students and 45 PhD students for a total of 82 graduate students in 1992.

During the period from 1977-1992 there was good support from industry to provide summer internships for the undergraduate students. These experiences often lead to job offers upon graduation. Salaries offered were at or near the top of those salaries offered to KSU graduates. Graduates from the graduate program found good opportunities in food, feed, baking and related fields.

FACULTY HONORS

Professor Wingfield served as chairman of the technical committee and Dr. Eustace was chairman of the educational committee of the Association of Operative Millers. Drs. A.B.Davis and J. Faubion were members of the Board of Editors of Cereal Chemistry and Dr. Hoseney was a member of the Brabender Award Committee. Dr. Paul Seib was chairman of the Hydrocarbon
Division of the American Chemical Society. Dr. Schoeff was secretary of the Market Research Committee of the American Feed Manufacturing Association. Professor McEllhiney, in cooperation with the American Feed Manufacturing, Inc., published another edition of the book, *Feed Manufacturing Technology*, and in cooperation with the trucking subcommittee, a publication on Truck Management.


**SPACE MADE AVAILABLE TO THE GRAIN SCIENCE DEPARTMENT**

Space became available to the department in the basement of Waters Hall and Waters Annex as a result of the reassignment of space used by the Agronomy Department for laboratories, offices and supply storage in those areas. These rooms were vacated when the Agronomy Department moved to the new Plant Science facility in Throckmorton Hall. Renovation work resulted in construction of a conference room funded from department SRO funds supplemented by funds from the Kansas Wheat Commission. An area formally used for storage was converted to a Wheat Room, a facility needed for participants from foreign countries who receive training in grain marketing, grain handling, and processing under the sponsorship of the International Grains Program. In 1981 plans were developed for renovation of space in Waters Annex to provide additional space and a classroom designed for use by the IGP activities. The planning of the renovation was done by architects assigned to the project by the University Facilities, which did the work. Professor Arlin B. Ward was instrumental in planning the Wheat Room and Waters Annex and also visual and projection equipment and devices for simultaneous translations. The Kansas Wheat Commission was responsible for the funding of the Wheat Room and the Kansas Legislature and the Wheat Commission appropriated funds for the Waters Annex project.

**INTERNATIONAL GRAINS PROGRAM**

The International Grains Program was established for the purposes of providing training
to participants in the processing and utilization of food and feed grains and of enhancing the marketing of grains.

Some Background

Professor Arlin B. Ward traveled worldwide in the 1960’s to bring technical training to overseas audiences of flour millers and grain processors, and, combined with activities of other faculty, the Department was reaching into every corner of the globe. Professor Ward began to encourage flour millers abroad to come to Kansas State University for regular academic programs as well as special short courses that used the experimental milling facilities as well as the pilot milling facility in Shellenberger Hall. Working with the Kansas Wheat Commission, Great Plains Wheat, Inc., and Western Wheat Associates, Inc. Professor Ward organized special seminars for wheat teams beginning in 1962.

Another international activity of the early 1960s in which the Department of Grain Science and Industry was involved contributed directly to expanding markets for U.S. grains. In December 1963 the Continental Grain Company sold one million metric tons of wheat to the Soviet Union, the first sale ever of U.S. grain to the U.S.S.R. Secretary of Agriculture, Freeman and the Continental Grain Company were very anxious that this transaction proceed smoothly and they wanted their own representative in the Soviet Union in order for cargoes to be checked upon arrival. The person chosen for this task was Kansas State’s Professor and Department Head John A. Shellenberger.

In February 1964 Professor Shellenberger traveled to the Soviet Union.¹ He was at Odessa on the Black Sea on February 24 when the first shipment of U.S. wheat arrived, 6,500 metric tons of durum on the U.S. vessel Exilona, and he worked with Soviet officials examining the quality of the grain.

Professor Shellenberger witnessed the unloading of only the one vessel during his two weeks in the U.S.S.R., but he visited extensively with Soviet officials about grain quality and unloading procedures.

Thus, Professor Ward’s work abroad, Professor Shellenberger’s role in the 1964 wheat sale, and activities of other faculty from the feed and bakery faculty laid the basis for a more extensive overseas role for the Department of Grain Science and Industry. In 1966 the Department’s international activities were formally institutionalized with the establishment of the Food and Feed Grains Institute (FFGI), which was created to allow interdisciplinary research activities in postharvest grains systems, that is, grain storage, processing, marketing and agribusiness development. Since 1967, FFGI had continuing agreements with the U.S. Agency for International Development and were conducting short courses in Grain Storage and Marketing. More on FFGI activities is found later.

The Idea is Born
It was felt that the Department of Grain Science could do more in the international arena, especially in the area of technical training in grain processing to support market development activities abroad. Moreover, the Department was growing rapidly, doubling its enrollment in the decade of the 1970’s.

In 1976 and 1977 the Kansas Wheat Commission and the Department of Grain Science and Industry discussed the prospect that a formalized program could be established using the technical facilities and professional expertise at Kansas State University to support overseas market development activities for wheat. Such an institute would be the first of its kind in the United States. The Kansas Wheat Commission accepted proposals prepared by the Department of Grain Science and Industry, and the Commission and the new head of the Department, Dr. Charles W. Deyoe, carried the idea to Great Plains Wheat and to officials of the Foreign Agricultural Service of the U.S. Department of Agriculture in Washington, D.C. The proposal elicited a very positive response, and was then taken to Western Wheat Associates with the hope that all technical training programs in support of wheat marketing activities could be brought together at one location. In working out these ideas and plans, the Department of Grain Science also reached out to representatives of the wheat industry in North Dakota and in the Pacific Northwest in an attempt to make the project broadly and truly national.

Prospects for Great Plains Wheat and Western Wheat Associates to put together a cohesive program were severely limited at that time, however, because the possibility of any other joint venture between the two cooperators took a back seat to their forthcoming merger, which was finally completed in 1980 with the establishment of U.S. Wheat Associates. Still, the proposal for a technical training institute for wheat generated sufficient interest that it was carried in January, 1978, to the annual meeting of the National Association of Wheat Growers in Wichita. While the proponents of the idea were seeking to assure that such a technical institute would clearly work for the best interests of the wheat industry in the United States, it was apparent that if any such proposal were to materialize quickly it would have to come from the bottom up rather than the top down, that is, the leadership would have to come from the state level rather than from a national organization, especially when the major national wheat organizations were focusing on the forthcoming merger.

While prospects for a cooperative national effort for wheat were fading in the early months of 1978, spokesmen in Kansas for the producers of corn, grain sorghum and soybeans were interested in seeing whether the proposed wheat marketing institute could be broadened to include those commodities as well. Such an institute, housed in the Department of Grain Science and Industry at Kansas State University, could provide technical support and assistance for the marketing of the major U.S. grains and oilseeds. While a technical training program would clearly benefit producers of wheat, corn, grain sorghum and soybeans in Kansas, the broader point was obvious - growers of those commodities any place else in the United States would also benefit.

With its expertise in flour milling, bakery science and feed manufacturing as well as in grain storage, marketing and handling, the Department of Grain Science was anxious to proceed. In Kansas, the marketing clout of the corn, grain sorghum and soybean producers had been enhanced the year before when the Kansas Legislature created marketing commissions for each,
joining the Kansas Wheat Commission which had been established 20 years earlier.

Working together, the four commissions met in Manhattan on February 17, 1978, to discuss the plans for a technical marketing institute that they would take jointly to the Kansas Legislature. Dr. Deyoe presented a comprehensive five-year budget for the institute that included the hiring of specialists in milling technology, mill control chemistry, grain marketing, grain grading and storage and other areas and that envisaged cooperation from other departments at KSU, such as Agricultural Economics, Agronomy, Entomology, and Animal Sciences and Industry, and from other organizations interested in promoting or expanding grain exports. As described in the proposed budget, the objective of the institute would be to assist the marketing activities for wheat, feed grains and soybeans by providing “technical assistance in wheat milling, wheat utilization, wheat quality assessment, wheat marketing, feed grains quality, utilization, and marketing and soybean processing and utilization in feed and foods by providing short courses, seminars and expertise to assist marketing activities at both domestic and foreign locations.”

Several of the nearly 50 people attending raised searching questions, showing their very keen interest in the proposed institute and their concern that the new venture be realistic in scope and properly funded. These issues were all aired thoroughly, and the roles of the cooperator groups working with the Corn, Grain Sorghum and Soybean Commissions - that was, the U.S. Feed Grains Council and the American Soybean Association - were discussed. After lengthy discussion, the meeting reached a broad consensus on the major issues, and the Corn, Grain Sorghum and Soybean Commissions joined the Wheat Commission in giving the proposed institute their formal support.

The Go-Ahead is Given

The Kansas Legislature gave the proposed training institute its formal blessing. For fiscal 1978-79, the Legislature appropriated $200,000 of general use funds for the new training and marketing program at Kansas State University, designated in the law as the “Agricultural Institute.” Thus, in the spring of 1978 the idea became reality, as the Kansas Legislature created the first professional institute of any kind in the United States to provide technical training in support of market development activities for U.S. grains and soybeans.

After launching the new institute, leaders in the legislature and in Kansas agriculture wanted to take a close look at a similar training program in Canada. On June 12, 1978, a team of a dozen people from Kansas, including legislative leaders, KSU officials, commodity commission members and representatives of the Kansas Farm Bureau, got into two small planes (one the Governor’s, the other the Farm Bureau’s) for a trip to Winnipeg to visit the Canadian International Grains Institute (CIGI). Established just six years earlier, CIGI provided technical training and short courses for overseas buyers of Canadian grains and grain products. The group from Kansas wanted to see how that kind of market development activity was carried out in Canada, and their visit to Winnipeg reinforced their conviction that it could and should be done in the United States.

As soon as it started, the new institute at KSU faced a full schedule of activities as well as the need to organize and plan for the future. On August 25, 1978, the first meeting of the institute’s
Advisory Board was held at KSU. Attending were several KSU officials, including Roger Mitchell, Vice President for Agriculture; Floyd Smith, Director, Agricultural Experimental Station; and, from the Department of Grain Science and Industry, Dr. Charles W. Deyoe, Department Head and Director of IGP, and Professors Arlin Ward and Eugene Farrell. Also attending were representatives of the four commodity commissions in Kansas, of Great Plains Wheat, Western Wheat Associates, the U.S. Feed Grains Council and the American Soybean Association.

At this meeting the group agreed on “The International Grains Institute” as the name, but it soon became apparent that this would generate a little confusion because of the already existing “Food and Feed Grains Institute” within the Department of Grain Science. Thus, a few weeks later the word “Institute” was replaced by the word “Program” and that new name stuck. From then on it has been known as the International Grains Program, or, more simply, as IGP.

Dr. Deyoe, previously designated as the IGP Director by Vice President Mitchell, told the meeting of several requests for technical short courses and other special activities. As a result of the expanded slate of activities, the Advisory Board agreed with the decision to proceed on the recruiting of specialized personnel, including experts in milling technology and feed grain marketing. Yet it was clear that the core of the program would be the faculty already in place in the Department of Grain Science and Industry, with individual faculty placed part time in IGP and this portion of their salary paid by IGP funds.

For the balance of 1978 the new program had a full schedule of activities, with 25 different individual and team visits from all over the world. The various visits covered a wide range of topics: wheat marketing, storage and quality; flour milling; feed manufacturing; baking technology; and agricultural education at land-grant institutions in the United States. From the outset the International Grains Program used three major tools to support market development efforts. First were the formal short courses, usually two weeks long, though some were shorter and others would last as long as five weeks. Second were special programs individually prepared for each of the more than a score of trade teams that would visit the International Grains Program every year. Finally were the overseas assignments to provide technical assistance, in which IGP specialists would travel abroad to assist market development activities with in-country seminars and workshops.

Annual reports for IGP activities have been developed since the Program began and can be consulted for further information regarding programs from the beginning to 1992.

THE THIRD FLOOR

The completion of the third floor of Shellenberger Hall was a significant achievement that was badly needed by the department. Following approval by the Board of Regents approximately 2 years were involved in developing the final plans for the addition and in developing the funding needed for the project. A national fund-raising campaign was developed. Dean McNeal, retired, vice president of the Pillsbury company as national chairman was assisted by H.D. (Joe) Hale,
president of ADM Milling company, Richard G Myers, executive vice president of Seaboard Allied Milling, vice chairman for baking, Harry D. Cleberg, vice president for feed sales and manufacturing Farmland Industries, and W. M. Jones, group vice president, Chow and Produce Products Divisions, Ralston Purina Company, in the industry fund drive that raised $787,000 matching $450,000 of funds appropriated by the Kansas Legislature and $300,000 from Kansas State University sponsored research overhead funds. The original foundation and structure were designed for the addition of a third floor and in 1975 a research laboratory and classroom were constructed as a part of this addition. However, it was not until 1983 that the total expanse of the third floor was completed. The installment of the third floor added approximately 10,000 square feet to the department as a whole, and at a total value of about $1,700,000 when including the value of donated equipment.

The third floor space provided for additional laboratories, classrooms, and offices. Also, the C. O. Swanson Library was moved to new and pleasant surroundings on the third floor. The additional cereal equipment provided a means for the special processing of corn, sorghum, and millet and this expanded the department’s research capabilities.

CURRICULUMS

Curricula for each program were reviewed during this period by faculty and industry input was invited from advisory groups for the respective curricula and from the AOM committees that faculty served on. The only major curriculum change in the three department divisions was in feed science and management, where the previous three options of business, nutrition, and operations were reduced to one with reduction in science requirements and elimination of all engineering course requirements. That curriculum shifted to predominantly business oriented. This represented faculty input and from discussion with industry personnel.

The curriculum situation appears to be complicated at the graduate level because a number of students are majoring in Food Science and Industry although pursuing their graduate research in the Grain Science Department.

NEW EQUIPMENT

Office equipment: The department acquired for research and office use computers and software facilities for word processing. The following equipment provides examples of equipment added:

Vydec 1200 Text Editors
Zenith Z100
One Vector
Feed Mill Equipment: New equipment in the feed mill included:
Wenger Extruder
Automatic sacker
Conveyor
Two feed roll stands
Forklift

New Cereal Milling Equipment: The flour mill had installed new air-filtering equipment and new roller bearings on the roll stands. The new third floor milling laboratory has the following equipment:
(5) double roll stands with drives and supports
(3) sifters
(1) purifier
(1) multi-strand pneumatic conveying system
(1) gravity feeder
(2) vibrating conveyors
(2) gravity table separators
(13) variable speed controllers
(1) motor control center
(1) programmable logic controller

Baking Laboratory New Equipment:
rounder
dough moulder
English muffin griddle
doughnut icer
spiral mixer
Kiser pie press
amyllograph
falling number apparatus
chopin alevograph
dextrin analyzer
intermediate proofer
bread slicer and bagger
roll divider and rounder
Mono high speed mixer
Reed oven
farino resistograph
mixograph
electroletic gluten washer
water acidity apparatus
IBM personal computer

MAJOR CEREAL LABORATORY EQUIPMENT

High performance liquid chromatograph with gradient elution capability
Interference-type refractive index indicator for HPLC
Laser diffractometer particle size analyzer
Near-infrared reflectance analyzer of the discrete filter type
Gravimetric electronic data system
Diode array ultraviolet spectrophotometric detector for liquid chromatograph
Automated research model HP1084 high performance liquid chromatograph
Grating monochromator near infrared reflectance spectrocomputer
Autoanalyzer for selected colorimetric analyses
Microwave absorption moisture tester
Chromatography data system for control and integration
Data system and interface for filter type near infrared reflectance analyzer
Digital plotter
Data mass storage unit
Muffle furnace with proportional control
Oven with proportional control
Electronic balance
Tecator fiber apparatus
Video camera (studio model)
3/4” U-matic cassette video recorder (2)
19” Sony video monitor and roll around cart
Fluorescent microscope
Apple II mini-computer

FEED EXTENSION

The Feed Extension staff, composed of Dr. Robert W. Schoeff, Dr. Robert A. Wilcox, and Mr. James L. Balding remained the same for many years, which contributed greatly to its experience and usefulness in meeting the public and providing expertise in feed technologies not only in the state, but also far beyond its borders. Subjects covered by seminars, short courses, and personal contacts are feed manufacturing, plant safety, quality control, laws and regulations, mill layouts, nutrition, materials handling, and government in limited feed manufacturing operations, but also served the large industrial feed manufacturer, especially in such areas as plant safety, government regulations, nutrition, and state laws. Computer operations were especially useful to the small operators because of the need for least-cost-operations and the extension staff has supplied assistance in these areas. However, budget cuts for extension at the federal level as well as state funding resulted in loss of extension positions so that after 1992 the department had funding for only one extension person.
FLOUR MILLING & FEED MANUFACTURING SHORT COURSES

Short courses for employees in flour milling and feed milling industries have continued. These courses were offered as a service to industry and were a separate endeavor from the regular university educational programs in these fields. The Association of Operative Millers short courses were given in the following years: 1974, 1977, 1978, 1980, 1982, and 1984. Average attendance was slightly more than 50 students and the duration of the course approximately one month.

Feed Technology short courses were given in the years: 1980, 1982 and 1984 with approximately 50 students per session. The duration of these courses also was approximately one month.

SCHOLARSHIPS

The Department had industry support for approximately 45 scholarships. Students with high scholastic attainments can be assisted in meeting their educational expenses when they enroll in the department.

FOOD AND FEED GRAIN INSTITUTE (FFGI)

The Food and Feed Grain Institute had been created and Dr. Deyoe, in addition to becoming Department Head, became Director of the Institute. Activity in FFGI was closely associated with Grain Science as several faculty were involved its programs and were jointly funded. In addition the SRO funds generated assisted in keeping up to date with copy and other equipment utilized in the support of the programs. The SRO generated by FFGI and departmental grant and contracts were involved in the funds needed for the completion of the third floor expansion.

COOPERATIVE AGREEMENTS WITH AID/S&T/AGR

Postharvest Grain Systems; July 1967 through 1990

From 1967 through the early 1990’s, the Food and Feed Grain Institute (FFGI) at Kansas State University (KSU) had continuing agreements with the Bureau of Science and Technology (S&T) of the Agency for International Development (AID) to provide assistance with postharvest grain systems involving grain storage, processing, marketing, and agribusiness development. This assistance was available to developing countries worldwide.

As the contracts and agreements changed over the years, emphasis shifted among the individual components comprising FFGI activities. Although different components were given more importance at various times, the basic components themselves remained relatively unchanged throughout this period. The major components were identified as technology transfer, training, research, and networking activities.

Technology Transfer
Technology transfer included technical assistance requests, reports and other publications prepared based on assistance requests and other subjects of interest, and the Postharvest Documentation Service (PHDS). The PHDS activity was housed in Farrel Library and was organized by a librarian funded by FFGI.

Staff members and consultants responded to 197 requests for technical assistance, including pre- and post-feasibility studies, from 60 countries.

Results of FFGI activities were published in the form of technical assistance reports, research reports, and special reports. A total of 113 technical assistance reports, 28 research reports, and 19 special reports on subjects of broad general interest were published through 1988.

PHDS, a computerized data retrieval system, was created in August 1978 to aid in the dissemination of information related to postharvest grain systems. Services available from PHDS included bimonthly acquisitions lists, document copies, and computerized document searches. PHDS had 1,267 clients, and the number of documents in the PHDS collection totaled 14,082. From January 1979 through 1988, 31,445 requests for documents were processed.

Training

Grain Storage and Marketing Short Courses were held annually on the KSU campus from 1970 through 1988. This intensive training in grain storage, processing, and marketing was provided to 496 participants from 82 countries.

Other on-campus training programs provided included a program evaluation, planning, implementation, and management course; courses on computerized methods of feasibility analysis; courses on systematic procedures for effective project formulation and evaluation; courses on grain handling, conditioning, and storage management; a workshop on the larger grain borer; and a seminar on the larger grain borer.

Funding for on-campus academic training was provided in grain storage technology for 41 students from 14 overseas countries as well as the U.S. (24 M.S., 17 Ph.D.), and in grain marketing economics for 10 students from 5 overseas countries (3 M.S., 7 Ph.D.). In addition, FFGI staff members advised and assisted numerous graduate students sponsored by other national and international institutions who were working on degrees in the fields of postharvest storage, handling, and marketing of cereal grains.

In-country training programs were designed so that the subject matter presented in the course met the individual needs of a given developing country. The objective of the training courses was to solve specific problems in grain storage, handling, and marketing through instruction of operational personnel and through the training of trainers. Training manuals were developed for each course in order to address the specific areas covered by the program. In-country training was provided to 1,049 participants in 21 countries.

Research
Based on problems encountered during assistance efforts in developing countries, research projects were developed to provide information not available for use in responding to those problems in postharvest grain systems. The overall objectives of the research activities were to apply solutions to problems existing in developing countries, assist developing-country institutions in improving human resources and research technologies, and provide applied training for developing-country researchers. Projects were carried out by staff members and graduate students whose work may or may not have been funded by the cooperative agreements.

Networking Activities

By virtue of its location within the Department of Grain Science and Industry at Kansas State University, FFGI formed working relationships with other academic departments located on campus. Through shared appointments of staff members, FFGI had direct contacts with the departments of Agricultural Economics, Agricultural Engineering, Entomology, Farrel Library, and Grain Science. These contacts facilitated cooperation among faculty members and provided the opportunity for research projects to be carried out in the areas of grain drying, grain storage, loss assessment, insect control and behavior, and grain marketing systems.

In addition to these contacts, FFGI established formal and informal linkages with institutions in various countries around the world. As a result of these linkages, FFGI participated in a number of international projects and programs, as detailed below.


Beginning in 1974, FFGI acted as AID’s representative to the Group for Assistance on Systems relating to Grain After-harvest (GASGA). This group included the member nations of West Germany, France, Canada, Great Britain, Australia, the Netherlands, the United States, and FAO. Their objective was to reduce food losses and increase the quantity and quality of food available to people in developing countries. As a GASGA member, FFGI hosted the annual meeting of GASGA in July 1975, sponsored a technical seminar on long-term storage of grains under arid tropical conditions in Washington, D.C., in May 1978. Participated in the publishing of the GASGA Priorities for Action in Reducing Post-Harvest Losses in 1979, and hosted the GASGA Executive Meeting in June 1982. In 1988, FFGI printed the Spanish version of a technical bulletin on the larger grain borer, Prostephanus truncatus.

An agreement for Cooperative Research on Postharvest Technology in Grain Science between FFGI and the Centro para Investigaciones en Granos y Semillas (CIGRAS) of the University of Costa Rica (UCR) was signed in January 1982 for the purpose of providing academic training at KSU and UCR for personnel of both institutions; initiating a training of trainers program; conducting research on grain drying, storage, and handling; carrying out postharvest loss assessment; establishing grain reserve programs; and developing a Latin American Postharvest Information Center.
This ongoing cooperation with UCR was extended for another 4 years beginning in January 1985. FFGI staff members have assisted CIGRAS personnel in planning a project entitled “Evaluation of the Postharvest Systems for Grains and Pulses in Costa Rica.” This led to the decision to undertake a collaborative project on Evaluation and Formulation of Postharvest Grain Loss Reduction.

FFGI had another link in Costa Rica with the Consejo Nacional de Producción (CNP). In January 1985, a Memorandum of Understanding for Collaborative Research and Development was signed between these two institutions. The purpose of this understanding was to develop research activities of mutual interest and to implement programs to address short and long-term needs of both institutions. Activities proposed under this program included grain handling, storage, processing, and marketing activities; price stabilization; grain grading; postharvest loss reduction; and training at the M.S. and Ph.D. levels.

FFGI and the Instituto Interainericano de Cooperación para la Agricultura (IICA) signed a General Agreement for Technical Cooperation on Post-harvest Losses and Grain Marketing. The objectives of this agreement, signed in January 1985, were to strengthen the national institutions in Latin America and the Caribbean responsible for grain handling and marketing, promote better coordination by analyzing the current situation in each country, prepare research proposals and the financial management for implementing these proposals, and provide technical assistance to carry out these activities.

KSU and the Escuela Agricola Panamericana (EAP) at Zamorano, Honduras, signed a Memorandum of Understanding for Cooperation in Postharvest Research and Training. The objective of this agreement, signed in 1987, was to establish the opportunity for cooperation in research and training in postharvest storage, processing, and utilization of grains. Networking with the EAP in conjunction with the Seed Technology Laboratory (STL) of Mississippi State University (MSU) produced a draft proposal entitled “The Development of a Seed and Grain Science Center for Central America and the Tropics at EAP, Zamorano, Honduras.”

SUPPORT OF SOUTHEAST ASIA COOPERATIVE POST-HARVEST RESEARCH AND DEVELOPMENT PROGRAMME:

FFGI participated in this program from 1977 through 1983. The program was sponsored by five international donor agencies and encompassed five ASEAN countries. The program was hosted by the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA), University of the Philippines, Los Banos.

As a member of a multinational team of postharvest specialists, a FFGI long-term advisor worked for 6 years throughout the Southeast Asian area (Indonesia, Malaysia, Philippines, Singapore, and Thailand). The technical team’s work was implemented in cooperation with the grain agencies and other national institutions of the participating countries. The team provided technical assistance to postharvest projects in four major areas: research, development, manpower training, and information.
Assistance was provided to research agencies in proposal planning and formulation, external donor support, management and monitoring of research activities, and analysis and evaluation of results. A total of 21 major research projects were carried out.

Development project assistance included technical advice and aid rendered by the technical team for operational activities such as design and development of equipment and facilities and formulation of feasibility studies. Seventeen development projects received continuous assistance throughout the duration of the project.

In the area of manpower training, the technical team conducted 14 regional and in-country training courses for various postharvest research and development workers. Furthermore, the technical team acted as resource persons for numerous country-organized training short courses in postharvest-related subjects.

Information services were organized and conducted to help facilitate the flow of relevant research and development information to postharvest workers in the project region. The activities undertaken included technical seminars on postharvest technology, exchange programs for personnel of grain handling and related agencies, numerous technical publications, establishment of the Postharvest Library, and attendance at international conferences and seminars.

SUPPORT OF PRICE STABILIZATION AND MARKETING RESEARCH PROGRAMS IN HONDURAS:

This program was designed to support and strengthen the activities of the Instituto Hondureno de Mercadeo Agricola (IHMA) by providing technical assistance, training of personnel, and institutional support. This support is provided by FFGI through technical assistance programs in three main areas: price stabilization and market development, market research and analysis, and facility management and operation. Assistance was provided to private firms and farmer cooperatives as well as to IHMA.

The project was originally initiated in January 1982 as a 2-year program focusing on price stabilization and market research, with a FFGI long-term advisor assigned in each area. It was later expanded in scope to include a third long-term advisor for facility management and operation, and the project was extended until April 1986. Short-term technical assistance and training expertise are provided by FFGI as needed to carry out the program.

Training and technology transfer in grain postharvest systems was a major focus of the program. Activities for accomplishing these goals included technical short courses, executive workshops, seminars, academic training, and on-the-job training. Training materials which were developed included slides and photographs, physical models, and demonstration sets, case studies, video tapes, microcomputer templates, and computerized simulation models.

Technical assistance efforts related to price stabilization and grain policies included (1) development and utilization of the IHMA computerized model to simulate benefits and costs of alternative intervention strategies, (2) analysis of alternative price support levels and quality differentials for basic grains, (3) development and implementation of internal reorganization
plans for IHMA, (4) design and development of IHMA’s Center for Information and Statistics, (5) development of IHMA’s computerized accounting and data base procedures, and (6) assistance in improving intervention patterns of IHMA’s grain purchases and grain sales for effective price stabilization to benefit producers, consumers, and marketers.

Technical assistance in market research and analysis involved (1) development of a market data collection system, (2) design and publication of IHMA’s market newsletters, (3) selection and use of computer hardware and software, (4) development of electronic spreadsheets and graphs of market prices and quantities of supply, demand, consumption, production, and related variables, (5) development and installation of procedures for obtaining and assessing market situation intelligence, and (6) development of procedures for assembling, publishing, and utilizing reliable information on trends in human consumption and industrial utilization of basic grains and grain products.

Technical assistance activities related to facility selection, management, and operations included (1) analysis of IHMA’s grain handling, conditioning, and storage network, and identification of priority changes to reduce operating costs and enhance operating efficiency, (2) detailed review of plans and specifications and supervision of construction of the IDB-supported rural silos and rice milling facilities, (3) supervision of planning, construction, and operation of the EEC-supported rural centers, (4) revision of IHMA’s facility maintenance program, (5) development and implementation of revised system of cost analysis for grain handling, conditioning, and storage functions by location and type of grain, and (6) design, installation, and operation of private-sector rice mills and other post-production facilities.

FFGI advisors also provided consultation on food and agriculture policy to those directly involved with policy-making and policy implementation in Honduran public agencies. FFGI advisors provided support in coordinating the FFGI program and other USAID-sponsored programs, and with related programs supported by EEC, FAO, ROCAP, IBRD, IDB, and other donor agencies.

STORAGE TECHNOLOGY DEVELOPMENT AND TRANSFER COMPONENT OF THE FOOD SECURITY MANAGEMENT PROJECT IN PAKISTAN:

The purposes of the Storage Technology Development and Transfer (STDT) component of the Food Security Management (FSM) project were to (1) to strengthen the capabilities of the Pakistan Agricultural Research Council (PARC) and cooperating institutions for testing and developing improved grain storage technologies appropriate to local conditions, (2) to enhance the ability of PARC to provide information on postharvest grain systems, (3) to assist in the development of bulk storage systems, (4) to organize and implement training programs for the rapid extension of improved technologies to all levels of managerial and operational personnel in the grain handling and storage sector, and (5) to provide training to enhance the skills of researchers and those personnel responsible for training programs.

Project activities, which were initiated in July of 1986, fell into four basic categories. The first was research, which consisted of five projects concerned with grain quantity and quality preservation techniques. They were (1) ecology of storage losses, (2) pesticide residues in grain
and grain products, (3) monitoring for insect resistance to pesticides, (4) development of integrated pest management protocols including weather information for storage management, and (5) wheat quality surveys. The second category was technology transfer, and those activities were composed of development of bulk handling and storage systems, support of postharvest information, and other technical assistance. The third category was external training, including academic and short-term training, as well as attendance at workshops, seminars, and meetings dealing with postharvest technology. The fourth category was in-country training, consisting of the presentation of a series of seminars, workshops, and conferences relating to different aspects of postharvest grain management; and the development of training units which provided a wide range of grain storage and handling training services to personnel in the Pakistani institutions involved with the STDT Project.

Activities undertaken in research included the planning and implementation of research projects and procurement of equipment and supplies needed to carry out the research projects. Technology transfer activities accomplished included the completion of a review of results of studies on the feasibility of public-sector bulk storage facilities, design of a bulk wheat handling and storage pilot project, and development of a post-harvest information system. External training activities included programming and conducting two 6-week invitational study tours and two 2-week study tours, and training of eight Pakistanis at the Grain Storage and Marketing Short Course held at KSU. In-country training activities included the planning and implementation of a series of workshops, seminars, and short courses.

FFGI staff involved in this project included a long-term advisor stationed in Pakistan, with short-term technical assistance and training expertise provided by FFGI staff members as required to carry out project activities.

RESEARCH FUNDING, GRANTS, AND CONTRACTS.

Over the years, faculty in Grain Science and Industry utilized funds appropriated through the Experiment Station in their research programs but were also successful in competing for and getting support from industry and other granting agencies. In the 1991 – 1992 period, grants awarded to the faculty in Grain Science and Industry totaled $1,273,402 and there were proposals pending for $157,303. The Food and Feed Grains Institute had grant/contract support of $1,135,019 and proposals pending for $1,158,511.

The activities of the International Grains Program and the Food and Feed Grains Institute provided an expansion of the Departments service nationally as well as internationally. As a result of the programs offered, the Grain Science Department was widely recognized and many attendees of those programs considered themselves as alumni and supporters.